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AN

ILLUSTRATED WEEKLY MAGAZINE,

FOR THE

ARCHITECT, ENGINEER, ARCHÆOLOGIST, CONSTRUCTOR,
SANITARY REFORMER, AND ART-LOVER.

CONDUCTED BY

GEORGE GODWIN, F.R.S., F.S.A.

LATE VICE-PRESIDENT OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS:

*Honorary Member of various Societies; Author of "History in Rules," "Town Sweeps and Social Bridges,"
"Another Blow for Life," &c.*

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

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THE BATTLE

Prologue.

THE day that we head our paper with a new date, does not necessarily mark any definite step in our lives and circumstances. The world wakes up much as usual, and man "goeth forth to his work and to his labour till the evening" without any sense of change; the duration of the period indeed is connected with the mechanism of planetary revolution, but the precise point at which we mark it off is arbitrary, and might be as well fixed in June as January. Yet the tendency to regard this recurring season as a new starting point, an occasion for considering our position, and our future work, is a natural and health-

ful one. It is a suggestion for a pause of inquiry as to the direction in which we are travelling, as well as an excuse for what the rowing men call a fresh "spurt." And so in wishing prosperous new year to all our friends, professional and non-professional, it will not be out of place to add a few words of suggestion as to the aim to be pursued by the representatives of architecture in the present day, if they would gain definite and enduring results from the work of this and the succeeding years.

Not that we are going to trouble our readers with an encyclopaedical view of the position and prospects of architecture, which, indeed, would be in danger of running somewhat beyond the ordinary limits of our article. And there are many practical points, on the importance of which all are pretty well agreed, and which only stand in need of sufficient experiment and investigation, to be regarded with an equal unanimity as to the ways and means of accomplishing the desired ends. But there are other subjects on which no one seems to agree, or to be much nearer agreeing now than ten or twenty years ago. And if there is one subject more than another in regard to which doubt, difference, and contradictory opinions seem to be the order of the day, it is that still vexed question, often so hotly debated of late years, as to the form, the nature, the degree of the purely artistic element which is possible in

modern architecture,—a question which, in some of its more recent forms, resolves itself almost into the inquiry whether there is really any such thing as architecture possible in the present day, anything comparable in importance and in beauty to the architectural remains of certain other epochs. Can we hope to say anything new or at all decisive on a subject which has been so much and so variously debated?

To a certain extent, the diversity of opinion on the question of style has been compromised. The "battle of the styles" is no longer carried on in its old form, and an armed neutrality prevails, consequent on the discovery and tacit admission, by partisans on both sides, that the mere revival of an old style will do nothing for us in the long run. A feeling of toleration has been established, partly owing to a really better insight into the principles of architectural style and design; and even one stern Goth is now content to admire and appreciate the beauties of Greek architecture, reserving his contempt for the detested "Renaissance,"—pooh-poohing Wren and all his works. It is satisfactory to find we have men so much greater than the architect of St. Paul's amongst us. More recently we have even seen another exclusively Gothic architect appearing as the champion of conservatism and respect in the treatment of our only Renaissance cathedral. This is so far well, as arguing the approach of a wider and more generalised view of the art of architecture. But there are evidences, among some of the most promising of our younger architects especially, of a growing doubt and dissatisfaction as to the whole status, the *raison d'être* of the profession of architectural design in these times,—a suspicion that the whole thing is possibly in some sort an anachronism: a feeling fostered, if not set on foot, by those who think themselves a rival body,—the engineers. And it must be said that such a feeling might not unfairly be prompted by the architectural history of this country for the last half-century. To the ordinary run of workers in the profession, those who are content to produce creditable and correct designs in the style preferred by their employers,—with whom the profession is, in fact, nothing more than a "respectable" way of earning daily bread,—such scruples would not, of course, occur. But to those who take more serious view of the work of their life, and who would be glad to feel that they are busied about work that will not only give them a living, but will be in itself a benefit to society,—something which has to be, and ought to be, done,—the doubt whether they are not engaged in a mere fashion, pursuing a shadow, may occur with disagreeable force and frequency, especially in the face of all the remarks and theories from time to time put forth from one quarter or another. They see that Greek architecture was enthusiastically studied and practised by men of excep-

tional ability, yet that its modern productions have failed to satisfy either our practical or artistic wants; that modern Gothic architects have strewn the land over with quasi-Medieval churches, of which people are already beginning to tire; and on the other hand architectural critics are ever found repeating that a new style cannot be deliberately made, and that some forms already in existence must be taken as a starting-point to work from. What is the truth out of all this contradiction? "Where shall we find the concord of this discord?"

The temporary character of the Gothic "revival," as it has mostly been practised, can scarcely be doubted. There has been such a blind admiration of everything Medieval,—such a systematised copyism,—such a condemnation of attempted progress,—the whole movement has been so closely associated with other mental tendencies and prejudices,—that architecture has been, in the main, reduced, more than at any other period, to a great dilettantism,—a mere medium for assisting in the reproduction or depiction of the lifeless features of a past age and state of society. On the other hand, it is not to be supposed or expected that men with any strong feeling for the beautiful and picturesque in building, practising as architects in the present day, must or can shake themselves free from the influence of the monuments of a greater age of architecture: nor is the fact that they cannot do so a clear proof that there is neither artistic genius nor originality among us in this century. For it must be remembered that the productions of the greatest periods in almost every art,—those which remain as standard examples for admiration and imitation,—have arisen at a time when the best part of the mind and enthusiasm of a nation has been directed towards that particular object. The Italian intellect of the fourteenth and fifteenth centuries was directed to painting, as one of the noblest objects of life, which might well employ the powers of the first men of the day. The English intellect of the Elizabethan era poured itself out in the drama; that of the Edwardian period found its expression in architecture; and the excellence of the dramatic and architectural works of the two periods is to be traced, in great measure, to the fact that in each case dramatic and architectural art, respectively, formed the one chief outlet for artistic expression, to which everything else was subordinate and subservient. The mind of the present age is more active, perhaps, than at any of those former great periods of art-production; but it is divided,—its strength is spent and distributed over a score of different forms of expression. Could we, by any magical spell, shut out suddenly from the educated England of to-day all artistic interest, all media for artistic expression, except architecture,—could we, at the same

time, furnish the same opportunity and excuse for the erection of great buildings which existed in the Middle Ages,—we should probably see a new growth of Architecture before long, in forms as impressive as any already existing. But we cannot do this: only a small part,—a very small part,—of the national mind is given to architecture at present; and that part is not in itself strong enough to escape from the impression left upon the art by the builders of a more purely architectural age. It is the same in other arts: we see it in the enduring influence of the school of Italian painting; still more remarkably, perhaps, in the almost ineffaceable impress left by that purely æsthetic people, the Greeks, upon the artistic hieut of mankind since their day,—as Lord Houghton has elegantly expressed it, in a little poem entitled, "The Flowers of Helicon,"—

"And downward thence to latest days
The heritage of Beauty fell
And Grecian forms and Grecian lays
Prolong'd a their humanising spell,
Till when new words for man to win
The Atlantic's riven waves disclose,
The wilderness there began
To blossom with the Grecian rose."

Certainly this neo-Greek blossoming on the other side of the Atlantic may not be, if looked at closely, exactly the kind of thing that an architectural critic would be enraptured with; it may be paired off, perhaps, with that resurrection of Mediæval castles which a New York paper assured Mr. Baskin he would find if he visited their city. But what we would indicate is, that the impress of the great age of every art, the age when that particular art was all-in-all to men, will not and cannot be effaced; that it must, and, indeed, ought, to influence those who aim at carrying on the same art in an age of more multifarious efforts and more divided aims. And, therefore, it is not fit that critics should hoist the black flag, and cry "no hope," because it is found scarcely possible to produce a pleasing architectural design in the present day, which shall not be largely based upon the features of one of the great styles of former times. It is natural and inevitable that it should be so. What is required is, that this adaptation from former styles should begin, so to speak, at the right end. The Gothic revival was not purely an architectural movement. It is a feature only in a temporary revival of modes of thought and feeling which were once part of the very life of the nation; a kind of blowing up of old embers, which is a very common phenomenon in history. Of this artificial revival, the modern Gothic architecture is part of the scenery; one of the "properties" of a very theatrical display. But it need not be used so. If instead of adopting the outer forms of the Mediæval buildings in the first instance, as we have mostly been doing in our churches, and fitting the use of the building to them, we begin at the other end, and, after considering the wants and requirements to be met, take suggestions from the Mediæval builders for their architectural treatment—hints to be worked out further, improved upon, adapted to the particular case in hand,—there is no reason why the study of Mediæval architecture should not exercise an influence in favour of, rather than adverse to, real originality. For originality consists quite as often in doing better, or in applying in some new manner what has been done before, than in absolutely creating a completely new form. We have instances among the works of modern architects,—not very numerous certainly,—in which this has been accomplished; in which we may see features and a mode of treatment clearly and ostensibly based on Mediæval models, and yet as clearly stamped with the modern designer's own individuality. And that designs so evolved may have a lasting and real artistic interest we may infer from comparing the results of a similar proceeding at another epoch in architectural history. We hold the Italian Renaissance to have been beset with serious, deep-lying faults and misconceptions, so far as architecture is concerned; but will any candid critic affirm that there is nothing in the designs, for instance, of Palladio and Sansorino—nothing in their working up and combining of classic details,—which has added to the domain of *inventive* design in architecture?

And it is in such consideration that we must find a reply to those who are inclined to look at engineering as the sole possibility in the present day. It has been suggested that the engineering works of this century are to us what the cathedrals were to the thirteenth century; that they may hereafter be studied as models, though

some may not suspect it now. There is a sort of basis for this idea in the fact (as we believe it to be) that few great things that have been done in the world have been recognised as great at the time of their being carried out. Presently the Mediæval architects had no idea that they were doing anything which would be the admiration of a future posterity, just as Shakespeare probably was not aware of the real value to mankind of the great dramas which he so carelessly giving to the world out of his superabundant treasury of intellectual wealth. But is it at all conceivable that at any future period any one would think it worth while to sketch, either en masse or in detail, the features of our principal engineering works, from more interest in them as beautiful and expressive objects? Can any lapse of time render the tubular bridge at the Menai Straits an object of pleasure to the eye? And in another point, too, the parallel scarcely holds good; for we should say the engineers of the present day have a very strong idea that they are doing great things, and make little concealment of their opinion on that point. The subject is recalled anew by the very suggestive paper "On the Progressive Use of Iron in Building," read at the Conference of Architects, and which we printed last week.

The opinion therein expressed, that the true architectural treatment of iron, is one which is frequently paraded in different quarters at present, and in which there is a certain degree of truth. But, like many other people who have got a new hobby, the advocates of this view override it a good deal. Mr. Aitchison thinks we had better have everything ugly, so long as it is our own. The alternative is not quite so desperate as that. We wish to have things that are beautiful and pleasant to look at around us, if possible; and when the writer of such a paper implies in one sentence that he can see no beauty in a Gothic capital (calling it a "course burlesquing of nature") and elsewhere finds admiration for so clumsy and bungling an artifice in building as the holding up of a long stone butel by concealed iron supports, we must conclude his "common sense" to be a little stronger than his artistic sense, and receive his observations on such points with caution. But there is a fallacy in the parallel drawn between stonework and ironwork in architecture, which seems to be oddly overlooked. Iron is not, like stone and timber, a purely natural material: it is one mechanically and chemically worked up to a condition for use in building. It is, therefore, under different conditions practically and architecturally; practically, because we do not really know how long it will last; and architecturally, because it can never combine with landscape as a stone or even a brick building will. If the Mediæval builders had been acquainted with iron, and roofed their cathedrals with it, it is probable that not one such roof would be left now: and on architectural grounds, the parallel between the cathedral vault and the railway station roof will not hold good, because it is evident that the builders of the former did look upon grandeur of effect as an object,—their buildings not being indeed utilitarian in a strict sense,—and it is certain that the designers or constructors of our railway-station roofs have no such aims. The point which might most reasonably be urged in favour of iron as the modern material, is that society is more changeable and mobile than formerly; that it may be more convenient to have comparatively temporary structures than vast piles made to last for generations. But even this argument, which would have a certain truth in it, we suspect would prove to be only very partially applicable. That iron is an important addition to our stock of building materials, and that there is an interesting problem for the modern architect in characterising architectural treatment of it, is, perfectly true. But why, because iron is discovered, stone should be any worse than before, we fail to see; and must label the dictum, which would call this the "iron age" of architecture, "not proven."

Another feature in the published report of the Conference proceedings, however, is suggestive; viz., the large space occupied by the purely practical papers, especially those dealing with treatment of new materials, and (on the whole, we must say) their superior interest and value. It is in the treatment of new practical requirements in general, and in the endeavour to bring these under the domain of architecture

properly so called, that the most interesting and fruitful problem for the modern architect may be said to lie. And most particularly this may be said in regard to town architecture. We are obliged to crowd together, in towns, for the needs of manufacture, of commercial as well as social intercourse. We have little less hideous, less depressing in aspect, without involving a disproportionate outlay; to render our private houses edifices pleasant and suggestive to look at, as well as comfortable to live in; these are points in which modern architecture with us has made but insufficient progress as yet, and in the course of endeavours to solve these the modern architect, if his interference be permitted, may find plenty of suggestion for novelty and originality of treatment. This kind of task, of course, seems prosaic, in comparison with the building of cathedrals, and yet it has its nobler side, too; and perhaps such humbler efforts, as they may seem now, would be as likely as any others to bring us to the "Golden Year," according to Tennyson's reading of it,—

"Old writers push'd the happy season back,
We forward,—circumers bold, for well I know
That unto him who works, and feels he works,
This same grand year is ever at the doors."

THE COAL QUESTION NOT ADVANCED.

VAGUE statements of contradictory opinions, illogical inferences from stated premises, blinking the main points at issue, and total failure to grasp the important question referred to them for inquiry, such are the salient features of the "Report of the Commissioners relating to Coal in the United Kingdom." It may be thought that it was from a dutiful wish to frame their language on the model of the very questionable English employed in the phraseology of the Commission itself, that the Commissioners have so successfully avoided the use of that terse, idiomatic, perspicuous style which would have been proper to a practical report on a subject of such deep national interest.

In fact, it can only be considered as a solemn mode of trifling to refer a question which should have been entrusted to the skilled investigation of a competent civil engineer, to the *diffident* hands of a Scottish duke and fourteen assessors. That respectable, even eminent, names are upon the Commission, there is no doubt. But what good service can the country expect from fragments of scientific or practical men bound up in tons of unorganised mass? "By snatches of time, now and then, from other duties," writes one, "I have got through my Coal Commission Report" (p. 71). "Preliminary estimates of the work to be done, and the cost incurred," writes another, "proved insufficient, both as regards time and cost." "I beg to record my earnest protest," are the words of the most eminent member of the Commission, "against the statement made in page xii. upon the probable existence of coal fields under the creeks and other secondary rocks in the South of England." Mr. Elliot disagrees with the introduction into the Report of the calculation by Professor Jevons, the only calculation, by-the-by, that has been verified by fact. Accord of any kind appears only to have been arrived at, by the careful suppression of any individual opinion, sage counsel, or practical issue of the five years' occupation of the Commissioners.

The Report commences with an elaborate statement of the mode in which the fifteen discordant Commissioners proceeded still further to pulverise their corporate existence by splitting themselves first into five, and then into seven, committees; the aptness of each of which for its task was insured by each of them having to leave to serve on any committee he pleased! It is true that the words follow, "in addition to that specially assigned to him." "The members chosen," it need not, therefore, surprise us to find, "proceeded, each on his own plan, to investigate." It is satisfactory to learn that, by the 9th of June, 1871, the work, which had been authorised on the 28th of June, 1866, "had so far advanced that the reporters held their first meeting," when they "forwarded a draft report upon twenty-three sub-reports." We wonder how long Isambard Brunel or Robert Stephenson would have taken, to draw up a report on this great engineering question, which really would have shed some light on the prospects of the future.

The object of the Commission, or rather what

ought to have been proposed as an object for the serious inquiry of a competent man, whose entire attention should have been exclusively given to the investigation, can only be inferentially arrived at, from the boggling language of the Commission, which the Commissioners quote at the head of their Report. That object ought to have been three-fold. First, to ascertain what quantity of coal exists in the United Kingdom, within practical limits of economical working, regard being had not only to absolute depth from surface, but to thickness of seam, and to mineralogical value of coal. Secondly, to state the actual consumption of coal, and to show, too, in what ratio, according to the statistics now attainable, that consumption may be expected to increase, regard being had to any increase in the cost of working. Thirdly, to point out the indications thus afforded of the probable diminution, increased cost, or even general arrest, of the coal supply of the future, and to indicate such improvements, engineering or legislative, as may seem called for to prevent waste, or in any other useful manner, to husband our supply.

There can be no doubt that a report that should reply to these questions, as intelligently and definitely as one of the great engineers, whose names we have mentioned, would have repaid to them, would have been a statistical paper worth some outlay of public money to obtain. How it is that no such report has been even attempted by this cumbersome and protracted Commission, it is for them to settle with those who appointed them. They appear, in fact, to have been instructed in the most slovenly manner, and to have by no means bettered their instructions by their mode of carrying them out. We speak, it must be understood, of the general Report, rather than of the more ship-shape details on which it is based.

The Commission, indeed, does call for a Report on the quantity of "coal which may be reasonably expected to be available for use." The mode in which this has been dealt with, is as follows:—"Doctor Sanderson,"—for it is characteristic of the Commission to hang their main assumptions on individual, and sometimes very slender, pegs,—states it to be his decided opinion that labour is not practicable in moist air of a temperature equal to that of the blood, namely, 98 degrees, excepting for very short intervals." It is unnecessary to say that we fully agree with Dr. Sanderson, although a reporter more familiar with the subject might have stated the facts in a more practical manner.

"The depth," the Commission continue, "at which the temperature of the earth would amount to blood-heat, is about 3,000 ft." We may remark that there is good reason (as admitted in a note) for calculating that this temperature, at which men cannot work, except for very short intervals, is attained at a depth of 2,690 ft., and that the pressure of damp heat upon the vital force is already considerable at 2,000 ft., a matter of not much commercial importance in reviewing the question of cost. A margin of 420 ft. in depth is, however, added by the reporters, in virtue of a difference of 7 degrees in temperature, between the heat of the working faces and that which they impart to the air. The evidence, however, reduces that difference from 7 degrees to 3 degrees. This is a question not only of efficiency of ventilation, and of the length to which the "long-wall system of working," which is credited with this advantage, is carried from the shaft, but of actual earth-temperature. A further depth of 580 ft., giving an additional rise in temperature of from 10 degrees to 11 degrees, and a corresponding amount of barometric pressure,—an element disregarded by the Report—is then allowed for "possible expedients which the future may elicit for reducing the temperature!" It is therefore "assumed that a depth of at least 4,000 ft. might be reached." At what cost is not inquired. That is to say, a theoretical addition of 1,310 ft., or of nearly 22 degrees Fahrenheit of temperature, beyond the depth at which, according to the evidence, men cannot work except for very short intervals, is "assumed" for the purpose of arriving at a round number of an agreeable magnitude. On this highly business-like and satisfactory assumption, the value of the labours of the Commission is made, in the first instance, to depend.

But we have not yet exhausted the assumption of Committee A. Even giving them their margin of 33 per cent. for contingencies, or for the possible outcome of lucky inventions, all carried to the credit side of the account, nothing is more certain than the fact, that a large proportion of

the coal, above the limit of practical working as far as depth is concerned, will never be brought to the surface. The Commissioners have, indeed, admitted this principle by limiting their calculations to beds of more than 12 in. in thickness. But it must be borne in mind, that with every fathom in depth, the great expense of opening a mine, the sinking of the main shaft, increases. The deeper the mine, the greater the area of the subjacent mineral that must be wrought from a single shaft, economy being duly considered. Without attempting to fix the inferior limit of the bed which may be thus economically wrought at a great depth, it is evident that 12 in. is ridiculously under the mark. Indeed, the bathymetrical limit must depend, in a great measure, on another element, entirely left out of sight by the Commissioners, namely, the mineralogical character of the coal. Between the total quantity of coal within 3,000 ft. or 4,000 ft. of the surface, and the total quantity of coal worth winning at these depths, there is an enormous difference. The Commissioners seem to think that if a spade is a spade, coal is coal. As to details of what every particular bed of coal is worth chemically, they evidently despise them. Have they not taken five years to make a report, such as it is? Would they not have required five-and-twenty years to frame such a report as we suggest? Let us be thankful for what we have got. If we are discontented, the Report has a word of comfort. "Every hypothesis must be speculative" (p. xvii.). Very true; but we hardly needed to go to a Cabinet Minister, and his colleagues, to be taught as much as that. In fact, a right acquaintance with the Greek tongue might lead any one to imagine that the phrase, though brief, is tautologous.

While thus the amount of coal practically likely to be worked is not even guessed at by the Report of this Commission, let us inquire how it fares with the second question, that which regards the probable future rate of consumption. Here, any one who looks at the Report with the admiration natural to ignorance, will say,—We have at least valuable matter! Here we have tables and diagrams, population curves, and decennial ratios! If the Commissioners do not know how much coal we have, they have at all events told us how long we shall be, before we expend that unknown "hypothetical" quantity.

Unfortunately, the same inability to make any practical use of the valuable information collected by the various committees, that characterises the Report under the first head, adheres to it consistently throughout. We are first told that 146,000 millions of tons of coal would last for 1,000 years, if burned at the rate of 146 millions a year; which profound arithmetical discovery is presented to us in two or three alternate shapes. A volume which was published in 1865 is then quoted, as giving an estimate that all our available coal will be exhausted in 110 years; and "yet another view" is placed before us, according to which, our supplies will last for "upwards of 1273 years." Between these rather wide limits, the Report leaves its readers to please themselves.

It does, however, although still with the same conscientious fear of incurring the responsibility of an opinion, detail an intermediate hypothesis, which it illustrates by tables and a diagram. Nothing can more strongly show, to any mind accustomed to deal with statistical information, the puerile character of the Report (as distinguished from the materials on which it is founded) than the selection of these hypothetical illustrations for prominent publication. The increase of the population of Great Britain in the decade 1811-21, was 1,971,416. In the decade 1861-71, the increase was 2,737,416. The first increase was at the rate of 15.977 per cent., and the second at the rate of 11.736 per cent. Thus, with a very rapid and augmenting actual increase, the rate of that increase, calculated on the numbers from which the comparison starts, in each instance, shows a diminution. It is assumed that this diminution in the rate of increase will continue; and a curve is drawn on that assumption, which arrives at an estimated population of 182,000,000 for the year A.D. 2231; to which date the exhaustion of our coal is considerably postponed, by this calculation. It is, however, left out of sight that while the rate of increase diminished from 1811 to 1841, this diminution began to disappear in the following decade; while from 1861 to 1871 the rate shows, instead of a diminution, an increase of nearly 5 per cent., or of 14 per cent. as compared with the lowest value. Any curve, then, that takes into account all the recorded

facts, will differ most materially from that proposed by the Commissioners. Indeed, the somewhat anomalous results of the seven censuses of the population, which form the element of the calculation, are such as to show, that we have as yet too few data to trace any course of probability, even for the next ten or twenty years. No serious and competent man, having his own reputation at stake, would have cared to give prominence to such a mere shot in the dark as the "Population Curve," lithographed by the Commissioners.

Connected with this totally imaginary curve, is a tabular estimate of the consumption of coal for the next four centuries, founded on the extraordinary assumption that, up to the year 1931, the consumption per head will slowly augment, but that from that date until the final exhaustion of the coal in 2231 A.D., it will remain an exactly determined and equal quantity. Really the public should not be called on to read what are called estimates, framed in such a manner as this!

We shall continue the subject in our next.

"HISTORY OF THE GOTHIC REVIVAL."

THERE was once a poet,—we will not here associate his name with his unfulfilled prophecy,—who wrote,—

"Doom'd to hide her banish'd head
For ever, Gothic architecture fled."

But did Gothic architecture ever fly this land? Notwithstanding all that has been said about the Revival of Gothic Architecture, we doubt whether it ever really died out. Every one knows there have been, for the last 200 years or more, edifices erected in accordance with the sympathies created by a study of Classic literature; and every one also knows that these do not, altogether, represent the work of those centuries. It would be, indeed, difficult to draw any line that would show so short a period as thirty years in which the most eminent architects did not design in the Gothic style. Inigo Jones has the credit of introducing Palladian architecture into England, but some of his Gothic designs in country mansions are of great interest. Sir Christopher Wren's Gothic was eclipsed by the proficiency he attained in the Classic mode of building, but not only were some of his earliest designs Gothic, but one of the last works of his long life, the steeple of St. Michael's, Cornhill, was also in that style. He died in 1723. In 1747 Walpole wrote to his friend Conway, that he had taken possession of his new purchase, Strawberry Hill. In 1749, Sir Hugh Smithson and the heiress of the ancient Percies were married, and in the succeeding years rebuilt a great part of Alnwick Castle in the Gothic style. "They are building at Northumberland House, at Sion, at Stanwick, at Alnwick, and Warkworth Castles," wrote Walpole to them, jeringly. And when the year 1796 came, the great octagonal tower of Font-hill Abbey, that was to be as high as a cathedral spire, was begun. In 1826 Sir Charles Barry built his church at Brighton; and in 1839 the first stone of the Houses of Parliament was laid. So that, in truth, Gothic and Classic architecture have existed side by side.

Mr. C. L. Eastlake, in the work before us*, gives an account of the events and circumstances that have led to the almost exclusive study of Gothic architecture, so that architects are found who are proud to say that they know nothing about any other, and do not think it worth while to look at an example of any other, even when it comes in their way. Mr. Eastlake shares our impression of the continuity, rather than decay and regeneration, of the Gothic style, by explaining that it is "an attempt to show how the taste for Medieval architecture, which lingered in England during the two last centuries, has since been encouraged and developed." A large feature of his book is a list of selected examples of Gothic buildings erected between the years 1824 and 1870; but he by no means limits his previous account to this period, for he begins with John Shute, and drops chronologically down past Inigo Jones, Wren, Holt, Batty Langley, Nash, Wyatt, and the rest, till he comes upon the men of our own time. We mention the list of selected examples, however, thus prominently because it appears to us to show the manner and measure of the author's bias, and of his knowledge of his subject. Some one

* "A History of the Gothic Revival." By Charles L. Eastlake, Architect. London: Longmans, Green, & Co. 1872.

remembered that even architectural critics, if possessed (however erroneously) with a strong conviction that an unsatisfactory building is going to be erected at immense expense, and that its erection will amount to a throwing away of the finest architectural opportunity of this generation, may think that they have grounds for opposing such erection, quite apart from any feelings which deserve to be called "virulent" or "malevolent." It is instructive, too, to be informed, on such good authority, what the "type of modern architecture" is, and that there is no mean between wild Mediaevalism and the New Post-office; but if the latter reference be meant for a fling at Mr. Fergusson, it is fair to remember that that gentleman has publicly and very clearly implied (though not feeling at liberty to make a direct statement) his non-complicity in that design, save in regard to some retouching and shaping.

Again, it would be a little rash to conclude that, because the *Daily News* can give no good reason for admiring Mr. Street's design, those who dislike it are necessarily in the same irrational predicament. We must protest, too, against the wholesale imputation thrown on the non-professional public by the statement that they are ready to "welcome" the termination of the dispute by the adoption of the present design, whatever its defects.

The English public know very little about architecture, certainly, but they (necessarily) know still less about this particular design, of which they have had but small means of judging; and to assert that they do not care what kind of building is put up in the metropolis, provided it answers its practical object, would be to infer that they are even more ignorant and indifferent about art than is really the case.

HAMMER-BEAM ROOFS.

At the meeting of the Architectural Association, held December 29th, 1871, a paper was read by Mr. W. White, F.S.A., on this subject, suggested for special consideration at a visit by some members of the Association to Eltham Palace a few months ago. The roof of the old hall, standing on walls dislocated by its action, might seem to discredit the principle of hammer-beam construction, if on examination it did not appear an instance of its imperfect application. The roof, although elegant in form and detail, is found to be very faulty compared with numbers of the other remaining specimens of its kind. The walls above the corbels are thrust outwards, and otherwise displaced; the framing of the principals has opened at the ridge, collars,—at most of the joints, in fact, of several of the trusses. The hammer-beams extend very slightly over the walls; the weight of the principal rafters descends within, instead of, as is usual, on the outer faces of the walls; on the depression of the end of the hammer-beams caused by subsidence at joints, rendered more largely by the flatness of the curved braces under the collars, the hammer braces have acted as powerful levers on the walls, submitting naturally to strange changes in their own forms at the same time. A combination of defects being found in this example. Mr. White considered carefully the various theories current as to the principles applied in these roofs. The idea that a system of equipoise was the aim of the constructors, though not unreasonable or entirely unsatisfactory, did not carry sufficient conviction to his mind to prevent him from considering that further investigation was necessary. His idea was, that trussing and tying, the intentional use of timber in a state of tension, were present in these combinations, as well as the more obvious and generally recognised corbelling and strutting. Dissecting the arrangement of the Westminster Hall roof, he found it probable that the great curved braces, assisted by the under-braces forming the trefoil, acted very frequently as ties, incapable of sagging or straightening, and thus of movement at their extremities. If this could be established,—with pendant pieces, principal rafters, and collar-beams in compression,—there would be found all the necessary parts of a true truss in the modern and customary sense; a construction in which the whole of the principal timbers are either pushed or drawn in the direction of their length. Though not in possession of a large amount of the kind of information required, only to be got by a minute examination of the joints of a number of roofs, in order to detect and appreciate the various halvings, tenoning, and

pinning, he thought he had found some confirmatory facts which would lead him to look still further into the matter; he, for his part, could hardly regard with ready acquiescence the statement often made that the course of Gothic roof construction in England "consisted in the substitution of frames of wood for arches and gables of stone, varying Mediaeval science from one material to another, and infusing into carpentry constructive principles that were previously the mason's own." The theory of equipoise, that might be summed up shortly as the balancing of the weight of the upper portion of the roof on the overhanging end of the hammer-beam against the weight of the lower portion on the other end of it pressed down by the principal rafter on the wall,—the top of the wall-pieces or pendant posts being a kind of fulcrum,—this theory supposes, almost of necessity, much forgetfulness by the old builders of the resistance of timber to tension. In view of the dignity and harmony with the masonic forms of large, grand architecture attained in the use of solid beams, of large scantlings,—dignity and harmony hardly possible with the use of more meagre scantlings nowadays; he was inclined to look for, what he thought he had found, viz., a not unscientific use of materials, a construction without parade of its triumph, but intentionally containing provision against the remotest as well as the immediate future. In the bulk,—considered as a new construction, we should now say the wasteful bulk,—of these timbers was lodged a reserve of power capable of being turned to new uses when slight failures, and perhaps varying conditions, altered the disposition of the strains. The roof of Westminster Hall, requiring only such maintenance as any building might be expected to call for after standing near upon 600 years, showed practically that the defects so readily seen at Eltham Palace Hall were not derived from the older example, which had within itself the means,—not of self-destruction, but of re-adaptation and of endurance.

The paper was illustrated by sketches and by many diagrams on the black board, which it would be necessary to reproduce in order to give in full what has been outlined above. The "Illustrations by H. Dunngay and C. Laver, of the Palace at Eltham, with Essay, &c., London, 1828," give the jointing of the roof with considerable care; though Mr. White thought he had detected a different treatment in some of the several principals. A discussion followed, and some opinions were expressed as to modern iron roofs, and their comparatively small chance of long endurance; the light rods used to provide against tensile strains have, it was stated, no reserve of strength to make them ready in case of new demands, in heavy gales, and other sudden changes of stress. Setting aside the inevitable, as it would seem, decay that will in no very long time demand the renewal of every iron structure, there are often other operating causes of disturbance, making one look with some satisfaction on the sober, simple construction, and the massive timbers, of the Gothic roofs. The lesson from the Eltham failure,—to give all cantilevers much solid bearing,—and other practical points, were dealt with; and the meeting separated with a vote of thanks to Mr. White, and wishes for a Happy New Year for all from the president.

NEW SYNAGOGUE FOR LIVERPOOL.

A new synagogue being required for the old Hebrew congregation, at present in Seel-street, a select competition was decided upon, and six architects were requested to furnish designs. Two of the invited architects declined to compete, and the remaining four accepted the invitation, namely, Messrs. Andsley, of Liverpool; Mr. Collins, of London; Mr. Grayson, of Liverpool; and Mr. Salomons, of Manchester. On Sunday, the 10th ult., by the votes of the free members of the congregation, the designs were reduced to two for further consideration; and ultimately the design by Messrs. W. & G. Andsley was selected to be carried out, and to Mr. Collins was awarded the second premium. The style of architecture adopted by Messrs. Andsley is Saracenic, treated with freedom. The building is to be executed in brick and stone, richly ornamented. The western front is in five graduated divisions, separated by octagonal and square turrets, terminating in domed canopies. A large doorway in the centre division gives admission to a vestibule, extending the whole

width of the building, and flanked with the staircases to the ladies' galleries.

The interior is spacious and lofty, and is divided into nave and aisles by columns and arches. The nave is covered with a vaulted ceiling, and the aisles by sloping panelled ceilings. The interior will be lighted by two orders of windows in the side walls, and a clearstory over the arches of the nave. At the east end of the building is placed the Ark, and behind it the choristers' gallery. The building is to be erected in Prince's-road, near the Church of St. Margaret.

EIGHT PLATES OF COAST SCENERY.

"COAST SCENERY."—the title seems to smell of the sea. It carries us off from dingy London to some daisy-carpeted southern down or northern link, looking out over bay or friar; from murky mid-winter, with the gas burning at noon, to the early autumn, with pater and mater-familias and their brood, rushing off north, south, east, and west, to the seaside, with that fondness for the water which is part of the nature of the city-people of Englishman.

The title above quoted indicates the presentation work, provided for the current year, for the members of the Art-Union of London, each of whom receives, for his guinea, besides the chance of a valuable prize in the general distribution, this series of impressions of eight steel plates, engraved from drawings by David Cox, Copley Fielding, and Samuel Prout.

It is only necessary to hear these names to be assured of the high quality of the works, and the originals have been worthily interpreted by the hurins of Mr. Willmore and his coadjutors.

We believe that that penchant for the sea we have noted will induce a great many people, who are only infants in art, to covet these plates; while the artistic quality of the work will tempt many who do not care much for the sea.

The views, though the same theme runs through them all, embody such different states of weather, &c., that monotony is satisfactorily avoided.

We have the calm summer evening, the setting sun lighting up the "Hulks," after Sam. Prout, which show the graceful sweep of line and careful touching in of detail in which he so delighted.

"Off Teignmouth," we have a short chopping sea, and the dark, driving clouds indicating rougher weather to come.

"At Beaumaris," while the sun still shines on the church and the houses along shore, the sea is getting rough, and the men in the boat are hastily getting down their mainsail.

In "Plymouth Sound," the contrast between the pitchy cloud in the background and the mainsail of the yawl and edge of the fortifications touched by the setting sun is exceedingly effective.

Taken as a whole, we do not think this Society has ever produced an annual work likely to please a larger number of people than the present. We cannot see that anything can be found in it to cavil at.

We notice from the return given in the report lately printed by the council, that in the last distribution the proportion of prizes was rather more than one to every twelve members, and we are mistaken if this year's issue, aided by the greater general prosperity of the country, does not greatly raise the proportion of prizes next April.

At a time like the present, when every institution, from Royalty to Bumblebee, is on its trial, and there is no title so sacred but that some one may be found with boldness enough to question it, it would be well for each one if it could show as good a *raison d'être*, as the Art-Union can, in pointing to such works as those now produced.

The New Library at Lincoln's-Inn.

For some time past the benchers of Lincoln's-inn have determined to appropriate some of the funds in their hands to the construction of a new wing to their library attached to the ball, which has of late years been found inadequate to accommodate the number of students who are in the habit of frequenting it. The design has now been carried out, and an additional building, 50 ft. in extent, is being rapidly constructed on the east side of the original structure, and immediately fronting the side of Vice-Chancellor Mahns's Court, which will produce a new building of nearly 110 ft. in length.

AGRICULTURAL PIPE DRAINAGE,
IN CONNECTION WITH ARTERIAL DRAINAGE AND
OUTFALLS.*

OUR president, in his opening address, at the commencement of the last session, kindly referred to my paper "On Arterial and Agricultural District Drainage" (vol. 1, p. 71, of the Transactions), and expressed a wish that our Institution should be put in possession of the details, both of the execution of pipe drainage and of its effects upon land.

Although the general results of drainage cannot but be well known to most of those to whom this is addressed, I venture to comply with the President's call, and will endeavour to place on record such information as I possess upon the subject.

Arterial drainage and outfalls are, as I have before stated, the leading works in all systems of land drainage, and to them I have paid particular attention as the means by which minor or subterranean drainage can be carried out safely, effectively, and permanently; but without a knowledge of the requirements of pipe drainage, arterial drainage cannot be properly designed and executed.

It may be remembered that in the paper referred to by our President, several methods are described by which arterial drainage can be accomplished, and it is shown that it must be dealt with in a scientific manner, and on an extensive and comprehensive scale, in order to prevent floods, to control the supply of water for all agricultural and social purposes, and to provide for the deep drainage of open ditches, and for pipe drainage.

Those who are familiar with this kind of draining, must have understood that the end of all pipe drainage, let the depths be what they may, is to keep the subsoil water at such a level as not to allow it to rise to the roots of the plants, injuring their growth by its coldness and non-fertilizing properties, and to render the soil above the pipes more friable and open, by making it moderately dry, and causing a circulation of air through it.

A very prevalent opinion existed that the sole use of pipe-drains was to take off to an outlet water which descended upon the surface of the land, as rain, or overflowed from springs, &c., and with many farmers this idea is still prominent, and they cannot understand that if drains are sunk in clay soils as deep as 4 ft., the drainage water will ever reach them, or the land ever be improved; and if left to themselves, they would not lay the drains deeper than 2 ft. or 2 ft. 6 in.

I have many times tried to convince them what is the source of the water, by showing it to them by trial holes dug in stiff clay, and asking them where they thought it came from, as there was no appearance of its having run down the holes from the surface of the land, or of its having percolated from the sides of the holes. I have shown them that it could only rise from the bottom; but in few instances only have I found that the conviction, even if arrived at, lasted very long. I have also shown them that, after a drain has been dug out to its proper depth, in a few hours water will gradually rise where there was none before.

Many instances are well known in which shallow drainage, say from 2 ft. to 2 ft. 6 in., has been taken up and the pipes roiled at depths of 4 ft. and upwards; and it is scarcely possible to believe that in the present day persons can be found who would practise shallow in preference to deep drainings. There have certainly been failures in deep draining, but these have arisen from imperfect work; either the pipes have not been laid in a true line in the drains, or proper attention has not been paid to the fall or inclination, or, more frequently, to the distance between each other at which the drains are laid.

When the soil between the drains has been rendered perfectly permeable, so that rain water sinks to the full depth of the drains, and the subsoil water rises up to their level, the work may be deemed to be satisfactory, as showing that the drains have not been placed too far apart, having regard to the depth in the particular soil which is being treated.

Many persons, being desirous of saving the cost of deep draining, have placed the drains closer together—with shallower depths; but it will be found that this system entails a greater cost and is not so efficient or durable. The

table, which will be found under the head of cost, shows the several rates per acre at various depths and widths apart.

The alternative, in case of a defect either from the pipes being laid at an insufficient depth, or too far apart, is to do the work over again or to allow it to remain a lasting disarrangement.

I will now proceed to direct your attention to the practical parts of the question, and will first deal with the nature of

Soils.—In laying out drainage the principal difficulty in determining both the depth and width apart of drains, is found in dealing with the different kinds of soils that are met with. The first question that naturally arises is,—what is the geological formation of the locality? and what is the inclination or dip of the strata? From the answers to these questions we are able to infer the existence or absence of permanent springs. Thus, for example, beds of gravel, sand, or other free soil, surrounded or underlain by beds of clay or other impervious strata, store up large bodies of water, which by slow percolation saturates the surface of the country. So that we can in such cases, by simple means and a small amount of work, free large areas of land from wetness. A knowledge of the soils may be gained by sinking trial holes, exceeding in depth the proposed drainage, or by boring to moderate depths.

The depth from the surface with which it is necessary to deal is really very small as compared with the great masses of material which make up any geological formation; but, nevertheless, it is highly necessary that the engineer should investigate every feature of the soil, the form of the land, its inclinations and produce, in order that he may be able to lay out the work to be executed both efficiently and economically, as well as in the manner best suited for the future improvement of the land. Soils may be classed in two grand divisions—clays and free soils, and it is these we have to deal with; but it must be remembered that each of them admits of several subdivisions, and in both cases rock may be mixed with them.

Depths of Drains.—In all cases in which loans of money are made by the drainage commissioners under the powers of their Acts, the Inclosure Commissioners, who sanction the charge upon property for the repayment of the loans, require 4 ft. to be the minimum depth of pipe drainage, and experience has fully confirmed the good effects of this rule, after several years' practice. This minimum depth has been fixed after mature deliberation; but it ought not to be imperatively insisted upon in every kind of soil or under all the varying conditions of land.

One constantly meets with the objection that water cannot get down through thick clay, and that it is useless to go so deep as 4 ft.; but our experience teaches us that the soil, having become more loosened and opened by cracks, admits the permeation of water to that depth at least; the very worm-holes permit the water to percolate, and after it has once found its way, by gravity, through the soil, by innumerable small passages, it never ceases, year after year, to continue the same course, until the whole depth, from the causes before cited, namely, the prevention of the capillary attraction upwards of ungenial water, the admission of air by the pipes, and the gradual filtering of rain from above,—is totally changed in character from that of an obdurate and untractable soil to that of a more genial plant-producing one.

The same effects are produced both in arable and pasture lands, but the system to be adopted in draining them is somewhat different. I have hitherto endeavoured to prove that there is a certain minimum depth at which pipe drainage is capable of producing the best results, more particularly when applied to stiff clay.

Distances apart.—I think a general rule might be established to determine, in connexion with the depths, the distances at which the drains should be placed apart from each other, and that is that the width should be a multiple of the depth: for instance, 4-ft. drains may be 16, 20, 24, 28, 32, 36, or 40 ft. apart, the depth being first found at which the level of the water-beds stands beneath the surface. We must then judge, from the nature of the soil, whether it will allow of the water finding its way, for half of any of the above widths, to the pipes, always bearing in mind that water will find its way most quickly to a vacuum or the point of least resistance. Take, again, any soil in which it may be found that the water level stands at 5 ft. deep, the multiples may be 40, 45, 50, 55, or 60 ft.; and so with 6-ft. drains, the widths may

be 60, 66, 72, 78, 84, or 90 ft. The drainer's judgment and experience will enable him to determine at which of these widths the particular soil which he finds will act best, remembering again that each line of pipes, *i.e.*, member again, only influences half the distance between it and the next one on either side of it.

The depths of pipe drains can be determined (as we have already seen) by many conditions of the soil and of the water-beds as they are found in the land; but the determination of the widths at which the drains should be laid apart requires much practical knowledge of the nature of different soils, especially as regards the facility with which they allow water to percolate through them, the object being to drain arable land sufficiently, while not overdraining grass land. The expense is lessened considerably when great widths can be attained, even at an additional depth. The rate I have before referred to as the measure of the width would still require the judgment of the drainer to decide what soils will be properly drained by any of those distances apart.

Inclinations or Slopes of Drains.—Owing to the constantly varying slopes of the country, scarcely any rule can be absolutely laid down for the inclinations at which the pipes should be laid. The greatest attention is required in laying the main pipes, into which the smaller branch pipes run. In flat countries they should always be set out with the spirit-level, and the depths from the surface given to the men at every one or two chains along the line. Water will run freely at inclinations of 1 ft. fall to 1,000 ft., 2,000 ft., or 3,000 ft. of length, where the pipes are well laid; but it must be observed that at every junction of a branch pipe the flow will be impeded in the main pipe by the water entering from the branch pipe, sometimes running with considerable velocity. So that as much inclination as possible should be given to the mains, in order that the hydraulic pressure may force the current towards the outlet. The inclinations of the minor or branch pipes must necessarily be controlled by the natural slopes of the ground. In a general system, laid out on a definite plan, it is better to have as few outlets as possible, and I need hardly say that all the minor or branch pipe-drains ought, at their lowest ends, to be united or joined up to one main pipe of such larger dimensions as may be proportioned to, and capable of discharging, the water from a given area of land; these larger pipes being conducted to the lowest extremity of the area to be drained, and there discharged into an open drain or stream.

The cost of long lengths of large pipes, increasing in size as they go, raises a question as to the expediency of using them, but the work is easier to maintain than when a large number of outlets is used.

I have frequently found it most useful, in laying both large and small pipes, where the bottoms of drains are in soft boggy, or sandy soils, and there is every probability of the pipes sinking or getting out of their proper inclination, to lay them on strips of wood cut into three planks of elm, or other timber as durables in water, from $\frac{1}{2}$ in. to $\frac{3}{4}$ in. thick. The cost is very trifling, and is as nothing compared to that of having to re-open and relay the drains, while doubt of the success of the work is thereby to a great extent avoided.

Outlets.—The pipe at the outlet or head should be raised above the ditch or stream, which should be cleared, and, if required, deepened for some distance, so as to ensure the water not being backed up into the pipes. I have adopted self-acting iron traps at the outlets, in cases where the tide has occasionally risen against them; but the chief object was to prevent the mud, of which there is generally a large quantity in tidal waters, from being taken up the pipes, and there left to deposit itself. All outlets should be protected by brick or stonework, set in mortar or cement, the foundations being sunk from 1 ft. to 2 ft. under the bottom of the ditch or stream, which should be paved to receive the water from the pipe.

Referring again to the depths of the drains, it is frequently necessary to lay the main drains 6 ft., 7 ft., 8 ft., or even 10 ft. deep in places, in order to drain land to an outfall, which lies at too low a level to allow of the ordinary depths being employed.

Sizes of Pipes for certain Areas.—In all engineering questions relating to the flow of water through pipes, there are fixed rules for ascertaining the quantity discharged, when running full, according to the size of the pipes, their

* By Mr. Richard Boxall Grantham, C.E. Read at the Ordinary General Meeting of the Institution of Surveyors, December 18th, 1871, Mr. Edmund James Smith (member) in the chair.

inclinations, and head or pressure above the point of entrance of the water into the pipe. But in the case of pipes in land drainage, which are not as a continuous tube, no rule can be applied to measure the quantity that flows, so as to adapt the sizes of the pipes to the particular cases in which they are employed, because the quantity of water which is taken in is very uncertain, and in some cases most irregular, and the inclinations vary at every change of surface, so that in some parts of the same pipe the velocity is very great, and at others very small. It is seldom found that the same amount of water is discharged out of any two pipes in the same field, and this is frequently the case even when they are side by side. The quantity of water varies very considerably under the different conditions of soils in which the pipes are laid; for instance, in free soils with springs, and in times of much rain, which penetrates quickly, all the pipes will run full, and likewise, at times, in free soils with rain alone. In free soils the percolation of water in suspension through the soil being slow, and rain water also descending slowly, the pipes are not overcharged; besides, in such soils, the pipes are at more frequent intervals, and would, if the water came as rapidly as from the free soils, discharge it more easily. In the early period of land drainage, pipes of 1 in. diameter were commonly used, but they were not continued for any length of time, and they were seldom if ever sunk in the ground deeper than 2 ft. or 2 ft. 6 in. Pipes of 1 1/2 in. diameter succeeded them, and, more recently, 2-in. pipes have been almost universally adopted for the branch drains. There was also the horse-shoe pipe, laid on the tile as a sole; but these have totally failed and become obsolete. The adoption of 2-in. pipes, the area of which is 3-14 square inches, has been a great improvement, inasmuch as, besides being in nearly all cases large enough for the water to run out, they allow the air to pass up when they are not full, as before described, and thus anchorate the condition of the soil above and around them. No single rule can apply as to size; but, as regards the sizes of main pipes, into which the minor pipes discharge, some attention is required to regulate them, and, if possible, their inclinations. In these cases, however, it would be impossible to fix the sizes by the ordinary rules of engineering; so that it is necessary to resort to experience, aided by a few approximations which serve somewhat as guides. These main pipes vary from 3 in. up to 12 in., and 2 ft. in diameter, in proportion to the area which will discharge into them, and the inclinations at which they are laid. The following table gives the approximate sizes of pipes for soils of maximum density and lightness:—

Diameter of Pipe.	Area of Pipe.	Area Drained.	
		In Clay Soils	In Free Soils.
Inches.	Square Fathes.	Acres.	Acres.
3	7-66	1 1/2 to 5	3
4	12-56	9	6 1/2 to 7
5	19-50	16	13 1/2 to 14
6	28-08	25	20 1/2 to 22
7	38-22	35	30
8	49-92	46	40
9	63-18	60	50
10	78-90	75	60
11	94-38	91	70
12	112-38	109	80

The several degrees of porosity of soils between the extremes, must be treated as experience may dictate, and the inclination at which the drains are laid will affect the question; for instance, a rapid fall of the branch pipes into the main pipe would necessarily require that the latter should be increased in size; but a slow discharge does not require larger pipes than those given in the table.

Directions of Drains.—In ordinary-sized fields it is convenient, and in no way interferes with the efficiency of pipe-drainage, to lay out the minor drains in each field exclusively for that field, but to connect them with a main drain, which may be laid so as to take the water from several fields to a distant outlet. In uniform soils, whether dense or free, the usual practice is to lay drains parallel to each other, on what is commonly called the *gridiron system*. In stiff clays, where the drains are more frequent, this plan is undoubtedly to be preferred, for the reasons before stated,—that the water may be equally drawn off from all parts, and the land uniformly aerated. In free soils, such as gravel, sand, and the like, where there are springs which rise to the surface, and are visibly saturating large or small areas, the drains may be run in

such directions as will enable them to tap those places, and ultimately to drain a larger area.

Deep as drainage may be laid, it is never altogether free from the possibility of being put out of order by the roots of trees or of certain kinds of crops which may penetrate the drains, and form a hindrance to the free passage of the water through them. The roots of the elm, ash, willow, and other trees are known to enter the pipes, and even pass through the ground for several yards to reach them, as if they were attracted by the moisture and air which they find in the pipes, and by the nourishment afforded them there. To obviate this difficulty, it is advisable, where it occurs or is apprehended, to use socket-pipes jointed with cement, or to lay the pipes as far as possible from the trees. I have found that embedding the pipes in lime, mortar, or concrete has prevented them from being choked, although close to trees which it was impossible to avoid, and has kept them clear for some years. The roots of some crops, such as wheat, turnips, carrots, mangold, &c., if they should penetrate the pipes, die away when the crops are removed, and are frequently washed out of the mouths of the drains by the strong flow of water through them. Other substances give the drainer a vast amount of trouble in obstructing pipes. Ochreous water, depositing oxide of iron, is a common source of obstruction. It appears to harden and consolidate as it receives air through the pipes, and ultimately chokes them. I have found it best to get at the source of the spring or springs, and conduct the water away by large pipes independent of the general system. Ferrous and parasitic plants will also get into the pipes, grow, and ultimately stop the flow of water through them. Another source of trouble is the percolation of sand into the pipes, which necessitates patience and care in taking them up, frequently after being first laid and relaid, until all the water has run out of the bed, and then laying them in straw and on strips of wool.

Pen land draining is one of those exceptional cases where great skill and attention are required. In an instance with which I am acquainted, some fen pasture-land that was letting at from 2s. to 3s. an acre, was drained and broken up, but it produced scarcely any crops. It was too closely drained, and some lime champed before it even partially recovered from the effects.

Mr. Clutton, in his paper on "The Cost of Conversion of Forest and Woodland into Cultivated Land," having alluded to the drainage which was carried out at Hainault and Shroob Walk, has drawn my attention to draining under those circumstances. I will just state that in the former case, although some pains were taken to grub up the roots of the oaks and hornbeams with the trees, we constantly met with them in the drains, and they were either taken out or cut through. Some of the roots in the light soils, in the southern part of the forest, were found deep in the ground.

At Shroob Walk, where the soil was almost entirely a uniformly stiff clay, we had not so much difficulty arising from this source, but in both cases the cost of draining was thereby increased, and this applies also to the land containing briars and underwood only. Could the draining have been delayed for a year or two, the roots would have nearly all rotted off.

Draining through rocky ground is very expensive, but, as in most rocks water either lies above the beds or below them, it frequently taps a large area of land, and where the rock projects out on the face of a sloping country, which it frequently does, it holds up the water in the land above it, so that one or two drains carried through it let free a large quantity of water, and the land will be permanently drained. The most obdurate rocks are those found in the high land of the old red sandstone, the lias, those of the coal measures, and others. This stone may be used for the farms or public roads, and this will very much relieve the expense of getting it out of the drains.

Cost.—The most material consideration resulting from all the experience of soils, depths, widths apart, inclinations, directions of drains, and sizes of pipes, is the minimum cost at which the work can be done, so as to obtain the best result in permanently improving the land. This must vary in different parts of the kingdom, according to the soil, the rate and quality of the labour for this kind of work, the seasons, and the price, quality, and cost of carriage of the pipes. Sometimes the cheapness of one or two of these items will counteract the dearthness

of the others, so that something like an average may be arrived at.

I have kept a register for some years past, which shows the rate of cost per acre and per rod of drainage works, executed under my supervision in localities distributed over a large part of the kingdom. This summary includes about 120 distinct works, representing every variety of soil and every degree of difficulty, ranging in quantity from 10 acres to 1,900 acres. The rates of cost extend from 3l. 6s. 8d. to 9l. 5s. 4d. per acre, and from 11 pence to 36 pence per rod, whilst the number of rods of drains to the acre varies from 39 to 115. The following are the results shown by this record up to the end of last season:—

Total Quantity Drained.	Total Number of Rods Cut.	Rods of Drains per Acre.	Total Cost.	Cost per Acre.	Cost per Rod.
A. B. P.	No.	No.	£. s. d.	£. s. d.	£. s. d.
15,006 2 16	1,136,219	75-7	90,284 12 10 6	6 0 3	10 7 0

It should be stated that these figures include the large and exceptional work of drainage of disafforested land at Hainault, the 1,900 acres of which cost upwards of 8l. per acre, and averaged about 105 rods of drains to the acre, the widths apart varying from 18 ft. to 60 ft. according to soil.

Where the rate per rod is high, the rate per acre may be low, and *vice versa*. This necessarily arises from the nature of the soils, the prices of the pipes, and the widths of the drains apart, with other varying circumstances before referred to.

I have arranged the following table, which gives the general prices of work under the various conditions:—

Ordinary Cost of Cutting and Filling Minor Drains, using 2-in. Pipes, at say, 25s. per 1,000.

Depth.	Rate per Rod for Cutting and Filling.		Rate per Rod for Pipes.		Total.
	s. d.	s. d.	s. d.	s. d.	
4 feet	0 8	0 5	1 1	1 1	
5 "	0 10	0 5	1 5	1 3	
6 "	1 1	0 5	1 6	1 6	

Cost of Main Pipes per Rod.

Size.	Price per 1,000.		Rate per Rod.
	£. s. d.	s. d.	
3 in.	1 15 0	0 7	
4 "	3 0 0	1 0	
5 "	4 10 0	1 6	
6 "	6 0 0	2 0	
7 "	8 0 0	2 8	
8 "	10 0 0	3 4	

Cost per Acre of Cutting and Filling, including Pipes at various Depths, and Distances apart.

Depth of Drains.	Distances apart.		Cost per Acre.
	Feet.	Feet.	
1	16	£. s. d.	
"	20	8 18 5	
"	24	7 3 0	
"	28	5 19 2	
"	32	5 1 10	
"	36	4 9 4	
"	40	3 19 5	
"	44	3 11 6	
"	48	3 5 0	
"	50	2 19 7	
"	55	4 10 1	
"	60	4 14 1	
"	65	4 2 6	
"	70	3 13 4	
"	75	3 6 3	
"	80	2 15 0	
"	85	2 11 3	
"	90	4 11 6	
"	95	4 2 6	
"	100	3 13 6	
"	105	3 6 0	
"	110	3 0 0	
"	115	2 14 9	
"	120	2 11 0	

To these rates should be added from 12s. to 15s. per acre for turfing, building up outlet heads, deepening and widening outfall drains, foreman's wages, superintendence, &c.

The cost of cutting through rock must always be exceptional, and no rule can be given for that kind of work.

Duration of Pipe Drainage.—Another question which deserves much consideration and attention is that of the duration of pipe drainage, and its continuously effective working. These properties depend almost entirely on the manufacture of the pipes, which are buried deep, and cannot be got at to be repaired without some expense, and which, when out of order, are

always liable to be neglected or repaired in an inefficient manner.

Where all the work has been well done, drainage executed thirty years ago is known to be in an efficient condition, although pipes were not then so deeply laid as they are now, and it may be fully expected that the deeper they are laid the less liable they will be to be injured or disturbed: a strong argument in favour of deep draining.

In conclusion, I have to make a few general observations on points which ought to be attended to in laying out and executing this kind of drainage, whether on a large or small scale. Like many other matters, drainage, when dealt with wholesale, can be done at less cost, and more efficiently. When an estate is to be drained, a comprehensive scheme should be at first determined upon, and taken in hand as a whole, whether the work is to be carried out all at once or to be extended over two or more seasons.

As to the manufacture of pipes—great variety exists in the cost, the localities in which they are manufactured, and in the quality. There is of late years a great improvement in the make of them. The cost in the yard, in different parts of the country, varies from 14s. to 25s. per 1,000, for 2-in. pipes, the 78 per cent. of difference partly arising from the quantity a manufacturer can make, owing to the facilities he has, and the nature of the clay, and partly from the price of fuel, or the amount of capital he can command. The carriage frequently very much increases the expense,—adding, in some cases, 50 per cent. to the first cost. The larger sized pipes increase in cost in greater ratio than the difference of the sizes, and the carriage also is greater in proportion, owing to increased thickness.

On an estate, where a large work is to be carried out, and where, probably, bricks are required for farm buildings and cottages, it is much more convenient to establish a pipe and brick yard upon it, provided proper clay can be procured, and a navigation or a railway affords the means of bringing coals.

Another important matter, upon which the successful result of pipe drainage mainly depends, is the superintendence. You want a man who not only can lay the pipes in a trench, but he must be of strict integrity, seeing that the trench is cut to fit the size of pipe, and with a proper fall, so that the waters shall always run clear away, and that every pipe is laid perfectly true in line, and so joined to its neighbour that neither loses any of its area by the ends not fitting truly and closely to each other. The foreman should watch closely that no bad (that is, unburnt) pipes are laid, as they will inevitably perish in time, and destroy the whole work. Men who are trained to the work become so skilled in laying out the direction of the drains that they can judge with tolerable accuracy the amount of fall in any distance, and the inclination at which the pipes should be laid. Of course in very flat countries the spirit-level must be brought to their assistance. The men who become the best skilled in digging the trenches make good wages; and I have always found that the workman who makes the best work earns the most money, and does the work most quickly. I would rather employ men who earn from 20s. to 23s. per week than those who can earn only 15s. or 16s.; but, of course, in a gang, all the men are not required for the most difficult and skilful part of the work. Farm bailiffs, who have other work to attend to, ought never to be employed to superintend drainage, as it requires the whole attention of the foreman to conduct a work cheaply and securely, and it is only men who are specially trained who can properly superintend it. There should not be larger bodies of men than from thirty to forty under one man's charge.

Another practice should be condemned by all who are interested in the success of these works, and that is that of giving pipes to tenants to lay themselves. Such work is never well done, and is just so much money thrown away.

All the drains ought to be laid down on the estate or other map so as to be referred to afterwards to find the outlets, and in case of extension to be able to add to the original work.

There is another matter connected with land drainage which must claim serious attention, and requires more than ordinary skill and judgment, *i.e.*, under-draining land to be made into sewage farms. I drained Breton's farm at Ronford, and after two years' working, it has answered well,—that is, the effluent water is, I

believe, superior to that coming from any other sewage farm. It is in a porous soil, and so is that near Merthyr Tydvil, which was drained by Mr. Bailey Denton. We have not yet had sufficient experience of the best mode of treating such cases, especially in clay, loamy, or rocky lands.

I hope to be able to give the Institution some information hereafter on this branch of the subject.

A long discussion ensued, which was adjourned to the next meeting, Monday, January 13th.

EXPERIMENTS ON THE STRENGTH OF MATERIALS.

DOLLING FREESTONE.

This result of some experiments on Dolling Freestone, from the quarries of Mr. C. Trask, have been made by Mr. Kirkally. It may be useful to record the results in our pages. The experiments were tried on eight beds and heights of stone to ascertain the resistance to a gradually increased thrusting stress, each stone being bedded against pieces of pine $\frac{1}{2}$ in. thick:—

Tested "against" the Bed.

6'04" x 6'05" = 36'54 super., height 6 in.—Cracked slightly with 75,240 lb., or 2,097 lb. per square inch. Crushed: 89,180 lb., or 2,411 lb. per square inch.

6'04" x 6'02" = 36'36 super., height 12 in.—Crushed: 79,620 lb., or 2,189 lb. per square inch.

6'03" x 6'02" = 36'30 super., height 18 in.—Crushed: 70,870 lb., or 1,952 lb. per square inch.

5'98" x 6'00" = 35'88 super., height 24 in.—Cracked slightly with 62,270 lb., or 1,735 lb. per square inch. Crushed: 65,890 lb., or 1,836 lb. per square inch.

Tested "on" the Bed.

5'98" x 6'00" = 35'88 super., height 6 in.—Crushed: 89,380 lb., or 2,490 lb. per square inch.

6'07" x 6'08" = 36'91 super., height 12 in.—Cracked slightly with 69,210 lb., or 1,876 lb. per square inch. Crushed: 83,620 lb., or 2,265 lb. per square inch.

6'08" x 6'04" = 36'72 super., height 18 in.—Cracked slightly with 72,770 lb., or 1,982 lb. per square inch. Crushed: 79,850 lb., or 2,174 lb. per square inch.

6'04" x 6'06" = 36'60 super., height 24 in.—Crushed: 77,040 lb., or 2,103 lb. per square inch.

SACRISTIES.

ST. GEREON'S CHURCH, COLOGNE.

ANY person who has compared the arrangement of our ancient English churches with the same class of building on the Continent, must have noticed the fact, that while on the Continent the sacristy always forms an important feature, and is frequently of large size, in England it is nearly always a small (not to say mean) building, and in most of our churches does not exist at all. Now, there is considerable difficulty in accounting for this difference in ecclesiastical arrangement, because the varieties of rubrics and rites were not sufficient to explain such a discrepancy. Some have supposed that in England the sacristy was formed by portions of the church being screened off for that purpose, and probably this was the case in some of our village churches, where to this day the lower part of the tower is still used for that purpose, though of course this most inconvenient arrangement could not have existed in the larger and more important churches. It has also been suggested that the great length noticeable in the chancels of some of our churches is to be accounted for by the fact that the altar did not stand against the east wall, but was placed one bay from the east end, and the space behind it was used as a sacristy; and there is much to favour this supposition; for, in the first place, where ancient sacristies do exist in this country, they are very frequently found built out at the east end of the church; secondly, the general arrangement of the great reredoses in our cathedrals and abbey churches, with doorways on either side of the altar, would seem to suggest such position for the sacristy; and it is quite evident that at Meopham, in Kent, and Tideswell, in Derbyshire, the sacristy was formed in the eastern bay of the chancel, which was cut off by a stone reredos, marks of which still exist in both churches. Even, however, if this were the case, the sacristies so formed must have been

exceedingly small. At first sight, this smallness of the sacristy would seem to point to great simplicity of rubric; but this is contradicted by the great size of the chancels in most of our churches, and their elaborate fittings, even if there were no historical evidence to prove that before the Reformation the English ritual was gorgeous in the extreme. Some people have asserted that in England, as a rule, the priest vested at the altar, and that the "parvise" was used for keeping the vestments, sacred vessels, &c.; but we can find no authority whatever for this assertion, and even supposing it to have been true that the priest vested at the altar, it is scarcely possible to conceive that his assistants did the same thing, or that the choir took off their cloaks and put on their cassocks and surplices in the chancel of the church. We confess that we are still at a loss to account for this peculiarity in English ecclesiology, and the suggestions which have from time to time been made upon the subject seem only to involve it in a deeper mystery.

Of the sacristies which do exist in this country, perhaps the most perfect are those of York Minster. However, even these are small and unpretending, and seem quite out of keeping with such an immense cathedral. The most beautiful buildings of this description existing in this country, are the sacristies of Wimborne Minster, Dorset, and Laton Church, Bedfordshire. The latter is a singularly beautiful example, and although rather small, is a costly building. It is vaulted with stone, and the roof supported upon a central column. Two sacristies exist at St. Peter's, Maneroff, Norwich, one above the other; both are at the east end, and occupy the usual position of the lady-chapel in large churches. Similar sacristies exist at the churches of Lavenham, St. Peter-per-Mountergate, Norwich, and Allhallows Church, Barking. The sacristy of the latter was rebuilt during the last century, but occupies the site of the ancient one. Good examples of ancient sacristies are to be seen at the churches at Margate, Rotherham, Hillesdon, and St. Mary, Oxford.

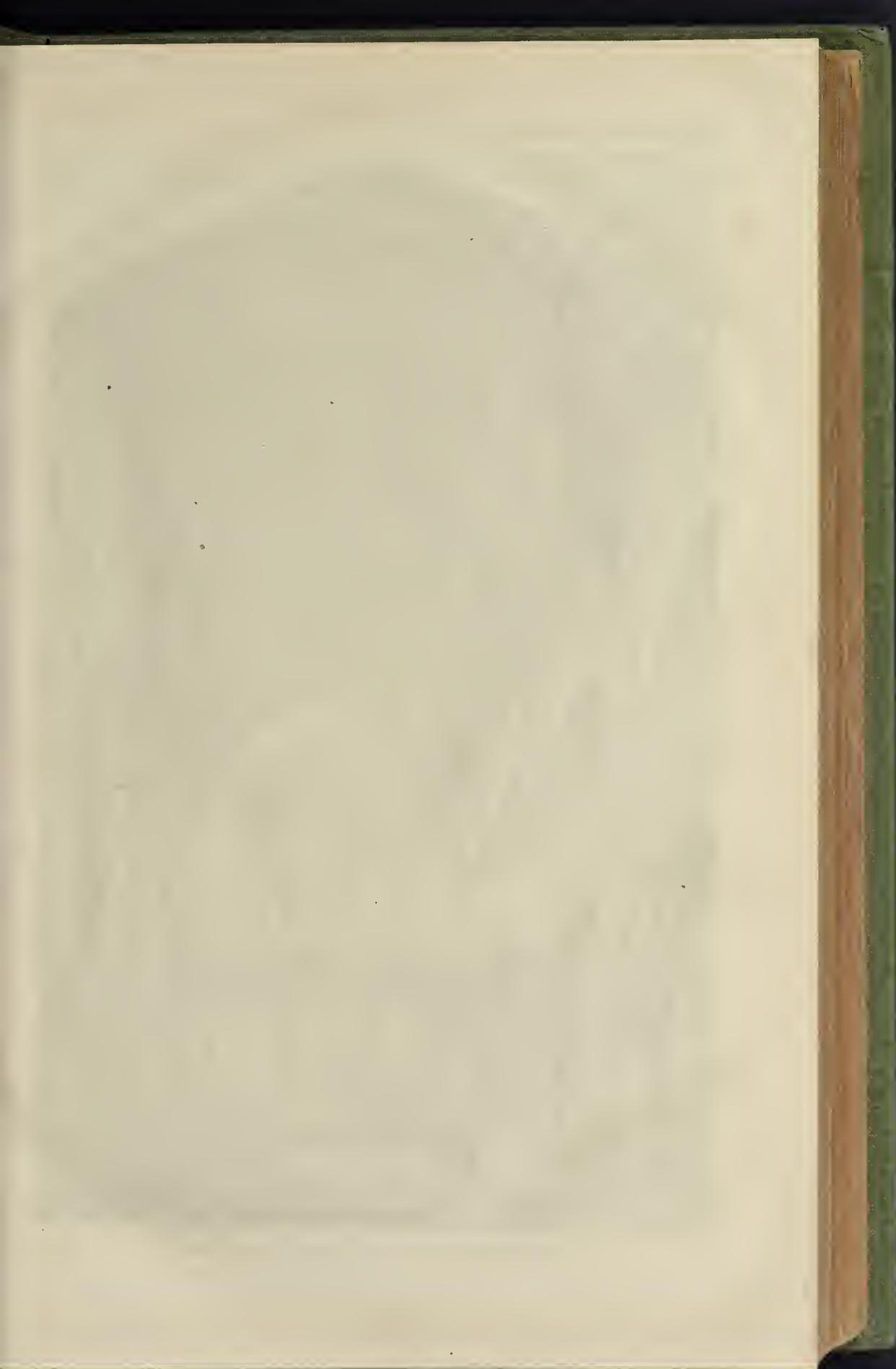
On the Continent, and especially in Germany and Italy, the sacristy is always an important feature. The example we give from the Church of St. Gereon, in Cologne, is a noble example, and is interesting from the fact of its containing a considerable amount of its ancient furniture; for instance, the altar, several aumbryns, the sink, &c. The rest of the furniture, though of the seventeenth century, is costly and handsome. The windows are filled with superb ancient glass, and, as will be seen from our engraving, the whole building is of a rich but very pure fourteenth-century style, singularly English in appearance, and quite free from that wiryness which is the defect of so many German buildings of this date.

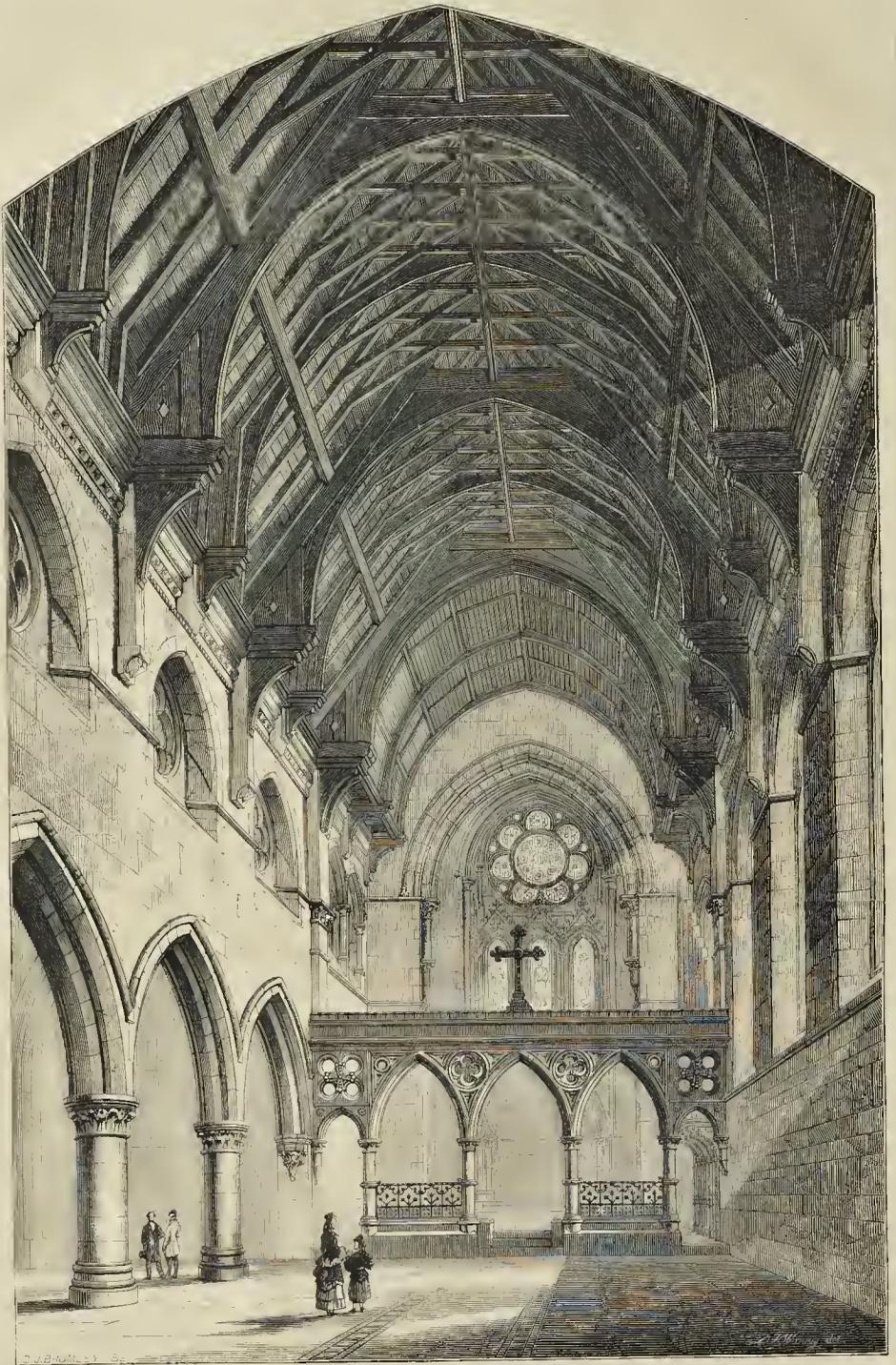
Remarkably beautiful examples are the sacristies of the Cathedral of Cologne; they are internally the most beautiful portions of the whole building, especially the outer sacristy, which consists of a square building, with its vaulting supported upon a slender and singularly graceful central column; the windows are of four lights. Against the east wall is an ancient altar with well-moulded "mensa" and base; and against the north wall is a most superb *sacro-mensa heisteria*, a perfect forest of niches and pinnacles. The floor of this beautiful apartment is composed of small black and white tesserae arranged in patterns, and is a most valuable example of a fourteenth-century pavement.

The sacristy of the Cathedral of Frising is perhaps one of the noblest in existence. It is divided into a nave and aisles of equal width, five bays long, by two rows of octagonal columns of red marble. The whole is beautifully vaulted in stone. At the east end are the altars, over which are ancient pictures of great beauty. The whole building was originally decorated in colour, portions of which can still be seen.

The sacristy of the cathedral at Hildesheim is of a similar plan, only its axis is from north to south, and not from east to west. It is a plaster building, and not so large as that of Frising. It contains one altar dedicated to St. Thomas of Canterbury.

The sacristies of the cathedrals of Ratisbon, Freiburg-in-Breisgau, Aix-la-Chapelle, and Munster, are all interesting buildings; and those of the churches of Oberwesel (which contains its ancient altar and reredos); St. Mary's, Wurzburg; Holy Cross, Schwabisch Gmund; and very many others, are excellent examples of the care which ancient German architects expended upon this portion of their ecclesiastical edifices.

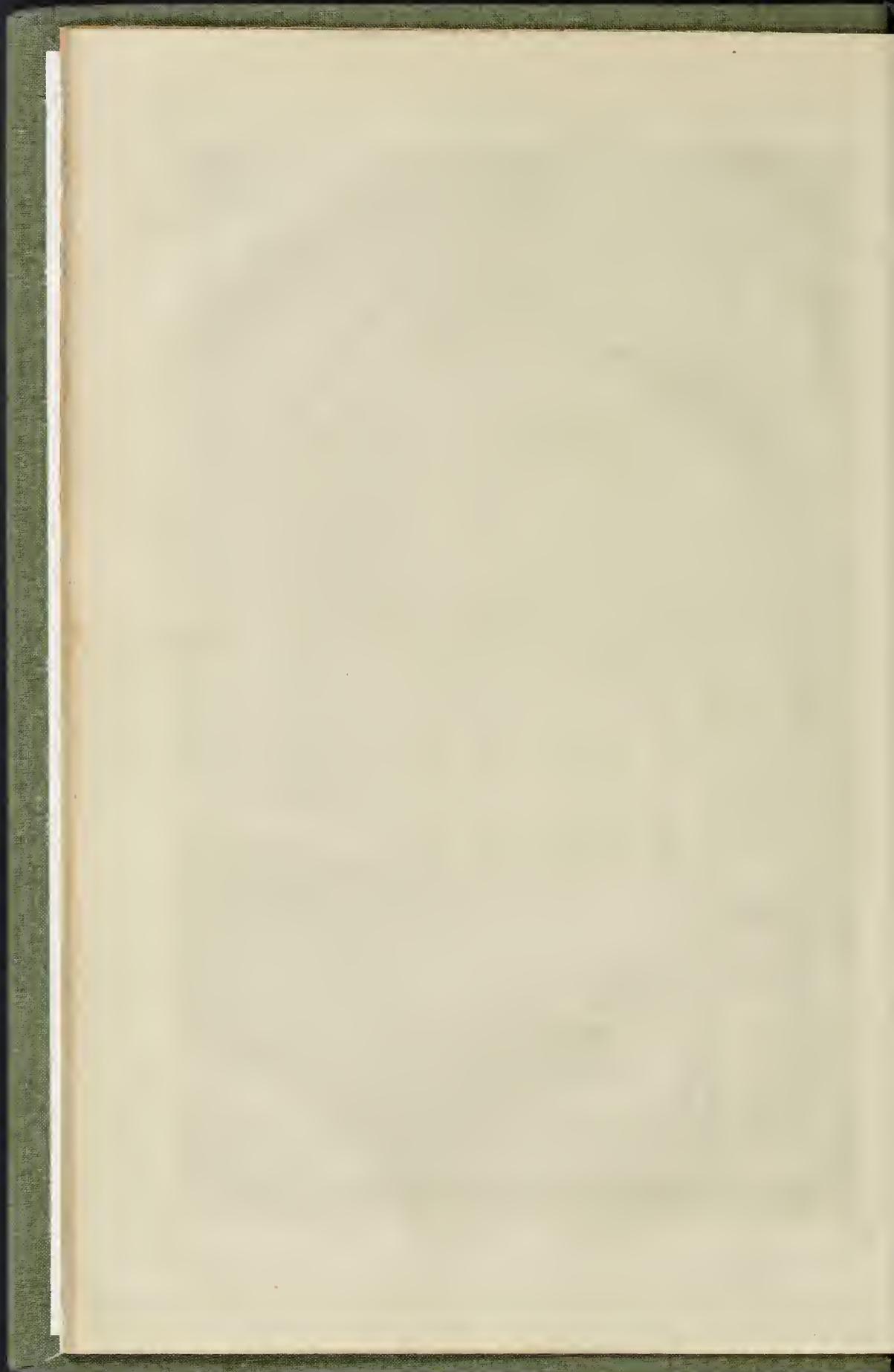




ST. JOHN'S CHURCH, BATH.—MR. ARTHUR BLOMFIELD, ARCHITECT.



THE SACRISTY OF ST. GEREON'S CHURCH, COLOGNE — FOURTEENTH CENTURY.



CHURCH OF ST. JOHN THE BAPTIST,
BATHWICK, BATH.

This is not an entirely new church. The original building, erected a few years since, consisted of a nave and chancel, with a transept, organ-chamber, and a small tower and spire, forming a porch at the north-west angle. The congregation having far outgrown the accommodation, an extensive enlargement became necessary. Mr. Blomfield was called in, and prepared a design for adding to it as much as the limited site would permit. The plan consisted of a large and lofty nave (the existing one becoming the north aisle), a south aisle and porch, a large organ transept, and priests' and choir vestries. This scheme had to be very considerably modified, and the south aisle abandoned, on account of the expense. The present plan has the same features, with the exception of the north aisle, but carried out in a plainer manner.

As there was considerable difficulty in adding a nave of satisfactory proportions in the usual way (owing to the limit of the site westward), the main roof is carried unbroken from east to west, only a sacarium, 15 ft. deep, being cut off by a lofty arch at the east end. The choir is taken out of the nave area, and surrounded by a low stone septum and metal screen, and towards the west there is a stone rood-screen, which serves to divide the choir from the nave, and to receive the thrust of the old chancel arch. The division is further marked by a pair of coupled principals in the roof.

The roof over the choir and sacarium is simply decorated in colour; and a considerable amount of stained glass, including the east window and the side windows in the chancel, has been presented by various donors. The reredos consists of a very effective mosaic picture of the Nativity, set under a richly-moulded arch, which forms part of the architectural design of the east end. This, as well as the decorative painting and the stained glass, was executed by Messrs. Bell & Almond. The altar and choir-stalls, in oak, were executed by Mr. Bates, of Stovesboro, Herts. The carving was done by Mr. Earp, who also executed the pulpit. The metal-work is by Mr. Shrivell. The contractor was Mr. G. C. Mann, of Bathwick. The organ, which is a fine instrument, though yet unfinished, is an electric one, by Messrs. Bryceson, the organist sitting behind the choir-stalls on the opposite side to the organ.

The general dimensions of the building are:—Nave and choir, 96 ft. 6 in. long, 29 ft. 6 in. wide, 35 ft. high to plate, 60 ft. to ridge; sacarium, 15 ft. long, 21 ft. wide.
The total cost was under 5,000l.

CHURCH DECORATION AT WEYMOUTH.

THE parish church of St. Mary's, Melcombe Regis, which is a structure devoid of the marked features of ecclesiastical architecture, has this year received a Christmas decoration deserving of a passing notice. The church, which furnishes some 2,000 sittings, is an elongated square, with galleries on the north-west and south sides—the gallery front being continuous, and divided by plain stone columns into spaces of about 12 ft. each. The entire sweep of the gallery front is covered with a series of needlework designs, in which the utterance of the shepherds, "Glory to God in the highest, on earth peace, goodwill toward men," is shown by church-text characters of about 13 in. each. The letters are formed principally of laurel-leaves and scarlet cloth on a white ground. The word "God," which occupies one of the gallery openings, is rendered by letters of white swan's-down on scalloped squares of scarlet cloth, the terminals of this design, as well as that of some others, being diapered with strips of scarlet cloth fastened at the points of intersection with rosettes of ivy leaves and swan's-down. The other principal words are composed of scarlet cloth, some with trimmings of swan's-down, each design having a border at top and bottom formed of single laurel-leaves, relieved in each half-lozenge by diamond-shaped pieces of scarlet cloth and wool, and forming a continuous zigzag pattern throughout the sweep. The gallery spaces on the east end have each the word "Alleluia," shown in white letters on a scarlet ground, with ornamental trimmings. On the eastern wall is a large painting about 30 ft. square, the sides being at the top of an elliptical shape, following the line of the ceiling. Fitted to the upper sweep of the frame, a roll, scalloped on the upper edge, and about 15 ft.

long exhibits the text, "A Saviour which is Christ the Lord," in white, on a ground of scarlet cloth. The letters, which are decorated with ivy-leaves and yew, form a continuous scroll. The credit of the design is due to Mr. G. R. Crickmay, architect, who is this year one of the churchwardens of St. Mary's parish, and it has been carried out by a small body of honorary needlewomen, who have shown precision and taste in the execution of the work.

ON THE PREVENTION OF NOXIOUS
SEWAGE EMANATIONS.

THE writer of the article with the above heading, in last week's *Builder*, advocates that is no other than a mischievous fallacy. He says that "there is no smell from self-cleansing channels; . . . that the only need of traps and ventilators is to guard against accidental stoppages;" and that, "as a rule, where there is smell from the drains or the sewers there is stagnant deposit." Now, it is a fact that "good tubular sewers or drains . . . so constructed . . . as to be self-cleansing, and to be always clear of deposit," give out noxious emanations the same as sewers and drains of deposit. The writer seems to think that, as "fresh human excreta is innocuous," and that as "the period of noxious decomposition begins usually not later than about four days in the sewer-tank," it is removed in self-cleansing sewers before decomposition takes place and foul gases are evolved from it. But this is not the case. Those who have taken particular notice of sewage flowing in sewers will tell him that little or no excreta is ever seen towards the outer end, and not even in those from separate streets. The water, and its motion or agitation in the sewers, quickly dissolve the excreta, whose gaseous constituents then enter into chemical combination with the water; then, the mass being foul, and warmer than the air which occupies the large rainfall space above it, the agitation of it by the flow, together with its warmth, and exposure to the less temperature of the overlying air, causes it at once to emit noxious gases. There is an old saying, that "the more you stir a certain compound the worse it smells." It is even so by the motion of the sewage through the sewers. The writer's fallacies, such as the above, and his theoretical interferences with the practical details of the necessary works, have retarded, and will, I fear, continue to retard, sanitary progress.

The lightest and most abundant of the gases which emanate from the sewage—namely, sulphuretted hydrogen,—flows up the drains to the highest points under the water-traps to the sinks and closets, through which it escapes, not only every time water is discharged down them, but when the pressure of the pent-up gases on the outlet sides of the traps is greater than the pressure of the external air on their inlet sides. The above, then, is what naturally takes place in every sewage-channel, whether it be self-cleansing or of deposit; and hence the necessity to "make a vent therefrom upward. . . . and carry the same to a convenient height; for so the offensive ayre as fast as it riseth bath issue, and stayeth not in the passage."*

The writer says truly that "the most effectual course is not to combat with the gases when produced, but to prevent their production." No one has ever prevented their production in self-cleansing channels, and cannot do so. "Good tubular sewers or drains . . . so constructed . . . as to be self-cleansing, and to be always clear of deposit," are as much "the bulbs of retorts, and the house-drains as the necks, conveying the "into the houses," as are the sewers and drains of deposit. The "bulbs," in fact, are in both the large air-spaces which are provided for the rainfall above the sewage. The nearest approach to the desideratum of preventing the production of the gases would be to reduce the capacity of the "bulbs" to a minimum,—that is, to make the sizes of the sewage channels proportionate to the maximum

* "How to Take Away the Offence of Noisome Vaults."—"Make the vent thereof upwarde as large or larger than the tunnell downward, and carrye the same up to a convenient height, for so the offensive ayre as it riseth bath issue and stayeth not in the passage."—*Sir Hugh Plat*, "The Jewell House of Art and Nature, 1594." This was drain-ventilation, about which there has lately been much clamour, publicly proposed 275 years ago.—J. P.

flow of the sewage. By doing this, noxious emanations from the sewage would be greatly reduced, or almost prevented. But this would involve the adoption of the "separate system of drainage," which consists in carrying off the sewage by one set of drains, and the rainfall by another set. This system, after every other has been hindered through, will be adopted. Complete ventilation of the main drains could be effected by revolving fans placed in them at suitable situations, and driven by the force of the sewage currents. The noxious gases as they emanate from the sewage would be drawn into and driven up the ventilating pipes, which would be connected with the fans, and carried above the altitude of the houses.

JOHN PHILLIPS.

NOTES FROM AMERICA.

I MUST preface my letter with a description of railway travelling in America, and confess that Great Britain is a long way behind the times. 1st. In regard to luggage. When a traveller arrives at a depot, his luggage is taken from him, a brass ticket given him, and a corresponding ticket attached to his luggage, the station marked on the same: so, when at the end of his journey, he hands the ticket, and receives his luggage. Again, the cars (all railway-carriages are called cars) are far more convenient: a smoking-car, palace-car (fitted up bondior fashion), and sleeping-cars, to each; there are a filter for drinking-water, and closets for males and females.

The New York State (about the size of England) is well intersected with railways. Some of the cities are really very pretty,—streets laid out with avenues of trees, in summer having a very pleasing effect, besides acting as a shade from the sun. There are several very fine cities, Albany being the seat of the State Legislature; and the House of Assembly, if built according to the drawings of the architect, will be a very imposing affair; but it seems to your correspondent, that if the cities would patronise bricks, instead of timber and limestone, there would be fewer fires, and the buildings erected would be of a more substantial character. New York city, in the writer's opinion, is a long way from a Paris, and never will approach London. The Central Park is a very beautiful place, with good skating-ponds, and fine walks; but there is a great deal too much "shoddy" in the "turn-outs," and one can see at a glance, like moek jewelry, it is very good for display, but, after all, not the genuine article.

Just now the municipal powers in New York are likely to be comfortably provided for in the State prisons, for merely robbing the City Treasury of a few millions of dollars. Could the writer but have had the privilege of surveying or estimating for the repairs of broken windows, he would have had now a "splendid stone front" in the 5th Avenue.

QUERCUS.

TURNERS AND WOOD TURNING.

HAVING seen a letter in your issue of December 16th upon "Wood Turners and Wood Turning," I hope you will favour me by publishing a few words upon the subject. "Wood Turner" thinks with Mr. Olley that if a man can produce two specimens from an architectural drawing, he must be a good workman. I must differ from them, as a good turner is expected not only to work from architects' drawings, but to do a hundred and one things that an architect would not think of; and allow me to say that as a rule (at the West end of London, and I dare say it is the same at the East end), when turners work from a drawing, if it is so ordered, they copy it exactly. As for what a turner can earn, I know men who consider themselves first-rate workmen, who, if they were paid full prices for their work, would never earn even moderate wages. Your correspondent wishes turners would combine to produce good work, and stand out for fair wages. There is now a society in existence for these purposes; but although it is flourishing, it has not received the support it deserves from the trade; and if "Wood Turner" be a journeyman, I hope he will add practice to precept, and join the society, and give the members the benefit of his twenty years' experience; and if he be a master, if he will address a letter to me showing what course the society ought to follow for the improvement of the trade, it shall be laid before the members, and it will be certain to receive careful consideration.

It is a pity so many apprentices are taken by men who do not know how to teach them their trade, but there are masters who do employ journeymen, and take apprentices, who are incompetent in every sense of the word. There is one who considers himself the first turner in London, and works from architects' drawings: he has had several apprentices, and his foreman says that he never turned one of them out as a first-rate workman. As for inferior workmen being obliged to become masters and ruining the trade, the masters have in a great measure themselves to thank for it, on account of the many inconveniences they put their men to, such as working in dark and badly ventilated workshops, having inferior lathes and tools, and in some instances keeping them waiting for their money. I have had to wait for two hours, and then go away short of half my earnings, and when I began my work on Monday morning, found my employer was in the country recruiting his health (with my money). Such things as these make careless workmen, and often drive men to the public-house, when they are waiting about on Saturday for their money. There are many first-rate workmen who have started in business for these and similar reasons. I shall address another letter to you more fully upon this subject, and likewise upon the late competition for the freedom of the Turners' Company.

W. A. BARBER, Secretary,
The Society of Journeyman Wood
Turners in General, Southampton
Arms, 350, Euston-road, N.W.

"A REVIVER FOR SOUTHAMPTON."

SIR.—Observing a letter under the above heading in your issue for December 23, 1871, signed by one who describes himself as knowing the district well, and as having given close observation to the subject, permit me, as secretary to the South Midland Railway Company, to express my surprise that your correspondent should state the saving in distance between South Wales and London, by the proposed tunnel, at twenty-four miles, when the promoters only set it forth at sixteen miles.

The ease with which it makes companies with autogenic interests work over each other's lines, and allow through rates at low charges, at the same time getting over difficulties on paper which have proved insurmountable in practice, is simply amazing.

It is aware that the line from Southampton to Salisbury is South-Western; from Salisbury to Bath and Pining Great Western, more than half of this being but a single line, and therefore incapable of accommodating the traffic of this port, extremely circuitous, and with bad gradients against the load?

Does he remember that the totally neglected country traversed by the South Midland is as fully entitled to consideration as regards railway facilities as its terminus, and that no comparison can be drawn between Mr. Fowler's high-level and costly bridge and that proposed at Sharpness, since Admiralty regulations can present no difficulties, the fact being that high-masted vessels do not go higher up the river than the entrance to the canal?

If your correspondent be interested against us, let him remember he will do his own case no good by misstating ours.

J. B. LE FELVRE, Secretary.

* * * With this the correspondence may end.

KENSINGTON ROAD AND HYDE PARK.

This main arterial thoroughfare, in its extent from Regent-circus westward to Kensington for a distance of two miles and a quarter, may be termed the grand Boulevard of London; the corresponding Bayswater-road on the north side, extending for a mile and a half along the Park border, being somewhat inferior in width of roadway, but having the advantage of more important buildings along its line.

The abatement of the old Park boundary brick walls, and the substitution of a handsome iron railing, have altogether changed the character of both these thoroughfares, and at the same time have given an apparent extension to the grounds and plantations within the *enceinte*. In the Bayswater line no paltry ranges of mean shops border the road, nor sever the continuous sylvan view; because on this line successive ranges of noble terraces have been erected within the last forty years, which, from their

happy position, fetch double the rental of equivalent structures in other parts of the town.

On the Kensington route it is far otherwise: the most valuable portion of the Park border, extending from Albert-terrace, Knightsbridge, to near Rutland-gate, for the length of half a mile, is curtailed off by ranges of paltry old shops, and by the still greater blot (so far as the frequenter of the antiquated grounds are concerned) of the antiquated cavalry barracks of Knightsbridge. The backs of the old houses have been judiciously planted out by landscape gardening, trees, and shrubs; but the barracks advance 30 ft. upon the Park drive, exhibiting windows and troopers, in dress and undress, to the extent of 450 yards!

The principal object for improvement is, however, not the Park border, but the grand Western Boulevard. From Kensington the road is sufficiently wide, and nearly direct, until approaching Prince's-gate, the Park side footway is gradually widened from 10 ft. to 20 ft., the west side of the gateway; as far as railing preserving its lineal direction as far as the east side the fence is protruded 18 ft. at a sharp angle upon the causeway, the south slope continuing onwards to the barracks; so that this building cuts off the view of nearly the entire width of the causeway, thus marring the line of route in this its most valuable portion. Here Princes-terrace, Emismore-place, Rutland-terrace, and the adjacent highly-improving quarters are choked in, and muffled up by unsightly shops and public-houses; as the barrack is an insuperable obstacle to all improvement, even in this position, which would otherwise command a *tenfold rental*.

There are other sites such as the Chelsea Guards' Barracks, which would be much more suitable to the Horse Guards, and even nearer to Buckingham Palace and the Houses of Parliament. The plot occupied by the barracks measures in length 400 yards by a mean width of 60 yards; and on the road line of this plot, at least 20 ft. might be thrown out into the road, to enlarge the causeway, and open a continuous view as far as the junction with the Brompton-rd. Upon this site a range of Park-side mansions might be built for a length of 300 yards, leaving a marginal plot of 30 ft. in width on both the Park and road frontages, giving at least 3,000*l.* a year in ground-rents, so as in quarters for the troops, and at the same time to realise incalculable advantages for this the best quarter of fashion, which has been so long under the ban of squalor and depression.

In completing the allocation and opening of the Boulevard to Albert-gate, there is, however, a range of nine paltry shops which should be cleared away, so as to open out the vista from the range of Albert-terrace on the east end, and the stables of his Grace the Duke of Wellington, occupying an area of 180 ft. by 90 ft., might possibly spare 20 ft. in depth along the Knightsbridge-road frontage for the public accommodation, and for the realisation of so grand a metropolitan improvement. These stables cover every foot of the large area, extending from the line of Park-wall in the rear, to the Knightsbridge footway in front, advancing on the latter 40 ft. farther than the barrack façade.

As viewed from Hyde Park-corner, just opposite Apsley House, from which the inner Park Drive and the Fair Mile Ride branch off, this southern border reach of Park presents a charming prospect. The borders are laid out in the most perfect style of landscape gardening; shrubs, fine forest trees, and flowers adorn its whole extent, as far as the Serpentine head and falls. But walk along it. For about 500 yards an appropriate iron railing fences it off from the main Piccadilly route; and then a narrow wedge of paltry and antiquated shops clings on to the old Park wall, as far as a modern chapel, with two public-houses as supporters, one on each hand; a pawnbroker; and lastly, the residence of the French ambassador, a handsome structure, at Albert-gate. In continuation, two fine houses follow on the opposite gate piers, and then there are five or six warehouses and workshops, built right up to the Park wall; after which the gardens of Albert-terrace open out, and redeem the stigma of huddled, shapeless, and crazy tenements. Next comes up to the wall the less offensive range of six houses in Park-place, and then, of course, a public-house; lastly, the barrack boldly intruding its unsightly red brick eleva-

tion, still unblushingly advances 30 ft. upon the Park drives. Well, what is the consequence? Why, the Park fashionable drive ends here, and a quadruple line of equipages during the season stops short of it, returns, and circulates within a range of a quarter of a mile!

A great portion of the tumble-down houses in the line belong to the Dean and Chapter of Westminster; and if we look to their possessions in courts, lanes, and the vile slums near the Abbey, there is small hope of improvement through their mediation. But this is a great and vital public question for some Governmental authority, or for the Board of Works. All the public parks have been wondrously improved of late, and the benefits derived from them by an increased and cumulatively growing population fully attest their value—no plant is disturbed, no flower plucked—and this shows their gratitude.

The parochial authorities of Kensington have of late widened the main street opposite to their new church now in progress; their co-operation in rectifying the grand Piccadilly boulevard would insure its completion. The extension and enlargement of great thoroughfares already undertaken by the Board of Works will no doubt prove highly beneficial to commerce, and to the inhabitants generally; but the improvement and widening of our old-established lines of intercourse, and the removal of blots that are odious in the eyes of foreign visitors would not only relieve our metropolis of discredit, but aid in elevating it to the rank it ought to hold, as being at the same time the wealthiest and the most beautiful in Europe.

QUINTANA.

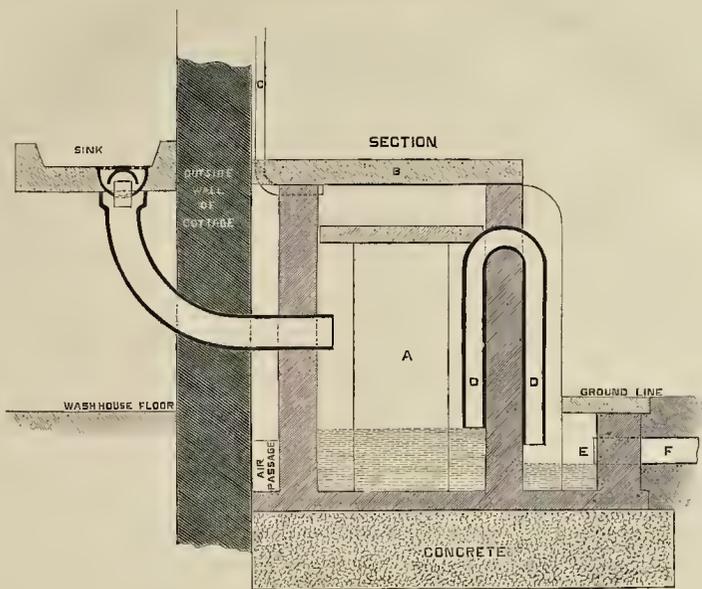
THE WOODEN STAIRS IN THE COURT THEATRE.

In reply to a letter from "Y" in a recent number stating that "there is a flight of stairs made of wood, leading from the street down to the pit of the Royal Court Theatre, Chelsea," Mr. W. Emden, as the architect of the theatre, writes:—"The pit steps are of stone, surrounded and entirely supported by brick walls, with a stone landing at head and foot; and the same can be said of all the other public stairs in the building. 'Y's' letter appears to have been written under a misapprehension arising from a cause which I proceed to explain. After the Court Theatre had been opened to the public the landing at the head of the pit stairs was enlarged, and to meet this enlargement the stone steps from pit to street (about seven in all) were cased with wood. This casing is completely cut off from the general woodwork of the theatre, and even though the building were burnt to the ground, yet would the stone steps from pit to street, with their wood casing, remain intact, nearly so: that they would continue to afford safe egress during the most violent conflagration must be at once apparent from my explanation."

This reply does not remove the objection raised. A landing having been formed at the top, as stated, the wooden flight of stairs is, of course, in advance of the stone steps, said to exist, to the extent of the width of the landing. The Building Act demands that stairs in theatres shall be of stone, or other fireproof material, and those down to the pit here are not so. "Y," therefore, is quite correct in objecting to them, and did not write under any misapprehension.

MONUMENT TO THE LATE BISHOP LONSDALE, LICHFIELD.

The monument which has been erected in Lichfield Cathedral to the memory of Bishop Lonsdale, who, after an episcopate of twenty-four years, died in October, 1867, has been publicly unveiled. The memorial, which is a fine work of art, stands underneath the arch on the north side of the sacristy. It consists of base, recumbent effigy, and canopy, with three elevations and pinnacles. In the base, which is composed of layers of green marble of various shades, and of alabaster, there are medallions in alabaster, with carved shields containing the late bishop's crest and symbolical representations. Around the upper edge of the base is engraved the following inscription:—"John Lonsdale, D.D., Bishop of Lichfield, born January 17, A.D. 1788; deceased October 19, A.D. 1867. Erected by the diocese in memory of his eminent learning and piety, his unwearied labours, and paternal care, during an episcopate of twenty-four years." On the massive base



Self-Acting Syphon Sewage Tank.

SELF-ACTING SYPHON SEWAGE TANK.

SIR,—A short account of this apparatus, which has now been for several years in successful action at some cottages of mine in Essex, may be of interest.

I may premise that when the cottages came into my possession the sewerage arrangements consisted of privies of ordinary construction for the excreta, and simple holes in the ground near the scullery for the house-slops; these holes, as well as the privy cesspool, being emptied at intervals, and the contents spread on the gardens. The privies were readily converted into earth-closets by reducing the cesspool in size, rendering it water-tight, and providing buckets and scoops for the earth; but at first the tenants would not use any earth at all, and, eventually, all they could be induced to do was to throw down earth occasionally, and that in quantities quite insufficient to absorb the moisture of the excreta and urine slops. The objection of the tenants to the use of the earth arose not merely from the trouble involved, but from a notion that it spoilt the contents of the cesspool as manure. Perfectly as the dry-earth system effects the innocuous disposal of the excreta, with proper care, my experience convinces me that nothing short of almost daily superintendence will secure this care in the present state of ignorance and indifference of agricultural labourers, even of the better class.

The question of how to dispose of the sink and scullery slops was more troublesome. There was no drain they could be run into without causing a nuisance; and how were they to be applied to the land in any way that should be self-acting? Ordinary surface irrigation would require too much attention; and sub-irrigation, by underground pipes, though more promising, was open to the great objection that the small amount of sewage would not be able to force itself any distance along the pipes, but would lie in one place, and gradually choke them. To overcome this difficulty, I devised the Self-Acting Syphon Sewage Tank. The accompanying sketch shows the tank as it has been actually in action for the last three years. The sink is connected by a trapped iron pipe, with a small water-tight tank (A), covered with a movable stone cover (B), and provided with a ventilating pipe (C), which is carried up the outside of the cottage. The outlet from this tank consists of a syphon pipe (D), so arranged that it will not discharge any sewage till the liquid in the tank rises above the top of the syphon, when it at once becomes charged, and empties the tank

very rapidly. As soon as the sewage is lowered to the level of the bottom of the syphon (which is a short distance above the bottom of the tank, so as to leave a space for the deposit to be cleared out periodically), the syphon is thrown out of action, and allows the tank gradually to fill again with sewage. The syphon discharges through a small well (E) into a drain (F) leading to the sub-irrigation drains, which latter consist of common 2-in. agricultural drain-pipes laid about 12 in. below the surface of the cottage gardens. The sewage flows out of the joints of the pipes, fertilising the soil, and purifying itself.

The syphon arrangement has these two important advantages,—first, that the concentration of the flow of the sewage, effected by discharging the collected supply of several days in a few minutes, forces the liquid a considerable distance along the sub-irrigation pipes, and prevents their being choked; and, second, that the intermittent action of the syphon gives full opportunity for the soil to purify the sewage, on the principle of "intermittent downward filtration." Of course, unless the land itself is naturally porous and dry, it must be under-drained, with special precautions; otherwise, the sewage will penetrate direct into the drains, without sufficient passage through the soil to purify it. I experienced this difficulty from the garden (the subsoil of which was mild clay) having been previously drained without any reference to its being irrigated; but, notwithstanding this drawback, the sewage was, under ordinary circumstances, entirely absorbed by the soil.

The sub-irrigation pipes were intended to be taken up and cleaned annually, and provision was made for readily doing this, by laying them on a continuous bed, formed by dividing larger pipes longitudinally into two equal parts; but it was actually found unnecessary to disturb them for nearly three years. A strainer has recently been introduced to intercept the solid matter from the syphon, which will, no doubt, render the action of the pipes still more satisfactory; and I am also making arrangements for having the whole apparatus constructed complete in iron, with various improvements, which will, I believe, render it cheaper, more efficient, and portable. Though designed for cottages, the apparatus is evidently applicable to any house where a dry system of disposing of excreta is used, and where there is a garden or other land below the level of the house to which the liquid sewage may be advantageously applied by sub-irrigation.

ROGERS FIELD, C.E.

there is a recumbent figure of the bishop, in full canonicals, with pastoral staff at the side, mitre on the head, the hands raised as in supplication, and the feet resting against the typical dragon. This figure is in alabaster. From the base rise four pillars of green marble, surmounted by foliated capitals. These, with four flying buttresses in yellow Mansfield stone, support the canopy, from which rise three richly-carved hoods and a number of pinnacles. The canopy is in Painswick stone. The hoods are surmounted with figures of angels, in alabaster. The whole is rich in carving.

The monument, which has cost 2,000*l.*, was designed by Mr. Gilbert Scott. The work, with the exception of the recumbent effigy, which was executed by Mr. Wats, the painter, was carried out by Messrs. Farmer & Brindley, Westminster. Some who remember the mild face of the late bishop seem to think that the expression on the features in the effigy is a little too harsh, though the likeness is good.

SOANE'S MONUMENT.

SIR,—I have read with much interest the correspondence in the *Builder* between a "Soane Student" and a "Lover of Truth," and can confirm the statements of both correspondents, for at the beginning of last year the tomb of Sir John Soane was in the deplorable condition described; it has, however, since been repaired under the inspection of Professor Donaldson and myself, at the expense of the immediate descendants of Sir John. This is the second time within the last nine years that the monument has been repaired at great cost, but we have no means of securing it from future wanton injury. The trustees of the Soane Museum in 1870 opened a correspondence with the parochial authorities of St. Giles-in-the-Fields, who repudiated their liability, and suggested the removal of the monument to the Soane Museum!

I entirely concur with your correspondents on the disgraceful neglect of our closed cemeteries. Why should there not be a legally-qualified Board to supervise and protect these cemeteries, many of which contain the remains and monuments of by-gone worthies? In some rare instances they have been planted and rendered pleasant places of resort—small breathing-places in our crowded metropolises. The cemetery of St. Giles-in-the-Fields ought to be an especial place of pilgrimage for the lovers of English art, containing as it does the remains of our great sculptor, Flaxman, and of Soane.

JOSEPH BONOMI.

Soane Museum.

THE OLD MASTERS AT THE ROYAL ACADEMY.

FEW things would give a better idea of the latent and wide-spread wealth of this country, even in objects of fine art, than a summary account of the 270 pictures which, in this the third year of its self-imposed task, the Royal Academy have collected from the galleries and apartments of public and private owners, and hung on the walls of Burlington House. True, there is room enough and to spare,—vacant saloons and single rows of paintings in one or two that are not vacant. True, the gathering of 1872 falls far short in number, and possibly in interest, of its predecessors. True, that there is much now exhibited which, even if it originally illustrated the art of the great names it boasts, or gave unmingled pleasure to the spectators, can be said to do so no longer. But, with all these admissions, there is yet enough to make a morning spent in the rooms of the Royal Academy an occasion of extreme delight as well as of valuable instruction.

The main feature of the present exhibition is a large number, comparatively speaking, of admirable portraits, by the first masters of picture-portraiture that the world has seen. An opportunity is given, not to the student alone, but to the skilled artist, and the ripe critic, for improving his taste by the comparison of noble works of Vandyck, Titian, Gainsborough, Rembrandt, Rubens, Velasquez, Sir Joshua Reynolds, Romney, and other painters.

As an instance of the rare educational value of the exhibition, we may refer to a most valuable set of studies, by Vandyck, which have been lent by the Duke of Buccleugh. It is, however, a doubt whether these monochromes are not sketches, of course by Vandyck, made for the engraver. Among these there is one of the Infanta Isabella Clara Eugenia, the Vice-Queen of the Low Countries, whose name is so familiar to the student of the time of the Emperor Charles V. She is represented, not in a widow's dress, as stated in the catalogue, but in that of a religious order, with her rosary by her side. The little panel on which this sketch is made, is, like the rest of this important series, some 9 in. by 7 in. The whole character of the Infanta has been grasped by the genius of the painter, and firmly, yet delicately given in the sketch. There is the heavy Austrian échin (the inheritance, together with the Tyrol, of Pouch-mouthed Mez), treated with grace, but without weakening the force of the feature. There is the eagle glance and the commanding brow and nose of one born in the purple. Now the Earl of Hopetoun has sent the full-sized painting of which this small panel contains the study. It is a magnificent picture, 55 in. by 44 in., in admirable preservation; and yet, grand as the picture is, it hardly renders the countenance with the vigour of the sketch. The *justa* position of these two historic treasures is extremely interesting.

It is not the fault of the Academy that Rembrandt had two mothers,—or at least that we are presented with the portraits of two very different old ladies under this title. One of them, No. 68, the property of the Earl of Hopetoun, is a replica of the well-known No. 775 of the National Gallery, the best being (if memory is reliable) a little more full-faced in the Earl's copy than in that belonging to the nation. The latter is inscribed, "Æ. S. I. E. (*Anno Ætatis Sux*) 83," and dated 1634. It was formerly in the Enard collection, and has not been identified by the careful compiler of the catalogue of the National Gallery with any known subject. The second portrait at Burlington House is numbered 179, and belongs to the Duke of Buccleugh. It is a very different countenance from that of the old lady in the ruff. Attired in the dress of a nun, with a thoroughly Rembrandtesque gloom thrown by the hood, and relieved by the white pliners, this noble old dame is reading a ponderous volume. Her features approach nearer to the regal curves of the Infanta Donna Clara than to the somewhat bumpy outline of the other portrait. But what is very remarkable is, that although there is no resemblance that can be traced between the modelling, or the technical drawing, of this fine countenance and that of the painter himself (of whom a portrait, also belonging to his Grace of Buccleugh, and numbered 158, hangs near, very closely resembling No. 221 in the National Gallery), one may well imagine that there is a likeness. Nothing is so subtle as family likeness. In the present instance, the similarity of outline is between the old lady in a ruff and the painter;

but a deeper sympathy seems to lie between his genius and the face of the noble woman.

Foremost amongst the most interesting features of the Exhibition is the Raffaele lent by his Royal Highness the Duc d'Anjou, No. 95 in the catalogue. This brilliant little Virgin and Infant is an undoubted work of the great master whose name it claims. It is on panel, 18½ in. by 11 in. It is in very good order, and judiciously framed, lighting up the whole side of the apartment with its red and blue drapery. The features of the Infant are on the same type as those of the Aldobrandini Madonna, which, however, it by no means rivals in heauty. But the loving, half-wondering expression of the mother's face is almost unrivalled among the Virgins of Raffaele. It is the expression, not the painting, that is so admirable; and the treatment of the hair of the child is—as far as memory serves—unique. Little rays and glints of glory spring out from the tiny hairlets; and although the conventional nimbus is indicated, both around Mother and Child, the self-luminous tints of the latter are wonderfully imaginative and divine.

Probably of more actual value than the solitary Raffaele are two paintings by Leonardo da Vinci,—the most cultured and learned, if not in all respects the first, of the great Italian masters. One of these is a Madonna belonging to the Duke of Buccleugh (117), on panel 18½ in. by 14 in. A curious injury has occurred to the forehead—on which a raised curved line suggests the idea that the upper part of the head has been restored. It is, however, most probably, an evidence of the barbarous piety that imagines that it adorns pictures of saints by attaching crowns of silver or of gold to the canvas. The complexion of the Virgin is of the lovely olive brown so often to be seen in the works of this master. The hair falls in crisp, almost wiry curls; the face of the Infant, who is contemplating a little cross, is almost sentimental. But the motive of the picture is that very Cross. As the child regards the symbol, so does the mother regard her child. The composition is, of course, masterly; the face of the Madonna, especially the mouth with its shadowy outline, exquisite. The large-sized hand must have been painted from the real model of the painter. The greenish blue of the background, where sea fades into sky, has suffered more than the rest of the picture. This painting is one of the highest value and interest.

The second Leonardo is the portrait of a young man, on panel, 21 in. by 14 in., the property of Mr. W. Fuller Maitland. It would be difficult to point out a picture so limited in size and in subject which more fully illustrates the genius of an unsurpassed artist; and yet it is one which a person might be pardoned for passing, if he only saw it closely, without remark. Full of cracks in the paint, faded in the colouring, with the modelling of the right hand so much obliterated that the outline appears to be out of drawing, a close inspection shows more traces of the ravages of time than of the magic of art. But stand at that distance at which Leonardo, in his *trattato di pittura*, defined that a picture should be seen, or a little further off, and the form becomes instinct with life, the hand assumes mobility and heauty, and the face looks forth with a noble individuality that dwells long on the memory. The figure holds a scroll on which is written, in Lombard hand, the date 1494, the words ANO 20, and the monogram M. R. The portrait has rare value.

Correggio is unrepresented in the exhibition. We may say the same of Titian; none of the four paintings attributed to that prince of portrait-painters bearing any visible marks of so illustrious a pedigree. Titian, indeed, may be said to be nobly represented at second hand, for Hilton's "Ganymede," the property of the Royal Academy, has been evidently inspired by the "Ganymede" of Titian in the National Gallery. In fact, the first impression was, "how much better lighted the picture is here than in the Gallery!" The treatment, however, is different. The noble head and mighty plumage of the royal bird, his soar across the field of vision, the charming face and eager heavenward look of the boy, the tender grasp of the eagle, which holds the quiver of the "Ganymede" rather than his flesh,—all these are elements of a very fine picture. The attitude of the bird is questionable; so it is with the eagle of Titian.

Other Italian masters in respectable numbers are more or less worthily represented by one or more pictures. Of Giorgione there is the "Temperance" belonging to the Royal Academy, famous for its glorious hair, but with a lip be-

tokening anything but temperance in passion. Of Guido Reni there is one of the stock figures, women with up-turned eyes and wounds of body or of mind—Cleopatras, Magdalenes, or what not. This one is called Saint Agatha. The right hand is beautifully drawn. The countenance is pallid with the pangs of death. There is a fine study of two figures by Andrea Mantegna, lent by the Duke of Buccleugh. Three Tintorettoes are harsh and grim. In one of them, a very ill-composed family picture, the first person of the Trinity is introduced in a most inconceivable fashion. Sir Conns Lindsay sends three portraits, entitled those of "the Painter's Three Daughters, by Palma Vecchio." It is impossible to recognise in either of these three squalling girls, with mouths most unpictorially open, the Juno-like heauty whom Bordone loved to paint. A holy family, by Palma Vecchio, is lent by the Queen, from the Hampton Court collection. In this, the St. John, who has attained to manhood during the infancy of his Irish cousin (contrary to the opinion of St. Luke) has a fine face enclosed in a veritable bush of hair. A noble modelled and tenderly treated St. Sebastian, by Palma Il Giovine, is attributed in the index to Il Vecchio. The Holy Family by Parigi Bordone, from Hampton Court, is an inferior work, for which these same damsels of the Palma family have been models. Sir William Drake sends a fine painting of Piero de' Medici, by Bronzino, in good preservation, with massive features, and most uncompromising aspect—a thoroughly characteristic portrait. Two very poor specimens, said to be by Sandro Botticelli, are without interest, unless it be from the fact that the worse drawn of the two is exhibited by Mr. G. D. Rosetti; which may explain certain peculiarities of style. One picture is attributed to Annibale Caracci, two to Gaspar Poussin, and one to Nicholas Poussin, which are best complimented by silence. The most noticeable work of the minor Italian masters is a large *noli me tangere*, by Barocci, 110 in. by 74 in., the property of Mr. Wentworth B. Beaumont. If abstraction can be made of the utterly undignified conception, and thoroughly conventional treatment of drapery, this is rather a pleasing picture. The composition is effective, although the left leg of the Christ is nowhere to be seen. The colouring is bright and lively; the Magdalen, the reverse of either a mourner or a penitent, is a remarkably gay, pretty girl, coquettishly and tastefully dressed. The shadowy outline which gives such delicacy to the faces painted by this artist is most conspicuous in these two very youthful countenances.

Passing to the great feature of the exhibition, we note no less than thirty-two paintings by Vandyck, a most unusual wealth of portraiture. Of these a couple of dozen are the studios contributed by the Duke of Buccleugh, to one of the most remarkable of which we have above referred. The portrait of the Marquis Spohna is lent by the Earl of Hopetoun; the complexion as fresh as if painted but year. The stern, crafty face looks out from the canvas as if its owner were ready for intrigue or for war. Nothing but the gleam on the armour recalls the lapse of nearly two centuries and a half. The portrait of James Stuart, Duke of Richmond and Lennox, is lent by the Duke of Buccleugh. It is a wonderful physiognomical study, and a marvellous painting. Then comes the noble Governess of the Netherlands, before mentioned. The profile of Henrietta Maria, Queen of Charles I, lent by the Queen from Windsor Castle, with a bust as flat as a pancake, shows that, as with lesser painters, the magic of this great master's touch might at times be impaired by the weight of a royal command. We should be much obliged to the writer of the catalogue to explain whom he intends to designate by the title of the Queen of Philippe le Roi,—a full-length portrait of a full-formed young beauty, in a black dress, half frightened at her own splendour. The bunches of pale brown curls, and faintly defined eyebrows, of which the right is arched more than the left, agree with the inscription, "Æt. Sux 16, 1631." The husband of this stately girl, the Counsellor Le Roi, not the King of Spain, a noble-looking man, also in black, with sharp face and hand resting on a noble deerhound, is the companion picture. These fine portraits, 80 in. by 48 in., belong to Sir Richard Wallace.

By Rubens there is one portrait only. It is life itself—a man in a ruff and sabbled robe, lent by Earl Brownlow. There are three landscapes, with cattle and figures, by Sir Peter Paul, tolerably well known; the "Timber

Wagon" (51), "The Rainbow" (125), and "The Watering-place" (195). Five paintings are attributed to Rembrandt—the old lady in the ruff, who was eighty-three when the painter was twenty-eight, which disposes of the maternity question; the old lady in conventional dress; portraits of the Burgomaster Paibian and his wife, the former in a falling ruff, with a fine sad countenance, looking out from the canvass, and a chubby ugly boy—the latter with a miraculous ugly ruff, within which is a very vigorous and masterful life. The child, to whom she is giving a dollar, has an unmeaning face, older than that of the mother. The signature "Rembrandt" casts some doubt on the authenticity of this portrait, as well as on the companion piece, exhibited by the Duke of Buccleugh.

Sir Richard Wallace lends two portraits of Spanish Infantas, by Velasquez. These pictures, together with some others from the collection of the late Marquis of Hertford, seem to have suffered by long keeping in the dark. Nine pictures have the assurance to claim Holbein as their father. If the portrait of Archbishop Warham be from the easel of Holbein, he must have intended it for a sign-board. The portraits of Sir W. Butts and his lady, are subtle in their physiognomical power. The keen, penetrating glance, and irritable yet humorous mouth of the physician to whom Shakespeare flung a crumb of immortality, are admirable. The lady looks well content to be so.

There are seven pictures by the English Vandycck, Nos. 140, 202, 247, 254, 257, 260, 263. The first of these, the portrait of Lord Camden, shows how noble a fine face may look in a formal wig. There is a soft, shadowy outline to the features of the great judge that recalls the touch of Barocccio. The second, belonging to the Marquis of Hertford, is gone. It looks like the ruin of a Romney. It is inconceivable that, as mere matter of manipulation of colour, it should be by the same artist as No. 247, a very fine, bright portrait of Vestris, a young man in a full mass of powdered hair thrown back from the face. Lady Mary Bouldby looks out from the canvas with her blue eyes, set off by her grey powdered hair, and square-cut red silk dress. No. 257 is rather gone. It might stand for Jonathan Wild. Lady Lucy Douglas is wonderfully poor for a Gainsborough, if such it be. Mary, Duchess of Montague, grand-daughter of the Great Duke of Marlborough, a stately and beautiful lady, might almost be taken for a portrait of Maria, Marchioness of Athlery.

The sixteen works by Sir Joshua Reynolds are enough to fill the mind with rage. Certainly there is sufficient to prove that this great painter was not over-estimated by his contemporaries. But here and there a picture, left as it came from his brush, shows what terrible havoc Time has wrought with the majority of his paintings. We are familiar with many of them by engravings. But the best of these reproductions are but feeble shadows of the fleeting beauty of the originals. We know Reynolds only by ghosts. The exquisite beauty of the "Comedy" who has enchained Garrick—and small blame to him—by her irresistible charms, is not even hinted at by the engraving. This noble picture is sadly gone. "The Jessamy Bride," two portraits, the "Infant Academy," Lord Hertford's portrait of a Lady in a blue dress, the charming "Infancy," the fascinating Nelly O'Brien, are faded, tarnished, or cracked. In Mr. Cowper-Temple's "Girl leaning on her Hand," with a face so full of fun, the bitumen comes out in piteous bubbles. "Cupid Disarmed" is sadly spoiled. The ruin of these beautiful pictures is rendered more deplorable by the striking contrast afforded by the admirable condition of Lord Hertford's portrait of Mrs. Robinson (143), in which the charms of a somewhat discontented beauty are fresh and bright.

Sir Peter Lely's portrait of Lord Chancellor Clarendon in his robes is a noble picture. The florid face, youthful aspect, trim moustache and royal of the historian, seem an anachronism when attired in the gold and black robe of State, with the heavily embroidered purple for the Great Seal on the table. There is a fine portrait of a Sculptor (88), in which a marked trait of the sculptor's band,—the division of the little finger from the others,—is marked. The head is dignified by a cloud of yellow hair,—the falling band is tied in an unusual and very picturesque fashion. The portrait of the Countess de Gramont is from Hampton Court. That of Lady Elizabeth Wrothesley is marked by the overstrained histrionic attitude so common in the painting and sculpture of the day.

A RESPONSE TO THE QUEEN'S LETTER.
DECEMBER 30TH, 1871.

The letter of her Gracious Majesty to her people has been read far and wide, and has touched the hearts of all. We need make no apology for printing the following response.

A good and gracious ending to the year
Thy letter to thy people comes, O Queen!
Right welcome to them are its genial words,
Breathing calm confidence and trust serene.
Calm confidence in their firm loyalty,
And trust serene in their large, loving heart;
'Tis not the first time thou dost truly say,
That in thy sorrow they have taken part.

How their hearts wept with thine ten years ago,
When he who well deserved those anguish'd
tears—
ALBERT THE GOOD—was taken from thy side—
Thy loss and theirs, to ever-coming years.

Yes; still they mourn that upright man, who
lived
As if he held from Heaven the high behest
To prove himself to his adopted land
True bearer of his motto—*TARU UNO FEST!*
And when, but now, the darken'd wings of
Death
Seem'd closing once more o'er thy sadden'd
soul,
Thy people's prayers for thy son's life
went up
To Him who can both life and death control.

At length, when better tidings were sent forth,
And hope revived within each watcher's breast,
How joyfully they hail'd the cheering words,
Which gave their anxious fears some little rest.

And now they wait, in tremulous regard,
For every whisper from that royal home,
And feel it is their own peculiar friend
Who from Death's shadowy portals back doth
come.

If it could be that any closer tie
Were needed, 'twixt the nation and its head,
'T would surely spring from this deep sympathy
Which centres round our Prince's still sick
bed;

And from thy noble-hearted words, O Queen,
With those of that sweet lady by thy side,
Whom thou dost call thy daughter, and who long
Has been thy faithful people's joy and pride.

May God in mercy grant our mutual prayer,
And soon again to health and strength restore
The son, the youthful husband, father, friend,
Whose kindly face we long to see once more.
R. F. H.

THE NEW GUILDHALL AT
WINCHESTER.

THE ceremony of laying the foundation-stone of the proposed new Town-hall and Public Offices at Winchester, which had been postponed on account of the illness of the Prince of Wales, was performed on Friday, the 22nd ult., by Viscount Eversley, the high steward of the city. The new building, which will be situated on the south side of the High-street, nearly opposite to St. John's House, includes a large assembly-room, 85 ft. by 45 ft., a council-chamber, orsions-hall, magistrates' room, public museum or library, offices for the town clerk and city surveyor, committee-rooms, police station, with apartments for superintendent and policemen, fire-engine house, &c., the whole of the interior being warmed by hot water. In the centre of the principal front a clock-tower rises to a height of 120 ft. to the top of the vanes, the faces of the clock being 85 ft. from the ground, and if illuminated will be seen from most parts of the city. The design of Messrs. Jeffrey & Skiller, architects, of Hastings has been accepted, the estimated cost being 11,000l.; and Messrs. Joseph Bull & Sons, builders, of Southampton, have contracted for its erection for the sum of 10,496l.

The mayor and corporation assembled at half-past one o'clock, and a procession of the civic, clerical, and other authorities, headed by the band of the 60th Rifles, escorted Lord Eversley to the site of the new hall, where the stone was laid with the usual formalities, in the presence of a large crowd of spectators. On arriving at

the site, Lord Eversley expressed his thanks to a merciful Providence which had enabled them to meet after the postponement. The mayor then requested Lord Eversley to lay the foundation-stone, and Mr. Alderman Budden, as chairman of the building committee, briefly described the intended new structure. The Archdeacon of Winchester then offered prayer, and Lord Eversley, having been presented with a silver trowel, laid the stone. The mayor thanked his lordship for the performance of the ceremony, and he, in return, addressed the mayor and citizens in a graceful speech, alluding to the fact that Winchester claimed the precedence of London for municipal institutions.

DRAINAGE OF WEYMOUTH.

SOME time ago, after a visit to Weymouth, we commented somewhat strongly on the sanitary condition of this otherwise agreeable watering-place, especially in connexion with the state of the Backwater. We are glad to hear that the Town Council are now considering a plan which has taken six months to prepare. It is proposed to construct a dam across the Backwater, and to form intercepting sewers, so as to carry the sewage from the Backwater. The system of sewage irrigation is also proposed, the estimated cost of the whole works being 27,600l. The scheme is said to be generally approved by the local authorities, and will, it is expected, be speedily carried out. If the town be wise they will allow no time to be lost after satisfying themselves that a really good plan has been obtained.

THEATRICAL.

AMONGST the good things going on at the theatres just now—and there are several—should be specially noticed "Pygmalion and Galatea" at the Haymarket, "The Bells" at the Lyceum, and "On the Jury" at the Princess's. The Greek interior prepared for "Pygmalion" shows care, and is very satisfactory. The statue was modelled by Mr. Burnie Phillip. The writing of the piece is admirable, and, if we mistake not, it will live. Miss Robertson particularly distinguishes herself in it, and Miss C. Hill displays force which few gave her credit for. The acting of Mr. Henry Irving in "The Bells" is a thing to be seen, and places the actor high in his profession.

Covent Garden.—Mr. Augustus Harris has again succeeded in producing incomparably the best pantomime of the season, both as regards its composition and getting-up. The story of "Blue Beard" is followed with consistent burlesque, and the scenery, processions, and ballet are fittingly gorgeous. The review of the troops, with a military revel, is one of the most remarkable scenes of its kind ever presented.

COMMON SENSE IN STAGE SCENERY.

WHEN considerable thought and expense are bestowed, as now, upon the imaginary fairy scenes at our theatres, to satisfy the tastes of the public, as also in competition one house against another, it is very distressing to find that a little common sense is not bestowed upon the scenes of ordinary pieces, especially in reference to the positions of doors and windows. Let me state one example, which is like many, as an illustration of the want of common sense. The fact that the *Builder* was the first who struggled to reform stage-scenery will be my excuse for sending this to you. In the next piece now being played at the Princess's, wherein two of our best actors in their individual walk, and a very promising and improving young actress, take part, there is a scene of an interior, which is made use of more than once, and where, facing the audience, there is a window, showing a distant view of the clock-tower of the Houses of Parliament and the tops of many houses, which, no doubt, is intended to make the audience understand that the river Thames flows between the room in which the action takes place and the prospect seen through the window. Within 5 ft. or 6 ft. of this window, in the same wall, is a much-used door, so much used, indeed, that I was kept in a state of excitement whenever an exit was made, expecting that a violent scream would be heard from the person just departed, on account of his having tumbled headlong into the street, if not into the bosom of Father Thames; and, what is still more ridiculous, in one instance the departed was looked after by

one present in the room, who, gazing through the open doorway, turned his face towards the position of the window. In reality such an arrangement is impossible; in ideality it is truly ridiculous; and I ask again, why cannot a little common sense be brought to bear upon such matters, which destroy all truthfulness in any piece placed before playgoers who may be otherwise carried away with the natural and painstaking acting of the performers? Y.

OXFORD-STREET TRAMWAYS.

By the reproduced and reprinted London Street Tramways (Extensions, &c.) Bill, which was rejected by the House of Commons last year, it is proposed that powers should be conferred upon the company to lay somewhere about 16½ miles of tramway in some of the principal streets of London. The thoroughfares include Edgware-road from Kilburn, Oxford-street, Grand Junction, Marylebone, and Uxbridge roads; Holborn, Holborn-circus, St. Andrew's-street, Shoe-lane, St. Bride-street, Farringdon-street, and Ludgate-circus; Goswell-road, Aldersgate-street, and St. Martin's-le-Grand; the Borough High-street, York-street, and St. Thomas-street, Denman-street and Duke-street; Marylebone-road, Chapel-street, Upper Baker-street, and Albany-street; Harrow-road, Portobello-lane, Westbourne Bridge, Westbourne-terrace, and Bishop's-road; Craven-road, Eastbourne-terrace, and London-street. The promoters bind themselves not to lay their lines upon or along the London Bridge Railway Station or station-yards, or any of the streets, roads, or other approaches leading thereto from the Borough High-street or Wellington-street without the consent of the companies in writing under their common seals. The railway companies will not be the only or the most formidable opponents of the proposed tramways.

INAPPROPRIATE CLOSING OF THE BRITISH MUSEUM.

STRELY some of our public institutions are managed with very little wisdom. On New Year's day the British Museum was closed for the purpose of being cleaned and making additions to its collections. It will be re-opened to the public on Monday next, the 8th inst. But why close it on New Year's day; another week would surely answer the purpose if it need be closed at all. We saw scores of holiday people within a brief space of time, who had toiled up to the Museum looking with dismay at the intimation that they had toiled for nothing, and worse than that, that their day was spoiled. Let us suggest to the trustees that another arrangement should be made next year.

THE DESTRUCTION OF BOILERS.

SIR,—My engine boiler, a Cornish one, nearly new, is much pitted or eaten on the upper side of the flues, which I attribute to the alum in the water. Of course it never encrusts or "furs up." I think of introducing some hot lime into it, to counteract the sulphuric acid of the alum. The boiler is now empty and dry, except the small "pits" (which are nearly half through the plates, and about ½ in. diameter), which are wet with a fluid of rather a sweet taste and of iron. Will any of your engineering friends assist me? W. D.

THE MINEHEAD RAILWAY.

THE first turf of this line was cut on the 28th ult. The contractor for the execution of the works is Mr. Frederick Furniss, of London. The finances requisite for the undertaking have been raised independently of the public. This branch line of railway leaves Watchet by a junction with the West Somerset Railway; and it was intended in the original Bill to cross the two turnpike-roads (one of which leads from St. Donnans, and the other from Doniford to Watchet) by level crossings; but, on the representation of the inhabitants of that place, it was afterwards arranged to divert the least important road, and the other to cross over the railway by a bridge near Mr. Thorne's yard, thence through the pasture-field, over the mill-stream and meadow, and cross the Mineral Railway at Whitehall, running by the side of that line up the valley, until within about half a mile of Washford. It then curves to the right and enters a

deep cutting on the north side, and closely adjoining the turnpike-road at the Green Dragon stop-gate, this being the most important piece of work throughout. Soon after it enters the valley at Old Cleve, and runs down to the sea at Bradley-gate, where it is intended to erect a station for Blue Anchor, Carhampton, &c. Thence from this point it runs parallel with the seashore, and between Higher and Lower Marsh there will also be a station for Dunster, &c., which is rather over half a mile distant. Afterwards it is a perfectly straight and level line to Minehead, the terminus being near the beach. The contractor is to complete his undertaking by the end of the year 1872, and the railway will afterwards be leased to and worked by the Bristol and Exeter Railway Company, with whom terms have been arranged.

COMPETITION, BERLIN.

WE are requested to announce that the First Commissioner of Works has received a programme for the erection of a new House of Parliament at Berlin, for which the architects of all nations are invited by the Imperial Government to compete. The particulars will be reprinted for the use of architects, and be ready for distribution at the Office of Works on Monday next. The designs will have to be sent in to the Imperial Chancery at Berlin, with the authors' names, before the 15th of April next, and a prize of \$144 will be given for the best design, and a fifth of that amount for each of the four next best designs.

"JACK PLANE"

SIR,—Would you oblige me by receiving the enclosed is. (stamp) for the benefit of the widow and children of the late Mr. Randall (Jack Plane), and at the same time allow me to appeal to all working men who have been readers of the sensible, manly, outspoken letters our deceased friend was in the habit of writing in the *Builder*, to contribute a trifle, according to their means, and so in some measure to console the widow and fatherless. An accident, any day or hour, might reduce those near and dear to us to poverty. OSES A. TATTON.

SURRENDER OF HOUSES BY A BANKRUPT TO THE SELLER.

IN the Court of Bankruptcy, before Mr. Registrar Spring Rice, in re Lessor, Mr. Webster, on the part of a debtor, who is a builder, made an application to the Registrar, under the 23rd section of the Act, under the following circumstances:—Shortly before he presented a petition for liquidation he had contracted with the owner of some building land to purchase two carcasses of houses and fit them up, and he now wanted to surrender them to the seller.

The Judge said that in all bankruptcy cases such an application could only be granted after notice. Mr. Dalton, who represented the trustee, stated that there were no rights of third parties to be interfered with. It appeared that a building contract had been entered into, between a person named East, and the petitioner, that Lessor should buy two carcasses in Tuffnell Park-road, at a ground-rent of 8s. each, Lessor contracting to finish them, and lay out 300l. The trustees were most anxious to disclaim the property, inasmuch as the charges upon it would be more than its value, and they were in this position,—they must either disclaim or be called upon by the ground landlord to complete the contract.

Under the circumstances of there being no third parties to be injured, the application was granted.

THE QUESTION OF WAGES.

WE are requested to state that a copy of the following has been forwarded to the employers in the building trade of London and vicinity:—

"Paviors' Arms, Johnstone-street, Westminster, January 1st, 1872.
SIR,—As the representatives of the Operative Stone Masons' Society in London and district, we again take the liberty of addressing you, in accordance with a resolution passed at a general meeting of the above-named society in reference to the nine-hours question, and in the matter appertaining thereto, viz., the question of wages. And in referring to these questions, we would beg leave to draw your attention to the rigid and daily increasing adoption of the nine-hours system throughout the country, and to the innumerable number of artisans that will commence that system from this day, at the same wages for the nine hours as they previously received for ten hours; and in many cases this has been conceded by the employers without a request from the employed. Another significant fact that we would call your attention to, is, the adoption of the nine-hours system by several of the large railway companies,—a class of employers that hitherto have not proved themselves very anxious to meet the just demands of those in their employ, not even sufficient to secure the public safety. Seeing such to be the case, and knowing that employers in the building trade of London and its vicinity have generally been unwilling to meet any just requirements of those in their employ, providing that reasonable notice of those requirements be given to insure the employers against any serious loss, we therefore beg to give you notice that the masons of London and its vicinity are desirous of continuing the nine-hours system, as at present established, all the year round, instead of expiring on the 15th of February, as

now arranged, and that we are willing to work at the present reduced rate of wages for the next six months; and that on and after the 1st of July, 1872, the wages be 8d. per hour, making our average weekly wages, as near as possible, the same under the nine-hours system as that hitherto received for the ten hours.
We hope, sir, that, in considering this request, you will keep in view the foregoing remarks, and grant us a favourable reply at your earliest convenience.—I remain, sir, your obedient servant,
P. WILSON, Secretary to the Committee.

Resolution passed at a General Meeting, Nov. 30th, 1871.—"Resolved, That our committee memorialise the master builders of London and its vicinity, asking them to concede the nine hours permanently, after February 15th, 1872; and give notice, at the same time, that on and after the 1st of July, 1872, we shall require an advance of 1d. per hour."

BUILDING ACT CASES.

AT the Woolwich police court, before Mr. Patterson, on Wednesday last, Mr. Collis, district surveyor, summoned Mr. William Tamsett, builder, of Charlton, for neglect to give notice for certain works done at No. 1, Inkermann-terrace, Charlton; to wit, constructing brick-work and flue to two coppers, the plan set forth being that the work was there before, but required rebuilding. The magistrate decided that Section 20 brought the work within the rules. Penalty, 20s.

HOUSE-DRAINAGE.

SIR,—An article in your valuable journal of last week, under the above, and signed, "D. A.," suggests that corporations should take this work entirely into their own hands, it being the only means of having satisfactory drainage. I would venture to suggest that the "respectable builder," or firm, should be employed for this work, without being subject to cutting down the price to the lowest fraction, which, of course, leaves no alternative but to encourage bad work. Is drainage the only work found fault with? Is it not a fact that works of every description have to be done over again simply because the "respectable builder" is cut out of his work through men who know or care not how work is done, so long as they make a profit? Who, may I ask, is to blame in this matter? Is it to be supposed that a speculative builder has no more sense than to spend 30l. or 40l., in order to make a good and complete job, if he is only to receive one-half this amount from his client in return? Again, are corporate bodies, as a rule, of perfect perfection? Would it be impossible for such a body of gentlemen to have the pipes laid to the wrong inclination, or even upside down? Let the public be satisfied to pay a fair price to respectable men, and doubtless they will get fair work in return. W. H. W.

THE ACTUAL CONDITION OF WARWICK CASTLE.

THE Chairman of the "Warwick Castle Restoration Fund" has sent us the following report on the condition of the building:—

Dec. 28, 1871.

DEAR SIR,—In reply to your request that I should send a statement of the extent of the destruction caused by the late fire at Warwick Castle, I beg to forward you the enclosed report.

The most ancient parts of the Castle are the vaulted basement under the state rooms, hall, &c., the main wall on the river front, some internal walls, and the towers and gateways on the courtyard walls. All these are uninjured by the fire.

The international decorations have been executed at periods ranging from the date of Charles II. to the present time.

The distinction between the state apartments and those used by the family is not so marked as has been supposed.

The whole of the rooms have been more or less occupied.

The present family, in order more freely to admit the public, have chiefly inhabited the east wing, but have never given up occupation of the rest when occasion required.

The main walls of the east wing are of the same date as the west. The rooms have been entirely reconstructed, and some years have been spent in decorating them with objects of antiquity procured from Italy and elsewhere.

The following is a list of the rooms and principal objects destroyed:—

The Hall—totally, except the outer walls, the roof of which was constructed about forty years ago, when the remains of a very early roof were discovered (1150). The panelling was of the

state of Charles II. All the furniture, chests, desks, embroidery, tapestry, the principal portion of the armour, including the buff coat of Robert Lord Brooke, and Charles Edward's sword, are entirely lost.

The Marble Floor is also much damaged. The Large Dining-room—partially injured. Breakfast-room (*temp.* Charles II.), the Library, Lord Warwick's Sitting-room, and Staircase are totally destroyed.

Lady Warwick's Boudoir—Partially burnt. Three rooms had been recently reconstructed and filled with ancient furniture and fittings, comprising Italian chimney-pieces, doorway and pilasters from Rubens's house at Antwerp, old Italian bookcases, tables, &c. The most valuable books and pictures were preserved; but a portrait of Francis, Earl of Warwick, by Gainsborough, a portrait of the first Lord Brooke, and various others, were destroyed.

Above were seven bedrooms, furnished with old leather pictures, carving, &c., all totally destroyed. Above the dining-room were three large bedrooms, with other rooms above them; these also are destroyed, as well as three rooms on the asement.

The contents of the dining-room, state rooms, and armoury passage were removed, and are injured. The whole of the state rooms and chapel west of the hall were not touched by the fire.

A. SALVIN, JUN."

CONSECRATION OF RYDE PARISH CHURCH.

On Tuesday the new parish church of Ryde—the corner-stone of which was laid in August, 1869, by the Princess Christian, as the representative of her Most Gracious Majesty the Queen, and which has been built by Mr. Gilbert Scott, R.A.,—was consecrated by the Bishop of Winchester.

The structure is not yet completed. The tower and spire are not commenced, and the ornamental details of the exterior are not fully carried out. The north porch, too, is not at present begun. The great east and west windows are by Messrs. Clayton & Bell. The interior carving of the church has been executed by Messrs. Farmer & Brindley. The capitals of the arcades are cut in foliage, natural leaves alternating with conventional through the series. The pulpit is of variegated alabaster, and is based upon a cluster of fluted columns of polished Derbyshire marble. It is octagonal, two of its sides being open to form an entrance; the other six are deeply sunk in panels, into each of which are introduced subjects sculptured in white alabaster, each panel comprising two representative figures of Old and New Testament or pre-Nicean saints and martyrs. Thus there are combined Isaiah and Jeremiah as prophets; St. John the Baptist and St. Barnabas as preachers; St. Peter and St. Paul as apostles; St. Stephen, St. Alban, St. Agnes, and St. Catherine as martyrs; the sixth pair being the Virgin Mary and Mary Magdalene. This work has been executed by Messrs. Twigg, of Ashford, Derbyshire; and the panels are by Messrs. Farmer & Brindley.

THE SMOKE NUISANCE IN BRISTOL.

A few days ago Mr. Arnold Taylor, of the Local Government Office, attended at the offices of the Board of Health, Bristol, in pursuance of a memorial from certain ratepayers, to make an inquiry with reference to the smoke nuisance in Bristol. A large number of tradesmen and others tendered evidence to prove the existence of a great nuisance in smoke, soot, and deposits of small coal. Among the large establishments generally complained of were Messrs. Fry & Sons' cocoa manufactory, Messrs. Finzel's sugar refinery, Counterslip; and the Porter Brewery, in Bath-street. The proceedings lasted about six hours.

At the close, a discussion took place, in the course of which the Government Inspector said his opinion was that an inspector should be specially appointed to look after the smoky chimneys, and he suggested that other cases might be taken before the magistrates. The smoke nuisance would never be abated in large towns until they got the local authorities to take severe measures, and make it a matter for general police duty. They had a stringent Act in London, and it was put into the hands of the

police, and every policeman on the beat had orders to report every case of smoke nuisance to his inspector. The Inspector mentioned incidentally that in Bradford the local authorities had taken the matter in hand, and the nuisance in that town had been reduced quite 50 per cent. What he wanted the Board of Health to do was, to look at it in this light, that a smoke nuisance was a preventible nuisance, and that it could only be dealt with by careful and continuous inspection; and he suggested that the Town Council might appoint a Smoke Committee independently of the Board of Health. Eventually the Inspector intimated that he should report what he had heard to the Local Government Board.

Books Received.

"CHOLERA and Typhoid Fever: a Plan for the Collection and Disposal of Sewage on the Separate System. By J. B. Waring, F.R.I.B.A., &c. Day, Savoy-street, Strand." Mr. Waring here advocates what seems to us a very impracticable system, however correct it may be theoretically; and above all impracticable on the great scale for towns. The Moulle dry-closet system is a good one, as an adjunct in country districts, or in or adjoining bedrooms for the use of the sick, &c.; but Mr. Waring out-Moules even the Moulle system. He says,—

"The plan I propose is this. Keep the fluid and solid refuse of your houses carefully apart. In every house there should be a well-built and spacious soil-shaft, with which every closet is to be connected. The seat of the closet is furnished with a pan having two separate vents, one for the liquid, the other for solid excreta. The liquid will flow off into a tank or reservoir prepared for its reception alone, and furnished with a tap, by which it can be taken off as required, and either be converted into ammonia, be used for any manufacture in which ammonia enters, or be otherwise utilised. The seat itself, when pressed on by the body, should cast a superficial layer of earth, sand, or soot, on the bottom of the pan,—the soot might be collected or kept in the house for the purpose; the excreta deposited, a covering layer of sand, earth, or other deodorising material, should be discharged over it, as in the earth-closet patented by Moulle. The pan should be furnished with a reversible bottom, and the excreta, thus thoroughly enclosed by a deodorising coating, will fall into the soil-bin beneath, forming altogether a very powerful manure, and be taken away at stated intervals by our present chulupen carts: by steam-carriage in large towns, and by carts in small, or by hand in villages, to properly-constructed receptacles in the country, and be sold (I believe at a very great profit) for manure, either in the immediate neighbourhood or wherever desired, with perfect ease, and with freedom from danger to health to any human being. We shall thus, by the aid of a little thought and care, have transformed our demon of death into an agent of life.

The ash and dust bin may be kept separate from the soil-bin; that is a matter of the simplest arrangement, and can be easily effected by a separate shaft. The servants' closet might be separate, and attached to a separate shaft, having special openings to the dust-bin and liquid tanks, for the ridance of basement refuse. We have still the slops of our houses to deal with; and this is yet more easy, by means of a sink in one side of the closet, communicating by a pipe with the special slop-tank beneath or by connection with the sewers, which are to convey away fluids only."

So, even on this system, we come to sewers and tanks at last. And yet Mr. Waring says:—

"Cesspools, drains, and sewers form a legacy from our forefathers which we shall act wisely henceforth to repudiate. Cesspools are generally abolished; drains and sewers we still stick to, and they to us. By the addition of more water, great care, improvements of construction, and the separation of the liquid from the solid matter at the reservoir, we shall have freed ourselves from their most deadly results; but we have only 'scotch'd the snake, not killed it.'"

—"Specification of Sir George Bowyer, bart., for Improvements in the Construction of Road Tramways. Clayton & Co., Whitefriars, Printers." Sir George has patented a simple plan of laying a tramway in asphalt, the wheels merely running in an easy groove a little below the level of the road, and into and out of which they can readily go. The asphalt is to be laid upon concrete, and can be drained by pipes beneath. If sharp-edged wheel-tires, he notes, wear the asphalt rapidly, they may be rounded off. This might be done in the case of the cars, but other wheels might waste the asphalt as well. —The Garden says,—What a pity it is we do not contrive some less expensive and more attractive way of destroying the thousands of evergreens planted about London every year, than that of planting them and allowing them to be blacken and perish before our eyes from the effects of our smoke-pestilential air. There perish annually as many beautiful young evergreen shrubs and trees in and near London from smoke as would suffice to plant a whole country. We know no greater evidence of obtuseness of mind than is shown by this persistent wasting of precious time and precious energy, and destruc-

tion of healthful and beautiful young evergreen trees and shrubs. It cannot be too widely known to every town-planter that so long as we are satisfied to live in a sea of the refuse of our fire-places, so long shall we find it impossible to have in cities healthy specimens of vegetation that retain their foliage in winter.—The *Art Journal* for the new month, says of Japanese Paper:—"Upwards of 250 distinct species of paper are manufactured in Japan. Many kinds made in the distant provinces are submitted to a distinct process in Yedo, and each kind has its distinctive name. Specimens of all these have been deposited, by the care of the Foreign Office, at the South Kensington Museum. We have little doubt that the manufacture of paper in this country will be affected by the acquisition of this valuable knowledge as to the mode of preparation of an article very superior to our own. The point most against the introduction of the hark of the *Bronssonetia* to our mills is, that it is not until the fifth year that the stools or shoots of the tree, resembling the shoots of the hazel in English coppices, are available for hark. The importation of the peeled fibre will probably be attempted. The substitution of a finer vegetable paste for any coarse and inferior size is no doubt one great cause of the excellence of the Japanese paper. The Tororo root would probably bear exportation as well as the fibres. If perfectly clean and pure fibres and roots were introduced, and Japanese workmen induced to show the process employed by them to the foreman of one of our mills, there seems little reason to doubt that, with the aid of our excellent machinery, we should soon produce such admirable paper as the world has never yet seen."

Miscellaneous.

Warwick Castle.—On Tuesday evening in last week, the second meeting of the Warwickshire Archaeological and Natural History Society was held at the Court-house, Warwick, when Mr. Tom Burgess, of Leamington, gave a brief history of Warwick Castle, from the earliest period to the time of the "King Maker." The lecturer gave an interesting account of the ancient earthworks yet remaining on the line of the Avon, and pointed out that these were evidently the frontier fortresses of an early tribe. Warwick was doubtless one of these frontier posts, and the mound in the court-yard was probably the site of this fort, if not the original mound itself. The subjection of Warwickshire to the Romans was dwelt upon, and then Mr. Burgess read the extract from the Saxon chronicle giving an account of the erection of the castle at Warwick in 913, not 915, as stated by Dugdale. This castle was one of a series of frontier Saxon fortresses erected by the daughter of King Alfred to repel the incursion of the Danes settled in Derbyshire and Leicestershire, on the east of the Watling-street Road, under their chief, Guthrum. The story of Gny and the Dun Cow was traced to the contemporary conflicts with the Danes, for Dun Cow was probably but a corruption of Dancgang. Sketches of the original fortresses, and the probable appearance under Ethelred, and Turchill, were made on a black board. The demolition of the old castle, by the adherents of Simon de Montfort, led to a summary of the progress of military architecture, and the present castle of Warwick owes much of its design to the lessons gained at the famous siege of Kenilworth, and the subsequent Scotch and French wars. It was this experience of the powers of attack and defence which induced Thomas, Earl Beauchamp, to erect the towers and outer defences on the east of the castle, as we see them now. Some floral legends connected with this period, the *planta genista*, the forget-me-not, and a peculiar Warwickshire legend of the red rose were related. The fact that Wycliffe translated the Bible, and that Chaucer and Gower were living during the building of the castle, was mentioned.

Photographs enamelled on Copper.—The *Illustrated Australian News* states that at Clunes a photographer named John Tanner has, after four years' labour, succeeded in producing photographs enamelled on copper. We may state, however, that five or six years ago a photograph was sent us from Canada which seems to have been enamelled on zinc. It had all the delicacy and fine texture of a daguerreotype without its metallic glance.

International Trade-marks.—The following American case is reported by Haselme, Lake, & Co., patent solicitors:—"An equity suit respecting trade-marks, of international interest, was recently decided in the United States Court for the Washington district. The suit was instituted by Mr. David A. Burr, counsel for Rogers & Sons, the celebrated cutlers of Sheffield, against Philp & Solomons, contractors to the Treasury department, for the supply of Rogers & Sons' cutlery. The plaintiffs alleged that the defendants had supplied counterfeit articles with their trade-mark, and they asked the court to grant an injunction, and claimed heavy damages. The defendants did not deny the sale of imitation articles or the use of the trade-mark in question, but proved that these articles were manufactured in Prussia by a firm known as Rogers & Sons, who use the trade-mark under a royal licence, and that Prussian cutlery bearing this trade-mark had been extensively imported and sold in the United States for many years, and also that the plaintiffs had not registered their trade-mark, as provided by the recent Patent Act. The defendants contended that the suit could not be maintained in view of the above facts. Wylie, J., refused the injunction chiefly on the ground that the plaintiffs had, by their acquiescence in the infringement, waived their right to assistance from the court, and he also stated that the Prussian firm was entitled to the use of the trade-mark where the cutlery was manufactured. The acquiescence of the plaintiffs was presumed, no evidence being offered to show that the trade-mark had been used with the consent or knowledge of the Sheffield firm. The judge did not comment upon the fact that the plaintiffs had not registered their trade-mark in the United States is now a matter of the first importance to English manufacturers and merchants, for which provision was made in the Act of last year."

Building Materials and Fire.—Mr. Mullett, the superintending architect of the Washington Treasury Department, U.S., has been interviewed. He says:—"Cast iron, absurd as the statement may appear, will not resist as much heat as good sound oak timber of the same dimensions. Fire expands the iron and warps it and breaks it very easily. Indeed, if oak timber should be treated by any of the processes of liquid silicate, it may be considered almost a fire-proof material compared with cast iron. As for stones suitable for building purposes, as I told you before, there are few that are fire-proof, though some approximate the necessary conditions, and, except in severe conflagrations, may be generally depended upon. Granite, marble, and sandstone are not to be trusted, as they soon perish by exposure to the heat, as has been shown a thousand times. But I am strongly in favour of liquid silicate as a preparation for wood to be used for building purposes. My attention was directed to this material some years since, but I have not had an opportunity to investigate the subject fully. I believe, however, that it merits more attention than any other suggestion that has been made public, and may yet prove one of the most practical solutions of the question of non-combustible construction that has yet been offered. Whether this or some other process for making wood incombustible is the more desirable, I am not prepared to say. I am, however, decidedly of the opinion that any process by which wood can be rendered non-inflammable at a reasonable cost would not only be an inestimable blessing to the public, but its use should be rendered imperative by law."

Accidents.—On Tuesday, during a heavy gale, a large brick building, the Rosebank Engineering Works, at Bonnington, near North Leith, was blown down. The loss is said to be upwards of 4,000l. Three or four men had a narrow escape.—While the petty sessions were being held in the village of Killybeg, in Leitrim, the floor of the court-house gave way, and about 300 persons fell to the ground floor, a height of 18 ft. The magistrates and attorneys escaped unhurt.

Motive Power for Street Vehicles.—It is reported from New Orleans that a new way has been discovered to use ammonia as a motive power, the principle being that of the ice-making machine. Motion is obtained by rapid evaporation and energetic absorption. An ammonia-engine is said to have made 800 trips, and drawn a car at a much cheaper rate than it could be drawn by horses.

The Royal Institution Lectures.—Dr. J. Tyndall, F.R.S., is delivering a series of six lectures "On Ice, Water, Vapor, and Air," at the Royal Institution. In his second lecture he illustrated a subject to which we adverted in speaking of the address of the president of the last meeting of the British Association,—namely, the principle of arborescence, in what we may call mineral life. Professor Tyndall showed some beautiful examples of crystallisation by making salts and metals deposit crystals from small quantities of their solutions placed in the electric microscope. Silver and lead ferns appeared as if endowed with life; crystals of ferrocyanide of potassium were seen growing, in pulsating waves, as if the crystallising force had to accumulate strength every few seconds to overcome some resistance,—a phenomenon which has not yet, it is believed, been investigated by men of science; at all events, the lecturer said that it was a novel observation to him. Crystals of chloride of ammonium grew, like delicate and graceful ferns. Finally, the lecturer showed how, beam by beam, Nature builds up the crystals of ice, every portion of the structure being singularly beautiful; and he melted a thin slab of ice in the electric microscope, so that the observers could see on the screen the star-like forms of which it is built up. Both old and young listened to the lecture, as usual, with the greatest interest and pleasure. The theatre was filled to overflowing, many of the listeners being only able to obtain standing-room.

Mr. Ruskin's Christmas Gift.—In his twelfth number of "Fors Clavigera" Mr. Ruskin tells his working-class readers that he has made them the Christmas gift he promised—7,000l. Consols in all clear—"a fair (dike)," he says, "of what I had, and to as much perpetuity as the law will allow me." He adds:—"It will not allow the dead to have their own way long, whatever licence it grants the living in their humours, and this seems to me unkind to those helpless ones. Very certainly it is inexpedient for the survivors, for the wisest men are wise to the full in death; and if you would give them, instead of stately tombs, only so much honour as to do their will when they themselves can no more contend for it, you will find it good memorial to them, such as the best of them would desire, English law, he thinks, needs mending in many respects; in none more than this. As it stands, he can only vest his gifts in trustees, desiring them, in the case of his death, immediately to appoint their own successors, and in such continued succession to apply the proceeds of the St. George's fund to the purchase of land in England and Scotland, which shall be cultivated to the utmost attainable fruitfulness and beauty by the labour of man and beast thereon, such men and beasts receiving at the same time the best education attainable by the trustees for labouring creatures, according to the terms stated in his book.

Proposed New Swimming-bath and Public Bathing Station at Brighton.—A memorial is now in progress of circulation, which will shortly be presented to the Town Council, petitioning them to lease a portion of the beach, opposite the Norfolk Hotel, to Professor Cavill, the champion swimmer of the South Coast, for the purpose of erecting a swimming-bath there, and also for the formation of a public bathing station. The size of the proposed bath is 60 ft. by 30 ft. It will be provided with about thirty dressing-boxes, and will be built of concrete below the beach up to the height of 12 ft. or 14 ft., the top being surrounded by a glass screen, something after the style of those used at the head of the West Pier. Mr. W. W. Eldridge, of Brighton, is the engineer. The bathing station would be situated on the southern side of the bath, and would be screened from the public gaze by canvas stretched on poles, and reaching from the eastern and western walls of the bath down to the water's edge.

Hoardings in Newington.—The *South London Chronicle* says:—"A very necessary precaution has been taken by the Newington Vestry. Builders must in future put up hoardings before pulling down old houses on the Walworth-common Estate, and where footways are disturbed a temporary planked footway must be provided. But why limit these provisions to this one estate?"

Edinburgh.—The North Bridge is to be altered and widened at a cost not to exceed 10,000l.

Cheap Telegraphic Communication with America.—It is proposed that the Government of Great Britain and the United States should purchase the existing cables and newfoundland land-lines, paying for the same by terminable annuities, and charging only such rates for the use of the cables as will meet the annual interest charge. For this purpose, one fourth of the existing tariff would suffice for the present,—that is to say, messages of ten words could be carried for 10s., instead of 2l. It has been found that with each successive reduction in rates the use of the telegraphs has enormously increased, as is evidenced from the fact that the earnings are now much greater with the rate at 2l. than they were formerly at 20l. per message. It is believed that the reduction to 1s. per word would not be final, but that still further reductions might be made, and the number of cables increased on the same plan of terminable annuities, without becoming any burden on the two Governments. The attention of the various Chambers of Commerce in Great Britain is being called by this question by Mr. G. T. Smead, of 21, Mincing-lane, London.

Accommodation for Private Patients in the Fever Hospital, Islington.—The pauper-poor asylums having now relieved the Liverpool-road hospital of the very poor, the committee have rendered the hospital available for the reception and treatment of other classes of cases, including the working class not receiving parish relief. Patients will be admitted into the general wards on the recommendation of a governor or annual subscriber of one guinea, or, as heretofore, on payment of two guineas on admission, or of one guinea weekly. For such patients as require isolation and better accommodation, eight large rooms have been prepared and furnished with every requisite for comfort, in which a single patient, or two children of the same family or from the same school, can be received. The payment for one of these rooms, with the attendance of an experienced nurse, and the care of the resident medical officer and physicians, and including food and medicines, has been fixed at three guineas per week. Members of working men's families will continue to be received into the hospital on much lower terms, we presume, than these.

Arbitration Case.—A case of considerable interest has just been concluded at the Westminster Palace Hotel. The Ryde Corporation have determined upon purchasing the works of the Ryde Gas Company, and the latter being willing to treat for the sale, the price was left to arbitration. The witnesses for the Corporation considered the value to be under 30,000l., and based their calculations upon a 16½ years' purchase of the net annual profit, which they placed at 1,800l. This they considered fair, as though the company is incorporated by Act of Parliament, they thought it should not be treated as such, while the Corporation had the power to purchase. On the other side, it was argued that the company was incorporated, and was thus entitled to a twenty years' purchase. They placed the annual profit at 2,800l., and if this calculation was adopted, and a further sum allowed for surplus land and plant, the company would be entitled to a sum of over 60,000l. The arbitrators, Mr. Cawley, M.P., and Mr. Hawksley, C.E., with Mr. Hunt as umpire, have taken time to consider their award.

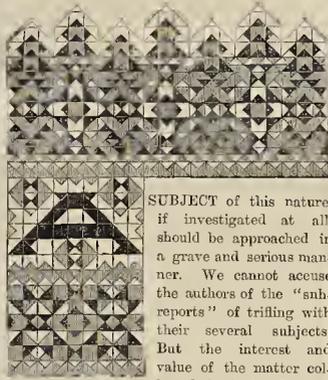
Pre-historic Relics in Cumberland.—At the last ordinary meeting of the Manchester Literary and Philosophical Society, Mr. R. D. Darbishire, F.G.S., gave an account of a remarkable discovery of pre-historic relics in Eden-side or Gihl Tarn, near Brunsfords Station, St. Bees, Cumberland. The find is a remarkable one, and is said to be, so far, unique in England, affording apparently a characteristic instance of the forest moss-pits. A watchful observation had failed, so far, to detect any traces of piles or platforms, such as indicate what are known as lake dwellings. Mr. Darbishire exhibited and described a series of cells, more or less highly finished; certain very interesting specimens of wooden huts for cells, clubs, and paddles; a quern, and several remarkable grinding-stones of different forms; and fragments of rude earthenware, found by Mr. Finham, of Quayle, and himself.

The Inventors' Institute.—A paper on "Inventions and Patents connected with Buildings," by Mr. Banister Fletcher, will be read this Thursday evening, the 4th of January.

The Builder.

VOL. XXX.—No. 1510.

*The Coal Question a Serious Subject.**



SUBJECT of this nature, if investigated at all, should be approached in a grave and serious manner. We cannot accuse the authors of the "sub-reports" of trifling with their several subjects. But the interest and value of the matter collected, is frittered away,

instead of being augmented, by each succeeding distillation; until in the ultimate Report of the Commissioners, which is that to which the public look, it becomes absolutely *nil*; or, in fact, assumes a negative value, as tending to show that nothing sensible can be said on the matter. Now it so happens that Professor Jevons published his work "On the Coal Question" in 1865, and that he there gave an estimate of the consumption in 1871, which has been almost exactly verified. Here, then, is a statistical expectation, which certainly deserves much more respectful treatment than to be put on all-fours with the optimistic speculations which we have just dissected. Indeed, when it is borne in mind that, while the general population of Great Britain may be roughly said to double itself in a century, the population of the larger towns, the great consumers of coal, tends to double itself in less than half that period, it would seem as if the most probable error of Mr. Jevons would be in defect, rather than in excess. In support of this view it should be remarked that the returns for the ten years from 1859 to 1869 show a rate of increase much nearer to 4 per cent. than to the 31 per cent. taken by Mr. Jevons.

In face of the protest of Sir Roderick Murchison, we must treat the question of the existence of workable coal, beneath the cretaceous and other secondary rocks in the South of England, as one which it is impossible, at present, seriously to discuss. The most salient points, therefore, which we consider that a competent reporter would have elicited, from the inquiries and evidence brought before us, are these.

The deepest colliery in England has a shaft of the depth of 2,376 ft., which is still being sunk. From the depth of 1,800 ft., to that of 2,376 ft., the increase of temperature becomes more rapid than is the case in the first 1,800 ft. The temperature of the earth, in this shaft, at the depth of 2,376 ft., is 92° Fahr., or 4° higher than that which would result from the data relied on by the Commissioners, but within 1° of the rate which we have ourselves adopted. At a depth of 2,706 ft. (neglecting the disparity of increase above shown to exist), the coal in this pit would become unworkable, without some as yet uninvited aid to the respiration of the miners.

Some of the Belgian coal-mines are stated

to be carried deeper than any in Great Britain. At *La Mouille longe*, a boring was continued for four years, from 1853 to 1857; and the enormous depth of 920 metres (or 3,017 ft.) was arrived at, without passing out of the coal measures. The Commission has not thought it worth while to seek for the practical test to which their theories might be put, by ascertaining the facts of the Belgian mines. The rate of increase of temperature indicated by this boring, is considerably higher than were the highest assumed from English data, and a variation in the rate, at increased depths, also results from the experiments.

In the Monkwearmouth Colliery, at a depth of 1,640 ft. from the surface, the physical powers of the miners begin to flag at a temperature of some 80° Fahr. Medical evidence is not required by those who are familiar with the effect of the summer heat of Egypt, of Algiers, or even of Italy, Portugal, Spain, and the South of France, on the English constitution, to inform them that the rise of every single degree above 81°, is accompanied by a sensible loss of the power of exertion. This temperature may be expected at the depth of 1,920 ft., and with every additional nine or ten fathoms, additional difficulty, exhaustion, and consequent cost are experienced by the miners.

It results from this view, that our national anticipation of a successful winning of our coal, at a depth much exceeding 2,700 ft. must depend on the result of a method to which the Commissioners have alluded, without seeming to be at all aware of its crucial importance. It is to the introduction of pneumatic machinery, that we are indebted for the completion of the Mont Cenis tunnel; not only on account of the mechanical advantage thus obtained, but also in virtue of the effect on the air of the tunnel, produced by the constant escape of the compound air that is forced in to work the machines. Mr. Lindsay Wood gives evidence that the air escapes from coal-cutting machines at a temperature of 7° Fahr. below freezing. But if, by the employment of such machines, or even by the introduction of special pneumatic arrangements for the purpose, the air would be so reduced in temperature as greatly to extend the zone of depth penetrable by the miner, all mines infested by fire-damp, or choke-damp, would be excluded from a benefit inconsistent with that voluminous ventilation, which alone can adequately dilute, and sweep away, the fatal gases. It is characteristic of the Report that it does not refer to this most important question. The "Sub-report of Committee A" contains a brief paragraph on the subject. The value of the collateral evidence obtainable at Mont Cenis, does not seem to have occurred to any of the reporters.

The only condition, therefore, from which we can at present calculate, with any practical wisdom, on the productive working of our collieries at a depth beyond 2,000 ft., is that of an adequate supply of air of a lower temperature. It would be possible, even in the summer, to deliver a ventilating current of a temperature little, if any, above 50° Fahr. at the entrance of the galleries at a considerable depth. But the deeper the shaft, the longer, on economical grounds, must be the working galleries, and the more will the temperature of the ventilating current be raised, by passage through the mines. This rise in temperature, which is somewhat unintelligibly alluded to in the Report, appears to be directly as the length of gallery passed, whatever be the volume of the current. It is rapid, of course, in proportion to the differences of the temperatures of the earth and the current, but is comparatively unaffected by the velocity of the latter; but any attempt to lower the temperature of a mine, by giving double rapidity to the ventilation, while it requires eight times the power, produces but inconsiderable results. In

Rosebridge Colliery, a column of air was raised 19.5° Fahr. in a course of 3,140 yards. The earth temperature here is only 80° Fahr. The results of such a length of passage, through galleries of 10 or 15 degrees higher temperature, would be far more marked and unmanageable.

Without undergoing the labour of remodelling details, on a plan which the Commissioners ought themselves to have regarded at least as an alternative, we are yet in a position now to state that the available quantity of coal on which we can, with any prudence, depend, must be very far less than the 146,480 millions of tons which the Report states "may be reasonably expected to be available for use." Instead of calculating the contents of a zone of 4,000 ft. in depth, we see that we are only justified in expecting to penetrate (with our present experience, and at anything like our present cost) to a depth of some 2,700 ft.; which is 32+ ft. deeper than our present deepest shaft. At, or even above, this depth, the soil is of the heat of the blood; and the rapid heating of the air, according to our present best methods of ventilation, would be such as to render workings, of a length at all proportionate to the expense of the shaft, quite intolerable for human labour. Besides the 13-40ths thus to be deducted, a further allowance, undefined but considerable, must be made for poor coal, and for seams above 12 in. in thickness, but too thin to be profitably worked at a great depth. Thus, for instance, in the Somersetshire coal-fields, the total thickness of coal in forty-six seams is only 98 ft. 4 in.; giving an average of 2.13 ft. for a seam. In the Golden Valley collieries, a depth of 1,920 ft. has been reached, and the cost of bringing the coal to the bank is said to be about 8s. per ton. It is thus clear that an effort to win coal from a considerably greater depth, out of the 6,000 ft. or 7,000 ft. of which these coal measures consist, is likely to be counteracted by commercial considerations. The modest term of 4,219 years for which this district will be able, in Mr. Prestwick's opinion, to maintain a yield equal to its present product, thus becomes a vanishing quantity. No engineer, with all the latitude of estimate with which the profession are sometimes reproached, could be justified, on the evidence adduced, in making the probable quantity of available coal, in the coal-fields of the United Kingdom, reach the amount of 100,000 millions of tons. The 110 years which Professor Jevons allows for final exhaustion must be, in common prudence, proportionately diminished in duration.

The check upon consumption that will be effected by a rise in price, is another of those essential elements of the question which are ignored by the Report. But for a hint on page xviii, it would seem as if the Commissioners were not aware that such a commercial question had any existence. This hint only makes the neglect still more glaring. There are many reasons to lead us to expect an immediate increase in the price of coal. To say nothing of the nominal increase, due to the steady influx of gold, we may remark, on the one hand, the uneasy feeling among the coal-miners, and, on the other, the mode in which winning is becoming more costly and hazardous, in such cases as those of the Golden Valley and the Monkwearmouth collieries. Whatever be the reason, there can be no doubt that the Commissioners, to use their own language in a note that forms an awkward comment on the text, "are taking the most favourable view in reference to deep working that the evidence will possibly allow" (p. 82). In fact, the idea of the propriety of that course of action on which Committee D (p. 118) so *naturally* plume themselves that they "have done all in their power to allay the fears of those who have thought that the national supplies of fuel must terminate," appears to have been the real motive of the Report.

* See p. 2, ante.

Such a mode of dealing with the subject is neither creditable, wise, nor honest. Great expense has been incurred, five years of time have been consumed, a mass of evidence has been collected, and the House of Parliament are presented with a report which blinks the main points, is either an absolute nullity, or is inconsistent with the evidence, and which acknowledges, in a note in small print, that its starting-point is contrary to experience. Showing us that coal cannot at present be economically worked at a greater depth than 2,700 ft., and that no mine in this country is worked within 324 ft. of that depth, it assures a workable zone of 4,000 ft. in depth! It places in contradiction to its conclusions, the opinion of our highest authority, himself a member of the Commission. It neglects altogether the evidence which is attainable in Belgium, and in the Alps, on some of the most important physical questions that affect the subject. It ignores the commercial question, the very bones of the matter, altogether. It tries to make things pleasant to the public; and it does so with a feebleness of utterance which it takes fifteen men to attain. No single writer would have had the courage to take the responsibility of such a report; no professional member of the Commission, if the matter had been left in his hands, but would have given us more reliable advice. The vice of referring such a matter to a numerous committee, presided over by a Cabinet minister, who has not the experience, and who ought not to have the time, to deal with the subject, is illustrated to the utmost. The opportunity of drawing up what would not only have been a State paper of the first class, but something more,—a permanent chapter in the physical, industrial, and commercial history of mankind,—has been frittered away. We are presented, under a high-sounding title, with a result neither reputable nor reliable, and we cannot repress the feelings of humiliation, and of disappointment.

PUBLIC IMPROVEMENTS IN PARIS AND LONDON.

SIR JAMES PENNETHORNE.

At a meeting of the Royal Institute of Architects, on the 18th ult., Mr. Arthur Cates read an interesting and valuable Biographical Notice of the late Sir James Pennethorne, which necessarily included reference to the numerous schemes for the improvement of the metropolis with which the subject of the memoir had been connected, and produced a discussion that may be usefully reported.

In 1832, said Mr. Cates, Mr. Pennethorne was, in consequence of the experience gained by his connexion with Mr. Nash, employed by the Commissioners of Woods, and commenced to devote his attention to devising plans for the improvement of the metropolis. The great works which had been carried out under the inspiration of Mr. Nash, and by which the West-end of London had been in fact created, were completed. The source from which the funds lavishly but wisely expended, had been derived, was no longer available; and a Select Committee of the House of Commons having, in 1838, approved and recommended for adoption the plans submitted by Mr. Pennethorne for metropolitan improvements, he was (with Mr. Chaworth) appointed to carry them out,—not, however, as designed by him, but trimmed and bowed down to satisfy the requirements of economy; and although the four streets authorised by the Act 3 & 4 Vict., cap. 87,—viz., New Oxford-street, Endell-street, New Coventry-street, and Commercial-street, Spitalfields,—have proved of the utmost service to the circulation of the traffic of the metropolis, it is now certain that could his enlightened views have prevailed over the narrow spirit which influenced the decision on his plans, the metropolis would not only have been greatly benefited, but improvements greatly needed, and now rendered almost impracticable, would have been carried out at moderate cost. Until the formation of the Metropolitan Board of Works (1855), he was constantly engaged in devising schemes for improvements, which were more or less advanced, some even having been brought into Parliament; but all general projects fell through from the difficulty of providing the necessary funds, a difficulty which is now removed. Besides the formation of the new streets, and other improvements, such as those at Picnic, Kensington Palace Gardens, Windsor High-street, &c., he carried out Victoria Park, Kennington Park, and Battersea Park; the works of the latter, after

many years of delay, having been hurried on in a manner which prevented the complete realisation of his design. The scheme for a northern park, which in 1852 was proposed to be formed under the name of Albert Park, was fully worked out by him; and had funds been available, and the project realised, would have added largely to his reputation as a landscape gardener.

In the course of the discussion which followed, Mr. Edward Hall, visitor said,—I wish particularly to direct further attention to the difficulties in which Mr. Pennethorne was constantly placed in treating Government works. During the whole time those works were under consideration, or were being carried into effect, he was thwarted in a manner which one could hardly conceive without close study of the subject, such as, I may say, I have myself given it. You will find some of the results of those difficulties in the line of Bow-street and Endell-street, and in that of which Coventry-street and Long-acre were to form part. If those lines had been carried out as Mr. Pennethorne designed them, we should not have had that corner which there is, where Coventry-street joins New Coventry-street, where stands the restaurant called the "Cremorne Branch," jutting out and interfering with the direct route of the traffic. We should have had a broader route, and there would not have been the danger that there is on every opera night, in Coventry-street. Nor would there have been the projection of the corner of Drury-lane and Great Queen-street. We should have had a tolerably straight line, taking in Coventry-street, Long-acre, and Great Queen-street, without the present twisted junctions. The actual defective arrangements were owing to the excessive anxiety for diminution of expense, and to the absence, in Mr. Pennethorne's supervision of his forethought as to future requirements, and his judgment as to modes of proceeding. Thus, only one side of what is now Endell-street was dealt with; and the other side remained as inferior property, whilst there were formed the awkward turns at the north and south ends of the street, instead of the line being made straight from Wellington-street to Bloomsbury-street. But it will surprise those who have not paid attention to the history of this subject, to be told that it was argued by recognised authorities in these matters, that a crooked line was better than a straight one. It was maintained by Mr. Higgins, a surveyor of the day of some eminence, that it was much better that the traffic should take a turn in the case of any crossing of streets than that it should cross at right angles. The consequence was that the suggestions of Mr. Higgins and of Mr. Richard Lambert Jones, the latter a great man in the City in those days, were preferred to those of Mr. Pennethorne; and it was also owing to their influence that Middle-row, Holborn, was allowed to remain so many years as it was.

Professor Kerr.—We lost in the late Sir J. Pennethorne a man of special ability and special education, who seems to have devoted his lifetime,—and that apart altogether from considerations of specific employment,—to the great question of the improvement of the metropolis, and not merely its improvement in the sense in which the phrase is generally used,—such as merely cutting a new street through a back slum, and making a new line of thoroughfare,—but, as far as he dared, the architecturesque improvement of the metropolis generally, which is a consideration of so much importance in London, as compared, for example, with Paris. There is a question which I have often heard asked, but have never yet heard properly answered, viz.—Why is it we in London find it utterly impossible to do as the Parisians have done with regard to their streets? We are richer than they. We have greater necessities with regard to traffic. The property affected, I have been told on the best authority, is not, as many of us may have supposed, more valuable than theirs. And yet we find they are able to cut straight lines in the precise direction in which they are felt to be desirable, and so to form grand thoroughfares through Paris in all quarters; and though it may be the fact that embarrassment has ensued, yet there is no appearance, even in this the darkest day Paris and France have ever seen, of the dreaded result of an actual crisis. I have always felt disposed to consider that money laid out in the improvements of a metropolis is money well invested for the people. True, it may not bring a direct return in the shape of a money profit, but it brings profit in many an indirect way,

which makes the outlay what is called a successful investment; and I think it is a pity our financiers and public men of business are so unwilling to take that view of the question. When a common tradesman builds new premises, or puts a new shop-front into his house, he does not expect to get a direct return for it in money. He makes his place more attractive and convenient, and he knows that his business will improve in various unexpected ways as the consequence; so that he makes it answer on strictly businesslike and financial grounds. In the same way I contend the public of the country, looked upon as a community in business, will find it a judicious investment, and not a mere waste of money, to pursue the architectural improvement of those great centres—and particularly London—in which business is carried on. By recent arrangements, as we know, the future improvements of London—at least, in their purely utilitarian bearing—are to be a portion of the operations of the Metropolitan Board of Works.

The question, however, arises—who is to take the initiative in those projects which such a Board can scarcely be expected to initiate. Our First Commissioners of Works, our architects may be excused for suggesting, are in this view of the case of no use whatever. It is notorious that our First Commissioners, one after another, have been mere politicians, who, having what is called a claim upon office, have been put into that particular position to work their way up, if possible, to some higher post in the scale of dignity. I humbly submit that is not the best way in which to deal with the architecture of London, or with the outlay of the public money, in any kind of building; and I think it may possibly be ultimately found to be necessary—I hope it may—to have something like a proper and responsible professional authority in connexion with the Government and Parliament, which shall take into consideration all questions of the kind; and especially those which affect Government property, and the great thoroughfares in which the Government buildings are situated, as in the case of the Whitehall quarter; and I venture to say it is impossible to accomplish anything upon a dignified scale, unless there is some such agency provided to initiate intelligent proposals with something like authority. I must say the Metropolitan Board, so far as it has gone, in street improvements, has succeeded to a greater extent than many of us supposed possible a few years ago. I think we must all agree that that body deserves especial credit for success in respect of the several grand lines of thoroughfare, which have recently been opened. But I think there are some things which the Metropolitan Board cannot be expected to do—which the Government must do if they are to be done, at all; and the question is a most important one,—how the initiatory steps are to be taken, now that the office of Government architect is swept away. I do not see in the policy of the present First Commissioner, or in the new machinery of the Office of Works, anything approximating to such an agency as would serve to initiate public works in an efficient manner.

Mr. G. Herbert West.—I would remark, in reference to the observations that have fallen from the last speaker, that in my opinion the different conditions in the laying out of new streets in London and Paris arise not so much from differences in the cities themselves as in the Government and the nature of the people. In this country we can never expect to have an autocracy such as that under which Baron Haussmann carried out the improvements of Paris on so grand and gigantic a scale, being seconded by an irresistible law of expropriation, which served more especially to make the fortunes of many who were engaged under it. The first plans carried out were those for streets which were not designed by M. Haussmann, but which were decided upon under the rule of Louis Philippe and the Republic. The plans were divided into three sets or networks, which we might characterise as the really desirable, the useful, and the extravagant. The first, which had been decided on before 1859, comprised the Central Markets, the Boulevard Sebastopol, the Rue de Rivoli, and the opening up of the city. The second, decided on in 1859, included the Boulevards Prince Eugene, Château d'Avant, and Malesherbes, &c., Pont de l'Alma, Avenue Marbeuf, &c., Rue de Rome, de Lafayette, &c., the Parc Monceau, and the Bois de Boulogne and Vincennes. The third network comprehended all the streets round the New Opera, *i.e.*, the Rues Halcy, Anker, Scribe,

Chateaudun, Quatro Septembre, &c., Boulevard Haussmann, &c., and on the left bank, the Boulevard St. Germain, and the Rue de Rennes, Guy Lussac, Monge, &c. The first set cost 272 millions of francs, the second 410, the third 615. Total, 1,297,000,000 francs, equal to 51,880,000*l.* Before the Boulevard Sebastopol was undertaken, there had been great discussion as to whether the existing streets, St. Denis and St. Martin, should be widened by buying up the houses and setting them back—whether an entirely new thoroughfare should be made. In 1850, partly perhaps for military reasons, the preference was given to the new boulevard. It was argued that interference with existing thoroughfares did more harm than good, and damaged trade, and that it was better to buy up houses in the back slums between two great streets, and drive a new boulevard through them. The difference in the nature of the traffic of the two cities is such that in London you cannot drive streets at haphazard through old quarters of the town and be sure of their bringing in a profit upon the outlay. In Paris, if they form a new street in which the ground-floors of the houses or shops, as is almost invariably the case, they are sure to meet with occupiers, and the upper floors will let in flats. So there is sure to be a good return on the money spent. But if you were to drive a new street through Drury-lane, you may be quite certain no one would live there; shop-keepers would not take the shops, and the houses would not let in flats, or as respectable lodgings, but the street would remain as poor as before. In Paris the tradesman occupies the shop and the rooms behind it, or at the top of the house, and in intermediate portions you have all sorts of people living, from the most wealthy to the poorest; and you are sure to have a traffic through the street, for Paris is a round city, while London is a long city. Our great avenues of traffic are by Oxford-street and the Strand; that in the other streets goes in no particular direction, but in Paris wherever you drive a new street you are sure to have traffic through it, since it forms one of the radii of a circle. This is clearly seen in comparing the omnibus maps of Paris with those of London. When a railway was proposed for Paris similar to our own Metropolitan Railway, it was objected to because the traffic was not sufficiently definite in its direction for it to be likely to prove of real service. In London you may have passage streets, but nothing more, however good the houses may be. In Paris you are certain to have a street more or less of palaces: some of the streets are very well inhabited, and all more or less bringing in good rents, and you cannot make sure of that in London. Since the Government have taken up the system of renouncing the employment of architects, you cannot have men in London corresponding to Baron Haussmann, or the present prefect of the Seine, with a body of architects working under him. In short, the differences of conditions are so great that you cannot fairly compare the two cities.

Mr. Eastlake.—What is the difference in rents?
Mr. West.—Enormously higher in Paris. There is one street built in the time of Louis Philippe upon the London principle, of setting back existing houses, I mean the Rue Rambuteau, which runs through the old part of Paris. The Boulevard St. Michel was certain to be a great line of traffic. The Boulevard Haussmann is perhaps the only great street without shops which could be compared with our streets of private houses. It is only half finished, and other streets have been left in such a state of incompleteness that you cannot take them into account. The Boulevard St. Germain has been begun at both ends and in the middle, but left unfinished, because it will require twelve millions of francs to buy up the *École de Médecine* to complete it. Some of those streets may be gone on with, but I should scarcely think M. Thiers will finish the streets round the New Opera.

Mr. Hall.—The real reason why in Paris the improvements are, as in my opinion, so much more successful than in London, is that in the former city there is preliminary design or *plan*. That is to say, there is general plan and principle observed, dealing with the whole of the French metropolis. In London there has been no general plan; for even Mr. Punchthorne's plans were only applicable to a small portion of the area of the metropolis, not to repeat mention of the fact that they were made under the greatest disadvantages. The principle in Paris has been that which was observed by Wren in making his

well-known plan for the improvement of the city. The principle in each case was this:—Decide what shall be your centres, and then form main lines to and from them, and direct lines. Every capital city has three or four main centres, such as a commercial centre, a centre of pleasure, a fashionable centre, and a centre of government; and it is necessary to decide upon these or to treat these as having been decided before you arrange your main lines. In Paris, pleasure is of greater importance than it is in London. Therefore, having decided to remove the Opera House, it was a main point to make routes converging to the place fixed upon as the site of the New Opera. I disagree with the last speaker in what he said with regard to the utility or non-utility of the streets round the Grand Opera. I think those streets have been well devised. I may mention, for example, the Rue Lafayette. Any one looking at the plan of Paris will see that the principle adopted by Wren has been carried out, though for the whole metropolis and suburbs, instead of the design being confined to one portion of the metropolis. I agree with the gentleman that some of the recent improvements of Paris are almost extravagances. No doubt a great deal has been done to keep the population employed. Still there is in Paris, I believe, a much greater return for the expenditure than people here are in the habit of supposing; and I am inclined to think when there is supposed to be a difficulty in getting occupation for buildings in new streets in London, it is forgotten that a part of the general demand of the present day for places of residence is one for residences for the middle and "lower middle" classes; but in too many cases we erect comfortless buildings, badly planned and ill-constructed by speculative builders, and there is no inducement to occupy them. People have been driven to reside in the suburbs; but there is a growing feeling of disadvantages which attend suburban residence. If we had properly planned buildings in properly planned streets, no doubt they would be occupied; and the improvements would give that return on the investment to which Professor Kerr has so well alluded.

Mr. R. Phend Spiers said:—As far as our experience has yet gone, there seems to be a decided distaste on the part of the English public to living in flats. There are some in Victoria-street, and though they have been built twelve or fourteen years, I am not aware that there has been such a demand for that kind of lodging as to call for a fresh supply. I can bear out what Mr. West says as to the facility with which shops and apartments in new streets in Paris are taken possession of. On the appearance of a new street, with the road hardly finished, and while the street itself is not much known, it is natural to suppose that the shops would only be taken by an inferior set of shop-keepers, who commence business somewhat in the way of the American stores, but it will be found that, after the lapse of two or three years, the shops are tenanted by respectable tradesmen; much money is laid out on them, and they form an additional attraction to the fine architecture of the street which has been opened. The rents of these flats far exceed the rent of our houses in London, even in the suburbs of Paris. In the outside of the outer line of Boulevards, a suite of five or six rooms on the third or fourth floor cost more than a twelve or fourteen-roomed house in the centre of London; and when you come to the Boulevard St. Michel and Boulevard Stansbourg, the prices obtained are immense. To a certain extent we may set against that the expenses which Londoners incur by living in the suburbs, in going to and from town daily. Some live at distances which cause an additional expense of 20*l.* or 30*l.* a year in railway or cab fares, and that does not include the family travelling expenses; and if these are added to the rent of the house in the suburbs of London, it would bring it up to about the same price as is obtained for the flats in Paris. The French have been accustomed to be satisfied with a much smaller quantity of everything than we are. They use very little water, and believing that they can wash themselves with the corner of a wet towel, they do not see the necessity for a bath; and the same with regard to food and everything. The rooms are only just as large as is necessary. They have not large families, or it would be difficult to understand how they could manage with such small accommodation. As a rule, these flats contain not more than a quarter the space which there is in our English houses.

Mr. E. R. Robson, Fellow.—In reply to the inquiry why it is that in London we cannot carry out public improvements on the same comprehensive scale as has been done in Paris,—it may be remarked that in this country we are subject to the provisions of the Lands Clauses Consolidation Act of 1845, which are applicable in all cases of public works and improvements, just as in the case of railways. The result is that in the case of opening out new streets you cannot obtain just the amount of property which you require, and no more, if there is any objection on the part of the owner. What has been done in the way of improvements in London has been done on a pottering though expensive scale. In Paris they have a fixed tribunal to which all cases of purchases are referred; but under the Lands Clauses Act such a thing as taking the exact quantity of land you want is impossible. Two points have been stated with regard to the laying out of streets: one is, that an absolutely straight line is best. For my own part, I think that is questionable. In my opinion, where the bulk of the traffic is of a heavy description, a slight *détour* is preferable to crossing streets at right angles. In Paris there is more light traffic than heavy. In making straight lines of streets we reduce the thing to the point of convenience, and art is nowhere. Take the case of St. Martin's Church: convenience would ignore such a thing, standing, as it does, partly across the line of St. Martin's-lane, but art did not. I do not myself hold the notion that all new streets should be strictly straight lines. In Paris we find that every straight street requires an ornamental column at the end, and it is the column which is seen rather than the architecture of the street.

Mr. Arthur Coates, in replying, said,—I am not surprised that the discussion should have taken the course it has. The contrast, vast as it is, between the public works of Paris and those of London is naturally a subject of great importance; but those who have spoken in terms of regret at the difference between what has been done here and on the other side of the Channel have forgotten one element. They have spoken almost as if this country was deficient in designers of taste and art. I protest that, while our rulers or those who have the control of these matters may be deficient in these points, there are plenty of men available who are competent to the task. The one great thing wanting has been funds, and in that respect London has been placed in a position different from Paris. Those who have not studied the map of London of 1805 can have no idea of the mass of tortuous lanes and miserable dens that have been swept away, where now we have valuable property, and some of the most important districts of the metropolis. The great work carried out by Nash which converted the narrow and tortuous lanes around Old Swallow-street into the present noble thoroughfare of Regent-street, and the great improvements round St. Martin's Church, Pall Mall East, West Strand, &c., were carried out at the expense of the State; and it having been decided that the land revenues of the Crown, from which the funds had been so wisely provided, should no longer be used for such purposes, the further progress of such works was suspended. I have indicated in my paper the manner in which it was desired to continue those improvements, but the only funds at disposal for the purpose were those arising from the coal duties, &c. For the works already executed, those dues were mortgaged for years, and further sums were obtained by further mortgage of those imposts. The funds thus raised were soon exhausted, and there were no means of raising other moneys. The policy of the Government had been to keep London in a state of helpless infancy, cut up into little districts, ruled as regards parochial interests by vestries, but without the power of combination and joint action, which alone could lead to the execution of works worthy of the metropolis. The constitution of the Metropolitan Board was a very great advance on this state of things. That Board in time acquired power to raise money by taxation, and we have seen the result of this control of funds, in the construction of new streets, projected many years ago, and the formation of the Embankment, which is a work equal to anything in Paris or any other city. We may assume that if London had been favoured with the means of raising money that existed in Paris, we should have had works which, if not equal in brilliancy, would have been equal in utility to anything in Paris. Paris has been more fortunate; the octroi, a ready means of

raising funds, was in full operation. At the end of 1852, the loans raised by way of annuity to meet the expenses of the occupation of the city by the allied armies in 1815 expired; but in place of the agitation which would have arisen, to reduce the taxation, and sacrifice the great interests of the City to a paltry gain for the present time, the wise administrators pledged those duties for further terms, and by the fund so raised and further loans, based on the credit of the municipal revenue, commenced those great works to which allusion has been made. It was the large sums thus raised which gave the first impetus to the improvements carried out by Baron Haussmann. Then, again, in France the State generally acknowledges its obligations to the capital, by contributing one-third, more or less, to the improvements carried out, which affects localities in which the State and the whole country are interested. Thus the works around the Palais Royal and the east side of the Louvre were constructed by the aid of large contributions from the State. If you compare the two cities, you must do so on the same basis, and London will then hardly stand in dis-advantage.

"INVENTIONS AND PATENTS CON- NECTED WITH BUILDING."

This was the subject of a paper read at a meeting of the Inventors' Institute, on the 4th, by Mr. B. Fletcher; Sir A. Brady presiding.

Mr. Fletcher said,—"I shall first take the entire building and work, thence to details. Probably I proceed in this form, as it is the usual course pursued in designing buildings, bearing in mind, too, the injunction by the poet,—

"Consider what you undertake,
And analyse it well,
And ever work from whole to part,—
Grand principle of master art,—
That makes that work to tell."

Well, in what does the house of to-day differ from the house built 100 years ago. I must be understood to mean the usual houses which are being built all over the kingdom, and not as alluding to an exceptional house here or there.

It is wise to imitate the prudent tradesmen who just now are "stock-taking," and I am afraid, if we take stock, and look upon the houses of to-day and those built some 100 years ago, like that I live in, we must say not merely that our predecessors built much stronger and better houses than we do, but also that the inventions and patents (grand as they are) have been so little utilised by builders, that even in conveniences the old houses will almost equal the modern. It is strange that this should be so, if one considers the almost appalling number of inventions and patents that yearly are granted. Take, for instance, this country, and the average number per annum during the last ten years: a little over 3,000 applications were made, and of these more than 2,000 were granted. The number applied for last year was 3,500, and of these, according to the average, two-thirds would be granted. Now see how slow Old England is. In the United States, for the year ending the 30th of September, 1871, 19,129 applications for patents were filed in the Patent Office (including reissues and designs), and as many as 12,950 patents were issued. Yet again, starting as this is, we find that this number was not so great as that of the preceding year. I notice the fees received during the year by the United States Patent Office amounted to 671,583l.!

I cannot say what proportion of patents relate to buildings; but one sees from time to time in our professional papers a long list of such patents; so that, no doubt, the thought must arise in the mind of the public: why, then, are not these inventions and patents more used?

I will explain. A man, if he can invent something which will enable him to produce cotton 1d. per pound cheaper, or some machine which shall be a perfect substitute for hand labour in some department where the demand is unlimited, may out of such single invention amass a great fortune. The one condition of such success is that the article manufactured shall be in great demand, and that his invention has saved money in its production, or that he shall produce a better article at the old price, or that by his invention useless materials may be made available (for example, much iron is now used by the application of the hot blast that formerly was thrown away: I do not say to the improvement of the iron, but that formerly it could not be used at all). Now, you will notice in all cases the basis of large profit is from extended demand for the article. It is therefore evident

that an inventor who turns his attention to patents in connexion with manufactures, has the prospect, if he succeeds, of larger profit than he who devotes himself exclusively to patents connected with buildings. This may account in some measure for the relative small proportion of inventions relating to building.

Having, then, shown that the inventive genius is somewhat allured from building-patents by the temptation of larger gains, a few words will be well to indicate the difficulties that beset those who, having devoted their time to this class of patents, succeed in producing a valuable and useful one. The architect who is building a house probably goes to see the invention,—likes it,—thinks he will try it,—hesitates,—finally probably decides against its employment, from fear that it may not be successful. Yet, I think, little blame can attach to him: if the invention succeeds, the merit is the inventor's; if it fails, all the blame falls on him, for selecting such a "fandangle, stupid thing" such will be the language his client may use to him. He therefore has no inducement to recommend a novelty, as it cannot benefit him in his practice, and by so doing he may lose a client. Is it, then, to be wondered at that we are so conservative in our decisions?

Qui bona, you may ask, all this explanation if there is no remedy? Well, I have a remedy. It is the formation of a commission, with unpaid members, who should inquire into patents or inventions, when (and not till then) the results are being manufactured for sale, and should test them, and should also invite the opinion of all who use them; and these commissioners from time to time should report the result of their investigations. I would base their operations very much on the mode of proceeding adopted by the commissioners of the Locomotive, and I think my hearers will agree with me, these commissioners have done much good. I feel sure that the commissioners I propose would be of great service if the gentlemen were carefully selected.

I have said that houses now are built very much as they were houses ago. Go into any ordinary house in any of the suburbs of London, and what difference will you find? Why, the house is as nearly as possible a counterpart of any old house, except that it is not so strongly built. Shutters are gone, and perhaps instead of the sash bars (which, by-the-by, some architects are now putting in their new works), a large square of plate-glass. In fact, the house when ready for letting usually has not one of the modern appliances.

This being so, let us consider what a house should be.

It should first have a good damp course, to prevent damp arising. Every room should have an air-flue to let the foul air escape, and those rooms where gas is burnt should also be provided with an external ventilator. The pipes from closets should be carried up in an inside recess, to prevent frost, and should be accessible by merely opening the wooden covering. The bells should also be so carried up. There should be a hydraulic lift where the house is large. Water, hot and cold, should be on the bedroom floors, and in the lavatories attached to the water-closets. Where cupboards are put, they should be fitted having regard to the use they will be put to. For instance: in bedrooms, they may be made like wardrobes. To see what is being done out of this country, look at the Americans. Take one of their houses: not a servant (or help, as I should perhaps call them) wanted upstairs, every room always ready except the dusting; the bed, a spring mattress (no making required); a tap to regulate the temperature of the room; washstand, with hot and cold water laid thereto, and waste therefrom; so that positively while we are quite helpless without our domestic servants, they can do every thing upstairs without servants. Surely the picture I have drawn shows how much we have to do before we can call the Englishman's castle really a home fit for this century. Well may I quote those lines,—

"So hard
The growth of what is excellent; so hard
To attain perfection in this neither world."

In proceeding to details, the lecturer compared granite and marble, mentioning that the price of the "dark slab" supplied at the Midland Railway Terminus was 3l. per foot run, for the columns, which are 2 ft. 8 in. in diameter, and advocated where slate was used for internal work it should not be in imitation of marbles, but should be in plain tints, relieved with gold and colours, some beautiful specimens of which were produced. He mentioned the various

kinds of stone-preserving processes, but would not express any opinion as to their merits. The new Midland Railway Station is being treated with Professor Church's process, and also with that of Mr. Ransome; and he also considered the patent stone of the latter, specimens of which were produced, worked with the chisel. He touched on fireproof construction, mentioning the price, inclusive of rolled joists and concrete, of the Dennett system at 4l. 10s. to 5l. 6s. per square for "model houses," and 5l. 6s. to 6l. 10s. for ordinarily-sized houses. Many specimens of moulded bricks he explained, with the machine for making them. As to concrete building, this formed an important portion of the paper, and he took great pains in showing its advantages and disadvantages as compared with the ordinary building materials. He noted the former to be cheapness, strength, and durability, rapidly of construction, and economy of space; the latter its liability to failure from the use of improper materials, or from the want of knowledge and proper care, and the limits which the material and method impose on architectural design and decoration. He objected to the imitations he had seen of stone fronts by concrete, with care of that material to form mouldings, and facing it with Portland cement. Such a method, he considered, would soon bring concrete building into disrepute. There is little doubt that concrete building, so far from being necessarily a "sham," may be made an admirable and useful material capable of perfectly legitimate treatment with good results. The different kinds of apparatus used in the erection of concrete buildings were treated of. Amongst the peculiar features of concrete buildings was mentioned that with regard to steps; four of Portland stone pounded to one of cement were stated as the proportion. The cost of these steps is about half that of Portland stone. Seven to one is the usual proportion for general building, but four to one is used for coping out for mouldings, and two to one where the projection is very great. An advantage in regard to sanitary arrangement was mentioned, viz.:—that it will take any number of flues for any purposes anywhere; so solid is the material, that flues may come within 3 in. of outer face. All fitting into vertical grooves must be avoided, as the swelling of the cement prevents the lifting of the apparatus. The new shaped core to chimneys was explained, which obviates the necessity of making the chimneys tapering, and it was shown that this prevented a series of recesses to catch and hold the soot. In roofing, the thickness of concrete should be 4 in. to 6 in., with thereon 1 in. of asphalt. He next alluded to Messrs. Hayward's latest invention in pavement lights, including the hexagonal and half prismatic lights, also the square half prismatic light for filling in existing pavement lights to increase their lighting power. He produced seven different samples of sash-fastenings, all to prevent opening from the outside, some being cheaper, and some more effective than that recommended by Colonel Henderson in his official circular. He considered it was want of information on the part of Colonel Henderson, and showed how the one he recommended could be opened from the outside if the sash did not fit very closely. Many examples of locks and their fastenings, door-springs, and rollers, water-bars, easement fastenings, revolving-shutters, electric bells and domestic telegraphs, cottage organs, stoves, lifts and hoists, dust-shoot boxes, pipes, paints and enamels, &c., were exhibited and explained. An ingenious letter-box was also introduced. And he concluded his remarks with this observation,—“I think, however, there is a grand future for architecture, but it must be by striving to combine in buildings all the scientific inventions of the day, to do so continuously and with judgment; and herein new forms will be created by the use of new materials, if only the desire be present not to be slavishly bound by precedent, but earnestly to strive to make the requirements of science express themselves in our works. Whilst, therefore, I contend no architect should have or invent any patent, or have any interest in any, for the reason that he may be tempted to use it when some better thing may have been discovered (and this merely from the natural love we all have for the children of our brain), he should be ever willing to experiment with all the inventions of others, and thus give them aid. I have learnt much while perusing my investigations, and if I but lead others to investigate for themselves, I am confident they will also learn much.”

The discussion was adjourned to February 1st.

THE LAW COURTS.

SIR,—If the people of England do not get a good building for the central Law-courts of the nation, it will certainly not be from want of public discussion; and yet, if a great national establishment can be designed by public discussion, as an Act of Parliament, it will be a new era in the history of architecture, and England will be the first country that has been able so to dispense with architectural genius.

If the multitude of critics, with the approbation of the public at large, can produce a work of art, then surely the architects who built the celebrated works of old have lived to little purpose, and again, if the works so produced are satisfactory, and "the people's architecture" is the best, it will still be a matter for curious investigation why the architectural art should be different from other arts in that respect. We do not get our pictures painted and our statues carved by public competition, nor is the poet laureate selected by a committee upon poems, still less should we think of inviting public opinion for suggesting improvements to the artist in the course of his work.

Now, it appears to me that this difference in our mode of dealing with architectural works, as compared with other arts, is possibly one of the chief causes why that art has fallen in this country into a lower rank, and why its productions have been unsatisfactory. I cannot see why the same course should not be pursued in architecture as in painting; namely, to select an artist, and then, having given him his instructions as to the general extent of the work, to leave him practically unfettered as to the manner of carrying them out. This notion will, I have no doubt, appear to many to be a rather startling innovation upon our habits in this respect. We have been accustomed to think that every man knows exactly what sort of a house he wants, and that a majority of a committee must be able to say what sort of a building is required for any public purpose. But I suspect the truth is, that the public have never sufficiently considered the subject to be able to separate the idea of the requirements of the business to be done in the house from the idea of the mode of providing for those requirements. What architect is there who has not received a letter from the intelligent house-proprietor about to build, showing exactly how the back staircase could be added on for next to nothing, or how a corner, 5 ft. square, with a gas stove in it, could be easily cut off from the hall for his own snugery; and yet, who cannot or will not say what is the traffic or business to be provided for in any part of the house.

There are instances to be found in the public buildings of our own country (and, indeed, of other countries) of the effects of this kind of interference with the architectural artist upon the buildings themselves; but of the results to the artists, the withering of individual genius, and the growth of a mere desire to please the popular taste, little is known or felt.

It is just this hampering of the genius of the architect which I think has been the main cause of the difficulties and disappointments connected with the Law Courts buildings; and, as an evidence of it, I may quote the very award of the judges on the competitive plans. This was to the effect that, as no one architect had precisely fulfilled the conditions laid down by the commissioners, they therefore selected that plan which most nearly did so, and combined it with the elevation most pleasing to themselves, and thereupon presumed that the most efficient building would be produced.

Now, is that a system likely to promote the growth of that independent, true artistic spirit which Mr. Fergusson says can be produced, if the architects and the nation choose it? Is it not in itself an argument why architects should be content to run along the groove of popular opinion, and cease to hope for any originality of thought?

And yet the judges were only strictly carrying out the instructions under which they acted, which were to select the plan that in their opinion best fulfilled the required conditions. It is to these conditions, therefore, that we must look for the fountain-head of the mistake. It is to these that I drew attention in a previous letter, which you were kind enough to publish in your periodical; and if you do not think the subject too much exhausted, I wish now to point out a little more in detail, what I consider to be the injurious effects of some of these upon all the designs for the law buildings.

The first and chief of them was, I think, the precise limitation of the area, both in extent and form. I will venture to say that for the business to be carried on there, and considering that it is acknowledged to be one of the largest collections of public buildings ever massed together, it was as small and as badly shaped a site as was ever appropriated to a public building. The area defined in the original instructions was about 900 ft., by 500 ft., the larger dimension lying approximately east and west. This is nearly the same as that occupied by the Houses of Parliament, but the latter is a long building of comparatively narrow depth, and with an open area about it, especially on the south side, which it faces. The Fulcrics and Louvre together occupy a length of nearly 700 ft., by 300 ft. broad; but they face the south, and the interior is nearly one large square. The Escurial is one of the largest palaces in the world, being 650 ft. by 550 ft.; a great deal of the site is garden; it is in a sunny climate and isolated; whereas the site proposed for the Law Courts is shut in on all sides by private houses; and the number and character of the offices to occupy it is such, that the whole area must be covered as closely as can be done, and without regard to aspect.

All sanitary engineering is tending in the present day to the spreading of buildings in such directions and extent as shall insure the greatest amount of sun and air; and the absence of these two vital forces in any public building would, no doubt, be perceptible in the health and energy of the functionaries employed in them. Now, I consider it impossible that any architect can arrange the rooms required in the original instructions on that site, without having a great number of small courtyards into which the sun will rarely or never shine, and a great number of windows of rooms with a northern aspect. And why should it be so? If the nation wants a palace of justice in which to conduct one of the most important branches of its administration, why should not the nation ask an architect to define the space required for it, letting him take these sanitary questions into consideration, as well as the greater one of taking the opportunity of opening out a fresh lung in the metropolis; thus making the Law Courts an abode of cheerful light instead of one of damp and darkness. It is not the expense that would stop the nation, for that has never stopped it in doing what it considered to be right; and when we consider what the single towns of Belgium did to provide town-halls and cloth-halls, and what our own provincial towns are now doing for their public buildings, expense would hardly be an obstacle in a question of space for the Chief Courts of Law of the British empire. It would be better to secure the ground, and to postpone some of the buildings to a future generation.

The real difficulty is in the limitation which has been imposed, step by step, on each authority concerned: first, the Government fearful of debates; second, the Commissioners fearful of responsibility; third, the architects anxious to do something; and, fourth, the judges cabled and confined by the acts of the other three.

What, therefore, appears to be wanted to make the site a habitable one, in a sanitary point of view, is greater length east and west, so that the buildings can be arranged in such a manner as to allow the sun to penetrate at some time of the day into nearly every living-room.

The second important defective point which appears to me to be found in the instructions is the proposal to make a great hall the central feature of the whole mass. This idea originated, I have no doubt, from both administrative and aesthetic considerations. The lawyers felt that a central place, where everybody would be sure to find everybody else, would be an important saving of labour and anxiety to all concerned in the business to be daily carried on in these courts; and both lawyers and architects were taken by the idea of a grand feature forming a veil as well as an aesthetic centre round which the whole mass could be grouped; and the architects, and especially Mr. Street, made the most of the idea, sacrificing certainly light and air; and in my opinion convenience and real aesthetic effect to it.

First, with regard to convenience. The law courts of England cannot be looked upon as one whole, like a palace or a State office, as far as their administration is concerned; they are only a collection of independent courts placed together for convenience of general intercourse.

Each court or set of courts has its separate times and nature of traffic, and separate staff connected with it. And whatever the changes in the business of the courts relatively to each other, it is not probable that the independent character of each court will be ever much reduced.

The members of the legal profession naturally wish for the greatest possible facility for their passage from one court to another; while, on the other hand, for the orderly conduct of each court, it is desirable that they should be separated from each other. For a distinguished barrister, who has to make speeches in two courts within a few minutes of each other, they should be as close as possible; but it may be doubted whether the officers of the court or the suitors would be so desirous of proximity.

Then, again, each court has its peculiar wants in accommodation, and the concentration of them in close symmetry would interfere with such peculiarities at the outset, and with any little additions or alterations that might be hereafter required; and who will be held enough to say that such will not be necessary in these days of change? For this reason alone ample space should be reserved round each court or set of courts.

Then, again, a great hall may be too great—for convenience in finding people. All the persons concerned in all the cases in all the courts would be mixed up together; and when they amount to some hundreds, a single room would probably not be so convenient as a long gallery, distinctly divided into compartments; the access to such a gallery from each court might be made easier than into one central hall, and the persons concerned with each court would be separated.

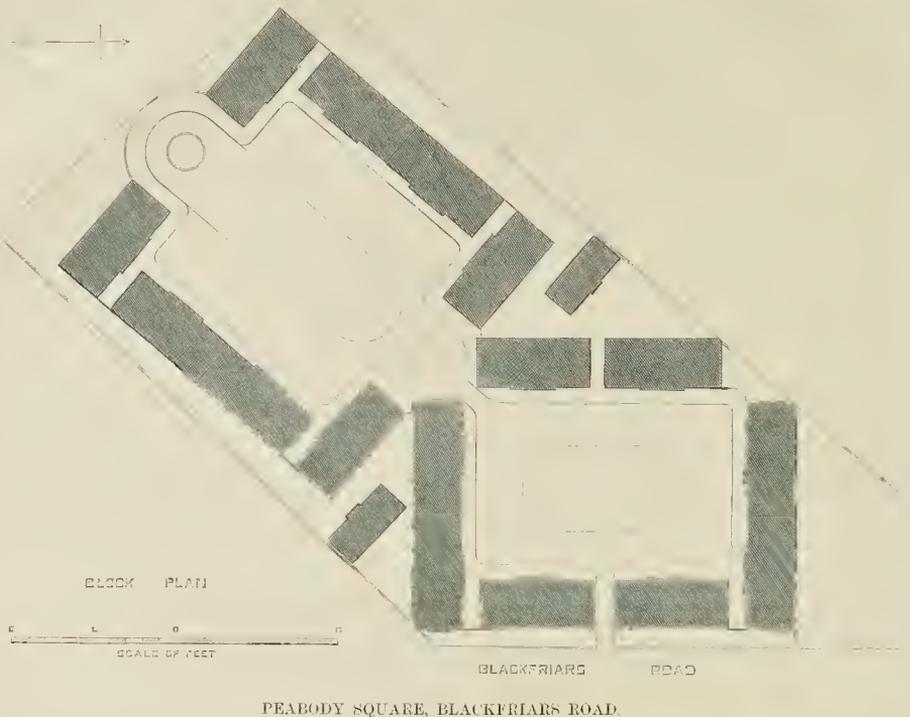
Lastly, concentration means an additional number of stories, and that means exclusion of light and air, and extra labour for the employés and the public.

Then, with regard to aesthetic effect. If I may venture, after the numerous and learned professional criticisms that have lately appeared in the public papers, to touch upon such delicate ground, I should say that the idea of a mass of building closely, concentrically, and symmetrically disposed round a central feature, is contrary to the principles of Gothic architecture, and more in accordance with those of Classic architecture. In the former, each building or block might be symmetrical, but the assemblage of them would not be necessarily so, as each would be designed to suit its own particular object. The character of Gothic architecture more accords with the idea of a collection of partially-detached buildings, and extending over a greater space than in Classic architecture; and therefore, from this point of view, the Gothic style is particularly suited to the Law Courts buildings. There are no examples of ancient Gothic establishments, I believe, to guide us in this particular case. The great ecclesiastical establishments consisted of those detached buildings whose independent symmetry would have been marred by too close juxtaposition. But the later styles of Gothic would doubtless afford a groundwork for an assemblage of independent buildings into one connected mass, such as the Palace of Justice ought to be. None of the architects, however, appear to have tried those styles.

Then, if I may venture a step farther, and enter upon the still more debatable ground of the moral effect of a design: it appears to me that, if the Courts of Law are to some extent independent tribunals, that idea should be visibly expressed in the building. All persons should be able to perceive that it is a collection of courts, and the actual courts themselves should be the most prominent features throughout the whole mass. But a central hall is quite contrary to this conception of the design; for it makes it simply one huge place of assembly, one gigantic forum or basilica, to which various tribunals are attached.

Thus it appears that on all four counts—moral effect, aesthetic Gothic effect, convenience, and health—the verdict should be against the central hall.

It is true that I am now writing in ignorance of the plan of Mr. Street's latest design. The area, and its shape, and the required accommodation, may have been altered since the original instructions were issued; but judging from the elevation of it that has been published, the general idea is only a modification of his original one; and, it is to be feared, a modification made, not in accordance with Mr. Street's own wishes, but to meet the views of the Government. But supposing the accommodation required to have



been so reduced as to do away with some of the objections I have raised, what provision is there for future extension, such as will inevitably be required as the population increases.

I venture to put forward those doubts affecting the whole proceedings connected with the Law Courts buildings, as questions of professional art. As a constructor of some years' practice, I wish to protest against any designs limited by such restrictions, as affecting the proper responsibility of an architect, and being incompatible with satisfactory work. And I hope that the leading architects of the country, who are all interested, and to some extent responsible, in the matter, will combine in requesting the Government to give an opportunity for a design to be made free from such trammels. Otherwise I fear the same result will happen to our latest and largest public building as has happened before in one or two such cases in this and other countries; that when it is half done, and a new Government in power not committed to the decisions of their predecessors, the building will be pulled down to make way for one on larger principles; and then not only will the time and money have been wasted, but it may be impossible to produce such a perfect work as could now be erected.

And I calculate on the support of Mr. Street himself to such a motion, as I should think he would not be sorry to have an opportunity of showing that his unfettered ability can produce a work which will be a mark, not of the past, but for the future, of English architecture.

J. B. COLLINSON,
Colonel Royal Engineers.

A New Pagoda has just been completed in Rangoon, amidst great popular rejoicings. The *Rangoon Gazette* says that "the total height of the pagoda and *steeple* is shown at 240 cubits and 6 inches, equivalent to about 375 English feet."

PEABODY-SQUARE, BLACKFRIARS-ROAD.

PEABODY-SQUARE, recently erected for the Peabody Trustees from the designs of Mr. H. A. Darbishire, consists of sixteen blocks of buildings, inclosing two quadrangles communicating with each other, and is situated on the site of the old Magdalen Hospital, on the west side of Blackfriars-road, near the Surrey Theatre.

All the blocks are alike in construction and arrangement. They are four stories high, containing ten rooms on each story, and these are distributed in dwellings of one, two, and three rooms, giving a total of 384 dwellings, and 640 rooms.

The living-rooms measure 13 ft. by 11 ft., and the bedrooms average 13 ft. by 9 ft., with a height of 8 ft. 2 in. from floor to ceiling. The former contain the usual cooking range, with boiler, oven, and hot-plate, and are provided with cupboards, shelves, and meat-safes. Some are provided with coal-boxes, others have coal-stoves in the adjacent sculleries. There are two sculleries on each floor, containing water-closet, sink, and water supply; also a dust-hopper communicating with dust-cellar in the basement, to which access is obtained by an interior staircase. A bath-room, with enamelled bath and plentiful water supply, is provided on the ground floor of each block.

These buildings differ from the majority of those which the trustees have erected, inasmuch as they have no corridors; the staircases are inclosed, and the washing accommodation is contained in laundries apart from the dwellings. The dimensions of the rooms, also, are rather larger, and their cupboard convenience is increased. The buildings are plainer, and less imposing in appearance, than their predecessors; their cost is materially less, and they are more popular with the tenants. As we said in the account we gave when they were first opened, they are more homelike and agreeable than the other establishments erected by the Trustees.

The handrics consist of two detached buildings, each containing accommodation for twenty washers at one time. The washing-rooms are on the ground-floor, with water-closet, wringing-machines, &c., and the drying-rooms are above. The works were executed by Messrs. William Cubitt & Co.

A portion of the site belonging to the trustees is still unoccupied, but it is proposed to cover it with similar buildings as soon as possible, the demand for the completed dwellings being considerably in excess of the present supply. We give with our view a block plan showing the position of the blocks, and a plan of one of them to a larger scale.

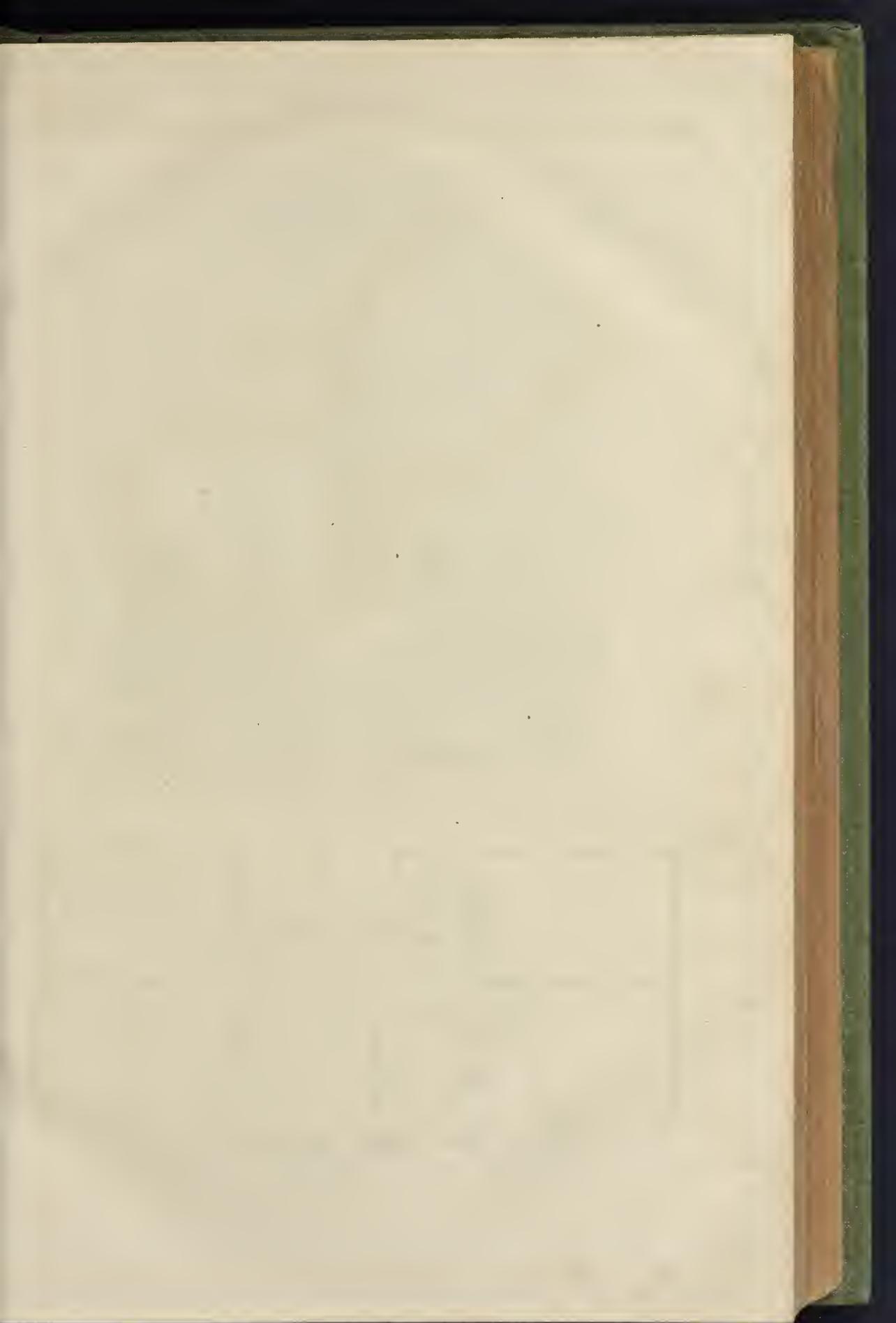
MONUMENT OF THE CHICAGO FIRE.

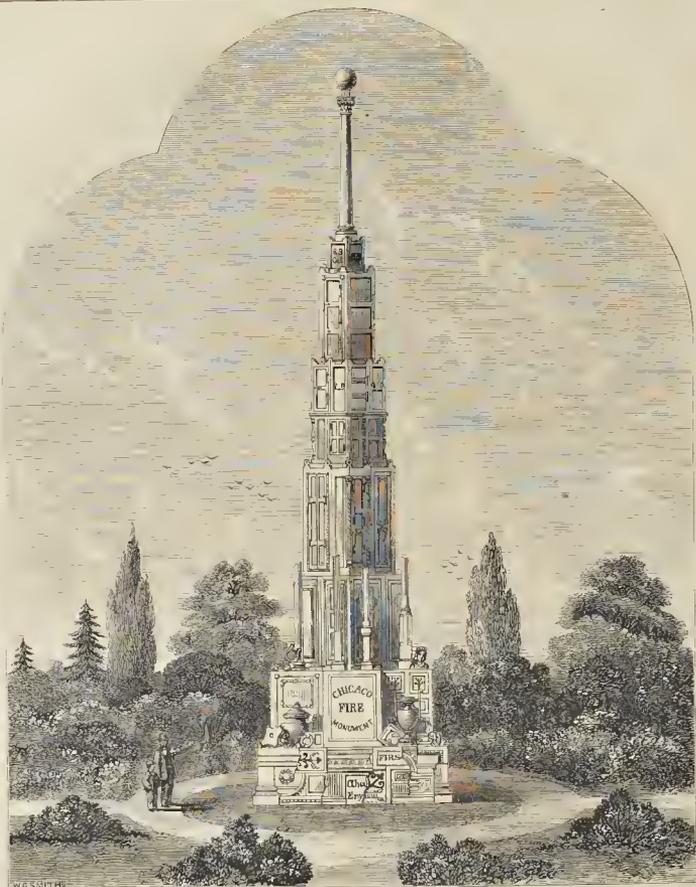
OUR engraving represents an odd monument about to be set up to record the recent dreadful fire. It is to be erected in Central Park, West Chicago, one of the large city parks, on a site just within the principal entrance, originally designed for a monument.

The materials are relics of the late fire that destroyed the entire business portion of the city, together with about one-third of the residences, and consist of iron safes, columns, sculptured stone cornice and ornaments, which have been presented for the purpose, and are now being hauled to the site.

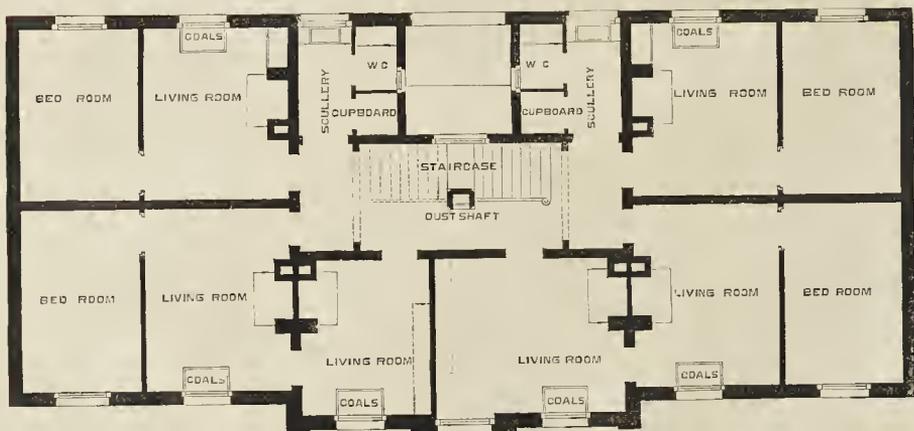
The height of it will depend to some extent upon the amount of material collected; it will exceed 100 ft. The work of construction will commence as soon as the weather will permit. The architect is Mr. W. L. B. Jenney, of Chicago.

We can scarcely anticipate a satisfactory result: the monument will suggest the advertisement of an enterprising safe-maker. Chubb, Milner, or any other of our manufacturers in this line would doubtless supply good specimens for the purpose free.

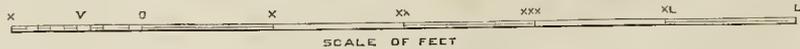




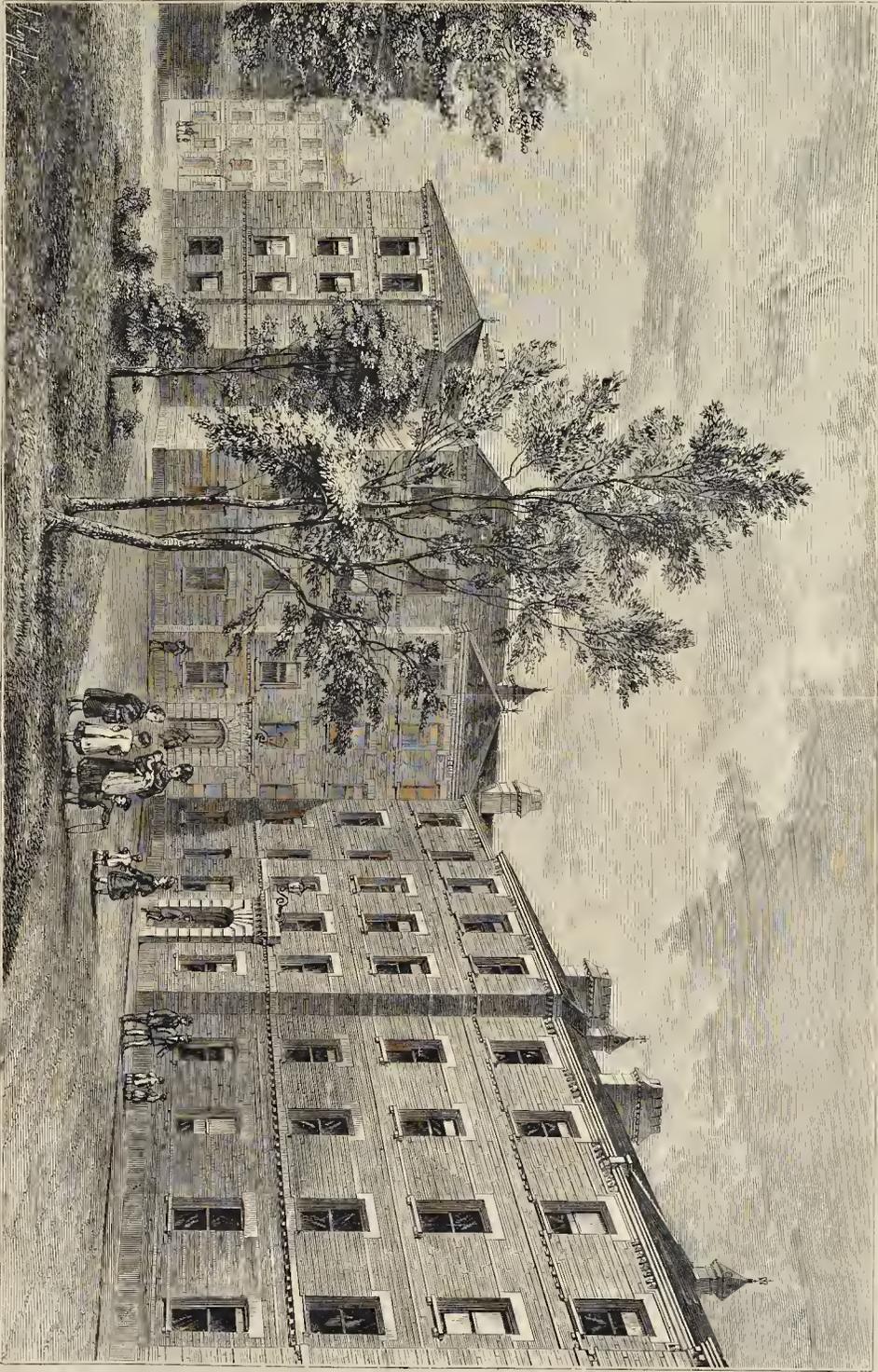
FIRE MONUMENT, CENTRAL PARK, WEST CHICAGO.—Mr. W. L. B. JENNEY, ARCHITECT.



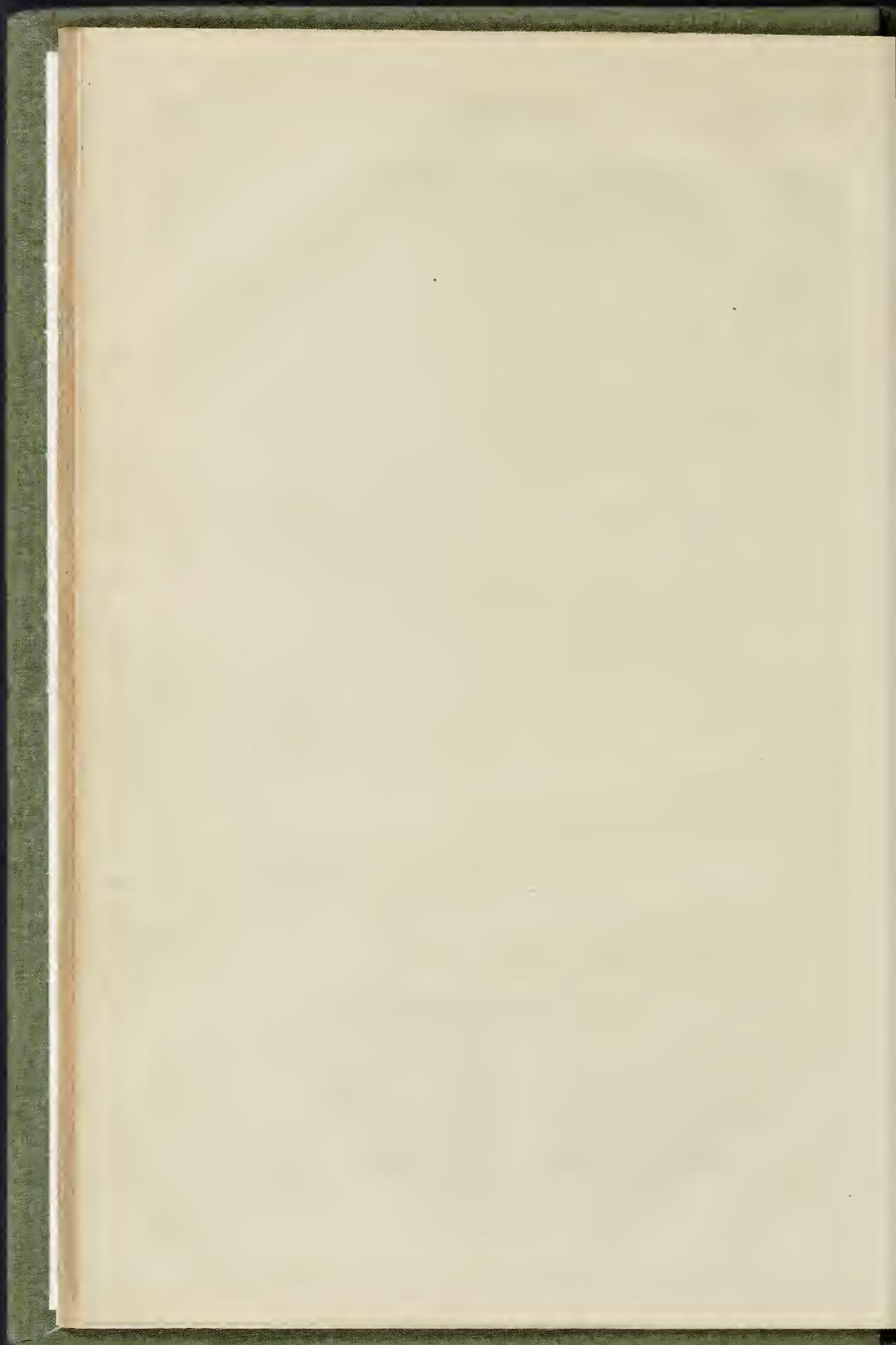
PLAN OF 1ST 2ND AND 3RD FLOORS



PEABODY SQUARE, BLACKFRIARS ROAD.



PEABODY SQUARE, BLACKFRIARS ROAD.—MR. HENRY A. DARRSHIRE, ARCHITECT.



DEADLY WAKES AND WASTFUL FUNERALS.

An edict has at last gone forth against wakes and funerals, both in Ireland and England. Cardinal Cullen has felt it necessary, not only to condemn the demoralising practice of nursing the dead, but to threaten a sort of religious penalty that is likely to have some good effect with the members of his flock. It is many years now since the *Builder* first drew public attention to the pernicious and criminal custom of "waking the dead, and so killing the living," carried on in the homes of the London Irish.

An Irish Roman Catholic priest located at the practice of "waking bodies is disgraceful." He cites what must be considered a terrible picture, that forty persons had sat in one room with the corpse, and that during the night fourteen gallons of beer were consumed.

To this painful picture might be added a little more colouring without the least exaggeration. Let us imagine that among these forty persons there were at least half of them females, the majority of them marriageable; and that besides the beer there was probably half a gallon of whisky drunk, and a quantity of tobacco smoked. The character of the songs and conversation that usually distinguish such gatherings can be imagined, and the moral degradation and blunted feelings they superinduce. Having ourselves witnessed Irish wakes, not alone in Ireland, but in London, in the wynds and closes of Edinburgh, Glasgow, Newcastle-on-Tyne, Birmingham, Sheffield, Leeds, Liverpool, and various other towns in the kingdom, we can form an estimate of their baneful effects.

We have known cases where the deceased, when living, was only existing from hand to mouth; yet his death and "wake" were the signal of the most wasteful expenditure on the part of his friends and relatives.

Many thousands of the London Irish are members of burial societies, to which husbands and wives may certain weekly subscriptions, amounting from twopenny to perhaps fourpence, and even sixpence a week. In this the conduct of these poor people is most commendable. The sums paid at death average, perhaps, from 50s., for a child, and from 5l. to 10l. or 12l. for an adult (husband or wife). Unfortunately too often this sum that should be economised by the survivor in the providing for the funeral and the grave, while bethinking of the future, is thoughtlessly squandered in nursing the corpse, and feasting the jubilant mourners who come from miles around to drink with all due reverence, "The memory of the dead." Then comes the solemn mockery of the poor man's funeral, or the poor woman's, as the case may be, and more money is wastefully spent. Certain of the Eastern undertakers, who specially provide Roman Catholic funerals, have in requisition "a Catholic house" for the conveyance of the deceased London Irish, and this custom has become so recognised, that many of the Irish poor would resent as an insult any attempt to convey the remains of their relative in any but the orthodox vehicle.

An Irish funeral of somewhat large dimensions may be seen almost any week in the year at the East-end of London, or in the Borough; but a bonafide Irish funeral cortege and procession, with all honours, is becoming a rather rare occurrence anywhere out of the Emerald Isle.

Once the body is consigned to the earth, a few of the mourners may return straight home; but, unfortunately, a very large portion of the men who form the funeral procession will betake themselves to the public-houses in the vicinity, and night and drunkenness envelop the conclusion.

If the dignitaries of the Roman Catholic Church had begun their crusade a quarter of a century ago, how much disease and misery might have been prevented! Imagine, in the case of a man or woman dying, perhaps, of some dangerous disease, the body being waked from Wednesday or Thursday till Sunday afternoon, the coffin, even if there be one, fill the last moment unclosed!

The love for "the Sunday funeral" induces the people to nurse their dead for days, to the imminent peril of the health of the entire neighbourhood. We are not exaggerating in any particular. What we state we know.

We are free to admit that there are respectable families who permit wakes in connexion with their deceased relatives from feelings of reverence and the old ties of country and

custom. Neither religion, morality, public decency, nor public health can, however, sanction or permit the continuance of such a baneful custom. The practice is bad and reprehensible in all views, whether it take place in homes above the reach of want, or in the homes of the working poor. If people could only be brought to realise the picture usually presented at these "wakes," in all their baleful, senseless folly and wickedness, their extinction might be looked for. There are probably very few writers or reformers of abuses who in reality know aught from personal observation of these doings. Many here in London, who view them in the mind's eye through snatches of information from time to time in the newspapers, laugh at them, from their comical aspect. There are worse evils attending and arising from the practice of "wakes" than the drinking of beer and whisky,—worse evils even than the infection transmitted from the dead to the living. The corpse may be buried, and the drunkard resume his daily labour; but in the home of the dead there may be more than one sad remembrance of virtue undermined, of young womanhood unsexed, and the dolorous sequence in the streets and the river.

Let the clergymen of all creeds side with the law, and let the law be not harshly but firmly enforced. It is sufficient to cope with the evils we have pointed to.

AS TO A NEW STYLE.

The question of a new style, which has lately been agitated, has closed, as usual, without producing any tangible results.

And thus it will ever be, until it is argued with a clearer conception of what constitutes a style of architecture than the writers of some of the letters I refer to have shown. A careful study of the history of the art will prove that the distinction between varying styles is not to be sought in the arbitrary use of certain "forms," "features," or "details," by one or the other, but that it lies far deeper, and is to be found in the characteristic mental tone of the builders themselves, of which such styles are an accurate reflex.

Let us take the case of the Greeks, a people whose leading characteristics were intense love of absolute perfection, and perfect confidence in their own ability to attain to it; whose emotions were few and kept carefully under control; unimpassioned advocates of philosophical calm, with a sweet distrust of variety. What sort of buildings could be expected of such a race, but just what they actually erected?—all on one simple fundamental plan, with no complicated construction or straining arches to destroy the appearance of self-contained repose which was the Greek ideal, but with all their homologous parts exactly uniform and worked up to as high a pitch of beauty as they were capable of.

It was far otherwise in the Middle Ages; the high emotional tone, the deep reverence of the Mediæval mind required to be impressed with the long-drawn aisles and lofty vaults of the Gothic church. In such a building the round form of arch inherited from the Romans, with its strong lateral thrusts, had no place; where economy of vertical space was not only useless but undesirable, the pointed form, which, in all its various uses, carries the aspiring principle firmly stamped upon it, was much more appropriate, and was no sooner discovered than universally adopted.

The same aspiring tendency carried the roof upwards into lofty gables externally, extended counter-weights into pinnacles, and tower-caps into spires; while a conviction of the unattainability of perfection, and yet of the necessity of pressing forward impatiently on the road to it, caused that roughness, want of finish, and healthy imperfection, which so much distinguish Gothic from Greek work.

Thus, with the exception of window tracery, the result of the accidental invention of colour-glass, we have the main distinctive features of Mediæval architecture; the production not of arbitrary "taste," but of an unalterable psychological law.

Did the limits of a letter allow, I might point out how Oriental indolence produced the flat surfaces and spiritless arches of Eastern architecture; how Egyptian gloom raised the massive piles that crowd that strange land; how the characters of the Chinese, Hindoos, and all other nations may be predicted from their architecture as safely as the habits of an animal from its

organisation; how, finally, even the safeguard of literal copying has not prevented this age fixing its stamp faintly on the so-called revivals of other styles. Can we, then, believe that it would fail to fix it with firmness and vigour on an architecture developed anew from its elements? Revivals of old styles can never be a success, unless we reproduce the tone of thought of the age that gave them birth. The clear mind of Pugin saw this; but unfortunately his admiration of Mediæval art was so great that he actually proposed to effect such an impossible reproduction, and in his enthusiasm led the way himself.

By developing an architecture from its elements, I mean that we should begin in theory, as other nations did in practice, from simple squared masses of building material; and bringing to the work a senso of beauty trained by assiduous study of the Creator's noblest works, shape these rough blocks to such forms as shall give not only pleasure, but satisfaction to the faculty so cultivated; and beauty, I believe, is but the expression of an all-pervading, guiding reason in form.

We can then add ornament, the representation of the most admired works of nature, to give additional interest to the building; enrichment or patterns to relieve plain surfaces; and colour, whose use needs no comment.

The ancients designed on these principles buildings which are real and true organisms, each part designed especially for its own place, all together forming a harmonious whole. We pick their buildings to pieces, and, considering each part as a fixed quantity under the name of a "detail," or an "ornamental feature," patch them together, like children with a box of bricks, to form structures frequently with as little truth in them as the well-known monster of Horace's imagination.

To predict what the style of this age will be is, perhaps, premature; yet, I think that there can be no doubt that the breadth of view which distinguishes modern thought will tend to spaciousness in the area of buildings. The pointed arch, I think, will be found unsuited to the period, and the round form will be adopted, with a slight ellipticity (the long axis, of course, vertical) to give it that life and vigour wanting to the pure semicircle; and, as the Mediæval architects made the development of painted glass windows one of their chief cares; so the great problem of this age, I believe, will be, or rather has been, propounded by the invention of wrought-iron roofs.

I have already trespassed too much on your space; permit me but to add, that I should not have written a letter controverting, as this does, the opinion of so many eminent architects, had I not first practically proved the possibility of designing buildings, monumental and domestic, in the new style whose cause I am advocating. Although want of leisure has hitherto prevented the working out of complete illustrative drawings, yet if any gentlemen who take an interest in the subject should be willing to lend their assistance, a short time would suffice to lay the scheme before the public in its practical working, as well as in its theoretical bearing.

Let me not be misunderstood. I lay no claim whatever to the "invention of a new style." I am simply anxious to show that the style of the nineteenth century is not a visionary dream; and that its conversion from a potential to an actual existence is neither difficult nor troublesome.

A CAMBRIDGE GRADUATE.

THE SITE FOR THE LAW COURTS.

DEMOLITION OF THE BUILDINGS IN ST. CLEMENT'S DANES.

DURING the present week the owners and occupiers of the houses and other premises in St. Clement's Danes, whose property has been obtained by compulsory purchase for the purposes of the New Law Courts, have commenced preparation for giving up possession of their several tenements preparatory to the work of demolition being proceeded with. Miss Coventry, the proprietress of the "Anchor" dining-room and restaurant, opposite St. Clement's Church, and who has received £2,500, as compensation for her lease and goodwill, closed her premises early in the week, and on Thursday had a sale of her effects preparatory to immediate removal. On Monday next, the 15th instant, the St. Clement's Danes Vestry, who have received 10,000l. for

their premises, including the old burial-ground and the almshouses adjoining, will give up possession of the property. Mr. Dr. Silva, the cigar-dealer and billiard proprietor, who occupies the premises next to the vestry-hall, and who has received £2,100*l.* in compensation, announces that he gives up possession at the end of the following week; and we understand that the Midland Railway Company, who occupy the premises adjoining as one of their parcel-offices, will remove about the same time. The occupiers of the four houses in St. Clement's-lane, leading to the Inn, who have also received notices, as well as the old matrons who occupy the six almshouses belonging to the Vestry, are to give up possession immediately, when the whole of the buildings will at once be taken down, but we learn that the bodies in the old churchyard will first be removed under the faculty granted by the Bishop of London. We understand that the St. Clement's Danes Vestry intend to make a comfortable provision for the inmates of the almshouses who will be turned out of their premises for the purposes of the New Law Courts.

SANITARY MATTERS.

Malton.—Drain fever and drain ventilation are now receiving every attention everywhere. The Malton Board of Health have appointed a special committee to inquire into the subject of drain-ventilation, the condition of private houses as to drain-connection and water-closet and soil-pipe ventilation, the covering of cesspits, and general sanitary matters. The inspector has been ordered to visit all houses using water-closets, to inspect drain arrangements, &c., and report.

Nottingham.—In a letter to the *Nottinghamshire Guardian*, Mr. Sidney R. Stevenson, architect and surveyor, Nottingham, says:—Having been called in to inspect and report upon the condition of the drainage of property in the higher situations of Nottingham, I have been astonished to find so little care taken in the sanitary arrangements of the better class of houses. In one case I found the cold and hot water cisterns (fixed in the bath-room) supplied the kitchen, bath, and lavatory; and from the same cold-water cistern the water-closet was supplied. It is almost superfluous to tell your readers that through the closet-valve in the cistern the noxious gases from the main sewer have the chance to force themselves into all parts of the house, and to impregnate the water with their effluvia. . . . A factory owner, with whom I am well acquainted, states that when he has occasion to blow off steam the inhabitants of the adjacent small houses have frequently told him that the steam from the sewer has found its way through their drains and sink-traps into their houses. If such be the case with the floating steam of an engine boiler, with how much more power must the foul gases of the sewers force their way through the majority of drains and traps? A serious case of typhoid has just come under my own observation from this cause. The residence abuts upon what is considered to be one of the most healthy parts of Nottingham—the Arboretum. The effluvia accumulates in the sewers of the lower parts of the town and rushes to the higher, and by accelerated power the gases force their way through lavatory basins, closet valves, and places little suspected. Surely these facts are worthy the consideration of the Sanitary Committee and their able surveyor, Mr. Tirbotton.

Sheffield.—At a recent meeting of the Local Health Committee applications for the vacant post of chief sanitary inspector were opened. These numbered upwards of a hundred. Though the committee sat upwards of three hours, they found it impossible, having other business to transact, to read the testimonials of the various candidates, and to come to a decision upon them. The meeting was therefore adjourned. The committee were able, however, to come to a decision as to who were the most suitable candidates; and fifteen or sixteen of the best were selected. The list of the selected candidates was as follows:—Mr. Tudor, engineer, Manchester; Mr. Drake, sanitary inspector, Salford; Mr. Weyer, civil engineer, Leicester; Mr. Clarke, sanitary inspector, Norwich; Mr. Roome, sanitary inspector, Rawmarsh; Mr. Dobson, sanitary inspector, Glasgow; Mr. Fitzpatrick, sanitary inspector, Liverpool; Mr. Coghlin, chief sanitary inspector, Margate; Mr. Winn, civil engineer; Mr. Maskell, from the office of Mr. M. E. Hadfield, Sheffield; Mr. Lancashire, from the office of the borough surveyor,

Sheffield; Mr. Crofts, nuisance inspector, Huddersfield; Mr. Currie, chief sanitary inspector, Newcastle; Mr. Watson, Sheffield; and Mr. Griffith, sanitary inspector, Ashton-under-Lyne. The contest was ultimately between Mr. Roome and Mr. Crofts, and the latter was elected by a majority of one.

Pollution of the River Lea.—A deputation from the Society for Improving the Condition of the Poor, consisting of Mr. Charles Reed, M.P., Messrs. Robert King, Hacon, and Kemp, have attended the Lea Conservancy Board, to present a petition:—

"That the river Lea is the means of wholesome exercise and recreation to many thousands of the inhabitants of Hackney and of the East of London; that the discharge of part of the sewage of the parish of Tottenham into the river Lea, north of Balby's-lane, makes both the river and its banks offensive to passers-by and dangerous to health, and pollutes the stream for the whole of its course through this parish; that those who live near the river and those who resort to it are exposed to the risk of disease by its effluents, and are deprived of the proper use and enjoyment of the river."

The petitioners therefore request that steps may be taken for preventing the sewage of Tottenham from being discharged into the river. The chairman received the petition, and stated that the Board was taking effective measures to suppress the evils complained of; but there were restrictions in their Act which retarded their proceedings; but he assured the deputation that the nuisance of the Tottenham sewage would soon be abated, as the Board had now under consideration a plan for the interception of the drainage of that populous place.

THE NEW "SOCIAL MOVEMENT."

MR. SCOTT RUSSELL has addressed a letter to the lords, gentlemen, and fellow-workmen who constituted his Representative Council of Working Men and Council of Legislators, containing a programme of the measures which he thinks are needful to turn the celebrated seven resolutions into legislative acts. He hopes it will soon become his duty "to lay before the Council of Legislators the communications they are awaiting;" but meanwhile, as the premature disclosure of their plans has for a while arrested the progress of the movement, he wishes to utilize the time by obtaining their individual co-operation, before the date of the meeting of Parliament.

He thinks that it should be stated in the preamble of these measures, that in some countries lands round towns are held by their inhabitants for the common good; that in England the Legislature has taken from the people millions of acres of common land, which were the entailed estate of the people; that though human beings have not been recognized as objects of value, skilled men and their families are national wealth, and the rearing and cultivating of healthy families is an object of the highest public utility. Parliament should, therefore, grant powers to villages and towns to purchase outlying lands just as railway companies do. The quantity to be—

"one acre for one-tenth part of the inhabitants in towns exceeding 20,000; half that quantity per head where the town exceeds 100,000; and in towns and villages under 10,000 it may reach one acre to five of the population. These lands are to be used as follows:—One-half shall be appropriated to detached cottages in gardens, the other half shall be held as common land, left free in the middle of the cottage ground, within which there may be enclosed school-houses in their play-grounds and gardens, recreation-grounds for the people, a town-hall, market-houses, and places of instruction."

The Corporation to have powers of road-making, purchasing and letting property, building and pulling down and destroying unwholesome buildings and appropriating land for the common good. The revenue for these purposes Mr. Russell would raise from the rent of land. The agricultural value of land is fifty shillings an acre; a town of 10,000 inhabitants would have an acre; that land 1,000 families in cottage gardens, who would pay 1,000 rentals of fifty shillings each; and, considering that the common lands have been taken from the poor for the benefit of the rich, they must be restored by means of a property-tax, which would, of course, fall on the rich. A third source of revenue would be the rental of the cottages. A rental of 105 shillings a year will not only pay for building a cottage, but will repay the capital in a moderate time; and thus "a rental of 155 shillings a year will give a family home, health, and garden ground." But for these purposes capital

will be wanted, not less than 150,000,000*l.* sterling—the price of a war.

"The rentals of these cottages will defray the interest and repayment of this 150,000,000*l.*, and the land-tax will enable the artificial value of the land to be converted into Consols. The increased value of a million skilled men will be worth to the country more than 50,000,000*l.*, a year in the enhanced value of the productions of their industry. Then there are roads, drainage, gas, police, markets, schools, and public buildings, and all the other elements of town organisation; these must be provided for by special revenues. The organisation of these communities is to be municipal.

"The public service is to be organised for the common good, on the fashion of the Post-office. An organised postal delivery, on the Swiss model of parcels and goods of all kinds, 'is of the highest importance to the well-being of the common people;' and the same is true of savings-banks, life and fire insurance, annuities, currency, and money."

"In the middle of every group of homesteads the State will have to plant out a group of skilled teachers,—men skilled in head and hand, men specially skilled in the trades and occupations of the district."

In conclusion, Mr. Scott Russell begs that those proposals may be taken into consideration, with a view of correcting and maintaining them "into fitness for laws." Whether they can be brought into one enactment or many, they all he contends, hold together, and in his view any one will probably fall apart from all the rest. He therefore urges that these questions may be considered, "not as isolated measures tending to better only a part of an ill-conditioned human being, but as the elements of a condition of life tending to better and elevating the physical, moral, and intellectual well-being of the whole man."

BEHAVIOUR OF SAFES AND VAULTS IN FIRE.

THE experience of the late fire in Chicago affords much information regarding the relative merits of safes and vaults for the preservation of papers or other valuables. The work of digging out safes from the ruins, which was begun as soon as the heat of the smouldering piles would admit, resulted in proving the fact that safes, however well constructed, would not, under all circumstances, preserve their contents unharmed. Those placed in wooden buildings, as a rule, held papers and books in good condition; the materials of which such buildings were composed burned so quickly and entirely, leaving nothing remaining to smoulder and retain the fire, that safes did not become heated through. But in buildings of brick and stone the result was more unfortunate. The safes fell among masses of material which burned steadily, and gave forth intense heat for days after the first fire, and thwarted any attempts made at removal. The safes lying in the midst of such heaps of fire became intensely heated throughout, and when efforts to remove them were finally successful, their contents were found, in many cases, to be ruined. Books, papers, and bank-notes still retained their form, but had changed to black in colour, and, upon the slightest touch, crumbled into powder. In almost an exact proportion to the length of time they had been forced to remain in the burning ruins, safes were found to have their contents unharmed, or partially or totally destroyed. It is evident that, while a well-constructed safe will hold unharmed books and papers; yet, remaining in the fire for a long period, no one yet made will fulfil its purpose. With vaults the result proved entirely different. In nearly every instance well-built vaults held their contents intact. Bricks and mortar proved excellent non-conductors of heat, and upon the opening of large vaults which stood for some days in the midst of fire, their interiors were found scarcely warm, according to our authority, the *American Builder*.

These discoveries will doubtless have the effect of introducing more largely the construction of vaults in buildings devoted to business uses, and the disasters resulting from their faulty construction, of which the one in the Custom House furnished a notable example, will perhaps induce more care in building. A vault badly built is worse than a poor safe, for the latter does afford a degree of protection to what is within it, while the former gives no protection at all.

It must not be inferred from the statements made above that safes buried in the ruins of the late fire did not accomplish a great degree of good. Property of immense value was preserved through their agency, and where not exposed to heat of the most intense character, and for a long time, the safes generally stood the test well, and reflected credit on the makers, and must continue to be used, even where faults exist; for, to

secure perfect safety, valuables must be placed in a safe surrounded by a vault; and, for ordinary fires, safes have proved themselves equal to all requirements. But for such occasions as the late fire only vaults can afford the perfect security needed.

THE TRADES MOVEMENT.

London.—It is understood that a conference of the master builders of the metropolis is about to be held, to decide upon what steps should be taken with reference to the request of the Stonemasons' Society that the employers should adopt a uniform nine-hours system for the whole year, instead of confining the nine hours to the winter months, and terminating that rule on the 14th of February. Added to this, the demand on the part of the society for an advance of one penny an hour on the present rate of wages, on and after the 1st of July next, has caused a considerable amount of anxiety amongst the leading men in the trade—in fact, amongst the master builders generally,—as the penny an hour would add something like 10 per cent. to the present amount paid the men. Not the least important question to be considered by the conference is stated to be—in connexion with taking contracts—that of the large prospective increase in the cost of building operations, should the nine hours and advanced wages hereafter apply to other operatives in the building trade besides the stonemasons.—The East of London has been placarded with notices, offering labourers employment at Carlisle at the wage of 3s. 6d., with the additional inducements of cheap lodgings, daily payments, and railway fares paid.

Lock-out at Messrs. Pontifex & Wood's.—The General Council of the Amalgamated Society of Engineers have considered and discussed a dispute which has arisen between Messrs. Pontifex & Wood, the extensive engineers of Shoe-lane, and their workmen; and to decide what should be the action of the men with reference to proposals of their employers, by whom they have been locked out. Mr. William Allan, the general secretary of the society, stated that he had an interview with the firm on the previous day, and he now submitted to the council the proposals of Messrs. Pontifex & Wood. Mr. Pontifex said in effect that the nine-hours system had been conceded to the workmen, a rate for overtime having also been agreed upon. What the firm wanted was that the men should leave off work for tea at half-past four, that they should take half an hour for tea, that they should resume work at five, and leave off finally at six. For the overtime worked the firm were quite willing to pay their men at the rate of "time and a quarter." After discussing the question in various aspects, the council unanimously resolved that the proposal of Messrs. Pontifex & Wood could not be accepted by the men, as it was at variance with the principle of the nine hours.

Trades-union Congress at Nottingham.—The fourth annual congress of the trades' societies and trades' councils of the United Kingdom commenced at Nottingham on Monday. There was a large attendance of delegates. Mr. George Potter, of London, was elected chairman until the credentials of the delegates were received. He delivered a short address, in which he congratulated the delegates upon the prosperous state of the trades generally, and trusted that good results would emanate from the proceedings of the congress. The scrutineers' report showed that eight trades' councils and forty-three district organisations were represented at the congress. Seventy delegates had been accredited, representing constituencies amounting in the aggregate to 255,712. Mr. Leatherhead (Nottingham) was elected president for the ensuing year. The mayor of Nottingham entertained the delegates at a banquet in the Exchange-hall.

The Potteries.—The members of the various branches of the Operative Bricklayers' Society, in the Potteries, Newcastle-under-Lyne and district, have given notice to the master builders that they require an alteration in the "working rules of the Potteries," passed some short time ago by Mr. Davis, the late Stipendiary. In the first place, they ask that the time for leaving work shall be half-past five o'clock, instead of six, during the summer months, that they may be placed in the same position in that respect as the other branches of the building trades. In the second place, they ask for an advance of wages one farthing per hour.

Arbitration in Trade Disputes.—A "Bill to extend the Application of the Act to consolidate and amend the Laws relative to the Arbitration of Disputes between Masters and Workmen," which is to be introduced into Parliament early in the coming session, has been printed. It bears the names of Mr. Mundella, Mr. T. Brassey, Mr. Samuel Morley, Mr. W. H. Smith, and Mr. Thomas Hughes. The Bill is not a long one, having only eleven sections, with an appendix showing what portions of the Act of 5 Geo. IV., c. 96, are to be incorporated in the new law. The Bill provides that its provisions shall apply to all Boards formed for the purpose of settling disputes of any kind between masters and workmen in any trade; that every master who agrees to be bound by the decision of any Board shall keep displayed a copy of these rules, and give a copy to each of his workmen, who, receiving it, shall also be bound by the rules; that the attendance of persons and the production of documents shall be secured by proper means and under certain penalties; that the decisions of the Boards shall be in writing, and be enforced; that no member of any Board, or person bound by one, shall be liable to any penalty under any Act relating to breach of contract between masters and servants, of which such Board might under its rule take cognisance; that the acceptance of this Act by Boards shall be voluntary, and this acceptance may be entire or partial; and that the provisions of the Act shall not apply to Boards of conciliation only. There is to be, by the provisions of existing law, incorporated in the Bill, power to summon witnesses, and compel them to give evidence on pain of imprisonment; power for a married woman to lodge a complaint in the name of her husband, and for children in the name of parents and guardians; and power to enforce awards by distress or imprisonment.

THE THREATENED STRIKE OF MASONS.

SIR,—The threatened strike of the "Operative Stone-Masons" on 14th February, as announced by their secretary in your last issue, is one which will, if persisted in, lead in all probability to a repetition of the great "Builders' Strike" of 1859, with all its disastrous consequences. But, as one who has suffered considerable loss on that occasion, I would earnestly beg the "Operative Masons" to consider what they are about, and whether they have any justification for plunging the whole building trade into confusion and loss. A strike of masons must necessarily involve a lock-out of other trades. It was only in October last that the "Operative Masons" sent to the Builders' Society a memorandum of their wishes, which was acceded to by the majority of London builders. This memorandum was to the effect that the hours of labour should be 504 hours for the 14 winter weeks of the year, and 564 hours for the other 38 weeks, or on an average something over 54, but less than 55 hours per week for the entire year.

But, as frost and bad weather are certain to interfere more or less with masonry, it follows that masons do not, under present regulations, work on an average 54 hours per week, which hours have been decided on by the whole engineering trade as a proper carrying out of the nine-hours system.

All my brother master builders to whom I have spoken agree that there is no reason for now altering the hours of masons' labour from those which they themselves put forth three months ago.

I hope sincerely that common sense will induce the "Operative Masons" to withdraw their notice.

A MASTER BUILDER.

BIRMINGHAM, PAST AND FUTURE.

WHAT is going on in Birmingham, we fear, applies to many other towns. It is a subject often recurred to in the *Builder*. The editor of the *Birmingham Morning News*, in a leading article on this subject, says:—

The condition of the old part of almost any old town has been described and lamented over times without number. We shudder as we pass the street end of the crowded court, and we apologise for the vices of its inhabitants, by asking what better can be expected from those whose very conditions of life shut out from them the possibility of knowing what pure air or bright light is. We regret the existence of these dens of infamy.

But how many people are there in Birmingham

who know at this moment in what manner the future dwellings of the poorer classes are being provided? Nothing is really known; nothing is plainly said. No official acquaints the Town Council, month by month, of what has been done to the permanent injury of the town. No one gets up in his place, or, indeed, has a place in which to get up and say,—“Since our last meeting, twenty, or forty, or sixty more so-called houses have been begun or finished, in which decent life is impossible, or in which it is possible to live with either health or happiness.” And yet surely this is a matter whose importance cannot be exaggerated, and of which it is an absolute necessity that we have definite and exact information. For the fact is that, almost without exception, these additions to our town are in the hands of speculators whose worldly means are certainly not equal to their energy or activity. The buildings of the poor are mostly built by the poor, with money borrowed from the rich. The system of leaseholds is almost universal, and, comparatively speaking, freehold land is not to be obtained. If a piece of freehold land comes into the market. The consequence is, that the constantly increasing endeavour is to place the largest number of tenements upon the smallest possible plot of land. By this means the ground rent of each separate house is kept down to a minimum; and the success of the speculation is rendered more certain. The next object is to build the houses themselves with the smallest amount of material that can possibly be used. The walls are thin, the timbers are few and weak, the roofs are light, the internal fittings are of the cheapest and commonest description. Every method is studied by which space may be saved, and materials economised. One of the commonest, and, at the same time, one of the worst expedients, is to build rows of cottages back to back.

BUDA PEST COMPETITION.

THIS competition, in which the engineers and architects of all nations were invited to send in designs for the improvements of the capital of Hungary, was concluded in December last, and the only prize awarded to foreigners was gained by Mr. F. A. Klein, C.E., of Cannon-street, City, and Mr. Alexander Fraser, C.E., of Brook-street, Grosvenor-square, for superiority in the arrangement of the communications between different parts of the city, parks, ornamental works, waterworks, sewers, and docks.

CEMENTING RAINWATER TANKS.

MR. W. B. WILKINSON, in the *Builder* of the 2nd of December last (p. 944), states that the proper proportion for coatings of cement or brick to tanks, to make them impervious is, in his experience, 5 of cement to 1 of sand,—at least, so I understand his letter. This, however, differs so considerably from what is frequently practised and recommended, that it would be of much service if that gentleman would kindly write something further as to this matter. “Rendered with fine cement $\frac{1}{2}$ in. thick” is, I believe a fairly frequent description in architects' specifications, and, I presume, is also a description of the work executed under them. Some books of instructions could also be referred to where pure cement is either recommended or described as in ordinary use for this purpose. Intelligent builders are sometimes known to argue that a mixture with the best Portland cement of an equal quantity of the very sharpest and cleanest road-drift (say, from a flint-mended road) will add greatly to its success as a rendering coat, stating, as far as they become intelligible, that pure cement, from its expansive habits, ceases to adhere to the surface in parts, and stands out in bulges, in which cracks are afterwards formed, or pieces fall off; others, again, are found believing in something like this 1 and 1 proportion, alleging that the addition of the sand secures a slower setting of the coat, and with that a more equal contraction of the mass; that cracks are produced by the forcible separation of adjacent areas at a certain stage of the process of setting when the material is not thus prepared.

The proportions used by speculating builders in the neighbourhood of London for the cement flats which they love to put over the “wing buildings” of the stereotyped eight-roomed house in rows, are stated frequently as one of cement to two of sand. It is true that they rarely leave a thoroughly water-tight roof behind

them; but that may perhaps be attributed rather to the construction habits of these builders than to the composition of their cement. This necessarily also is not a good guide for tanks; for although the flat has to resist rain falling with some force, it has usually a good fall, and gets rid of it quickly; whereas a rain-water tank holds a most ingenious and indefatigable prisoner, always searching to improve the least possible chance of escape.

An underground brick tank in use is not a very accessible place for conducting experiments; this perhaps is some excuse for a want of conscientious judgment, and for a request for some carefully ascertained facts from those who have them in their possession. STAGNUM.

CONFERENCE COMMITTEE ON PUBLIC COMPETITIONS.

SIR,—Grant me a corner in your valuable journal to acknowledge, with thanks on the part of the committee, the receipt of communications on the above subject from the following gentlemen:—E. Ashworth, H. J. Austin, A. W. Blomfield, J. Boulton, R. K. Blesley, W. E. Brown, S. C. Capes, W. Chick, T. C. Clarke, J. A. Cory, J. Cunningham, H. A. Darbishire, A. D. Dawney, J. S. Dodd, G. A. Dunning, Edward & Robertson, F. W. Fiddian, E. W. Godwin, A. S. Goodridge, W. J. Green, E. Gregg, R. Griffiths, G. H. Guillaume, F. R. Haswell, J. Hayward, C. Henman, J. Hicks, G. M. Hills, J. H. Hirst, J. Honeyman, J. W. Hingall, T. C. Hyno, H. Jarvis, jun., G. F. Jones, C. Inyan, W. H. Lynn, J. D. Mathews, F. R. Meeson, J. Milne, J. Morris, E. Nash, R. Owens, W. Papworth, R. Plumbe, T. C. Pope, R. J. Rounien, E. C. Robins, J. Ruskin, J. P. Seddon, P. G. Smith, L. Solomon, T. C. Sorby, H. H. Statham, N. E. Stevens, G. E. Street, T. J. Street, E. Taylor, T. M. Taylor, J. Thomson, J. J. Thomson, A. H. Yale, Wadmore & Baker, D. Walker, F. Wallen, J. E. Watson, T. H. Watson, W. H. Weighman, W. J. Wilcox, and C. G. Wray; besides two anonymous correspondents, who will oblige by sending their names.

ALFRED SYMONS,
Hon. Sec. Conference Committee
on Public Competitions.

CUTTING OAK TIMBER.

SIR,—I propose to panel a dining-room in a house in the country, and to cut down enough of my own oak timber to do it.

Will any one tell me what sized timber I should cut?—whether it is advisable to cut it in winter or summer, bearing in mind that if cut in winter all the bark is lost? Also, what size it should be cut into, and when?—that is, how long should it be on the ground, when should it be cut up; and, when sawn up and laid up to weather, what are the proper sizes for it to be sawn into as boards? What are the best lengths, widths, and thicknesses that the boards should be cut down into as not to warp too much when finally cut into panels.

J. R. H.

EXHIBITION OF OLD MASTERS.

SIR,—Would you allow me to suggest to the directors of the Royal Academy that at the next week of this exhibition (that time of closing should be extended to eleven o'clock in the evening, and the price reduced to 6s.) The same plan is carried out at their annual exhibition. By so doing they would confer a boon on hundreds of people who have no other opportunities of seeing these grand old masters, and cannot lose half a day to do so.

J. R. GOUGH.

VENTILATION OF SEWERS.

At a recent meeting of the local Board of West Derby, Liverpool, the following minute of Mr. Robert Rawlinson, C.B., on sewer ventilation, was received:—

"By a return recently made relative to the sewers in West Derby, it appears that about eleven miles of public sewers have been constructed, and that on these sewers there are seventy-five ventilating shafts. It is considered necessary for safety to the public health to ventilate public sewers at intervals not further apart than 100 yards, or eighteen ventilating manholes and grates on each mile of main sewer. This rule requires that there should be on the eleven miles of West Derby main sewers 188 ventilating shafts, or 123 additional to those now in use. Rain-water spouts may serve to ventilate house drains; but these should not be reckoned in reductions of main sewer ventilation. With means for sewer ventilation as indicated, the air in the sewers will be comparatively pure. There cannot be concentration or stagnation at any part of the system, and it is in concentration and stagnation that danger to health arises. With profuse ventilation there will not be perceptible smell at the ventilating grates at any one point, as the dilution and dispersion of sewer gas will be unceasing. Foul smells and dangerous escapes of sewer gas only take place from severely inadequately ventilated. The West Derby local Board has more fully ventilated the sewers of the district than many other local Boards; but, to be safe, the additional number, as now recommended, should be constructed."

The communication has been referred to the Main Sewerage Committee.

BUILDING OVER A SEWER.

At the Hammersmith Police Court, Mr. Jonas Turner was summoned, before Mr. Ingham, by the Kensington Vestry, for erecting a party wall over the crown of a sewer in the Brompton-road without their consent.

Mr. Harding, the clerk of the vestry, attended in support of the summons, and Mr. Clayton defended.

It appeared that in the construction of the Metropolitan District Railway through Brompton a sewer was diverted, and another built by the side of the tunnel, unknown to the Vestry. It was the main sewer for the drainage of Walton-street, which was in the parish of Chelsea. As the sewer was laid in the parish of Kensington, it was vested in the authority of the Vestry, under the Local Management Act. The existence of that sewer was brought under the notice of Mr. Broadbridge, the parish surveyor of Kensington, for the first time in August last, when the defendant's builders deposited a plan for draining three houses into it. The defendant had bought the land through which the sewer passed from the railway company, and had built three houses upon it. The wall in question had been erected over the sewer.

Mr. Clayton said the defendant purchased the right which the company possessed in the land, and he supposed that he could build his houses upon it.

Mr. Ingham fined the defendant 20s. and 2s. costs.

Books Received.

A Group of Englishmen (1795 to 1815). Being Records of the Younger Wedgwoods and their Friends; embracing the History of the Discovery of Photography and a Facsimile of the First Photograph. By M. METEYARD. London: Longmans, Green, & Co.

MISS METEYARD conceives that she has now traced the proofs which establish the fact that Thomas Wedgwood, the younger son of the celebrated Josiah Wedgwood, and the only man of great ability amongst his sons, though an invalid for years, and unable to do much to show his ability to the world, was, nevertheless, the original discoverer of the photographic art.

"This fact," she says, "I have now, I think, set beyond all question. I have traced the link which connected the Frenchman Dominique Daguerre with the elder Wedgwood, and so onward, as far as my materials permitted, till we came to the testimony of Mr. Humphrey Davy and James Watt, the great engineer. If the letter descriptive of the processes of the 'silver pictures,' written in 1799, by Josiah Wedgwood,—the second to Watt,—should yet be found, every doubt as to the originator of this art must vanish; but the family of Thomas Wedgwood knew the discovery was his. We have the living testimony of their descendants to that effect; and the admirable facsimile of the earliest known heliotype, or 'sun picture,' given in these pages will add strength to that testimony. Mr. Mayer, whose property it is, derived it from an undoubted source; and many of these heliotypes were, it is said, scattered at one time about the Potteries. Mr. H. Adlard, the eminent steel-engraver, has, through the labour of three distinct processes, admirably rendered the original heliotype; and Mr. Mayer, an authority in these matters, thinks that it was the aut's copy of an etching by Teniers, or one of his school."

It appears that so early as 1790 Thomas Wedgwood had a correspondence with Priestley as to researches on light, in which Wedgwood was engaged; and Priestley's letters are quoted to that effect. "I like very much the plan of experiments you mention," said Priestley, in one of them, "as they will very probably throw some new light on a very important subject, about which we as yet know very little: indeed, light and heat are little known, and yet I think they are as open to investigation as air." And, again, in the same year, Priestley says, "I do not know that any experiments have been made on the curious and important subjects you mention, and I have little doubt but your labours in so new a field will be crowned with considerable success. All that is known of the kind is the general aptitude of the more refrangible rays to be reflected in such media as water and the atmosphere." "There is nothing," added Priestley in a further letter, "more within the field of random speculation than light and heat; their connexion is evident, but which is the element of the other is unknown."

The immediate result of these experiments was the appearance of two papers on the "Production of Light from Different Bodies," for the volume of "Philosophical Transactions" for the year 1792. They are, as literary productions, very immature.

About 1802, the subject of the "silver pictures," so far as the name of Thomas Wedgwood is concerned, finally reappears. From about the year 1793-4, when his health gave way, he seems never to have repeated his experiments on any truly scientific scale; but his camera and other instruments remained at Etruria; and these, when seen by visitors, occasionally brought the subject under discussion. Mr. Olshofer and Mr. Josiah Wedgwood—who had been often present during these experiments—could give every detail; and thus when James Watt visited

Etruria in 1799, on business relative to a hand-mill he and Boulton were supplying to the firm, the subject of Thomas Wedgwood's extraordinary discovery seems to have been discussed; and a few days later, Watt received a letter (probably a promised one) from Josiah Wedgwood, in which were given the details necessary to experiment. To this Watt replied,—"Dear Sir, I thank you for your directions for the silver pictures, on which, when at home, I shall try some experiments. I was thinking on your mill after I left you, and fear the motion of the spindle is too slow," &c.

"Now," says Miss Meteyard, "if the coloured pictures found in recent years at Soho, and the two 'heliotypes' still existing, and known to be the result of a most original discovery made by Thomas Wedgwood in 1791, were one and the same, would Mr. Wedgwood have given this detail of process, or Watt acknowledged its receipt? The want of producing cheap pictures by colour-washing had been carried on at Soho since 1775-6, and would not Watt have applied to Boulton or Egginton? or, indeed, would it have been necessary, when five minutes in the workshop close at hand would have supplied him with every thing he could desire, to be subjected to paper, pasteboard, wood, and metal? Moreover, the Soho pictures and the Wedgwood heliotypes, when seen side by side, are so utterly and wholly dissimilar as to present not a vestige of affinity. The same methods could not possibly have been used in their production. In the Soho pictures we see clearly a faded water-colour, generally lined and shaded by faint pencil strokes on by a mechanical though free, process, akin to stencilling; whereas, the two heliotypes still in existence show strongly the results of a process, effected by some accidental or fortuitous process. The hues are those of tarnished silver, faint through time and an imperfect method of manipulation. Old heliotype pictures generally represent subjects taken from Angelica Kauffmann, Benjamin West, Zoffany, Reynolds, and other fashionable painters of the time, this water-colour process being found to be suitable to portraits and figures than landscapes. But after the advent of Boyell and the fine engravers he employed, such mechanically-produced pictures fell into disrepute, and Boulton and Egginton were to commercially cease to continue the manufacture of unsaleable articles. The processes were discontinued, or turned to other accounts, the stock sold cheaply off, and such remains as remained being stored away in the chambers and closets of a great manufacturer, only came to light when the generation of workmen who had assisted in their production had died out."

Miss Meteyard's arguments, which, by the way, she seems to have rather weakened than strengthened, and rather unnecessarily, by a good many repetitions of it may be, are finally clinched by the grand fact, that the paper published in the June (1802?) number of the "Journal of the Royal Institution," was headed "An Account of the Method of Copying Paintings upon Glass, and of making Profiles by the Agency of Light upon the Nitrate of Silver." Invented by Thomas Wedgwood, esq.; with Observations by H. Davy."

"Here," says Miss Meteyard, triumphantly, "in the plainest and briefest words, we have the fact of the invention, and the name of the inventor publicly stated by one who was not merely a friend, but a man of the highest moral and scientific attainments. Egginton and Daguerre are as remote from these facts as though they had never existed. Had they been false, some other man would have been the beneficiary of the discovery practised elsewhere, the scientific and artistic rivalries of the day were sufficiently keen to have led at once to denial and adverse claims."

Of the processes employed or the results obtained from the heliotype experiments at the Royal Institution, no account exists. Of the earliest heliotypes, those taken at Etruria, 1791-3, two are still extant. One, a breakfast-table scene, is to be found engraved in the "Life of Wedgwood"; the second, and the earliest valuable, is given by Miss Meteyard in her new volume. Of this she says,—

"It is clearly a heliotype, or, as we should now say, a photographic copy, of an ordinary book-enslaving, for the cross-hatching of the grass's foot is distinctly visible. It was, probably, hastily torn from some book of travels lying on the table, for the purpose of fixing in the camera, or behind the glass, through which the rays of the sun were to pass. The original of this heliotype would just fit into an octavo volume, and appears to represent a Savoyard piper in the costume of his country. Finding some excellence in the picture, he may have torn a print from the nearest book at hand, and thus immortalized, by a new art, what in itself was intrinsically worthless. The authenticity of this heliotype is undoubted, and, as the earliest known specimen of a most original and beautiful discovery, is considered, by those most competent to judge, to be of great value."

The volume under notice is an interesting one, more especially as regards such friends of the family of the Wedgwoods as Coleridge, Godwin, Wordsworth, and others. Thomas Wedgwood was a benefactor to all of those named. He settled an annuity of 150l. on Coleridge; and not only were the coats of Coleridge's visit to Germany paid by him, but those of Wordsworth also—a newly discovered fact,—as appears from business documents, in which the exact sums sent to both are given.

The way in which a host of the documents on which much of both of Miss Meteyard's volumes at the Wedgwoods has been based were saved from destruction by "the right man in the right place" is wonderful. Mr. Mayer, of Liverpool, a well-known patron of art, took letter, on one accidental occasion, during a shower, in a small scrap-shop, in the outskirts of Birmingham, while on his way to the Continent; and there he saw a number of old ledgers, but, on carelessly opening up the boards, he found them empty; sufficient remained, however, to show him that they were business ledgers of the Wedgwood establishment at Etruria. On expressing his surprise, the shop-keeper told him they had been very useful for wrapping bacon and butter in, and that he had lots more, but he was afraid they were of much less value, as they were not big books, but small bundles. "Let me see them," said Mr. Mayer; and he was conducted up a ladder, with many apologies, into a dirty loft, where, literally, hundreds of weights lay, and the first paper he picked out was an inventory of goods taken by Flaxman to Rome in 1787. That Mr. Mayer secured the prize at so much a hundredweight need not be told, and he saw them himself sent safely to Liverpool. Miss Meteyard has had the advantage of rummaging at will through all this mass of valuable MSS. She has already made good use of them in both of her published volumes, and seems to contemplate putting them to other purposes equally interesting to the public.

Miscellaneous.

The City Guilds and Technical Education.—On Wednesday afternoon a meeting of the masters and wardens of the various City Companies was held at the Mansion-house, under the presidency of the Lord Mayor, to consider the question of technical education, as affecting the guilds of the City. Reporters on presenting themselves were told that their attendance was not desired, as the meeting was purely a preliminary one, and confined to the masters and wardens of the companies, together with the various clerks. Several members of the Ivery committee are anxious that the various halls of the companies should be utilised, by having exhibitions on each relating to their various crafts; but the new idea advocated by the masters and wardens is, that an aggregate exhibition shall take place at the Crystal Palace periodically. We are informed that the only business of a practical nature transacted was the passing a resolution to form a preliminary committee, to consist of a member from each company, and to be elected by their respective companies.

Engineer Institute, Chatham.—The Chatham correspondent of the *Morning Post* says the works in connexion with the new Royal Engineer Institute, at the School of Military Engineering, are likely to be pushed on in earnest, Mr. Sollitt, the contractor, being now in possession of the site. The building is in the Italian style of architecture, with a spacious entrance situated in the centre of the principal front, over which are Corinthian columns, in Portland stone, supporting a cornice, which is surmounted by an open balustrade running the whole length of the building. The lower portion will be built with white bricks, whilst the upper part will be built of buff bricks. On the ground-floor there is to be a vestibule and hall, with lecture-theatre immediately in the rear, the access to it being in front of the main entrance. On the right are to be the halls of study for construction and military engineering, and on the left the library, which will be a spacious and noble room; and the clerk's and secretary's office, with accommodation for the Royal Engineer Committee, whose labours extend to almost every scientific subject in the art of war. On the first, or upper, floor, are rooms for the testing of materials, survey office, and photograph rooms; whilst on the basement floor there is ample room for printing, lithography, and the chemical laboratory.

The Channel Steam Ferry.—Plans are being made at Elswick of some hydraulic machinery to be used in Mr. John Fowler's scheme of carrying locomotives and railway carriages across the Channel from Dover to Calais. Sir William Armstrong has calculated that the machinery will hoist train and all from the rail into the ferry-boat in the space of 4 min. 37 sec.

Sanitary Condition of Mile-end.—Dr. Matthew Corner, Medical Officer of Health for Mile-end Old Town, has submitted his report on the condition and public health of the district for the year ending March, 1871, to the vestry of that hamlet. He accounts for its late appearance by saying that there was a considerable accession of work, caused by the presence of the small-pox epidemic; and before this had subsided, the rumours of the approach of cholera still further added to this work. If (he continues) the number of births and deaths proportionate to population may be taken, — the former as an indication of material prosperity, and the latter of good health, — it might be presumed that the hamlet maintains its reputation for salubrity. The number of births for the year was 3,724, or about 40·7 to every 1,000 of the present population. The corresponding rate for the whole metropolis was 35 per 1,000 population. The births exceeded the average for the previous five years by 333. The annual death-rate in the hamlet was 21·5 per 1,000 population living; that for the whole metropolis was 24 per 1,000 population. The report of Mr. H. Leslaw, sanitary inspector (which is appended to Dr. Corner's), gives an account of works executed during the years 1870-71, and shows that the improved health of the people of the hamlet is not without its specific cause.

Extraordinary Conduct of a Workman. At the Oldham County Police-court, Thomas Beesby, of Manchester, was charged with doing willful damage to a rope. The prosecutor was a contractor, named John Falkner, of Manchester. He had contracted to repair the top of a chimney at Boundary Mill, Chaderton. The prisoner was engaged to dress the stones. Some dispute arose, which resulted in another man being engaged in the prisoner's place. A number of men were raising stones, by means of the usual machinery, to the top of the chimney, when the prisoner went to the place and threatened that if they attempted to raise another stone he would cut the rope. He was told that if he did so he would endanger the lives of two men on the scaffold at the top. He left the place, but in a short time returned again with an axe. A stone weighing 5 cwt. was then being raised. The prisoner deliberately struck the rope with the axe and cut it in two. To save themselves from falling from a height of 50 ft., owing to the vibration, the two men at the top had to cling to the edge of the chimney. The prisoner afterwards cut the rope twice. The prosecutor confined the case to a demand for 1s. 6d. damage done to the rope. The prisoner was ordered to pay this amount, with costs, or be imprisoned seven days.

Swimming Baths for South London.—A large building has been erected in the New Kent-road, immediately at the back of the Elephant and Castle Railway Station, containing large swimming-baths, which are also convertible into two spacious halls, adapted for lectures and dramatic and theatrical entertainments. The length of the building is about 250 ft., one-half of which is devoted to a corridor, along which, on either hand, are over thirty private baths. In continuation is the great hall, or principal bath, which is also 125 ft. in length, and which, with two galleries, is capable of holding about 4,000 people. The interior of this hall will have attached to it a stage, measuring 52 ft. by 27 ft., which will be supplied with the mechanical contrivances necessary for producing theatrical entertainments. In addition to the large hall or bath there is a smaller one, which is 52 ft. in length by 17 ft. in breadth, and both will be supplied with all appurtenances suitable to the bathers' comfort and convenience.

Land-spring next Gloucester House.—In the St. George's, Hanover-square, Committee of Works, Col. Ogilvy presiding, Mr. Walker asked the surveyor if he knew that there was a landspring in the house next to Gloucester House. Mr. Tonkins said he knew of it a short time ago. A builder made an application for permission to drain this landspring. It appeared that the medical officer (Dr. Aldis), reported to the vestry about this landspring in September and October, 1869.

Royal Architectural Museum.—We learn that a cast of the black marble tomb of Gundreda, wife of William de Warenne, and daughter of William the Conqueror, originally placed over her remains in the Chapter-house of Lewes Priory, has been given to the Architectural Museum.

The Inns of Court Hotel in Holborn.—This costly building, which was erected only a few years ago by the Lincoln's Inn Hotel Company, has recently been the subject of proceedings in Chancery, under liquidation, the business of the company having turned out an unprofitable speculation. The matter was before Mr. Church, the chief clerk, at the Chancery Chambers, on Tuesday, when it appeared that there were two offers for the absolute purchase of the establishment, — one by Mr. Sawyer for 50,000l., and another by Mr. Brooke for 70,000l., the object of the latter being to carry on the business of the hotel in conjunction with a number of the debenture-holders. The Chief Clerk adjourned the case in order to ascertain if Mr. Sawyer was prepared to make a further advance upon Mr. Brooke's offer, when it appeared he was; and the probability is that this building will shortly be purchased by new proprietors at the amount of its original cost. The Chief Clerk remarked that he should not sanction anything but an absolute purchase.

The West Ham Irrigation Scheme.—Mr. Robert Rawlinson, C.B., the Government Inspector, has held an inquiry at the town-hall, Stratford,

"in pursuance of the Local Government Act of 1858, and of a petition duly presented by the Local Board of Health for the district of West Ham, addressed to the Local Government Board, praying for the issue of a provisional order for the extension of their borrowing powers, in order to raise the capital required for the erection of sewage outfall and sewage distribution in the way of irrigation."

For this portion the Board propose to purchase, at a cost of 80,000l., Dagenham Farm, situated at about five miles' distance from the parish. Captain Flowers, R.E., the sanitary engineer of the Lea Conservancy, was present. After a lengthened discussion, Mr. Rawlinson summed up by pointing out that at Leamington, Northampton, Birmingham, and other large towns, after thousands had been spent, irrigation had to be resorted to; that the pollution of rivers was a most important matter; and that they must adopt some means for getting rid of their sewage otherwise than by passing it into the Lea.

Opening of New Waterworks at Winstler. The populous Peak village of Winstler has been a scene of great rejoicing, the occasion being the inauguration of the water supply. An ample supply of water had been found on the estate of Mr. Thornhill, at Stanton, which that gentleman readily placed at the disposal of the committee, and voluntarily gave 50l. towards defraying the expenses of conducting it to Winstler. Lord George Cavendish, M.P., the Duke of Rutland, Capt. Arkwright, M.P., and many other persons in the neighbourhood, liberally contributed towards the object, and the result is that the water has been conducted from Stanton (about two miles) in pipes; and this and the formation of a reservoir is estimated to have cost about 1,000l. The inhabitants have also materially assisted by their contributions and labour.

Decoration of St. James's, Tunbridge Wells.—The chance of this church has been decorated by Mr. Samuel Fry, of South Grove House. On a red ground are painted the sacred monograms, so as to form a diaper over the walls, and between the windows are scrolls, on which are written parts of Psalm xxii. and Isaiah liii., suitable to the subjects portrayed in the windows. The roof which is painted a dark plum colour, is relieved with outline drawings of yellow ochre. The central subject is our Lord in Majesty: on each side are angels with trumpets, and others with censers in the act of adoration. Farther away from the centre are others holding scrolls, and above the figure of our Lord in the centre panel is the symbol of the Godhead.

New Works and Extensions in Sheffield. Large extensions of existing works are being made, or have recently been effected, at Sheffield, according to the local *Independent*, which gives a lengthened account of them. By far the most important of the new undertakings are the works of Messrs. Brown, Bailey, & Dixon. These works are now in course of erection, and it is expected they will be in full operation within the next six months. They will be by far the largest that have ever been erected in Sheffield at one time, as they stand on no less than thirteen acres, and will give immediate employment to 1,500 workmen. The works are at Atercliffe.

The Restoration of Paris.—The destination resolved on for the great buildings of Paris burned under the Commune is as follows:—The Hôtel de Ville will be rebuilt by the city; the Tuileries and Palais Royal by the State; the Palace of the Legion of Honour by subscription; the Caisse des Dépôts et Consignations by the society itself. The Cour des Comptes, the Grenier d'Abondance, and the Ministry of Finance, being totally destroyed, will be razed to the ground and the sites sold. M. Thiers is particularly anxious for the restoration of the Tuileries, and will himself shortly present a proposal on that subject. The pavilion by the side of the river will alone be preserved in its present state. The two others and the connecting walls will be pulled down, as they are so damaged as to be useless.—*Galignani.*

The Thames Embankment Line of Frontage.—In the St. George's, Hanover-square, Vestry, Mr. Farrer asked Dr. Brewer if a line of frontage had been defined on the Thames Embankment. He understood it was proposed to erect an hotel on the Embankment, close to the railway-station at Westminster Bridge, and that the superintending architect had defined the line of frontage. Dr. Brewer replied that the line of frontage had been defined, and the plan deposited with Mr. E. Hollis, the clerk to the Westminster Board. He might add that if they took Mr. Horsman's house as one phmb and the Board of Control as another, and struck a line on the Embankment, that would define the line of frontage. Mr. Farrer gave notice of a motion on this subject.

Technical Examinations.—The Council of the Society of Arts have come to the resolution,—“That the time has now arrived when the present system of examinations is no longer necessary, and that the encouragement of particular subjects, bearing especially on arts, manufactures, and commerce, should be promoted by special means.” It will therefore be held that, after the next examinations, to be held in April, 1872, the present system will cease. The Council have under consideration a scheme of technical examinations. It is proposed they should give notice annually of the three, four, or five manufactures which would be taken up the following year, with a slight syllabus of the examinations which would be held at a few convenient centres.

Land in Manchester.—The *Manchester City News* gives the following as the result of the sales by auction of real property,—land, houses, and chief rents,—in Manchester and its immediate neighborhood, for 1871:—January, 26,322l. 10s.; February, 13,615l.; March, 35,050l.; April, 47,343l.; May, 56,952l.; June, 12,217l. 10s.; July, 121,145l. 10s.; August, 23,077l.; September, 22,769l. 10s.; October, 32,751l. 10s.; November, 19,937l.; December, 25,017l. 10s.; total, 436,277l. The plot sold in St. Ann's-square, which was free from chief rent, brought the highest price of the year,—at the rate, namely, of 67l. 13s. 9d. the square yard. A small plot in Princess-street, opposite the new town-hall, sold last week at the rate of 33l. 14s. 7d. the square yard.

Archæological Discoveries at Athens.—Some interesting discoveries have been made in excavations at the Ceramicon of Athens. Several tombs, some quite intact, have been brought to light, and among them, it is said, is that of two ambassadors of Corcyra (Corfu), who formed part of the deputation from Xenophon, sent to ask for the assistance of the Athenians against the Lacedæmonians. Another bears the name of Hipparete, daughter of Alcibiades. Other researches have led to finding a monument, composed of five tombs, bearing inscriptions, and belonging to the Vexiplos family; and a sixth, ornamented with a basso-relievo composed of two women, one standing and the other seated.

Workmen for New Zealand.—We have had a large number of applications and letters, probably not fewer than a hundred, in consequence of mentioning in our last report that agents from New South Wales were seeking to obtain the services of artisans for the construction of a railway in New Zealand. We have no further information on the subject. The persons concerned, if men are really wanted, should take means to make their address known.

Surveyorship.—Mr. Robt. Willey, M.R.I.B.A., of Lodge-chambers, Lodge-hill, has been appointed Surveyor to the Hand-in-Hand Insurance Office.

Settrington Church, near Malton.—The wall at the east end of this church has been painted in encaustic from designs by Mr. J. W. Knowles, of York. The space immediately above the altar-table, and extending across the chancel, has in the centre of it a Greek cross, between the arms of which are the emblems of the Evangelists, and on each side of the cross and at the extreme ends of the wall are borders in colours and gold, the spaces between having the Decalogue illuminated upon them. The dado underneath this design is of a deep red, diapered with a pattern of a pale shade of the same colours, black and gold, and the cornice which surmounts it, and is of stone, has been painted and picked out in gold and colours.

Victoria Park.—At last week's meeting of the Metropolitan Board of Works, a deputation, headed by Mr. C. Reed, M.P., expressed an earnest hope that the Board would recognise the importance of preventing any further building upon the open spaces immediately surrounding Victoria Park, and that measures would be taken for acquiring from the Government the land necessary for laying it out as a recreation-ground. A memorial embodying the views of the deputation was referred to the Works and General Purposes Committee.

Proposed New Buildings.—It is said that the late Baroness Weld has left the bulk of her property to Archbishop Manning for religious purposes. Among the special bequests are a large sum for the erection of a Roman Catholic church at Oxford; 7,000l. for the erection of a mortuary chapel in memory of her son, the late Captain Weld; various sums for the building of churches at Newbury, Twickenham, and London, and also for chapels in Surrey and Berkshire. Mr. Welby Enjin is named as architect to the whole of the buildings. The family threaten opposition.

New County Asylum for Lancashire.—There is at present in course of construction at Wittingham, near Preston, a large new county asylum for the pauper and other lunatics belonging to Lancashire, and which, it appears from a statement made at a meeting of the county magistrates held last week, will involve an expenditure of 120,000l. This is in addition to two other large establishments of a similar character which have recently been erected in the south-eastern and the south-western portions of the county, namely, at Prestwich, near Manchester, and at Rainhill, near Liverpool.

Improvements at Deal.—A block of houses, on the site of the old Navy-yard of the Government, is now in course of erection on the esplanade fronting the sea, called Prince of Wales's terrace. These houses adjoin the picturesque Deal Castle, and will be completed in the spring, thus affording the seaside accommodation of private houses, boarding-houses, and hotel, so long required at this fast-rising watering-place.

The Power of the Diamond.—An interesting application of the material is furnished in the dressing of millstones. The intense hardness of the cutting material used,—the hard black, uncleavable diamond,—is such that a single diamond has been employed for more than a year dressing a pair of French burr-millstones daily, without perceptible wear or diminution of cutting power.

Shaping Metals.—In a process lately proposed for shaping metals a mould is made in sections to suit the article required, and a sheet of metal is placed in it, after which a cover is clamped on to the mould, and water-pressure is conveyed to the interior by a pipe, whereby the metal is expanded to the counterpart of the mould.

A Year's Work by School Boards.—The *School Board Chronicle*, in surveying the work of the past year, finds that we have 330 school boards, with others in course of formation. The great fact for rejoicing is that compulsory attendance at school is not likely to prove a difficulty, though at first it was the greatest bugbear.

Society for the Encouragement of the Fine Arts.—The first conversations of the season will be held at the Suffolk-street Gallery on the 18th inst. On the 25th, a lecture will be delivered at the Gallery in Conduit-street on “Mexican Art,” by Dr. Zerff.

“Jack Plane.”—We have received for Mrs. Randall from “An old Reader and Purchaser of the *Builder*,” 1l. 1s.; from “R. T.” 6d.; and from “Four Sympathisers,” 10s.

The Pugin Student's Drawings.—The drawings and sketches made by Mr. Ernest C. Leo during his tour as Pugin Student for 1870, have been exhibited on the wall of the Meeting Room of the Institute of Architects. A portion of them, viz., the series illustrating the Trinity Chapel and Corona, Canterbury Cathedral, have been presented to the Institute by Mr. Leo.

The Proceeds of the Passion Play.—The receipts at the late representations of the Passion Play at Ober Ammergau amounted altogether to 62,000 florins, of which 27,000 were given to the 600 actors, 1,200 to the poor, 3,600 reserved for public works, and 10,000 set apart for the construction of a theatre. The rest has not yet been disposed of.

The Proposed Cemetery at Clapton.—A letter has been sent by the Hon. Secretary to the promoters of the Clapton Park Cemetery Scheme, declining to approve of the proposed site for the purpose of a burial-ground. Mr. Bruce's decision has given great satisfaction to the inhabitants and owners of property in the district.

TENDERS

For the erection of a new parish church (exclusive of fittings and tower), at Easton, Feurbrookshire. Mr. E. H. Logan Barker, architect:—

Davies	.....	£1,242 0 0
Hartley	.....	885 0 0
W. & P. Wither	.....	1,438 0 0
Morgan & Jones	.....	785 0 0
James	.....	745 0 0

For new villa residence and stables, at Abingdon, Berks, for Mr. T. Townsend. Mr. Edwin Dobby, architect:—

Claridge	.....	£1,724 0 0
Kimberley	.....	1,650 0 0
Bryson	.....	1,438 0 0
Honour & Castle	.....	1,586 0 0
Johnson	.....	1,578 0 0
Wright	.....	1,561 0 0
Orchard	.....	1,529 0 0
G. Jones	.....	1,500 0 0
T. Jones (too late)	.....	1,450 0 0

For the erection of 132 dwellings, in Ashfield-street, Liverpool, for the Liverpool Labourers' Dwellings Company. H. & A. P. Fry, architects:—

Roberts & Robinson	.....	£21,795 0 0
Jones & Co.	.....	21,540 0 0
J. & R. Duckworth	.....	20,989 0 0
Rome	.....	20,800 0 0
Mullin	.....	20,720 0 0
Haigh & Co.	.....	20,517 0 0
Urmon	.....	20,329 0 0
W. & P. Wither	.....	20,325 0 0
Quibbitt	.....	20,100 0 0
Tomkinson & Co.	.....	19,925 0 0
Thornton	.....	19,900 0 0

For new church, Grand Park, Rochampton, for Col. Croil. Mr. Wm. Allen Dixon, architect. Quantities supplied:—

Hutton & Chapman	.....	£2,450 0 0
Wicks, Bangs, & Co.	.....	2,370 0 0
Manly & Rogers	.....	2,247 0 0
Mann (accepted)	.....	2,145 0 0

For additions, &c., to Prince of Wales Tavern, Cambridge. Mr. J. L. Stewart, architect. Quantities supplied:—

South	.....	£1,463 0 0
Ellis & Son	.....	1,313 0 0
Elliot	.....	1,068 0 0
Wray	.....	1,039 0 0
Gough	.....	980 0 0
Bliss	.....	973 0 0
Yonison	.....	959 0 0
Jerrard	.....	894 0 0
Tapley & Co.	.....	839 0 0

For taking up and relaying sewers, on the Harrey Estate, Leytonstone, for the Leytonstone Sewer Authority. Mr. John E. Bressy, surveyor:—

Cole	.....	£375 10 0
Still	.....	355 0 0
Dunkley	.....	345 11 0
Ingham	.....	333 0 0
Potter	.....	324 0 0
Harris	.....	319 0 0
Puzev	.....	286 0 0
G. Jackson	.....	270 0 0
Harbard	.....	265 0 0
J. Jackson	.....	259 0 0
Goodair	.....	202 0 0
Sparrow	.....	195 0 0

For stables, &c., at Old Ford, for the London General Omnibus Co. Under the supervision of Mr. P. Tash. Quantities supplied by Mr. A. J. Bolton:—

Heath	.....	£724 0 0
Adams	.....	721 0 0
Crabb	.....	717 0 0
Bleas	.....	653 0 0
Yates	.....	647 0 0
Adins & Son	.....	647 0 0
Johnson & Co.	.....	622 0 0
Ford	.....	580 0 0
Atkinson & Walker	.....	585 0 0
Garrud	.....	537 0 0
Robbins & Co.	.....	517 0 0

For each-house, stables, and boundaries, at Hampstead, for Mr. James Harvey. Wm. Allen Dixon, architect:—

Wicks, Bangs, & Co. (accepted)	£212 0 0
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The Builder.

VOL. XXX.—No. 1511.

Originality.

Glance at the primitive signification of a word, so far back as it can be traced, gives us sometimes a hint of more than mere philology, a suggestion for apprehending more clearly the precise value of the idea hidden under an expression which has become hackneyed and drilled in its signification by constant use. The secondary meaning which such a word has acquired may be very different from its primitive meaning, yet the relation between the two may read a practical lesson. In architecture, for instance, there is now an almost pathetic cry raised, a kind of *vox clamantis in deserto*,

for "originality." The same demand is made in other quarters; in literature notably, and with some very queer results in response thereto; but it is more strongly and perseveringly urged in regard to architecture than to any other art. In many cases the demand seems the result of a wholesale development of negative criticism, on the part of writers who reverse Pope's conclusion, and say "nothing that is, is right:" ergo, give us something new; we do not mind what, so long as it is new. In this case it is clear that "originality" only means "novelty," and is used in that sense, whether intentionally or not. In common conversation, however, the word is used in almost exactly the same sense as "individuality," some quality or manner which gives a distinctive character to a man's work, by which we recognise it as his among other productions of the same class. A good many painters, a good many writers, are currently spoken of as "very original," of whom the expression is only true in this sense, and when, in fact, the more correct expression often would be that they are "very mannered," a phrase which cannot really imply the same thing as "original," since the one expression is always used with a complimentary, the other with an uncomplimentary, meaning. And as to novelty, if we set a column with its base upwards, and standing on its abacus, that would be "novel," no doubt, but would scarcely be praised as "original."

Origo is described in Latin dictionaries as derived from the verb *orior* (to arise), and its primitive meaning given as "that which causes a rising or springing up." And from one point of view this derivation certainly connotes to some extent the ordinary meaning attached to the word, as nearly synonymous with "individuality." That which has its source and "springing" in his own mind will be characterised by his own individuality, the latter being the apparent result, the former the hidden cause. But it is just this originating in the

artist's own mind which it is so difficult to get, and which is so rarely met with. We are so influenced by the ideas of others, so biased in our judgment by what has been done previously, so dependent on our predecessors for helps and suggestions, that it is only a small chance that is left for most of us to thrust into the composition anything that peculiarly belongs to our own mind and personality. It is only a few of the rarest and most powerful minds who have been able to become really founders of new ideas in art, "full-welling fountain-heads of change." The rest, it should seem, must be content to copy largely, to take most of their ideas second-hand, or to do nothing. "There's the respect that makes calamity" of so much of our architecture, in the eyes of the desponding school of critics. And if it is necessary to originality that each work of art should present a wholly new interest of its own, independently of whatever has gone before it, then is their despondency in this point very well founded indeed, so far as all analogy will enable us to judge. But the demand made by this class of critics upon architecture is an unreasonable one, in degree if not in kind, and such as would not be made upon any other art. We do not demand that each musician should invent new forms of composition, new principles of harmony, before we will allow him originality; we are satisfied if he can give his own colouring, his own treatment, to his ideas, without necessarily ignoring or departing from the laws and practice which governed his predecessors. We do not expect a new poet to invent a new language (and heartily wish some of them would not try!), or a painter a new system of manipulation. Yet these are hardly greater demands, relatively, than are made on the hapless architect by some of his advisers. But even if we waive the question as to the amount of originality of this kind to be demanded, is there not a question also as to whether this is the right way to look at the matter at all? Is it not just as fair and logical (and etymological too) to regard "originality" as signifying, not the effort on the part of each one to raise designs out of his own moral consciousness, but the return in each case to the original principle or motive on which the design of any particular object should be founded? Is not this in fact almost the very essence of originality, in so far as it can be obtained by the majority? We have occasionally minds which seem to be a new era in themselves; but for the most of men what is needed to make their productions worth terming original, is that they should look to the primitive meaning and intention of what they are designing, and treat it *ab initio* in their own manner, and not in somebody else's manner. When working on this principle, almost every man who is educated, and who thinks at all, has his own natural bias, his own idiosyncrasy, sufficiently marked to give distinctive character to his work. If, on the contrary, he works on a fixed type, accepted or thrust upon him, he voluntarily casts aside the main means and possibility of being original, and instead of enjoying the opportunity of varying the expression of an idea, he only allows himself scope for varying the form of other person's expressions. This drawback to originality in design is not confined to, or peculiar to, architecture. We see it, for instance, in the works of the earlier sacred painters of Italy, where certain types were accepted and followed for generations, not only for the faces and aspects of particular personages, but even for the treatment and disposition of the whole subject in representing such incidents, for example, as the baptism of Christ. Genuine originality was of course almost as impossible for painters under such circumstances, as it is for architects when they are willing to accept one particular type for a church, or for isolated portions of it, or of any other building.

Now, this consideration indicates, we think, more distinctly than it has hitherto been indi-

cated by architectural critics, the essential difference between originality, properly so called, and mere mannerism, novelty, or eccentricity. The latter is something only on the surface of a work of art, not in the least touching its intellectual value or the basis of its composition. When Sterne, in the later books of "Tristram Shandy," took to the devices of coloured leaves, blank pages, and unfinished paragraphs, this was not that he was more original than at first, but less so: he had worked far away from the original vein of humour from which the book had started, and, having spun it out beyond its limits, had recourse to these shallow devices to keep up the flagging interest of his readers. In like manner, when an architectural designer invents extraordinary and portentous chamfers over his doors, designs arches with scarcely any vertical pier, and with enormously deep vousoirs, and puts buttresses just where no one would expect them, this is not being original, but just the reverse: it is a proof that he has lost sight of the original object and end of building,—that he is using features without thinking of their origin or the principle on which they should be treated, and is only trying for a sort of cheap notoriety, by differing in small details from every one else, without purpose or reason, and deserves no higher praise than that of mere eddily. The worst of this kind of so-called originality is, that there is no rational limit to it, the effort of each one of the eccentric designers being to surpass the others in eccentricity; and as there is no principle to regulate or restrain their devices, such artists are driven to producing effect by a perpetually stronger dose, till their designs become little more than a jumble of meaningless whimsicalities.

To exemplify: if an architect has a window to design, he may choose to start from the assumption, either deliberately made or acted on through habit, that one particular form of window is the only one worth taking as a type, in the matter of design,—a pointed Gothic window, for instance, with moulded jambs and archivolts. Now, this leaves a very narrow field for the introduction of individual treatment. He can vary the radius of his arch and the profile of his mouldings; and, in order to be "original," he will take, perhaps, to some abnormal proportion of window, all height and no width, or the reverse, or will invent some ineffective variation of the moulding in the jambs in order to say that he did not copy, but was original. But if, instead of taking a Gothic window as his *point de départ*, he take the original idea of a window, which might be stated thus,—an opening for admitting light from without and for prospect from within, capable of variety of proportion in height and width, of being covefed at the top in various ways (by an arch, a lintel, or a combination of the two), presenting two special surfaces for decorative treatment (viz., the jamb and soffit at right angles to the window plane, and the filling in of the window plane itself, which may be decorative in an almost infinite number of ways), requiring an effectual and rapid removal of the rain from it at the foot, and in some situations being all the better for a weatherfend against sun or rain over the head,—if the feature, we say, be regarded in this way, there are fifty more chances of getting at an original treatment of it than if some one else's previous treatment were adopted as a fixed type, and we are limited merely to minute variations in detail of that type. And this would be originality in the true meaning of the word, attained by going to the origin of the feature, and taking the designer's own treatment of it from the beginning.

So of any other feature; a door, a tower, a porch: the question for the "original" architect is not, "What new variation can I make in the orthodox method of treating this feature?" but rather "What is the object of this feature, and how can I render it expressive and ornamental,

in keeping with that object?" We do not say that thus it would be possible for every architect to invent his own new treatment of every feature; the majority would necessarily be influenced in their ideas, some more and some less, by what others have done; nor do we say that it is either possible or necessary to do this kind of thinking out, *ab initio*, of everything a man has to design. Life is so short that the busiest amongst us especially are compelled to take many of our thoughts at second-hand. And it is probably quite true also, as several critics have argued, that the man who has studied most of other styles in all their varieties, will be the one likely to have the greatest number of original ideas at his command; for two different treatments of one feature will often suggest a third, again capable of variation, and so on. But we cannot help thinking that if this view of "originality" were more recognised and borne in mind by our architects, there would be more chance of really original designs making their appearance, not only from the fact that the mind of the designer would be applied to the consideration of what really was wanted to make an architectural treatment in a particular case, instead of what it might be the fashion to want, but also because from such a point of view even the copying and adaptation of other designs assumes a new aspect, since it is regulated by a principle which teaches us to adopt what is essential in the treatment, and ignore what is accidental, and thus places some sort of bonds to that reckless variation for variation's sake which has led to so many absurd eccentricities in modern architecture.

There will be one drawback, however, in the eyes of many modern architects, at least, to this view of originality, that in this case "originality" means thought. And people are living too fast now to pay anything for thought, and 5 per cent. certainly will not pay for it, in most cases, at least. It is to be feared that we cannot show our readers the way off the horns of the dilemma, except by adopting the simple but unpalatable course of doing work well, and being content to be ill paid for it. Whether the public mind will ever be in a state to recognise that there may be more thought in one building than in another (as they recognise it to some extent in paintings), and be willing to pay for this thought as "value received," is very problematical; but we take this to be the answer to those who demand more originality in architecture. Coleridge said that "to admire on principle is the only way to imitate without loss of originality,"—a dictum which the late Mr. Leslie adopted as a motto for his "Hand-Book for young Painters." Applying the same thought, we should say to the architects, that to design on principle is the only way to insure originality.

OUR GREAT FORTIFICATIONS AT PORTSMOUTH.

The effect on the architecture of the future of the employment of iron as a main material for building is a subject of extreme interest. It is not the architect alone who is concerned in the matter. While the architecture of a country, or of a period, is a reflection of the manners of the time, it reacts, in its turn, on the habits of the people. As far back as structural relics allow us to judge,—and the period is one not readily estimated in centuries,—the exigencies of military defence have greatly defined architectural progress. When to the strength of structure required for safety we add the means of such appeal to the imagination as was suggested by the rites of religion, we sum up the chief motives of architecture.

Six years ago (*Builder*, vol. xxiv. p. 73), as well as at other times, we ventured to offer some considerations on the effect likely to be produced on military, and thus on civic, architecture by the rapid strides that were being made in the improvement of projectiles. The Italian war had yielded novel and valuable experience, in the siege and fall of the once impregnable Gaeta, of the revolution that was in progress. Quietly and steadily, since that time, have our own Royal Engineers been at work, aided by the powerful resources of the Fairbairn Company at Manchester, in the preparation of an impregnable line of defences for our great naval arsenal of Portsmouth. With the commencement of the present year, the most novel part of these defences,—the skeleton framework of one of the largest iron forts,—has advanced to a condition which renders some detail likely to be acceptable.

The idea of impregnable fortifications is as old as any records of mankind,—older, it is possible than the lineal progenitors of any existing human races. What thews and muscles were theirs who reared the enormous megalithic structures of prehistoric date we have no means of judging. But we know that, not far back than two and a half millenniums, the great brick-building people that dwelt in the fertile valley watered by the Euphrates and the Tigris surrounded their thickly-populated home with enormous mounds of earth, faced with stone and with brick, from the broad summit of which even their women looked with contempt upon the armed forces of the invader.

What were the causes that led to the abandonment of the Assyrian method of fortifying large cities, or rather walled provinces, it is not easy to determine. The fact of the repeated capture of Babylon, and the knowledge of the power possessed by an invader of diverting the course of the great river that watered so large a population, must have told for much. But walls, though less stupendous, were still reared by the founder of cities. So late as the Roman occupation of England, that great engineering people drew lines across the northern boundaries of the island, to exclude the ravages of the Pictish and Scottish tribes. And the sentinels on the Great Wall of China still watch over this costly outwork of the stereotyped civilisation of the flowery land.

With the change in European life that succeeded the settling down of the successive waves of northern barbarians that had overflowed the corrupt and effete Roman Empire, individuals, whether petty rulers, great lords, or even municipal authorities, assumed more prominence than was accorded to any but the supreme heads and fathers of the nation in earlier times. Thus seigniorial castles and keeps arose, and the towers of many a robber chief dotted the landscape, in a manner more conducive to its picturesque charms than to the well-being of the inhabitants at large. We have examples of one kind of castle in the ancient Papal residence at Avignon. In this country we may point to Rochester Castle, as one of somewhat similar structure. The idea, indeed, of these square turreted buildings is illustrated by the Tower of London. But it is to another class of fortalices, such as is represented by the great Round Tower of Windsor, or by the Castle of St. Angelo, on a large scale, or by Conisborough Castle, in Yorkshire, and many an Irish tower on a small one, that our attention is recalled by the newest phase of our military architecture.

The combination of strength, economy of material, and economy of space that is given by a tubular structure is well known, even to those who have not pushed their experimental researches further than the examination of a stalk of wheat. For a defensible residence, a round tower, in the first instance, offers the most appropriate form. We remarked, not very long ago, as to the great number of these structures that rose, especially in Italy, before the introduction of gunpowder. But with that great advance in the science of offence, a new state of things arose. A single tower presented a mark that might be readily and fatally attacked by converging lines of fire. With imperfect artillery, the balance of force was greatly on the side of the attack. Private turrets, as no longer defensible, rapidly disappeared.

With regard to the defence of towers, or of regular fortifications, the erection of the noble circular towers that yet mark some fine old Norman structures was discontinued for two reasons. One was, that it was desirable to have the means of sweeping the assailants from the ditch by a well-directed fire. This the defenders of a round tower, or system of round towers connected by curtains, could not readily effect. The other was, that from every port-hole, or every embrasure, the gun pointed in a radial direction. Concentration of the fire of the defence on the head of the attack was thus impossible. For three excellent military reasons round towers, in spite of their great structural advantage, disappeared altogether from defensive works, even before the time of the organisation of the polygonal system by Vauban.

The latest outcome of engineering science applied to defensive structures has brought us back to round towers. At Shoemess, below Gillingham, and at one or two other commanding points near the junction of the Thames and the Medway, have recently been constructed new river defences of London and of Chatham.

Neither the metropolis nor the great school of our army can now be reached by any hostile vessel. These new forts are circular in plan, built in part of granite, but with the porches of their enormous guns protected by iron shields and framework of a strength suited to resist the utmost force of shot that can by any means be expected to reach them.

It speaks well for the officers and manufacturers who have been so long and so ably at work to protect the vital centres of the country from that surprise to which, a quarter of a century ago, we unquestionably lay open, that so little public attention has been hitherto directed to the progress of these important works. The notice that is now taken of them in course of execution for Portsmouth is due to the fact that the vast iron ribs of a structure that is without a rival in its gigantic strength (looking at the twin towers of 200 feet diameter each, and at the two smaller ones of 150 ft. and 120 ft. diameter, as forming parts of the same system of defence) have just been fitted together on the premises of the manufacturers at Manchester.

Portsmouth, it is asserted, when these works are completed, will not only be safe from any attack by sea, for we are approaching the limit of possible sea-borne batteries and offensive means, but she will be safe even in the unpleasant contingency of an attack by land. Eleven hundred thousand pounds is the sum that we are now spending in what our French neighbours call the blinding,—that is to say, the sheathing in a thick, impenetrable, ponderous shell of iron,—of the four forts that form the most novel and formidable features of these defences.

Of the great twin towers which are hereafter to give meaning to the line,—

"Britannia needs no bulwark, no towers along the steep,"

one is situated on a spot known by the name of No Man's Land, about 2,000 yards to the north of Hyde Sands, and the other upon the Horse Sand Shoal, some 3,500 yards south of Southsea. The main entrance to Portsmouth harbour lies between these two gigantic sentinels, which can bring their fire to bear on the channel at a distance from one another of only 2,000 yards. With these main forts are connected two others of similar construction, but of somewhat smaller proportions, the least of which,—that of St. Helen's, on the west of the Isle of Wight,—is of a diameter of 130 ft.

The two larger towers carry each two tiers of guns, the lower one containing twenty-four 600-pounders, of 12-in. bore, and weighing 25 tons each; the upper, twenty-five 400-pounders, of 10-in. bore, and a weight of 18 tons. The former throw a bolt weighing 600 pounds, which is propelled by the explosion of 85 pounds of powder. The velocity of the shot on leaving the muzzle of the gun is 1,300 ft. in a second. The force of impact is 7,000 foot tons at the muzzle, and 6,000 foot tons at a distance of 800 yards. In what we must comparatively call the smaller guns, the weight of projectile is 400 pounds, that of powder 70 pounds. The force of impact at muzzle is 5,000 foot tons; at 800 yards, 4,400 foot tons; and the velocity on leaving the muzzle 1,300 ft. per second.

We enter into these details for the reason that they are such as to enable us to understand how the military objection to the use of circular towers has been in this instance overcome. To attack an incoming iron-clad vessel, a concentration of fire is, no doubt, necessary. But the concentration which was formerly effected by training the guns of a broadside, as of a bastion, to bear on a single point, is now produced by the more simple, certain, and irresistible means of firing the whole weight of a broadside from a single gun. Could the bolts of the 64-pounders be made to strike at the same moment, in exact proximity, on the side of a vessel, the shock would be very far less than that caused by the delivery of a like weight of metal in one mass; while as to penetrative power, the large bolt possesses it, and the smaller ones do not. They might pepper away very disagreeably at the sides of one of the giants that are now set afloat, without any very imminent destruction. But the large bolt will go straight through 12½ in. of iron at 200 yards, 1½ in. at 1,000 yards, and 10½ in. at 2,000 yards. These measurements of the offensive power of the armament of the forts enable us to form a very satisfactory estimate of their defensive strength.

On foundations supposed to have been pre-

paved with great care, will be raised first a circular mass of masonry rising to the height of 16 ft. above high-water level. On this will stand a closely-jointed iron tower, of the height of 26 ft., and the diameter, as before stated, of 200 ft. The skeleton of the structure is formed of piers of wrought iron filled in with concrete. Vertical ribs of iron form a sort of palisade round these piers, being bound together by three wrought-iron rings, and finally planked with great iron slabs, each some 26 ft. long. There are three several concentric thicknesses of these iron plates, each 5 in. thick, the two intermediate spaces, also 5 in. thick, being filled solid with concrete. Under the port-holes, however, the thickness of the iron is increased to 17 in., with 10 in. of concrete. A bomb-proof roof covers the upper gallery, which runs round the inner part of this tower, on a floor of iron beams and concrete, to support the upper tier of guns. We can only hope for the sake of posterity that the effect of concrete on iron is fully understood.

This enormous mass of iron, of which the skeleton alone weighs 2,500 tons, is so delicately and accurately fitted together as to form a homogeneous whole. Every face joint is planned, every hole drilled. If it cannot entirely be said that neither hammer nor axe nor any tool will be lifted up upon it while it is in building; yet, that assertion will in a certain sense hold good: indeed, in the same sense in which it applied to that famous temple fortified dear to masonic tradition. Not a chip will be struck from the iron. It will all go together like the pieces of a watch, or of a rifle made by machinery. Hence any impact of shot or shell will be resisted, not by the surface struck alone, but by the whole immense weight and metallic elasticity of the entire tower. The enchanted castles of fairy tales are as nothing in face of this giant baby of modern metallurgy.

These noble iron forts will be accompanied by the minor protection of land batteries at Southsea and Gillecker, at the Needles and Hurst Castle.

We may be pardoned for one word as to the strategic importance of a series of works, as to the engineering qualities of which we have spoken. We cannot doubt that it is of the first order. We have to remember that for 800 years the sea has been to England a bulwark and a safeguard. On two occasions only since the Norman Conquest has this island been seriously menaced by a foreign foe. On each of these occasions our assailant was able to dispose of almost all the resources of that part of the Continent from which we could be readily attacked. The winds and the tides, with which even Julius Cæsar shunned a third time to contend, shattered the great Armada on our shores. The flotilla of Napoleon, if, indeed, it was more than a feint, as to which military writers are in doubt, was never able to put to sea. In this, the safeguard of the past, lies all the reality of our protection for the present.

For this reason, without prejudice to the importance of girding London with a chain of detached forts, and of protecting Chatham on its only vulnerable point, the hills on the left bank of the Medway, it is of vital importance to the safety of the country to have impregnable harbours in which our fleet may lie in absolute safety, ready to issue at any moment to sweep from the Channel an invading flotilla. For the Sussex coast, the point struck first by Cæsar, and then, eleven centuries later, by William, Duke of Normandy, Portsmouth is suited to fulfil this condition. With Portsmouth that which she is in course of becoming, no enemy will be able to throw a shell into her harbour. Resting on this perfect base, our fleet may be well able to answer for the inviolability of our coast south of the Thames. With regard to the Norfolk coast, a second Portsmouth would be desirable. We conclude that the Thames itself would be the station for the division of the fleet that had to defend this portion of our coasts. Portsmouth is our great defence against France. As to our defence against Germany, it is only about a twelvemonth since we have begun to feel that it is a duty to be provided.

While feeling that, in the present state of military and naval warfare, defensive measures like those which we have described are a wise and sound economy, we see no reason to depart from the opinion which we have before expressed, that the present form of seagoing bottoms is of an essentially temporary character. Two distinct considerations led us to form this estimate; and the course of events during the

past eighteen months has not only confirmed its accuracy, but gone far to turn opinion into certitude. One of these is the historic view. The amount of thought, science, and admirable workmanship that was expended, more especially by the armourers of Milan, in forming a perfectly safe, and at the same time very flexible, panoply for the defence of the person of the warrior, and a panoply of altogether different nature for the tournament, cannot be imagined by those who have never examined the actual suits worn by kings and nobles in the fifteenth and sixteenth centuries. A mode of attire that was at once consecrated by the use of generation after generation, and eminently handsome and noble, disappeared altogether in a few years before the improvement of projectile force. If this was the case with personal armour, how much more strong is the probability that a similar course will be followed by armoured ships, in which the mechanical laws of flotation operate as a positive limit to the thickness of the plate,—a limit beyond which one offensive power has already sensibly advanced. Add to this the fact, that it is not the strife between gun and target alone that must be regarded, but the irresistible force of that great guardian of forts and harbours—the torpedo. We feel convinced that the form of the war navies of the future must be altogether different from that of the strongest existing vessels, in which, when attacked by such torpedoes as we already make, the immense weight would only serve to ensure instant and total destruction.

Notwithstanding this progress of science, it may be hoped that the outlay on the Portsmouth works has been wise and satisfactory. Not only were all the details of these structures to a great extent determined before we had gained our present experience of torpedo action, but even were the case now to be decided, we should do well to pay a million or two extra for the mere sake of the moral effect, both on ourselves and our possible opponents. The fall of 1 per cent. in the price of Consols—to say nothing of the much larger amount of railway and other stocks,—would be a loss of six times the cost of rendering our chief arsenal impregnable. It may be urged that such a depreciation is only an imaginary loss,—that it is a debt we owe to ourselves, and a mere removal of money from one pocket to another. But the reply is, that the fall in the price of public securities is an index of the loss of public confidence, the effect of which is the arrest of enterprise of any description. When we know how a marked fall—say of 8 or 10 per cent.—is enough to paralyse trade, commerce, and manufacturing industry, we may easily believe that slighter depreciations of value represent diminutions of our productive action, of at least a magnitude equal to their own. To pay, then, a few millions more or less by way of insurance, in rendering our coast service, our fleet, not only seaworthy, but supreme; and our army that useful organ for which it offers an unsurpassed material, if only it be wisely organised and trained, is not only a penny wise, but a pound wise, economy. Regarded in this light, we congratulate the country on the well-organised defences now in course of completion at Portsmouth: while as a specimen of the art of the builder working in new material, to hid defiance to colossal engines of attack, which two years ago might have been well regarded as irresistible, we feel greatly proud of the iron fortifications that Manchester frames to guard our fleet.

EAST GREENWICH WORKHOUSE.

UNDER the title of "Christmas under the Poor Law," the leading journal gave, some time ago, an article concerning thirty-two of the thirty-three unions in the metropolitan poor-law district. The one union of the thirty-three "conspicuous by its absence" is singularly enough, that which includes two of the three towns—Deptford and Greenwich—represented in Parliament by the Right Hon. W. E. Gladstone, Prime Minister. The article in question contained statistics of varied character, embracing the number of houses, the number of inhabitants in the various unions at 1861 and 1871, the workhouses at which the inmates had egg-flip in the evening, and snuff and tobacco, and half-ounces of butter, in addition to statements of the quantities of beef consumed, and of the ingredients of the plum-puddings prepared. It is too late now to describe the Christmas treat in the Union Workhouse at East Greenwich, but a few particulars of the establishment will not be out of place.

It is not necessary to quote statistics largely to show that the Greenwich Union House is entitled to a place among the others of the metropolitan district. In locality the union is an outsider, but in extent and numbers it is a fair average example, and entitled to mention. It has a total population of 100,601 in the union, and has 851 inmates in the union workhouse. Among the others enumerated by the *Times*, that have larger numbers of either population or poor, are:—the City of London, with a population of 111,784, and 2,390 inmates of the house; Marylebone, with 159,169 in population, and 1,874 inmates of the house; St. Pancras, with 221,594 in population, and 1,610 inmates. On the other hand, showing smaller unions, with lower numbers of populations and inmates of the houses, there are Chelsea, with 71,086 population, and 523 inmates of the house; the Strand, with a population of 42,978, and 916 inmates; St. George's-in-the-East, with 45,235 in population, and 1,051 inmates; and White-chapel Union, with a population of 78,970, and 836 inmates. We do not know how the older children are dealt with in the several instances just referred to, but there are in the Greenwich Union Workhouse 66 children; and at the educational and training establishment at Sutton, 357 children chargeable to the Greenwich Union. The inmates of the Greenwich Workhouse, are at present 851, consisting of 320 males, adults, 465 females, and 66 children.

The assemblage of buildings constituting the establishment is Elizabethan in style, of white Suffolk brick, with stone sills and lintels, and was erected about thirty-six years ago. It does not provide a palace, as regards external appearance or internal decorations, but embraces such healthy and cleanly accommodation as is necessary for the shelter and maintenance of the helpless poor. A considerable space is left vacant, as garden-ground and forecourt, between the front buildings and the public road. The entrance is through a block appropriated to the Board-room, and a number of offices. This building is in two stories, and is flanked on each side by two other ground-floor structures, used for miscellaneous purposes. Behind the front block is an extensive quadrangle, one side of which is formed by the main building, and by long wings, which intersect and project upon it, without joining at the ends. The principal building consists of a basement, a ground floor, and two upper stories for dormitories, infirmary, rooms, day-rooms, &c. The entrance to the house is in the centre, close to which is the master's and other offices, and the dining-hall, which is used on Sundays as a chapel. A circular staircase, under a canopy, gives access to the rooms of the master and matron, and to the long corridors upon which the dormitories and infirmary and day rooms open. The number of cubic feet of air per inmate in the dormitories, the day-rooms, and the dining-hall, is in accordance with the ordinances of the Poor-Law Board. The statutory accommodation in the house is for 850 persons, we believe, and it contains at present just one over that number. Having gone over the whole house, however, we feel justified in saying that there is no evidence of crowding.

Mention has been made of the 400 Greenwich Union children that are at Sutton; but there are children chargeable that are too young to be sent thither, and about twenty will be found in the house.

Poor little waifs, three of them have been picked up in the streets! Who can foretell their future? They are all clean, happy, rosy, and bright-looking now, whatever their after lot may be. They are so young as not to have reached the age when dress indicates the sex of the wearer; but the mode of parting the hair and a little head ornament marks the girls.

A visit to a workhouse suggests melancholy reflections. It is humbling to note such a low form of human life,—in many instances it is mere existence, not life,—an unvarying round of eating, mauling, sleeping, dozing through an existence that has ceased to have use, aim, or object. It is curious to notice the effect that the workhouse régime has in prolonging the lives of those who may have often survived hard buffetings in the world. Anxiety and care concerning the future are thrown off at the entrance to the house, and the inmates are henceforth placed under conditions more favourable to health and longevity than they have ever before experienced. In the Greenwich workhouse there are 431 inmates that are over sixty years of age, and of these more than fifty have seen more

than fourscore years. Several have reached the verge of a century of life, and one, Thomas Taynton, of Bristol, who has been an inmate for four years, has passed, it is asserted, his 102nd birthday. These old persons of both sexes furnish startling illustrations of Shakespeare's marvellous text descriptive of old age and its infirmities, and of the "labour and sorrow" attaching to life beyond fourscore years. How true the descriptions of the aged as they are seen here! "The moist eye, the dry hand, the yellow cheek, the white beard, the decreasing leg, the increasing belly, the broken voice, the short wind, the double chin, the single wit; every part blasted with antiquity." The poor creatures can only drowsily answer shrieks in their ears by piping a childish treble, and in their pitiable second childhood are "sans teeth, sans eyes, sans taste, sans everything."

We heard good things said of Mr. and Mrs. Killey, the master and matron.

LONDON AS IT IS, AND AS IT MIGHT BE.*

In taking as the title of my paper, "London as it is, and as it might be," I am perfectly aware that I am choosing a colossal subject, and one which I can only hope to treat in a very cursory manner in one short paper.

In many respects there is no city in the world to be compared to London. Its vast extent and population, and its boundless wealth, form an inexhaustible theme for its panegyrists, and it would be perfectly absurd to compare any city, ancient or modern, with it in commercial importance and activity. Even in natural situation it is to be doubted whether many cities excel London. Whether we look at the central parts, rising by a gentle slope from the bold curve of the river from London to Westminster, or the natural beauty of the suburbs round the heights of Hampstead, Highgate, or Sydenham, or along the banks of the Thames as far as Richmond; and yet, with all these advantages, it cannot be denied that London is not so attractive as it ought to be. If to any one, one would think this place would, at least, be interesting to Americans, who draw their blood and their language from "Old England." But Americans will come here, rattle through the chief sights of the place as a matter of duty in a few days, and then rush off to spend the bulk of their time and money in Paris; and no wonder, for, compared with the gay and cheerful French capital, our London looks a dirty hole indeed. No one who wishes to pass a pleasant existence, with those advantages which are only to be obtained in a metropolitan city, would hesitate to choose Paris in preference to London, unless, indeed, the chance of being knocked on the head was thrown into the scale; then, perhaps, he might decide in favour of the latter.

It will not be out of place, then, I think, in an assemblage like this, which represents the architects of the future, to consider why this our city (which we justly and proudly consider the queen of the cities of the earth) compares so unfavourably with some others in external appearance; and if in the paper itself, or in the discussion which follows, we are able to ferret out any of its defects, and suggest any remedy for them, the object of bringing the subject forward will be answered.

I will divide what I have to say under four heads, as follows:—

First. London is abominably dirty, and there is no reason why it should be so dirty.

Secondly. It is much more smoky than it ought to be.

Thirdly. The general aspect of its streets,—even the principal ones,—is commonplace, uninteresting, and even ugly; and, compared with the advantages gained, a very trifling expense would make an astonishing difference in this respect.

And Fourthly. There is a want of uniformity of plan,—general supervision, from a fine-art point of view.

Now, as to the first head, by saying that London is dirty, I mean that it is dirty far beyond what it needs be. A certain amount of dirt we must always expect in every large assemblage of houses and human beings; but in London everything is dirty. How many of its buildings are so blackened by smoke, with their mouldings and cornices so choked up with the dirt of years, and in some cases of centuries, that

the effect intended by the architect is quite lost? How soon do its monstrous rows of brick-built houses assume one even tint of dirt? Even the trees seem only to assume their natural colour after a good shower of rain. The air is so full of dirt that everything is covered in an incredibly short time with a thick coating of dust; and as to the streets, an hour or two's rain is sufficient to convert them into a liquid sea of filthy mud. Now, the question is,—Is all this dirt absolutely necessary? Is there any reason, in the nature of things, why the dirt and smoke should have been allowed to accumulate on St. Paul's, for instance, apparently ever since it was built, without being once removed? Would it be sacrilege to give a good cleaning to the beautiful spires and spires in the City, the details of which are quite hidden by dirt? And why is the Mansion House the only building which is allowed an annual washing? This simple cleaning alone would quite alter the aspect of many views in London.

Then, look at the streets. A very few hours of rain are sufficient to make the evil appear. They are soon covered with a thick dirty mud. If the rain keeps on, this becomes more liquid, and is worked up by the cabs and vehicles into a regular slough. As these rush through the streets, they scatter the mud right and left over the unfortunate foot-passengers. These last transfer the mud from the road to the footpaths, and from thence into the houses, until the dirt and filth of London in wet weather has become proverbial. As an example of the mischief arising from this cause, I may mention that a few weeks ago I attended the service at St. Paul's on Sunday afternoon. It was one of those miserably wet days. The statues had just been thoroughly cleaned, I believe, for the first time since they were put up; and the crowds were being admitted by the west door; but, with that wisdom so characteristic of ecclesiastical authorities, no mats or scrapers were provided for those who entered to clean their feet, and the dirt from the streets outside was being rapidly transferred to the marble floor, there to dry, and to be afterwards ground up, and transferred, in due course, in the form of dust, to the lately-cleaned statues and other parts of the building.

But if the public buildings and the chief streets are dirty, what shall we say when we come to the back slums? What about the neighbourhood of Shoreditch and the New Cut? Those who have been employed on surveys or valuations in the back slums of London, may have seen those filthy little cottages, where each room is the dwelling-place of a family. At the window, on a board, sits the bread-winner,—perhaps a tailor or a shoemaker; the window has not been opened for years, or is nailed down, the panes broken and stopped up with wood, paper, or dirty cloths,—a miserable, squallid bed in the corner forms the nightly resting-place of father, mother, and sickly children, whose wizen features and rickety limbs are pitiable to behold; whichever way you look—floor, walls, or ceiling,—dirt, filth, you find on every side, and you rush out from the foul air with a feeling of intense relief,—those who have seen sights like these alone have some idea of the real dirt of London; but I leave these back slums for very despair at present, and will only speak of the chief streets and buildings. If the salt has no savour it will be in vain to try and season the whole lump; and I say that it is absolutely impossible to materially improve the aspect and cheerfulness of London, or make it vie in appearance with a city like Paris, till some thorough and frequent system of cleansing is adopted both of streets and buildings. The first and urgent want of London is cleanliness; and cleanliness we shall never have till public attention is thoroughly awakened to the evil, and the present condition of things is considered insupportable. Then, perhaps, a commission might be appointed to see why London is the dirtiest capital in the world, and some measures might be adopted for its continual cleansing. At present the dirt seems to be regarded as an evil which cannot be cured, and must be therefore endured. Some of the measures which might obviously be adopted are as follow:—Materials ought to be employed for the streets which experience has proved to be the most cleanly, such as the asphaltic and wood paving; and the streets and footpaths should be thoroughly cleansed as often as found necessary, the present staff for this purpose being at least doubled or trebled. More materials should be employed in the façades of streets which can be most easily cleaned, and every

building of any importance should be thoroughly cleaned at least once a year. What is the use of spending thousands of pounds in elaborate carving and ornament, and then permitting it to become merely the lodging-place of soot and dirt?

As a cleanly covering for buildings in a large town, I hold that the much-abused stucco, which can be painted as often as wished, holds a very high place; and Regent-street and the buildings round Regent's Park are certainly the most cheerful and clean-looking in London. But I do not wish for this reason to suggest building London façades in future with stucco fronts as the perfection of street architecture. Indeed, what I have to speak about under the head I am now treating of is not so much the erection of new façades as the keeping clean of those already built, and in this respect stucco has great advantages; and I believe I shall enter the Association with me when I say that if those who had the charge of the streets and footpaths kept them as clean as they might be kept, and those who had the charge of public buildings did the same, and that if each private owner of a house in a street-front were compelled to give his house a thorough and frequent cleaning, whether it were stone, brick, or plaster, a great step would be obtained towards altering the character and cheerfulness of London; and if the saving of things now constantly spoiled by dirt were taken into account, the measures adopted, even though expensive at first, would probably be found economical in the long run.

With regard to the second head,—that London is much more smoky than it ought to be,—I think there is no one in the audience will disagree with me on this, though the remedy may be more difficult to suggest than in the last case. On coming up by train from the country on a bright spring morning, with blue sky overhead, we notice a haze hanging over the horizon towards London as we approach the great metropolis, and, finally, the clear blue sky and pure air may be said to entirely disappear when we are whirled into the heart of the town. A really clear blue sky is never seen in London; there is always to be noticed a haze and dimness about it quite different from country air. Some one will say, perhaps, that this is a necessary evil, and one of the natural results of life in a large city; but anybody who has been accustomed to walk about Paris must have noticed that the air there seems quite as pure as country air, and everything in the best quarters looks fresh and clean from the sky down to the houses in the streets, except perhaps now where damaged by the shells of the Germans, or the fanatical hands of the Communists. It is almost impossible for us to tell how many bills we Londoners owe to this Hydra smoke, belched forth incessantly from hundreds of thousands of fires. It fills the air with soot, carbonic-acid gas, and other unhealthy products. It forms a large proportion of the dust which flies about ruining everything. It injures our lungs, and injures our eyes; it enters its way into our pictures and colour decorations, and thereby prevents the possibility of any general view of London being obtained. From the top of the Monument, or St. Paul's, on a calm day, the glorious prospect of industry and wealth rattling through the streets below, or carried on the bosom of old Father Thames, or attested by those forests of masts in the docks, is bounded in a mile or two by the sulphurous cloud which enshrouds everything in its arms. On a very windy day you can see farther; and when the wind shifts rapidly from point to point, it is curious to notice the smoky giant rolling first on to one and then on to another quarter of the City, the spires and prominent buildings of which alternately appear and disappear from view.

The smoke generally appears to cling pertinaciously to the town itself, so that the heights round, such as Highgate, Hampstead, and the Crystal Palace, are often visible, whereas the intermediate parts cannot be seen. What general views of London would be without smoke can be sometimes seen on a Sunday bright summer's morning, when scarcely any fires are lighted. I have sometimes been quite astonished at the beautiful views which have appeared from Richmond and the high part of Epping Forest; at such times giving general and beautiful views of the City which it would be impossible to tell existed at ordinary times. I was once told by a friend who had chambers in Pall-mall, and whose bedroom was a top room at the back of the house, that if he woke up on a summer's morning at three or four o'clock

* By Mr. A. Payne: read at a meeting of the Architectural Association, January 12th.

and looked out of the window, he had a clear and distinct view of a great part of the town; on looking out again, however, at six or seven, this had totally disappeared, and he was merely greeted by the smoke from the chimneys of the lower houses. It is this smoke, too, which forms a great part of the dust and black specks complained of under my last head, spreading a fine coat of dust and gloomy colour over everything they touch, and that it is prejudicial to the inhabitants is proved by the fact that those who have been bred in town two or three generations back lose vigour and stamina, as compared with those in equal circumstances in the country. But we have not done with the evils of smoke yet. Who does not know what a plague and nuisance a smoky chimney is. I have known more than one London architect's office where the draughtsmen have been obliged to sit in their great coats and gloves, in the middle of December or January, or else endure the alternative of being gradually smoked. Then comes the smoke doctor, that nightmare of the architect, with his horrible twisted chimneys, zinc cows, and other abortions, all warranted to cure, and "very handsome," according to the patentee's notions. These horrible things form an eye-sore in every street, and damage almost every architectural view in London. Let any one go on to Waterloo Bridge, and look at the noble and stately front of Somerset House, crowned with long rows of chimney-pots of such motley description that one might fancy that all the smoke doctors in London had had a turn at the building.

"Ah!" says the Gothic architect, "that is the fault of your Classic style, quite unsuitable to this cold climate, and to which chimneys cannot be adapted. In Gothic architecture, chimneys are a positive improvement." Are they, my Gothic friend, lover of realities and hater of shams? Come with me a little further down the river, and look at the Temple Library. Yes, those are very pretty elinancies, those at the sides, but they are never used, because they were found to smoke. I think you will hesitate to say that those ugly zinc pipes that climb up the roof (forming some of the most untidy chimneys in London) are a positive improvement.

I think it must be conceded, whichever way we look at it, that this smoke is a nuisance which ought to be abated; in fact, next to dirt, the crying evil we have to call out against in London is smoke; and, as in the former case, we shall never be rid of it till the public is persuaded that London is more smoky than it ought to be, and gives battle to the Hydra with that dogged determination to conquer which the British public generally does show when fully alive to an evil. Even then it would take months of discussion, and the brains of our scientific men would be severely taxed before we should have an answer to the question—How can we have heat and warmth without smoke, or with much less smoke than we have at present?

I believe this question has never been thoroughly and satisfactorily solved, though much has been written on the subject.

One of the chief methods which have been proposed to reduce the evils of smoke is improved grates and stoves, by which the amount of air supplied to the fire is regulated, and wasteful combustion prevented; and there is no doubt that a great deal might be accomplished in this way, and that it is a very important part of our duties as architects to study this subject, and see that our clients are provided with economical grates; for half the smoke and soot flying about in the air is nothing but wasted fuel and heating power lost. Closed stoves, no doubt, give less smoke than open grates; but it is to be doubted if Englishmen will ever give up their cheerful fireside for an ugly black stove. The same objection applies with equal force to heating by steam or hot water; and although an open fire often bakes you on one side whilst you are almost frozen on the other, still a bright blazing fire is a nice thing on a cold winter's night, when the snow and hail are beating outside, and not lightly to be given up.

In New York anthracite coal, or coal without bitumen, is used to prevent smoke with great success; and it seems strange that in this country coal should be prohibited on railway engines, where very little damage would be done by it, and be allowed in large towns where its effects are so disastrous. In Paris, at no very distant period, wood was burnt for fuel; and I remember an anecdote which shows how deeply-rooted was the antipathy of the fair Parisians

against coal. One of our English ambassadors, newly appointed to Paris, determined to set a good example to the inhabitants by burning coals instead of such an obsolete fuel as wood. Shortly after his appointment, he held a grand assembly, but was mortified to find that hardly any of the fair sex attended; they had heard that his excellency burnt coals, and fearing that their complexions might be spoiled, they stopped away. Whether complexions so susceptible were natural or artificial it is not necessary for our purpose to inquire: the moral is the same. No doubt, one of the most feasible plans for reducing the smoke- nuisance, would be to make regulations as to the sort of fuel used, and by advocating the use of coke and iron-bituminous coal wherever possible.

I hope I shall not be thought Quixotic in mentioning another scheme which has been hinted at in engineering circles. Those members of this Association who have been into the iron and coal districts, may have noticed some of the iron furnaces belching forth large quantities of flame and smoke, whilst others, which they are told are hard at work, they would imagine to be out, by their giving forth so little. Now, what is the reason of this difference? Simply that the owners of the latter class of furnaces have found out that by throwing away so much flame and smoke, they are wasting a great deal of heating power, and they collect the smoke and gases at the top of the furnace, and bring them back again for heating their boilers and other purposes. Is it not therefore possible, that if all the unconsumed matter which flies off in smoke in a vast city like London, were in some way collected and made use of, a very great saving would be effected, and the nuisance of smoke almost entirely obviated? The scheme, as I have heard it shadowed forth, is something of this sort. Every block of houses would be provided with one or more smoke towers, into which the fumes would be taken by descending or ascending flues as most convenient, with openings at intervals for sweeping. In the smoke tower, the smoke would be either burnt or utilised.

The advantages which could be afforded by this plan, if it could be brought from the level of mere suggestion to a practical scheme, are obvious, and there seems no reason why it should not answer as well for a block of small buildings as for one large one, or a factory, where it has often been carried out. In addition to carrying away and neutralising the smoke now thrown into the air, it would be a fatal blow to smoky chimneys, and the smoke-doctor and all his tin chimney-pots would be annihilated; for smoky chimneys are almost always caused by a downdraught on a chimney from some roof or higher point. The smoke-towers would be a fine opportunity for varied architectural design, and such blunders as the chimneys of Somerset House and the Temple Library would be unnecessary in the future. And with such powerful extraction shafts as the towers would be, we should have much greater chance of thorough ventilation for our houses, public buildings, and sewers, than we have at present.

I think I have now mentioned all the different proposals that have come under my notice for abating the smoke nuisance; perhaps some of the members present will be able to suggest others. At all events, I hope they will agree with me that something ought to be done. It is a scandal that the inhabitants of New York and Paris should keep their cities, comparatively speaking, free from smoke; and we, who consider ourselves in advance, or, at least, abreast of our neighbours, should permit the atmosphere of our city to be so polluted as it is at present. London never can and never will be a really pleasant place to live in till it is far less smoky than it is at present.

But I must now pass on to my third head.*

THE DEMOLITION OF THOROLD-SQUARE, BETHNAL-GREEN.

THE houses forming this square, to which we have repeatedly drawn attention in the pages of the *Builder* during the last quarter of a century, are condemned at last, and are now in course of demolition. If ever a parish swamp and fever-nest existed in this metropolis that knew no intermission in the sad havoc it made of human life and human morals, that hot-bed in the heart of Bethnal-green was one. Yet for

years the local authorities allowed it to exist, though its public shame was monstrous, and the dwellers within that ill-fated square were living and breathing in daily contact with the infectious dead. Its state twenty years ago, ten years ago, and last year, was nearly similar, but its latest phase was worse in one particular,—that the houses in the interval had grown older, and become absolutely uninhabitable. Here is the picture of the sanitary condition of this place of ill omen given in the *Builder* nearly a dozen years since:—

"At one inquest it was stated that, in twenty-two houses forming Thorold-square, twenty children had been attacked with illness, and that twelve of these had died. The Roger family occupied one room, and were ten in number,—eight children and the father and mother. Here, even without any other cause, overcrowding was sufficient to produce pestilence; but George Stratford, a weaver, tells us that there had been no water supplied to any of the houses but three for eighteen months, except through a broken and unusable pump. In the heat of summer they never had a puddle of water at any time for three weeks except what they begged from others as best they could. The closets had no pans and were not trapped;—in fact, they might be called cesspools,—sometimes they were empty, but he had seen them running over with soil. There were sixty families in the square, and about 350 children among them."

From 1860 to 1871, Thorold-square mended but little indeed in its water supply or closet accommodation, if we were to judge by a personal visit we made on two occasions last year. It was then simply disgusting to view the courtyard around, an open cess-pit into which the side channels of one side of Bethnal-green drained down a pretty steep gradient, carrying unmentionable filth and sewage to the very doors of those wretched tenements. The closets or perches, or by what other name they could be rightly termed, were indescribable;—the ash-pit or bin overflowing, and the middle of the square, filthy. Sicknes was still rife in the wretched abodes; the children were ragged, barefooted, bareheaded, and hungry, and not a few of them had the shrivelled and hardened features of old age. The aged were ghastly pale and broken down, and possibly broken-hearted; for how could they be otherwise, condemned in a manner to live as they were?

Is it not a mercy that such a slaughter-yard is abolished at last, though we hope at the same time that the evicted have found a housing of an improved kind near at hand to the centre of their employment. The houses that backed against the square on a line with Turin-street, and which, of course, formed a portion of this square, are being demolished also as we write.

Let it not be imagined that in the destruction of this villainous house property Bethnal-green gets rid of her worst evils. There are various other streets, lanes, and courts quite as bad, as we have long since instanced. Such as Nichols-street Old and New, and Half Nichols-street, Phoenix-street, and several other narrow and crooked defiles extending from the back of Shoreditch Church to a considerable distance eastward—right and left of Bethnal-green-road. In the demolition of Thorold-square a tablet with its name bearing date 1792 will disappear. The houses looked much older than that date would indicate.

SNOW-MELTING.

THE first fall of snow this season in the metropolis must have awakened in the minds of many inhabitants vivid memories of the almost total stoppage of traffic which occurred two years ago, when the heavy fall so rapidly accumulated in the leading thoroughfares in such a manner as to extinguish all locomotion except of the slowest and most expensive description, and defied all the efforts of the contractors' brooms and shovels in carrying it away. Then the removal of snow was the general topic of conversation, and induced the Commissioners of Sewers of the City of London to advertise a competition for snow-melting machines. Among those who tendered designs was Mr. J. F. Clarke, of Moor-gate (and to whom the 1st premium was awarded), who perfected an invention which he has patented, and which he considers fully able to grapple with and overcome any difficulty that may ever arise through such accumulations. Mr. Clarke does not propose to carry the snow to some far-off point, but, by a great concentration of heat at frequent places, anticipate the work of the wished-for sun. His patent consists in the employment of a series of metal slabs or plates heated by gas and air jets, and placed at an inclination of 2° to 1 ft. in a chamber or vault beside or over a sewer or drain. Upon

* In our next.

these heated plates the snow is thrown, and so melted, and the resulting water discharged into a sewer. The apparatus was put in operation last year, under the supervision of the City Engineer. The entrance to the rault can be easily made as a vertical shaft in any of the "side openings" usual to sewers. This vertical shaft is the shoot down which the snow is sent to the heated plates prepared to receive it. The advantage of the apparatus being placed in close proximity to the sewer is apparent, as an easy junction with the gas mains can be effected, and the apparatus itself offers no obstruction to the traffic. But to meet the exigencies of small towns, or any unforeseen circumstances in large cities, the apparatus is constructed so that it may be easily placed in a portable casing, and placed over any gully or other entrance to a sewer, and there perform its work. The cost in the City was ascertained to be from 5*l.* to 6*l.* per yard for destroying the snow without any extra street labour. If the same quantity had to be carted away, it is calculated the cost would be from 3*g.* to 4*g.* per yard, even supposing the horses able to travel.

The second prize for a scheme for snow-melting has been awarded by the Commissioners to Mr. J. S. Farrar, who proposed that the snow should be swept up to the centre of wide streets and the sides of small ones; then to be carted away, and thrown into the Thames, vacant spaces, the main sewers, and into heated troughs. Similar propositions were made in our columns long ago.

Mr. William Haywood made a report in 1871 on some experiments in melting snow, wherein he speaks somewhat favourably of Mr. Clarke's scheme. Mr. Haywood remarks, suggestively, in that report—"The recent snow-storm is the first to cause public inconvenience since 1867."

ORNAMENTAL GLAZING QUARRIES.

At a recent meeting of the Yorkshire Architectural Society, the Rev. G. Rowe read an interesting paper on this subject. He observed that a very moderate acquaintance with the works of Medieval artists was sufficient to excite our admiration at their singular fecundity of design; and the present subject afforded one of the many branches of ancient art by which the richness and variety of thought might be illustrated. In the general revival of the study of old stained glass, attention was attracted by that more manageable part of the subject which is understood by the term "ornamental quarries." After explaining the meaning of the word "quarry," he observed that the form of the quarry was a diamond, or sometimes a square put diagonally. It was also necessary that ornamental quarries should each contain within itself a separate pattern or device, since, as it often happens when the design occupied many adjacent quarries, the kind of glass is distinguished by the name of "Running Pattern" or "Grissaille Glass," much of which still exists in this country, and is very beautiful. The size of the pieces of glass which are called quarries has made them liable to vicissitudes peculiarly their own, and their number diminishes yearly. The common accidents of centuries, and the fragility of their material have been the chief causes of destruction; while, in more recent times, on the one hand their apparent insignificance has led to their being replaced by new glass; and, on the other, their easy portability has too often been practically put to the proof by over-zealous but not over-conscientious collectors of ancient fragments. But, notwithstanding, ornamental quarries are, even yet, sometimes found by the score. In such cases they may have formerly filled the windows of the church where they occur. These, however, are the chief dishes of the feast. More commonly only a few miscellaneous examples have been preserved. In some praiseworthy instances these have been carefully set aside upon the restoration of the building, and afterwards grouped together in one window, in a situation where the quarries could be easily inspected. It is also probable that in some cases we possess the only representative of the type that ever existed. The initial letters of the name of either donor or painter, or some canting allusion to it, seems to have been placed in a single quarry, perhaps at the bottom of the window, and to have survived all mishaps. These are extremely difficult to attribute to their rightful possessors unless some chance directs conjecture to the truth. Among other

specimens Mr. Rowe referred to one in St. Martin-cum-Grigory's church, with the letters C. R. upon it; and a square quarry containing a trefoil on which are the letters J. E. W., in Holy Trinity, Goodramgate, both of which wait for some one to unravel the mystery. He observed that there are but slender means whereby to judge of the age of quarries. Coarse rough glass of deep green colour is usually an indication of early date. As times went on they used better materials, or more probably melted them more thoroughly together, which caused smoother and cleaner glass to be manufactured. Its uneven thickness remains in old glass throughout, and at the same time forms its chief distinction from the modern materials, and also causes it to be more sparkling and gem-like. He observed that quarries are rarely found *in situ*. The ease with which a small independent piece of glass could be moved from one window to another manifestly conducted to this scarcity of examples in their original place in York. A handsome eiborium occurs at the Minster and in St. Dennis's. In the latter church is an Early Decorated window, having quarries for the background, which is surrounded by a border having a double rose, whose inner petals are yellow and the outer white. At St. Michael-le-Belfrey's is a curious grotesque representing a monk, armed with a sword and buckler, attacking a fabulous monster. Similar subjects often occur in the other work about the middle of the fourteenth century. In St. Martin-cum-Grigory's, York, is an interesting example of a quarry found in its original situation. The windows on the north side had been given by one person, probably a city merchant, whose mark appears in the border, accompanied with the letter R. There is also an R in a quarry in St. John's, Micklegate, of the same date and workmanship. Mr. Rowe next explained the method of arranging the quarries, which admits of a three-fold classification. The most frequent plan is to fill the whole inner space with quarries only, generally of one pattern, but sometimes with two, or even with an indefinite number of designs. Two of the south-aisle windows in St. Mary's, Castlegate, had, previous to the late restoration, the glass in the tracery border. It was composed of quarries of more than one pattern, with a plain white border; and in the centre of the lights were circles. These circular pieces contained crowned monograms of the sacred name of Jesus and of the name of the Blessed Virgin. In some instances the quarries are separated by a narrow band of richer work, producing an excellent effect. He gave several illustrations of this mode of arrangement, which always looks well. The third mode of dealing with them is where a considerable portion of the window is occupied by some picture subject, and the quarries are only used to fill up the empty spaces within the border. This practice especially indicates Perpendicular work; less often Decorated, and rarely if ever Early English. Instances of quarries being used as a background occur in St. John's, Micklegate, where a spiral pattern of four hawthorn leaves forms a ground to a picture containing figures of John Randman and Johanna, his wife. Another example has quarries set square-wise, bearing alternately a lion and an eagle. A latter instance is one which is coarsely drawn with eight small trefoils or points round a circle, and composes the field of a kneeling figure of Sir Richard York, who founded a chantry here, and died in 1498, being buried beneath the window. Other specimens are found in St. Dennis's, where the groundwork of a good Decorated picture window is formed of quarries bearing a cinquefoil. Mr. Rowe next observed that the form and size of ornamental quarries are liable to much variation. In York Minster there are some of gigantic size and corresponding poor effect, this being partly due to their devices, which are large and rambling, being indistinctly painted. The typical quarry presents a compact star-like design in the centre of a diamond, like that at St. Peter's, Norwich. A star of ten wavy points, at St. Martin's, York, is another good example. Some early quarries have a leaf springing from the bottom of the diamond. Graceful patterns are arranged by putting together four fleurs-de-lis; others are formed of four leaves, more or less natural. There are some examples of the first sort at St. Martin's, and of the second kind in St. Helen's and St. Michael's, Spurriergate. When the glass is of the full size and wants the border, it is a safe sign of the Perpendicular date. In the Renaissance

period the border was again revived, but the imitation is easily detected, for the bounding lines are not continued to the edges of the glass at the topmost angle. In Holy Trinity, Goodramgate, is a running pattern, where the golden border is rendered opaque by mineral colour and a row of dots scratched out of it. The effect is very good. Indications of dates are also to be derived from the changes which may be noted in the character of the workmanship. Much of the bold effect of early work is due to the custom of covering all the ground of the quarry with hatched lines crossing each other. In Early English work and in the rare specimens which we possess of the Norman period, these lines are painted with hair-like delicacy. In the Perpendicular lines, on the contrary, they sometimes employ these hatched lines to deepen the shades of the design itself, thus forging them were ornamenting a flat surface, and the lines, although occasionally fine and flowing, are usually broad and coarse. A late Perpendicular border at St. Michael's, Spurriergate, is composed of scrolls, wound round a stick, which bears the letters "n. m. n. m.," simulating an inscription. The colouring of quarry patterns is almost entirely limited to the use of the golden stain, which was introduced about the year 1310. The brown outline is painted on the inside in a medium which dries sufficiently firm to allow of the glass being turned over for the reception of the yellow stain at the back. The whole is then subjected to the fire at once. Cases where the whole pattern is stained yellow are met with in All Saints', North-street. In one example from St. Dennis's Church, what is probably a quarry has the design left white upon a yellow ground, which is distinguished from the border by a slight smear shade. After noticing at considerable length other peculiarities in the workmanship and the design, he next considered the question of classification. He observed the numerous examples which bear a quatrefoil in the centre, and the multitudinous varieties of the cross, which was developed, so to speak, from a form of four small circles surrounding a fifth. There are also many conventional designs, of which it was extremely difficult to make anything at all. About the middle of the fourteenth century the more natural drawing of plants and animals commenced. Of the latter, the most common is the heart, one of the supporters of Edward IV., of which an example is preserved in All Saints', North-street. In York Minster is a dog, which is, perhaps, part of the arms of the Stapletons, of Wighill. At St. John's, Micklegate, and St. Dennis, are examples of what, at first sight, appear to be horns, which is a Scriptural emblem, but they are probably butterflies. Mr. Rowe next passed to the numerous representations of birds, which were especial favourites with the later quarry painters. As might have been expected, quarries were a convenient vehicle for the representation of heraldic devices, including, under that term, initial letters, monograms, and mottoes. In conclusion, Mr. Rowe added a few words on the subject of modern quarries. The general revival of picture windows and the creditable specimens of this kind which are now produced by our artists have greatly tended to check the use of quarries. Besides the introduction of the latter, made of cast-glass, and very cheap, has brought disparagement upon this method of ornamenting our windows, but nevertheless they may sometimes be used with advantage,—for instance, in situations where light cannot be sacrificed. Moreover, quarry-windows admit of much enrichment. For small windows quarries alone, judiciously chosen, and bordered with rich colours, compose an excellent arrangement, at a comparatively slight cost. In every case the patterns should be hand-wrought, and be added some advice as to the patterns.

SCIENCE IN BIRMINGHAM.

BIRMINGHAM AND MIDLAND INSTITUTE.

THE annual meeting of the members of the Birmingham and Midland Institute was held on the 8th inst. in the Lecture Theatre. Mr. W. C. Aitken presided, and made a valuable address, dealing chiefly with the growth and progress of the Institution, the necessity for science teaching, and Whitworth's munificence. Speaking of the latter, Mr. Aitken said,—

The Whitworth Scholarship suggests to me a more powerful argument in favour of scientific instruction than a whole wilderness of treatises written by savans on the subject. Before us

rises the grand fact, that one who in early life was only a working engineer, who by his own unaided industry and perseverance conquered his early difficulties and realised a princely fortune; grander still to think that of that fortune he gave freely, to aid and to help those who, like himself, "feel it hard to climb," to facilitate the acquirement of that which he felt the want of himself in his youth, and his after-life confirmed him in, viz., the want of science in connexion with clever manipulative skill on the part of English workmen. In this he was still further confirmed by a visit made by him to America in 1853. He there saw that the superior intelligence of American workmen enabled them to use machinery of a high order, to compete with which the scientific education of our artisans is absolutely necessary. Hence Sir Joseph Whitworth's munificent gift. He maintains the connexion between science and manual skill. There is no more wisely-guarded gift than his. In the students' competition, the student must, to a certain extent, be able to use tools. In the mechanics' competition the candidate must be an expert. In both competitions ascertain amount of scientific knowledge must have been gained, for Sir Joseph Whitworth well knows from practical experience that these are the elements which united make the complete engineer, the able superintendent of a manufactory, and the perfect workman. Forty years ago Justus Liebig proclaimed to the world that the nation most quickly promoting the intellectual development of its artisans, must, by an inevitable law of nature, advance, whilst the country neglecting their industrial training must inevitably recede. This warning voice we heeded not. With abundant supplies of raw material, of mineral wealth to supply cheaply our great national industries, with workmen the best by far as regards muscle and clever manipulation, reckless and spendthrift-like we revelled therein, forgetting that cheap raw material can only for a time, in connexion with clever manipulation, preserve a monopoly, but only till a competing nation, by the education of its workmen, overcomes the difference in the price of raw material. This is distinctly proved by the competition we have been and are subjected to as regards manufactures, according to the Birmingham Chamber of Commerce; seventy-two branches of local industry are interfered with by the competition arising out of articles produced in foreign countries, where primary education, with a higher education embracing science teaching, is given to its artisans.

THE TRADES CONGRESS.

The proceedings of the Congress held in Nottingham have been very fully reported, and will afford subject for comment hereafter. Amongst the matters discussed of especial interest to the working classes was a resolution of Mr. Hicklin in favour of a reduction of the hours of labour throughout the country in every trade, "as it would be beneficial to the nation at large, and thereby proper advantage would be taken of the facilities for promoting the course of education, reducing taxation, and giving work to the unemployed." This, after some discussion, was carried by a large majority.

Amongst other resolutions passed were these: "That in the opinion of this Congress trades' halls and clubs are highly essential to the interests of labour, as they tend to bring working men together in a manner better calculated to further their objects than other places now resorted to admit of; this Congress therefore cordially advises every trade society to take the subject into immediate consideration."

"That this Congress views with serious apprehension the unfair competition caused by the introduction of convict labour being crowded into the public market, and that the disposal of such labour should be confined entirely to charitable institutions which exist in this country." The mover suggested that subsidised labour of this kind should be supplied to deaf and dumb asylums, hospitals, the army, navy, and the police. This, he thought, would be better for all parties.

Courts of arbitration and the question of labour representation in Parliament were also debated, a resolution approving of the direct representation of working men being passed. In the evening Messrs. Seely, Herbert, Mandella, and Morley gave a *soirée* to the delegates, in the Assembly-rooms.

On a previous evening a crowded working

men's meeting was held, under the presidency of Mr. Mundella, M.P. The Hon. A. Herbert, M.P., was also present. Mr. George Potter moved and Mr. Leigh seconded, "That in the opinion of this meeting trade-unions afford the best means of securing to the industrial population a just and reasonable share in the results of their labour as well as the rectification of the grievances under which they have long suffered." The resolution was carried, and a petition to Parliament determined on.

At the close of the Congress a meeting of the general committee was held at the Mechanics' Hall, Nottingham, to consider their mode of action for the coming session of Parliament, when Mr. Alexander Macdonald, of Holytown, Scotland, president of the Miners' National Association, was unanimously appointed president of the Congress Committee for the ensuing year. Mr. G. Howell, of London, was elected corresponding secretary for the Parliamentary Committee; and Mr. William Hicking, Nottingham, was appointed the provincial secretary of the United Trades Committee.

MONUMENT TO M. DUBAN.

A subscription has been opened in Paris to erect a monument to M. Felix Duban, at the office of the Central Society of Architects, 23, Quai de l'Horloge, and at the Ecole des Beaux Arts. A report of the proceedings on the occasion of the funeral of M. Duban, and the addresses then made, edited by M. César Daly, has been published, and will be found very interesting.*

PRIVATE BILL STANDING ORDERS.

The commencement of legislative action in relation to the private Bills for railways and other works, which Parliament is petitioned to authorise by the conversion of Bills into Acts, in the session of 1872, has been entered upon with a serenity by Parliamentary authority into the proceedings already taken, and whether the requirements of Parliament have been complied with up to this point, by the promoters of private Bills. The examiners on Standing Orders, Messrs. Frere and Robinson, stipendiary Parliamentary officers, have thus commenced their sittings.

On the first day the examiners' lists embraced the first sixteen Bills on the general list, and contained six railway Bills, and ten others, each of a different character from the other nine; as for instance, the Aberdeen District Tramways, Abraham Kill's Trust, All Saints' Church, Cardiff, Bannow Slob Reclamation, &c. None of the Bills were considered of much importance, or expected to excite much interest. In numerous instances when Bills are called by the examiner, there is no appearance on the part of promoters, from failure to have lodged the deposit, or the abandonment of their respective schemes from some other cause. The proposed new line to Brighton is among the dropped Bills of the session.

THE EDUCATION OF THE ENGINEER.

TOWARDS the close of the address made by Mr. Hawksley on taking the chair for the first time as President of the Institution of Civil Engineers, an address which will be deemed by some retrogressive in parts, he made a few useful observations on the subject of professional education, addressing them, he said, rather to each one of the 200 students of this Institution who happened to be present, than to the members who had acquired and usefully employed that peculiar knowledge by which they are severally known and distinguished.

To the students, then, the President said,—1st. Of all things, do not attempt too much. 2nd. Keep up and augment your knowledge of mathematics and the applied sciences, especially of those sciences which are most needed in that walk of the profession which you have selected for your own path; but again, I say, do not attempt too high a flight, for if you do you will never become a practical man. 3rd. Do not let your French grow rusty, and acquire German, if your leisure and aptitude are sufficient for the purpose, because your future vocations may be in countries in which those languages are either habitually spoken or are in considerable use. 4th. Acquire in the office, and by the study of esteemed works, a knowledge of form and design.

* *Fanfaillles de Felix Duban.* Paris: Ducher & Cie. 6, Rue Sorbonne. 1871.

5th. But bearing in mind that you will never become a practical engineer on theory alone, take every opportunity which presents itself of becoming apt in surveying and levelling, and in the methods employed in the setting out of works; learn the uses and applications of tools; make yourselves able to distinguish a good material from a bad material, good workmanship from bad workmanship, sound ground from treacherous ground, good puddle from bad puddle, good mortar from bad mortar, and a good workman from a bad workman. This knowledge is not to be obtained in a school, a college, or an office, and cannot be learnt from books. 6th. Make yourselves acquainted with every description of plant, and all the appliances and contrivances which an experienced contractor employs for the purpose of rendering a paper design into a substantial construction. 7th. Keep brief treatises on geology and chemistry always at hand, for some acquaintance with these sciences cognate to engineering is, in the present day, almost essential. 8th. Practise as much as possible the art of mental computation, for this will give you the means of almost intuitively arriving at determinations on questions of cost, and of at once seizing on the best of several alternative plans or methods. 9th. Be not afraid of soiling your hands or dirtying your boots, but be in every other respect—in thought, feeling, and conduct—a gentleman.

IRON PIPES FOR HOUSE-DRAINAGE.

In the opening address, already referred to, Mr. Hawksley said,—

On the subject of the removal of the sewage of towns, no new suggestions of importance to the professional engineer have recently appeared, nor, indeed, does it seem that in this department of municipal improvement much remains to be accomplished. It is, however, worthy of remark, that in house construction it seems desirable to abandon the use of earthenware tubes with numerous and imperfect joints, and to substitute the use of iron pipes, with few and perfect joints, care being taken to provide a sufficient number of flanchod or tightly-stoppered branches, to afford the means of access to the interior. By this simple arrangement, the escape of foul water and fetid gases from the drains into the lower stories of our dwellings may be effectually prevented, and it will become a comparatively easy matter to apply, in connexion with such pipes an effective apparatus without the house for preventing the access of contaminated air from the main sewers. In many cases, the so-called "ventilation" of the sewers is much neglected, and invariably with the natural result that the pent-up sewage gases make their escape at the place of greatest pressure or least resistance, and commonly into some house towards which the sewer ascends.

THE WHITTLESEY WORKHOUSE COMPETITION.

As many as twenty-five different sets of designs were submitted for this competition, with estimates varying from 4,000l. to 10,700l. Several of those were, either from excessive cost or inelaborance or inaptitude of design, deemed to be altogether unsuitable; and after examination of the remainder, four were in the first instance reserved for further consideration,—viz., those by Messrs. Nelson, of Leeds; Mr. Ladds, of Bedford-row; Mr. Oldfield, of Westminster Chambers; and Mr. Peck, of Gordon-square; estimated to cost, respectively, 5,000l., 4,500l., 4,550l., and 4,000l.

Eventually the design of Mr. Peck was selected conditionally on the contract for the building being accepted by a builder (to be approved of by the guardians) at a contract price satisfactory to the Board.

ST. MARTIN'S CHURCH RESTORATION, BIRMINGHAM.

ONLY eight sets of drawings were sent in, and from these the designs by Mr. J. Chatwin (1), Mr. W. Hale (2), and Mr. Edge (3), have been selected for premiums. In Mr. Chatwin's design, which is to be carried out at a cost of 12,000l., the west, together with the north and south, walls of the old church are retained; but the whole of the east end of the building is subjected to alterations, which have for their object

the lengthening of the edifice, with the addition of providing choir, vestry, and organ-loft at the north-east angle, and a vestry; and at the corresponding south-east side, the nave, hitherto a narrow span, is considerably widened, and the aisles undergo a corresponding reduction. At the east end a lofty arch, with bracketed pillars, connects the chancel with the nave. Short transepts are planned, with the object of providing gallery seats for the school children, and affording the extra accommodation which the abandonment of the present unsightly galleries necessitates.

In Mr. Hale's design the present setting out of the nave is maintained. The roof is open timbered,—a plain and effective design. Chiefly owing to the adoption of ridge roofing for the aisles, the elevation is more striking than that of the selected design, and more desire to adhere to the original design appears to be shown than is apparent in Mr. Chutwin's drawings.

LEICESTER MUNICIPAL BUILDINGS COMPETITION.

INQUIRIES are being made why the design by Mr. Barnard, to whom the first premium was awarded, is not being carried out. Some of our Leicester friends will perhaps explain.

CAMBERWELL VESTRY HALL.

ON Wednesday in last week the selection of the plans was made. The votes were by a show of hands, and stood as follows:—

NB Desperandum.....	1	—	—
Thoro'.....	11	8	—
Exposition.....	1	—	—
Civis.....	23	23	24
In Foro.....	15	10	30
Well Considered.....	23	25	24
Exclaudit.....	7	—	—
A l'oeuvre, &c.....	21	26	25

* Ties.

On opening the sealed letters "Civis" was found to be Mr. E. Power, of Walbrook Buildings, City; and "A l'oeuvre," &c., Messrs. Bertram, of King William-street. Mr. Power will carry out his design if tenders do not exceed the estimated cost of 8,000*l.* (which is made a special resolution of the vestry), and the works will proceed at once.

THE PROPOSED SCHOOL-BUILDINGS FOR WORCESTER.

IN an article on this subject in the local *Herald*, a correspondent suggests the desirability of the Worcester School Board seeking professional advice in the selection of designs. He says:—

"Upwards of thirty sets of plans have been submitted, derived from architects in the city and from London, Birmingham, Manchester, and elsewhere; the various designs being exhibited for public inspection at the Guildhall. However able the several members of the School Board may be in their various professional pursuits, they can scarcely be expected to know individually as gentlemen, or collectively as a Board, sufficient of the arts of architecture and construction to enable them to fairly and satisfactorily adjudicate upon the labours of upwards of thirty architects and the merits or demerits of their plans and designs."

Another correspondent states that certain plans which he can name were not deposited until the second day after the latest day for deposit, namely, the 30th ult.; and yet that these plans are included with the others for consideration of the Board.

ORDNANCE MAPS.

SIR,—Would it be possible for the officials having these maps in hand to expedite the publication a little? Admittedly they are splendid works in respect of accuracy of delineation, and are invaluable as bases of other maps and plans, and for reference; but, still, the time occupied in their preparation and publication is something alarming. The other day, observing an advertisement of a "new" series of plans of London, on a 25-in. scale, being published, I sent for a sheet, and had it coloured and mounted, for my office; but what was my surprise, upon examining it carefully, to find the notification that the survey was taken 1862 to 1865, and consequently when published it was already out of date! An entire line of railway, destroying many dozens of houses, had been made in the interim, and was not shown even as projected, and various other alterations which had meanwhile occurred were equally, of course, left out.

However carefully these plans may be taken, and whatever other care may be bestowed in the plotting, engraving, &c., it never can be contended that so great a lapse of time is necessary before publication. This 25-in. scale is now going on gradually over London; but who can tell what proportion of your readers will be alive at the finish if this is the rate of progress?

HERIOTSMO.

BUILDING IN SOUTH YORKSHIRE.

THE building trade in Sheffield and other South Yorkshire towns has during the past year been fairly brisk, and there is now a large amount of work on hand.

New printing-offices are in course of erection between High-street and the Hartshead, for the use of the proprietors of the *Sheffield Daily Telegraph*. They are entirely of brick, and will comprise printing-offices, reporters', &c., rooms, and all other conveniences. Mr. J. Rogers is the builder.

The erection of the new music-hall in Barker's-pool, Sheffield, is going on favourably, the slaters having just finished their work in time. The building itself externally has a somewhat heavy, overbulky appearance, but as the masonry gets in order and the scaffolding disappears, it will doubtless show to better advantage. When completed, one of the finest organs in the world will be placed in the great hall. An air-shaft is now being erected at the south-east corner in Burgess-street. Messrs. Longlen & Sons are the builders; Messrs. Dodger & Holmes, joiners, &c., and Mr. Bissett for plumbing work. This edifice is expected to be ready by Christmas, 1872, and will be devoted to concerts and other entertainments of the very highest class.

Messrs. Brown, Bailey, & Dixon are erecting with the greatest possible speed new works at Attercliffe, near Sheffield, where they will carry on business as steel manufacturers, spring-makers, ironfounders, and makers of all kinds of railway materials. The works cover 13 acres of ground, and will employ about 1,500 men. There will be a frontage to Milner-road, of about 400 ft. The shops are, machine and buffer shop, hammers, smith's shop, wheel shop and forge, rolling-mill; Bessemer-steel-works, to turn out 1,200 tons per week; and a rail-mill, which is to be the largest, or one of the largest, in England. Some of the shops will be ready next week, although the works were only commenced about five months ago. It is stated that Mr. George Brown (who is related to Sir John Brown) has designed the whole place himself, and has had it built under his supervision, the plastering being done by Mr. Uwin.

Mr. William Wostenholm, lately of Burgess-street, has just removed to a newly-built brick block of warehouses, workshops, &c., in Holly-street, which occupy the site whereon Messrs. Binney formerly carried on business as hammer, &c., makers. A new grinding-wheel has just been erected by Mr. Joseph Gaunt, in Cambridge-street.

New schools have been built very recently (and in some cases are yet unfinished), in Alderson-road, by Clubley & Stringfellow; in Hodgson-street, by Mr. Butler; in Pea Croft (ragged schools), by Mr. J. Butler; new schools and meeting-house for the Friends, in the Mect-house-lane; Pitsmoor schools altered by Mr. Shaw; new Wesleyan schools, Prospect-street, Walkley; Roman Catholic schools in St. Charles-street, Attercliffe, and some others. Messrs. J. H. Andrews & Co. are about completing the erection of the "Toledo Steel Works," at Neepsend, Sheffield. These works occupy over two acres, and have a frontage to the street of about 535 ft. They extend back to the river. Messrs. Sanderson, Brothers, & Co. are themselves building some extensive works at Darnall; and it is stated that they intend to concentrate their business there. Messrs. Cammell & Co., Limited, have built a new forge, to be used as an armour-plate mill; and an extensive forge is in course of erection at Messrs. Vickers, Sons, & Co.'s, Brightside. It is stated that both the last-named firms have put down the necessary apparatus to work some of their furnaces with gas, on the Siemens's patent principle. Messrs. Nixon & Winterbottom, Broadhall-street, have just rebuilt part of their works; Messrs. John Brown & Co. are putting down additional furnaces; Messrs. Newbold & Co., Newhall, have erected new works for saw-making; and Messrs. Firth & Sons, with many other Sheffield firms, have just completed altera-

tions suitable for their increasing businesses. New schools and church are being erected at Spring Hill, Sheffield, for the Roman Catholics; and the Midland Railway Company are erecting extensive new stabling in Saville-street, Mr. Saul being the builder. A very considerable number of other undertakings of importance are also on hand, in various parts of South Yorkshire; and the amount of private buildings is and has been very large indeed. A number of villas has been erected in Westbourne-road, Newbould-lane, Shortridge-road, &c., Sheffield, and a great number of smaller houses at Hecky, Walkley, and Attercliffe. It is stated that the slaters and other branches intend to go in for the nine-hours very shortly.

The price of mortar has been raised by some firms 6*d.*, in consequence of the advance in the cost of coals.

THE NEW (R.C.) CHURCH OF OUR LADY AND ST. PHILIP, ARUNDEL.

NOTICES of the progress of this church have from time to time appeared in this journal and in other papers, and occasionally it has been designated a cathedral, which it may be as well in this place to correct. It has not, and aims not at, more than the character of a parish church, of which there are so many and such splendid examples in the ancient fabrics of that class spread over the kingdom; and this church being founded and erected at the instance of the Duke of Norfolk, in the ancient deanery of the family he represents, being within a stone's throw of the famous Elizabethan Chantry and the old Church of St. Nicholas (the works of his ancestors), and grouping in the view of Arundel with the Castle, it would seem only natural, in the fitness of things, that a certain dignity and importance should be expressed in a structure that may be said to have a representative character like this.

The Duke, having chosen for his architects Messrs. Joseph A. Hanson & Son, and for builders the Messrs. Myers, the first work of throwing in concrete for the foundations was begun on the 27th of December, 1869; and although a very serious interruption took place in having to carry the foundations down to the solid chalk rock, which in some instances was as much as 50 ft. below the surface of the ground; yet, while we write, the building is well-nigh ready for the nave roof-plaster, some 70 ft. above ground; most of the exterior and some of the interior carving being done; the walls being 3 ft. and 3 ft. 6 in. thick (those of the tower much thicker), and faced with ashlar stone inside and out. The progress has been steady and regular, an evidence of the excellent arrangements and management of the builders.

The view of the church which we insert this week will give a good general idea of the arrangement. It is cruciform in plan, having nave and aisles to the west of the transept, and choir and chapels to the east. At the north-west angle the tower stands in the place of porch, and at the south-west angle is an octagonal baptistery projecting from the line of the south wall. Besides the entrance under the tower there is a great western portal, and in each transept a smaller door of admission to the church. At the south-east angle will be the sacristies, lying between and communicating with both the church and the presbytery. Within the church, at the west end is the large organ-loft, raised high on stone groined vaulting, and with carved stone parapet front. The whole of the church, the choir, the three chapels, the baptistery, and tower-porch, are to be groined vaulted in stone ribs and bands and chalk filling.

The dimensions of the church are as follow:—External length from east to west, 200 ft.; interior, across the transept, 91 ft.; width of nave and choir, 33 ft.; width of nave aisles, 12 ft.; width of transepts, 27 ft.; length of choir, 52 ft.; length of the chapel immediately on each side of the choir, and open to it by arcwalks, 34 ft.; height to ridge of nave groining, 72 ft. The groining of the nave, choir, and transept arches springs from a level of 50 ft. from the floor. The fîche, or sanctus bell-turret, rises to the height of 140 ft. The spire is intended to be 270 ft. to the apex. The north transept window (seen in the view) is 37 ft. by 18 ft.; sight measure. The diameter of the rose-window at the west end, 23 ft. 6 in. The church is intended to be opened during the present year.

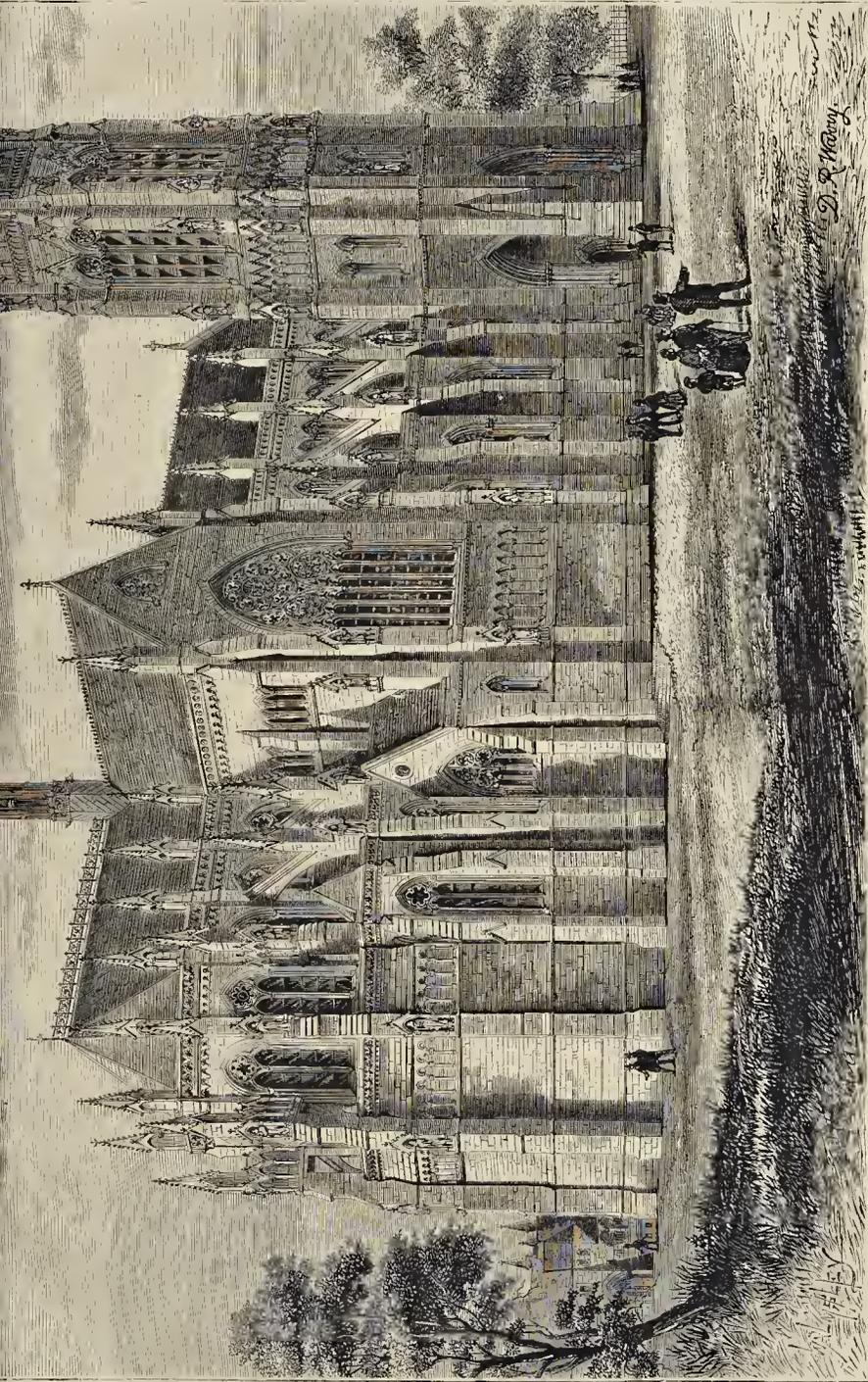


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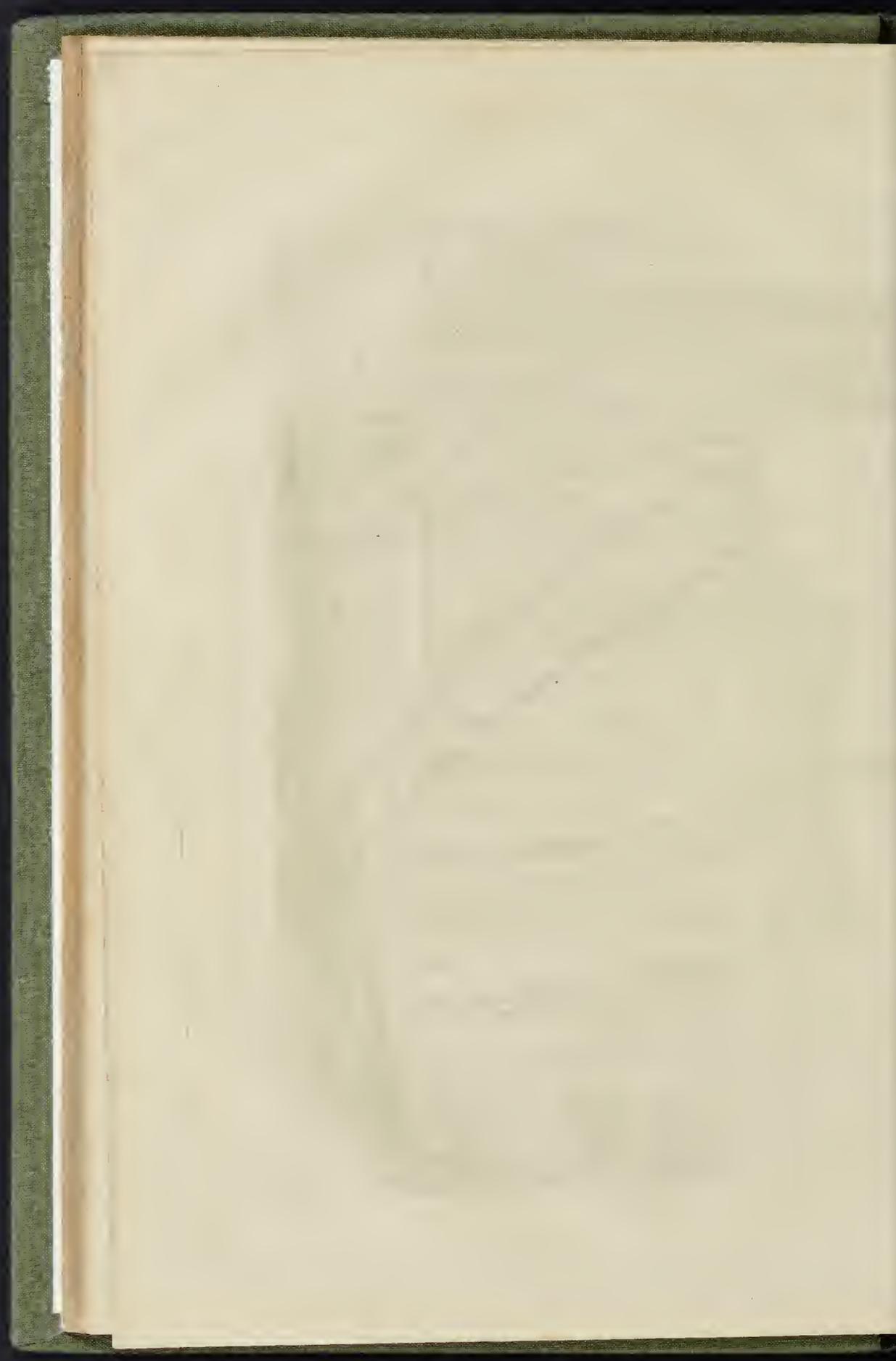
THE BUILDER

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THE (R. C.) CHURCH OF OUR LADY AND ST. PHILIP. ARUNDEL, SUSSEX.—MESSRS. JOSEPH A. HANSON & SONS, ARCHITECTS.



WATER SUPPLY IN MARGATE.

ONLY a few years ago the entire water-supply of the inhabitants of Margate was derived from wells, sunk but a few dozen feet down into the chalk, which is here from 900 ft. to 1,000 ft. thick; and these wells—public and private—were often within a very few feet of some neighbouring cesspool. Percolation, no doubt, went on continuously, day and night, from these cesspools into the wells, for no one in Margate then or now ever thinks of lining a cesspool with bricks, or of making it water-tight; and if this did not affect the death-rate, it must be supposed that filtration through the greater or less density of the chalk tended to disarm the exhalations of the cesspools to a great extent of their noxious qualities.

But the rapid growth of the town, and the perception by some of the inhabitants that, sooner or later, this comfortable and independent arrangement, of every man having his own cesspool and his own well, must inevitably break down, led to the proposition being made to the local Board of Health (Margate is a corporation now) that they should construct waterworks in the neighbourhood for the supply of the town; but the local Board rejected the proposition, and refused to expend the public rates upon any such visionary scheme. The matter was then taken up by a few private individuals, and they proceeded to form a Margate Waterworks Company (limited); but the local Board would not hear of it, and the joint-stock company to lay down their water-pipes in the streets. Thereupon the promoters of the scheme, nothing daunted, went to Parliament for powers to enable them to do what the local Board had forbidden; and to Parliament the local Board followed them; but there was some little hitch in the opposition offered by the local Board, who at first did nothing, until the time for lodging appeals had nearly gone by, and then made such scrambling haste that the resolution directing their legal representative to appeal was found to have been passed at a meeting of which the statutory notice had not been given quite soon enough to render it legal, and thus the opposition of the local Board fell through.

And so the Margate Waterworks Company got their Act, and Messrs. Docrwa & Son, of Ball's Pond-road, undertook the contract for the works.

There was no difficulty in getting water at the spot chosen, close by the famed Tivoli Gardens;—a main shaft of 13 ft. in diameter and 50 ft. deep, with leadings of an aggregate length of 400 ft., giving a yield of 200,000 gallons per diem,—equal to about 20 gallons per head of the population. The supply is continuous day and night throughout the town, and the analysis of the water is,—

Solid Matter per gallon.	Loss by Ignition.	Hardness before Boiling.	Hardness after Boiling.
45.02	3.30	18.31	10.35

The shares of the company are 10l. each, and its capital 16,000l. Very great difficulty was at first experienced in placing the shares, and many were offered at 8l. and 9l. each, that would now be esteemed cheap at 20l. The annual dividend is limited to 10 per cent., and the directors are making a move to increase their capital, and enlarge and extend their works.

Meantime, most of the public wells have been found to be more or less—and more rather than less—affected by infiltration of sewage matter, their brightness and clearness and softness have all been shown by analysis to cover very unmistakable dangerous qualities, and (not without some little opposition, however, on the part of the inhabitants, with many of whom these deleterious waters were in particular favour for the making of tea) the authorities have very properly had them closed.

And now the scene changes. The Town Council (the Local Board of the day) see that their opposition policy of a few years (about ten) ago was wholly wrong,—that the water supply of the town ought all along to have been in their hands, instead of in that of a private company; and now in the days of the success of that company, the Town Council have been making overtures to them to permit a purchase of their property for the benefit of the inhabitants; and so earnest are they in this matter, that they have within the last few weeks passed a resolution affirming the proposition that it is desirable for the town to possess the water-

works, and actually offering the company 32,000l.—just double their capital—for their interest therein.

The moral to be drawn from this plain statement of the facts is calculated to be of service to oppositionists upon local boards even of the present day. Whether the Margate Waterworks Company will sell out for double their invested capital remains to be seen. Rumour says that they will not.

APPOINTMENT OF ENGINEER FOR THE BRUTON DRAINAGE.

A CORRESPONDENT complains that having made an application for this appointment, and taken some trouble in the matter, he received intimation from Mr. Henry Dyne, by an open post-card, that his application "was not entertained." The complaint is a perfectly just one. Properly qualified candidates for such a post are certainly entitled to courtesy.

MEMORIAL CHAPEL TO THE LATE EARL OF DERBY.

A CHANTRY or memorial chapel, containing a statue of the late Earl of Derby, has been added to Knowsley Church. The new chapel has been inaugurated. It forms an addition to the north-east portion of the church, and has been erected at the expense of a number of friends of the late earl resident in the immediate neighbourhood. The design was furnished by Mr. Paley, of Lancaster. The chapel is built of red sandstone, and opens into the chancel by means of three arches, and into the transept by two arches. The groined roof is of pitch pine. The columns supporting the arches are of limestone, and the floor is partly of limestone and partly inlaid with tiles. The building will shortly be further enriched by several stained-glass windows. Around a portion of two sides of the chapel there are a number of carved seats of Dantzic oak, which are intended for the accommodation of the members of the Derby family who attend service at the church. In the middle of the chapel stands the monument erected by the tenantry. It is in the form of a recumbent statue of the late earl, by Nolle, in white marble, and resting on a carved tomb of white stone. The statue is said to be an excellent likeness. It represents the late earl attired in his robes of Chancellor of the University of Oxford, reposing as in the sleep of death. The four sides of the tomb will be enriched with the arms of the Derby family. The total cost of the memorial chapel is about 3,000l., of which nearly 1,000l. have been expended on the statue and tomb. The work has been carried out by Messrs. Burroughs & Son, builders, Liverpool.

THE LIVERPOOL FREE PUBLIC LIBRARY AND MUSEUM.

THE local Library and Museum Committee have just issued their report for the year ending on the 31st of August last. During the past year (they say) the Institution has pursued its course of usefulness to the utmost extent which the resources and space at the disposal of the committee have enabled them to go. The success of the autumn exhibition of pictures has been beyond their most sanguine expectation. The exhibition opened on Saturday, September 2nd, and closed on Saturday, November 18th. It was attended by 22,725 persons, besides holders of season tickets, numbering 313. The number of pictures exhibited was 887, of which were sold 235, at prices amounting in the whole to 6,395l. 2s. 6d. The committee have purchased, on behalf of the Institution, for the permanent gallery, pictures to the value of 500l., and are prepared to devote a larger sum for the same purpose next year.

The number of volumes issued from the reference library during the year has been 507,335, against 620,124 in the previous year. This diminution is partly accounted for by the closing of the library for several weeks.

During the year 2,038 volumes of books have been added to the library.

In reference to the museum, the following statistics are given:—Day visitors: 1869-70 (52 weeks), 146,473; 1870-71 (49 weeks), 362,657; decrease in 1870-71, 88,816. Evening visitors: 1869-70 (26 nights), 54,473; 1870-71 (25 nights), 42,730; decrease in 1870-71, 11,743. Total day and evening visitors in 1869-70, 500,946; 1870-71, 405,387; decrease in

1870-71, 95,559. Average of seven preceding years, 473,435; total of 1870-71, as above, 405,387; decrease, 68,048. The attraction of the museum not only brings visitors from the town itself, but the numbers have been largely swelled by excursion parties from the manufacturing districts. These fluctuate from time to time, according to the season, the weather, the wide extent of choice offered by the ever-increasing railway system. A cold, wet summer deters multitudes, whom a fine warm season would bring over.

A NEW SYNAGOGUE FOR SHEFFIELD.

THE corner-stone of a synagogue which is being erected by the Jewish community in Sheffield, has been laid by the Rev. A. L. Green, minister of the Central Synagogue, London. The present synagogue in Fig-tree-lane has for some time past proved inadequate to the requirements of a congregation much larger than was the case a few years ago; and, besides this, the lack of school accommodation has been very much felt. The new building is in North Church-street. The basement will consist of a school-room accommodating 60 children, with other rooms, approached on the level from North Church-street, and having a second entrance by a flight of stairs from St. Peter's-close. On the ground-floor is to be the synagogue, 38 ft. long by 30 ft. wide, fitted with pews along each side, and having the reading-desk or almemor in the centre. At the east end, in a semicircular recess, is to be placed the Aaron Hakodesh or Ark, containing the sacred rolls, on which are inscribed the Books of Moses. Over this will be a small stained-glass window, having the Ten Commandments worked thereon. A staircase in the lobby will lead to the ladies' gallery, which extends over the lobby. A teachers' residence and board-room are to be attached. The whole is to be built of brick, and in Early Gothic style. The roof will be open-timbered, and the seats and gallery front will be of pitch pine. The synagogue will accommodate about 230 persons. The builder is Mr. Wade; the joiner, Mr. Flowerday; and the works are to be carried out under the superintendence of Mr. Mitchell-Withers, the architect.

The total cost is estimated at about 1,800l.

NORTHERN ARCHITECTURAL STUDENTS' SOCIETY.

A MEETING of this Society was held on Tuesday evening last, Mr. W. L. Newcombe (president) in the chair. Some months ago Mr. Ralph Thompson, of Newcastle, offered to present to the Society a gold medal, to be given to the author of the best sketch or drawing from an existing building. The competition took place a short time ago, and the drawings submitted were sent up to Mr. W. Burges, of London, who kindly undertook the office of adjudicator. His award gave the medal to Mr. Joseph Oswald, of Newcastle, for a measured drawing of the choir of Lanercost Priory, Cumberland; and a present of books, as second prize, to Mr. W. H. S. Thompson, of Newcastle, for a sketch of the Ducre Tower, Lanercost. The president, in an appropriate speech, presented the medal to Mr. Joseph Oswald, who briefly replied. The medal is in the form of a star or Maltese cross, and has on one side the armorial bearings of Newcastle, and on the other a suitable inscription. After the presentation a paper was read by Mr. G. H. Morton, architect, and led to a short discussion.

THE NEW VICTORIA HALL IN SUNDERLAND.

THE newly-erected "Victoria Hall and Temperance Institute," Toward-road, near the Extension Park, Sunderland, has been opened with éclat. The new hall has been erected to supply the need, long felt in Sunderland, of a large public room capable of holding 3,000 persons; and as it is constructed in the theatre fashion, it is adapted for large public meetings, concerts, and musical and dramatic entertainments. The building fund has been supplied by a company of 11 shareholders, on the limited liability principle, the Sunderland Temperance Society holding shares to the amount of 2,000l., or one-fourth of the total cost of that portion of the building now completed,—the large hall, lobbies, and retiring-rooms. The cost of the completed portion was 8,000l. The principal

entrance is from Toward-road, whence a flight of steps leads to the floor of the hall, through a corridor. From the entrance level, a staircase leads to the dress circle, with its spacious lobby and retiring-rooms. The circle is fitted with numbered arm-chair seats, covered with red velvet plush, and a partition of glass separates the circle from the lobby. The platform is somewhat on the fashion of that in the New Town-hall of Newcastle. The original design of Mr. Hoskins could not be carried out for want of funds.

The whole of the various works have been carried out under the supervision of Mr. Charles Cobham, as clerk of the works. The contractors were,—for masons' work, Messrs. Hopper & Oliver; bricklayers, Messrs. Sydney & Parkin; carpenters and joiners, Messrs. David & John Rankin; plumbers, Mr. Henry Tonkinson; plasterers, Messrs. J. Montgomery & Sons; slaters, Mr. Robert Preston; painters and glaziers, Mr. G. N. Amison; gasfitters, Mr. J. J. Kirtley; upholsterers, Messrs. Holkirk, Smith, & Whitecross.

MID-LONDON RAILWAY.

THE ESTIMATES.

It may safely be assumed that, as so much expense has been already incurred in the survey of the line, in the scheduling of an immense amount of property, and in other outgoings, the promoters are quite prepared to find the necessary deposit, and to proceed, if opponents, legal forms, and the Legislature will permit them, to the execution of this important project.

In accordance with the Standing Orders of Parliament, the estimates of costs for the construction of the line were duly deposited on the 30th ult. for the 31st.

The Mid-London Line, it may be proper to recall, is to be promoted by two Bills, the more important being the eastern section. The names of five gentlemen of property appear on the Bill as constituting the nucleus of the company. Railway No. 1 is laid out as rather more than 1½ mile in length, to commence on the south side of Oxford-street, about eight chains to the east of the Marble Arch, and terminating in the parish of St. Anne, Soho, in George-yard, occupied by Messrs. Crosse & Blackwell. The estimated cost of this portion is for 163,000 cubic yards of excavation, at 6s., 48,000l.; covered way, including road, bridges, and retaining walls, 59,000l.; accommodation bridges and works, included in covered way,—culverts, and drains, 20,000l.; metallings of roads, 1,500l.; permanent way fencing, included in covered way, at 6,000l. per mile, 6,900l.; permanent way for sidings and cost of junctions, 1,000l.; contingencies, 15 per cent., 29,596l.; land and buildings, 6s. 1r. 16p., 390,000l.; total, 616,906l. Railway No. 2, of 1 mile 3 furlongs and 40 yards in length, extends from a junction with the eastern end of No. 1 to a junction in the parish of St. Sepulchre, with the London, Chatham, and Dover Railway. The estimated cost for this section is for works, 191,692l.; contingencies, at 15 per cent., 28,754l.; land and buildings, 7s. 1r. 10p., 480,000l.; total, 700,446l. Railway No. 3, of 6 furlongs 1 chain 18 yards, commences by a junction with No. 2, and terminates in Coleman-street, to the west of Moorgate-street. The cost of this line is estimated at 183,086l. for works; 19,956l. for contingencies; and 250,000l. for land and buildings, the land embracing 4s. 1r. 20p.; total estimate, 402,992l. Railway No. 4 commences by a junction at the end of No. 3, and terminates by a junction with the authorised Railway No. 1 of the East London Railway Company, in the parish of St. George in the East. The estimated cost for this section is, for works, 230,631l.; contingencies at 20 per cent., being 5 per cent. extra, 46,126l.; land and buildings, 7s. 2r., 410,000l.; total, 686,757l. Section No. 5 is a junction, 1 furlong 6 chains 10 yards, from Line No. 1 in the parish of St. Anne, Soho, to a junction with the authorised London Central Railway. The estimated cost of this section is 103,801l., including 50,000l. for land and buildings. The sixth section is a junction of 1 furlong 8 chains 6 yards, in the hamlet of Mile-end Old Town, between No. 4 and the authorised East London Railway; estimated cost, 85,714l.

An important feature in this project is the formation of a new street in two sections; the first commencing at the angle formed by Giltspur-street and Newgate-street, and terminating in the parish of St. Stephen, Coleman-street, in the city of London. The second section is from

the point just indicated to the junction of Commercial-street, Commercial-road, and White-chapel High-street. The estimated cost of the works, contingencies, land and buildings of the streets, is, for No. 1, 443,000l., and for No. 2, 957,000l. Part of the cost of the land and buildings for the new streets is included in the railway estimates already quoted.

The Bill and estimates for the western section of the Mid-London are again subdivided into two parts. Railway No. 1 is 2 miles 7 furlongs and 5 chains in length, commencing by a junction with the London and North-Western line at Willesden, and terminating in the parish of St. George, Hanover-square, on the east side of Park-street, near the west end of Oxford-street. In this section there are 37 road-bridges, and a railway-bridge, which, with retaining walls, are estimated to cost 102,000l.; the stations are estimated at 91,000l.; the total cost of works, 350,000l.; contingencies, at 15 per cent., 52,635l.; land (22 acres), and buildings, 338,000l.; total estimate, 711,535l. The second section, of 5 furlongs 5 chains, is from a junction between No. 1 and the London and North-Western Railway. This portion is estimated to cost 28,343l., including 5 acres of land.

The grand totals embraced by the two Bills and the two sets of estimates are thus: in the eastern section, lengths, 5 miles, 4 furlongs, and 22 yards; for railways, 2,596,616l.; for two streets, 1,400,000l. Western section, 3 miles 4 furlongs 7 chains, estimated cost, 769,878l., say 770,000l.; length of lines in all, 9 miles 7 chains 20 yards, estimated cost, 4,796,616l. This amount may possibly be considerably reduced by the Corporation of London, or the Metropolitan Board of Works bearing a portion of the expense of the new street from Holborn Viaduct to Whitechapel.

It is proposed to take powers in the Bills to underpin or otherwise strengthen all houses or other buildings within 100 ft. of the railway, after ten days' notice given to the owners, lessees, or occupiers of the houses or buildings to be underpinned, or otherwise strengthened, the company to be liable for inconvenience, loss, or damage, resulting from the exercise of its powers. If the owner, lessee, or occupier, gives a counter notice, disputing the necessity of underpinning, the question of necessity to be left to a civil engineer to be appointed at the instance of either party by the Board of Trade, the referee to be paid by the Company, and the other costs of the referee to be in his discretion.

LONDON ROOKERIES.

EFFORTS should be made to entirely sweep away the "rookeries" of London; i.e., those large collections of narrow, close, unhealthy courts and alleys which we find grouped together in masses, at certain parts of town. A single court is no object, but in some districts we observe a perfect wilderness of them grouped in an unwholesome mass. Now, when there are Alsatians of this description, the indigent will always seek them, or be driven into them, and all our efforts to improve their physical or moral condition, will be frustrated from the nature of their homes. Let these dens then be rooted out entirely, and let new dwellings on new streets be erected in their place. We do not content ourselves with building model lodging-houses in good positions; we propose to destroy whole territories of slums, and lay out new streets on the sites. At first sight, even 500,000l. may seem insufficient to grapple with such a colossal undertaking; but well applied, it would effect much.

It has proved more than once in the recent history of London that, upon buying up a quantity of crowded low-class dwellings, and making a good wide road through the mass, the ground thus opened out on an improved scale has gone far towards repaying the cost. A most important consideration and valuable for this purpose! Now in London there are several masses of courts on which this principle could be tried. An Act of Parliament would be necessary, which is said to cost about 1,000l. Take, for instance, the block of courts right and left of Bedfordbury, between St. Martin's-lane and Bedford-street; the blocks of courts about Drury-lane, about Clare Market, &c.; another block of courts south of Currier-street, Chancery-lane; the rookeries around Baldwin's Gardens, about Laystall-street; the fifty acres of courts and alleys all in a mass between Aldersgate-street and Bunhill Fields, opening

out of Upper Whitcross-street, Golden-lane, &c.; several acres of unwholesome courts in a block at the back of the Mint; and another block at Wapping between the London Docks and the river. These constitute the chief mass rookeries of London, and several have been remarked upon from time to time by the *Builder*. Our proposal is to buy them up, or the worst of them; then to level every building to the ground, lay out the land with good 40 ft. roads, and either build improved and larger dwellings there, or let the ground to builders. The ground or new buildings, as the case might be, could then be sold, and the net proceeds embarked in a fresh undertaking. It is doing only half the work to erect model lodging-houses here and there if the great bulk of the poor are still left festering in public stews. Let us sweep away these stews altogether.

Half a million of money would not indeed buy up all the courts of London; but it would do a very great deal by being invested and reinvested in the way just mentioned; more than might be thought. We submit that it will be difficult in the extreme to do the greatest good to the greatest number of people in any other manner. This would be a permanent and not a temporary benefit; it would affect the very poor most, and would indirectly benefit the whole capital. Building model villages, on the contrary, however desirable, would leave the poorest still untouched in their dens; and it must be remembered that the bulk of London working-men, however willing to live out of town, find it inconvenient or impossible in practice so to do.

H. & R. P.

EXPERIMENTS IN PAVING.

THE St. George's, Hanover-square, Works Committee have considered the question of the paving works necessary during the ensuing year. A report was read from a Committee of view recommending that in answer to a memorial from the inhabitants of Old and New Bond streets asking for asphalt to the carriage-way on the east side of Old Bond-street, a pavement of asphalt be laid down from Piccadilly to Burlington-gardens, and the inhabitants called upon to set their coal-plates in an iron rim. The Committee of view also recommended that Piccadilly between Bolton and Stratton streets be paved with Victoria stone. The surveyor, in answer to some questions, said the Victoria stone appeared to be a mixture of broken granite and Portland cement. After it was prepared it was placed in a bath of silicate, where it remained for a fortnight, becoming impregnated with silica and extremely hard. He had seen the Victoria stone laid down in front of St. Mildred's, Poultry, the only piece laid down in London, and considered it extremely durable, harder than York paving. The Committee decided to recommend the Vestry to adopt the report.

SEWAGE AND WATER SUPPLY.

HAVING suffered severely when young with fever, and since lost several friends, some of them men in the prime of life, who have left widows and large families to mourn their loss, and knowing others that are now sick with typhoid fever, I venture to pen these few lines.

During forty-five years, constantly having something to do in well-sinking, drainage, sewerage, waterworks, &c., my experience has shown me that as gunpowder is dangerous when put in contact with fire, so is nightsoil when in contact with water, where old wells, drains, cesspools, and inferior traps, and badly-fitted water-closets, are allowed to remain in use.

I enclose you section, showing the drainage and water supply of a house on a small piece of land I purchased in Chippenham, Wilts, twenty years ago, and on investigation at the time I found a large number of other cottages in the same condition.

—Knowing the danger, and having a large body of workmen, also my own family, located there, I endeavoured, with other persons, to obtain a public water supply generally for the town; but, not succeeding, I sank a private well for the use of ourselves and workmen, procuring most excellent water from the deeper springs, and from this well most of the inhabitants of the town are now supplied.

* The section shows a well for the water supply, lined with rough pieces of stone, between the cesspits of two privies, the contents of which percolate to the water.

As to rivers, I well remember seeing fine salmon taken from the Thames between Isleworth Ferry and Richmond Bridge, and often watched the gradual pollution of its waters since with regret. The time will come, if not at hand, when it will be necessary for the Legislature to take further steps in the matter, both as regards the water supply and the disposal of the sewage from the dwellings.

Providence provides a sufficiency of good water in England for every creature thereof to drink; and it will be expedient in some districts where the strata are favourable to sink new wells to the deeper springs, stopping out all surface matter and water. In other localities it will be necessary to revise some of those old water-courses and mill-dam rights, and also to substitute the steam-engine for the old water-wheel, so that the locked-up springs and pure water streams may be made more freely to flow for the use of the people?

With reference to the disposal of sewage, I think it would not only be a waste and loss to the country, but a sin to send it from our inland cities and towns to sea, for which it was not intended. As the grave is the great deodoriser of the dead, so is the earth to the excrement of the living.

The farm, England, is wisely arranged, with its parcels of fertile land, and also its portions of inferior soils, chalk downs, and sandy commons, left for the use of and improvement by man. And it contains also an abundance of the richest and most durable manure, if carefully husbanded, which ought to be conveyed to those soils placed by nature to receive it. And seeing what fine fruit, ears of corn, vegetables, and roots, were produced in the valley of the Thames, and by my father and others after the enclosure of Hounslow Heath, by the use of night-soil, urine, and contents of cesspools, I am convinced that in a reasonable time some of those unprofitable lands may be turned into fruitful gardens and paying fields in producing for the increasing population.

And if the Government and heads of families will still persevere in procuring for them good drainage, fresh air, wholesome food, and pure water, I think there need not be much alarm as to degeneration.

ROWLAND BROTHERHOOD.

THE NEW COURTS OF JUSTICE.

We have received a long letter from Mr. Edmund Sharpe, expressing his approval of special parts of Mr. Street's designs; but as it had already appeared in the *Times*, we cannot devote to it the space it would occupy.

Sir,—I have hitherto carefully abstained from all criticism on Mr. Street's designs, and have no intention of deviating from this course.

I regret, therefore, extremely, that the references to me in his recent pamphlet (many of which appear to me uncalculated for, and very misleading) oblige me to take steps to make public the real state of the case as regards my position in the late competition.

I hope my answer will be in the hands of the printer this week, and in the meantime must ask your readers to hesitate before accepting the statements referred to.

EDWARD M. BARRY.

DESTRUCTION OF CRUMPSALL CHURCH BY LIGHTNING.

DURING a recent thunderstorm of great violence, St. Mary's Church, Higher Crumpsall, Manchester, was struck and set fire to. There was a want both of water and of fire-engines; and the interior was completely gutted. The edifice was built in 1859, from the designs of Messrs. Mangnall & Littlewood, of Manchester, architects. It was 87 ft. long and 57 ft. wide (inside measurement), and contained sittings for 770 persons. It was in the Decorated Gothic style. The tower and spire were added about six years ago, at a cost of 1,500l., making the total cost of the building upwards of 6,500l. In the base of the tower was placed an organ, which, with the font and everything else in the building that could be burned, has been totally consumed. At the east end of the edifice there was a stained-glass window, which cost over 300l., and another at the south side. Both of these have been completely demolished. One of Milner's safes, although it was exposed to the fury of the flames for some time, has preserved

its documentary contents complete. The stone pillars of the church present the appearance of having been chopped with a ponderous axe.

The fire was first observed in the vestry, which is situated at the north-east corner of the building, and by some persons it is believed that the lightning struck this part of the church first. Others are of opinion that the spire was first struck, and that thence the lightning flashed down the conductor into the interior of the church, along a gas-pipe under the flooring, to the vestry, and afterwards to the roctory by an underground gas-pipe. Here it stopped by causing a slight breakage in the ceiling of the cellar, and without any other damage further than that of melting a small leaden pipe which supplies one of the upper rooms with gas.

The total amount of damage done is estimated at fully 3,000l., which, it is stated, will be nearly covered by the insurance.

LIBERALITY IN WILTSHIRE.

Sir,—In the agricultural village of All Cannings, in Wiltshire, a reading-room has been established by the more influential inhabitants for the benefit of working men, and which it is proposed to make self-supporting, if possible, by means of members' contributions. In the same village some new buildings are in progress, and the workmen employed thereon are necessarily strangers in the neighbourhood; but they have been in the same employ nearly three years, and bear characters above the average, yet are denied the privilege of membership, and consequently the use of the room.

You as well as the *Times* have urged the necessity of providing places of evening resort for working men who had done their daily labour; and I write this to show, first, the opinion entertained of building operatives in out-of-the-way country districts; and, secondly, the fact that with all the talk about the difficulty of wearing men from the public-house or beer-shop, and getting them to spend their leisure time in a better way, they have in many instances only "Hobson's choice."

T. P.

ST. PETER'S SCHOOLS, LONDON DOCKS.

The schools lately erected in this poor and thickly-populated parish were recently opened by the Lord Bishop of London. The school buildings are three stories high, and afford accommodation for 600 children, namely, 200 on each floor. The ground story is for the infants, the first floor for the girls, and the top floor for the boys. The schoolrooms are 7½ ft. long, 18 ft. wide, and 14 ft. high, and a class-room is attached to each, 19 ft. 6 in. by 18 ft. There are two entrances, one for the boys, and the other for the girls and infants. Two separate staircases have also been provided. Water is laid on throughout the buildings, and a lift for the supply of coals to the girls' and boys' schools has also been included in the general arrangements. Yards have been provided for both boys and girls, and are complete with the necessary offices. The buildings have been designed in an economical a style as possible. The exterior walls are faced with best stock bricks, relieved by bands of red and black bricks. All the windows have arches over them in red and malm bricks, with the exception of those to the boys' school, which have chamfered stone beads. A projecting parapet runs along the entire length of the building, and from the centre of the façade rises a gabled bell-cot, surmounted by a wrought-iron cross supplied by Messrs. Richardson, Slade, & Co. In a niche under the bell is a very beautiful carved stone figure of the Good Shepherd, from the studio of Mr. Farmer. The interior of the building has also been kept as plain as possible, the walls are all plastered, but the otherwise monotonous appearance is relieved by all the doors and windows having red and white brick arches over them, and all the windows have chamfered red brick sills. The wood girders carrying the floors are exposed to view, and are stained and varnished. The removable partitions between the school and class-rooms are treated in the same manner.

The corner-stone bears the following inscription—"To the Glory of God, and the advancement of His Holy Catholic Church, in the religious education of His children, this stone was laid on the Festival of St. Peter, A.D. 1871, by the Earl of Powis, LL.D., High Steward of the University of Cambridge. C. F. Lowder,

M.A., vicar. W. H. Martin, F. W. Paice, churchwardens of St. Peter's."

The contractor for the works was Mr. Ennor, and Mr. Whall acted as the foreman. The forms, desks, and class-room galleries have been supplied by Mr. Geo. Hammer, of St. Martin's-lane. The fittings for yard offices are from Messrs. Macfarlane's establishment. The gasfittings are being made by Messrs. Hart & Son; and a Gurney stove for each of the large schoolrooms has been supplied by Mr. Edwards, of Great Marlborough-street. Mr. J. R. Veal, of Wolverhampton, supplied the bills of quantities. The contract drawings were prepared by the vicar's brother, the Rev. W. H. Lowder, a former pupil of Mr. Butterfield, and now vicar of Alvanley, Cheshire. The buildings have been erected under the personal superintendence of Mr. Bowes A. Paice, of London, architect, who also supplied most of the working drawings.

MEETING OF BUILDERS IN LONDON.

We understand that a large meeting of employers of labour was held at the Palace Hotel, Westminster, on Thursday, the 11th inst. It comprised deputations from every seat of industry throughout England and Scotland. The demands of the operatives having gone on from ten hours to nine, and from that to eight and a half, with an intimation from Mr. Scott Russell that that was only a step to forty-eight hours per week, in competition with sixty-five on the Continent, masters find it indispensable, it was said, to form a defensive coalition, and the meeting turned itself on the spot into an association of employers to arrange or resist the demands of trade-unions and other combinations of workmen. A statement was given in by each firm of the number of hands in their employment, and the aggregate proved to exceed 100,000 men.

CEMENTING WATER-TANKS.

Sir,—In answer to "Stagnum," in your issue of the 13th, twenty years' experience has taught me the following:—Two of sharp washed sand and one of cement will stick to brickwork best. To make it impervious, float it, and finish it in one coat, by watching it as it setting; then take some dry cement in your hand, and dust it over, to draw out the water; work it again with the float, and then give it a thorough rubbing and pressing with the flat part of the plastering-trowel. By this plan I have completed a well 60 ft. deep, with the water streaming down the brickwork, and kept it all hack by beginning at the top and working down.

A. W.

Some of the remarks on this subject in your last number (p. 33) are good and correct. The addition of a proper proportion of good gritty sand makes the cement better, say, in the ratio of 1 to 2. The Hafody-Weiglodd Company, Wrexham, have a good article for the purpose, being a pure silica in its component parts. FLUANS.

WEST LONDON SCHOOL OF ART.

On Wednesday evening last Mr. Beresford Hope, M.P., presided over the annual meeting for the distribution of prizes to the successful candidates among the pupils of this institution, at 20½, Great Portland-street. The gallery was decorated with a good collection of the productions of the scholars, including oil-painting and water-colour, chalk, and pencil drawings, besides many architectural designs. On the platform were Mr. Geo. A. Stewart, the head master of the school; Mr. Peter Graham, the treasurer; Mr. S. M. Hubert, the hon. secretary; and Mr. J. H. Donaldson. At the request of the chairman, the head master read the annual report, which was of an unusually satisfactory character, and showed a steady increase in the number of the students as compared with that of former years. Mr. Beresford Hope, who has somewhat "dropped" architecture lately, made an interesting address, and insisted upon the necessity of the mind being trained to a wise perception of harmony and beauty. Without this perception, he said, a state of things bordering on the ridiculous would be produced. Art designing had the salutary effect of imparting ideas of proportion, of size, and, he might add, of common sense. If, unlike those who lived in the country, Londoners could not enjoy the sight of the majestic waves, or the variegated landscape, they might

find compensation in endeavouring, by the aid of schools like this, to elevate and refine their minds. He wished to impress upon his hearers that the prizes were but a means to an end. Having regard to the number, he was able to say that out of 116 schools of art in England this was one of the best. In conclusion, Mr. Hope complimented Mr. Stewart on the ability he had displayed in conducting the school. The successful candidates were then called forward, and received the prizes. Mr. Crayson, Mr. Webber, and Miss Keeton, gained the most. The Treasurer, in proposing a vote of thanks to the Chairman, could not help noticing that manufacturers, who had so great an interest in the success of schools of art, did not pay them so much attention as might be wished.

COVERED CAB-STANDS.

At the ordinary meeting of the Westminster District Board of Works, a letter was read from Colonel Henderson, the Chief Commissioner of Police, inclosing a sketch of a covering, which, with the concurrence of the Board and the Secretary of State for the Home Department, he proposes to erect over the cab-stand at Knightsbridge, near Sloane-street. Colonel Henderson, in his letter, set out that the Board would not be called upon to defray the expenses of lighting; that there would be a place at the east end of the stand for the sale of coffee and newspapers, and a refuge for persons waiting for the omnibus; while at the other end there would be a refuge for the cabmen. The cost of the stand, roofed in with glass in a horticultural fashion, Colonel Henderson estimates at about 700l.; and it was proposed, should the experiment prove successful to erect covered stands in other parts of the metropolis. Mr. Ridley hoped the Board would not surrender any of the public highway. The surveyor, in answer to a question, said he approved of the idea of the covered cab-stand. The Board decided to give the required permission so far as their legality can or may; with the proviso that the police authorities take all the responsibility, and remove the cab-stand covering at any time the Board call upon them to do so. Some years have passed since we first urged that protection should be given to cabs and their drivers.

CUTTING OAK TIMBER.

SIR,—In reply to the letter in the *Builder* of the 13th inst., I can give you some advice on the subject of "oak panelling."

I should select oak-trees known to be old and hearty, with clean, straight butts, from 15 in. to 20 in. in diameter; I should then have the bark taken off as they stand, and leave them thus till the winter,—the sap will then partially dry out, and make the wood a rich brown colour. As soon as they are cut down, have them sawn up at once into the lengths you require, the panelling, 6 in. or 8 in. wide and 1 in. to 1 1/2 in. thick. Be careful to cut out all the heart shakes, by having one cut through the centre of the log before edging the boards to the required width.

With regard to the drying process, stack the boards in a shed with a good draught through it, and load them down, with ships between each board, to prevent warping. If this be done they will be found to dry well and speedily, and they will not require to be exposed to the weather.

GEORGE MARSHALL, *Timber Merchant.*

SIR,—In reply to your correspondent, it is rather difficult to explain without diagrams; but I will try to do so. Cut the largest trees, bark then standing, in the spring, and fell them in the following winter, "if you wish to save the bark," but remember you lose nine months' seasoning of the wood (and there is, perhaps, too much made of this falling in the winter theory; it is seldom put in practice); cut off the longest length you require from the butt of the tree, and sell the top of the tree for a rougher purpose.

If the tree is large enough for the purpose, cut it into four, in sections, by drawing a vertical and horizontal line across the end, meeting in the centre. If too small for this, cut it into 4-in. or 6-in. plank, as soon as possible after felling, and then stack on end out in the open: do not lay on the ground, but stand it as nearly vertical on its end as possible, and keep it wet during the first three months. If the weather is dry, wet it with water poured on the top,

and allowed to run down. Let the ends stand on a piece of quartering, to keep it out of the dirt, or it will be stained some distance up. After standing thus for some six months, after putting it in a dry place for some time, cut it into the scantlings you require, always bearing in mind that oak will, after this seasoning, shrink in, at least half an inch to a foot, in width and thickness. They should then be stacked, and stripped, and covered with spare boards, and weighted on the top, for at least six months,—as much more as possible,—in a covered shed, with plenty of air, occasionally turned over and shifted, till they are dry enough to make dust when planed, and not turn the shaving black. They will then be fit for use.

I should advise for the panels to be cut as feather-edged boards, in radial lines from the centre of the tree; it will be a waste of material, but will repay in the beauty of the wood, and the way it will stand without warping. Most of the panels of the stalls of our old cathedrals were rent (*not sawn*) in this way, and stand admirably.

ROBERT PHILLIPS.

THE NEW HOUSE THAT JACK BUILT.

A Sanitary Version for Grown Children.

TWELVE CUTS.*

PAPER'd and plaster'd and painted down,
Nicely placed in the skirts of the town;

This is the House that Jack built.

This is the roof and the soaking rain
Dripping right through in seas of the drain,
In the New House that Jack built.

This is the nursery tow'd about,
Where smoke is kept in, and air kept out,
In the New House that Jack built.

This is the bed-room floor,—do you see?
And right at the end is the w-c.,
In the New House that Jack built.

This is the gas-pipe, sectional view,
'Neath the floor, with a nail driven through,
In the New House that Jack built.

This is the view of the kitchen floor,
The maid, and her bed behind the door,
In the New House that Jack built.

These are the dogs and the laddie cats
That would not harm the mice or the rats,
In the New House that Jack built.

This is the downward draught of the smoke,
Through the patent flue, designed to choke,
In the New House that Jack built.

This is the pump next the cesspit-wall,
Showing the well-hole, source and outfall,
In the New House that Jack built.

This is a view of the stagnant drain,
Where gases rise and fall with the rain,
In the New House that Jack built.

This is the master, ill in his bed,
And that is the doctor at his head,
In the New House that Jack built.

This is the coffin and stately hearse
Of the luckless subject of my verse,
That died in the House that Jack built.

LIGHTNING AND CONDUCTORS.

SIR,—I have seen it stated in the papers that Crumwell Church, near Manchester, which was destroyed by lightning on the 3rd inst., was furnished with a conductor. Will you kindly allow me to inquire, through the medium of your paper, what is supposed to have been the reason that the conductor failed to protect the building?

THOS. KNOWLES.

DAMP WALLS.

SIR,—I shall be obliged if any of your readers can tell me what many situated as I am would like to know, namely, how to keep out damp in an exposed position.

I have built a house on the borders of Dartmoor, using slate rubble for inside, and a light fireproof brick, made in the locality, for outside walls. These materials, with the aid of Aberthaw, having been put together in a very dry season, made the house a sieve, and for the first winter the house was wet through.

I next consulted some architect friends at a distance, who recommended me to give the outer walls a coating of a certain mixture of alum and soap. This was done, strictly according to orders, and the result was a second winter with the house wet through.

The following spring I had White's Portland cement put over the south and west sides of the house, to the ruin of its appearance, and, as far as I could judge, it kept the wet out, but the inner walls have nevertheless shown damp ever since (now two years), and I have had to listen.

A further portion of the house has been since coated with White's Portland cement, and has let in the wet as readily as ever.

I want to add to the house, but know of nothing suitable to build with. Battening does not keep out wet; it only hides it from sight by half an inch of plaster.

* The author would be very much pleased to see these lines practically illustrated in the interest of the public health. The readers of the *Builder* scarcely need it. No copyright reserved.

Can any of your professional or practical readers advise what, if any, solid building will effectually keep out wet? And if no solid building can be suggested, what is the best method of constructing double walls and bonding them together?

I have a dislike to paint and its periodical expense. Is there any material, of superior kind, of superior nature, of the consistence and waterproofness of tar, and that is made of a colour which is suitable?

I will only add that portions of the wall, painted externally four coats, let in the wet as badly as ever after the first year.

DEVONIA.

DUSTMEN'S WAGES.

In the St. George's, Hanover-square, Committee of Works, upon a complaint that dustmen had twice asked money for removing dust, Mr. Farris said he had made inquiries, and found there were three men employed, who were expected to remove seven loads a day, the price being 6d. per load. This was 1s. 2d. per man per day, which, he submitted, was a price much too low. Mr. Mitchell objected to an imposition being practised on the ratepayers. If people liked to give the dustmen money voluntarily, well and good; but a demand of money was another thing. The Chairman suggested that the contractor should be written to for an explanation. Mr. Cove considered the best course was, for the vestry to be its own dust contractor, and see that the dustmen had a fair day's work for a fair day's work. Dr. Schuchof suggested that the contractor be fined; upon which it was remarked that the price for removing the dust would be raised. The committee adopted the suggestion of the Chairman (Col. Ogilvy).

"POUR LES DAMES."

SIR,—Whether it be from a feeling of false delicacy, I know not, but the subject I will touch upon, with your permission, seems almost ignored. When our country-women are in France, their habits become somewhat Frenchified; and they are anxious to attain to the retiring accommodation there provided. What most foreigners think of our modest style, where health may be more maintained for some additional "penny sake," many are our large parks and promenades so destitute of accommodation, and why is the little that exists so carefully hidden from knowledge, as well as sight? Why should private individuals be left to provide for so great a public want? Such provision must always be inadequate, more particularly so when payment is demanded for that which is expected to supply and care for gratuitously. Retiring-places, *pour les dames*, should be erected in convenient corners, and one section should be free, whether in park, or street, or railway-station. I am sorry that it has been considered necessary to close the free places as some of our principal London stations, for surely a better course than that could be adopted. Many persons there are to whom ponies mean bread, and to insist on payment by them is hard, to say the least. The sterner sex has less to complain of, but a comprehensive system might be instituted that would provide for all requirements, without being unduly obtrusive.

LANTERN.

ASPHALTE PAVING.

THE Liverpool borough engineer (Mr. Deacon) has presented a report on this subject to the local health committee, containing information he had obtained on the subject of asphalt carriage-ways generally, together with the conclusions arrived at in relation to the probable advantages of their introduction into Liverpool, and suggestions as to the streets best adapted for a fair trial of two or more of the various asphaltes or asphaltic compositions now in use. Having referred to the experience of the use of asphalt in London and Paris, the engineer stated his opinion of its advantages and disadvantages in the following form:

"The advantages to be derived from the use of asphaltic pavements, as compared with granite or other sets, are—First, comparative freedom from noise under heavy traffic; second, absence from dust in dry weather, and of mud in wet weather; third, cleanliness of the footways, the dirt on which is chiefly brought from the carriage ways; fourth, increased comfort to carriage passengers; fifth, very great reduction in the wear and tear of horses and vehicles; sixth, reduction in the necessary width of openings to sewers and pipes; seventh, the facility with which repairs can be made, and their greater efficiency when made; eighth, the fact of the bed of concrete maintaining an even surface, and reducing the difficulty which results from settlement after reducing openings for repairs of pipes, &c.; ninth, the small, bulk and increased value of the street refuse as manure (which should be collected as soon as it falls); the absence of necessity for watering except for cleansing purposes. The disadvantages inseparable from the use of asphaltic pavements in Liverpool, as compared with the ordinary pavements, appears to be as follows—First, the greater first cost; second, general inapplicability to gradients exceeding 1 in 60; third, the sudden change in the traction of vehicles in crossing the joints between this and any other pavement; fourth, increased difficulty of finding loads in water or gas pipes."

Taking into consideration all the characteristics of asphaltic carriage-ways, the engineer said the conclusion could not be avoided that there were disadvantages inseparable from their use which would be felt to a greater extent in Liverpool than had been the case in London and some continental cities. Many of the streets in which their benefits would be most obvious had too great a gradient to admit of their use. There could be no doubt, too, that the cost of granite or other pavement was much less in Liverpool than in those places where asphalt had been largely used, so that the relative cost of the latter would be higher. Notwithstanding such drawbacks, the advantages of this pavement

would not fail to be felt; and if, as seemed probable, several companies would undertake to lay down a portion of some street on trial at an expense to the Corporation little, if any, greater than the present cost of sets, there could be no reason why they should not do so. For the purpose of comparative experiment, such as would enable the engineer hereafter to report on the subject with greater precision, that portion of Dale-street between Hatton-garden and North John-street (comprising about 4,300 square yards) would be the best. In London the Val de Travers asphalt was estimated to cost from 1s. 6d. to 2s. 3d. per yard per annum for seventeen years, and at the end of which time it was to be left as good as new. The Montrolier Asphalt Company offered to lay down their asphalt pavement over such portion of Dale-street as might be allotted to them, and keep the same in good repair for a period of twenty years, receiving from the Liverpool Corporation the same remuneration for the work as would be paid for laying and keeping in repair that portion of the street if paved with granite sets. The Barmes's Asphalt Paving Company tendered "for about 3,500 yards of asphalt paving for the carriage-road of any street in Liverpool possessing a gradient of not more than 1 in 40, the granite sets being removed, and excavations (if necessary) made to the depth of 8 in. at the expense of the Corporation." They added:—"We will, if with or without tramways, lay and furnish a concrete bed of about 6 in., and thereon lay asphalt of at least 2 in. thickness, thus furnishing the concrete, asphalt, and laying for the net price of 12s. 6d. the square yard; and we further undertake to maintain it in good order for the period of fifteen years, at the rate of 6d. per annum the square yard, reckoning over the whole surface."

The Health Committee have since come to the conclusion that it is not expedient to use asphalt for any of the roadways in Liverpool.

OLD WORK.

In the course of a lecture "On the Decline of Gothic Architecture after the Fourteenth Century," recently delivered at a meeting of the Chester Architectural Society, Mr. A. Rimmer said:—

Much stress was laid upon the necessity of entering into Greek feelings and trains of thought before Greek architecture could be understood, and the repose of the flat surfaces of Pentalican marble among the igneous rocks of Attica. The Greek felt security in the Parthenon, which was the state treasure-house, as well as the Temple of Athena, and, raised up on a bluff that, as there was no artillery, nothing could injure. But to appreciate the ancient classic mind more fully we should go to some of the remote provinces of Rome, for of the parent city so little was left that we knew almost nothing; the only safe thing to say being that there is nothing in the present day that can give us any idea of it. The lecturer said, "Take Idumca (Edom), a rocky fastness in the remotest parts of Arabia Petraea, and altogether unpromising for the hand of the architect," it was approached by a long winding road of four or five miles, that has no parallel in the world; sometimes it narrowed to a space of only a few feet, and sometimes spread out into deep caverns on each side, for the road went between enormous rocks, 400 ft. and more high, being three times the height, for example, of Chester Cathedral tower. Often the daylight was obscured by projecting cliffs, and the traveller seemed to go through a long tunnel with only a gleam of light far ahead. The mystery of this was proverbial before the Romans ever saw it. "Who will lead men into the strong city?" who will bring me into Edom? The marvellous Roman remains were dwelt on, and especially a vast temple that opened out to the astonished eyes of Captains Mangles and Irby (two of the few Europeans who ever were allowed to penetrate so far). They said, after describing the wonderful approach to Edom, covered with the remains of ancient Roman pavement, and having an infinite variety of grand sculptures, wherever there is light enough to see them;—"Where the precipices are at the highest, a gleam of stronger light breaks in at the close of a dark perspective, and opens to view, half seen at first through the tall narrow opening, columns, statues, and cornices of a light and finished taste, as if fresh from the chisel, without the tints or weather stains of age, and executed in a stone

of pale rose colour. Warmed at the moment we came in sight with the full light of the morning sun, the dark green of the shrubs growing in this perpetual shade, and the sombre passage from whence we were about to issue, formed a fine contrast with the glowing colours of the edifice. We know not with what to compare this scene: perhaps there is nothing in the world that resembles it. Only a portion of a vast front is seen at first, but it is so contrived that a statue with expanded wings, perhaps of Victory, just fills the centre of the aperture, which, being closed below by the sides of the rock folding over each other, gives the figure the appearance of being suspended in the air." The rest of a grand design opened at every step. This was to illustrate the eye for the picturesque that guided the architects of old; and, speaking of Gothic, he said that the old designers of England fitted their buildings to the sites they stood in so precisely, that after the solid spires of Liebfeld, that of Salisbury at first struck him as being lanky and too thin, and it was only when seen from various approaches on Salisbury Plain, covering over 200 miles, that he fully understood the picturesqueness of the sharp, incisive idea of height it was meant to convey. In order to design a building now, it would be necessary to make many drawings of the surroundings from the turnpike roads, and all the neighbourhood, to see where a stack of chimneys should show, where a front or a bay window, and where it should be partly hidden by a clump of elms or a hillock. This was not necessary formerly, for the old builders designed as they went on, and had all the accessories in their eye. A singular picture of the licence allowed to them may be found in the agreement for building the Trontbeck Chapel at St. Mary's, Chester, between William Trontbeck, esq., and Thomas Bates, mason. He describes the length and breadth, and says there must be "V, fairo and clenely wrought windows full of light," the best to be devised, &c. But the most touching part of the contract, and one that no mason could read at the present day without emotion, is where he speaks of the height of the chapel, which is to be carried up "as high as it needs reasonably to be." This shows how little the workmen of those days cared about "jerrying" their work. Unhappily, none of this chapel is left, and a series of splendid monuments perished with it; among these was one to Sir William and Lady Trontbeck of great beauty: the lady's head rested on a head-dress that might excite no remark in the present day, but must have been impressive in the sixteenth century. It consisted of a wreath of Trout and a Moor's head. The real cause of the decadence of English art is explained in an eloquent passage of Mr. Gladstone's, where he says that the lust for cheapness and the contempt for ornament took away the occupation of the true artists of England, and they ceased; this culminated in the time of Cromwell, where every article of beauty was thought to be idolatrous and carnal; but hadness does not satisfy, and Mr. Gladstone says, "the law of nature arrives at its revenge," "we have starved out the race that knew the laws and modes of the production of artistic beauty," and end by producing "malformations at a greater cost than would have sufficed for the nourishment among us of chaste and virgin art."

EARLS BARTON CHURCH.

THE works of restoration at this most interesting old church are now in hand, under Messrs. Slater & Carpenter. The tower is so well known as a so-called Saxon relic, that it is needless to say much about it; excepting that beyond repairing the floors, nothing will be done to it, nor will the original Saxon plaster outside be disturbed.

The nave and aisles are wide and lofty, and of good Decorated and Perpendicular detail. These portions will have new roofs in character, and the defective stonework restored, and will be entirely reset.

The chancel is a very interesting portion; it is of Norman date, and was originally terminated with an apse; but in the thirteenth century it was extended and finished with a square east end, having a noble triplet window. All along the Norman walls is a blank arcade, and the Norman sedilia and piscina are refixed in the later wall; above this arcade are the inner jambs of Norman windows, with rich chevrons worked on them; but the arches and the rest of the windows have disappeared, to make way for

larger Second and Third Pointed windows. The First Pointed low side windows remain, with the hooks for the wooden shutters which formerly filled them.

The general effect of the chancel is a mixture of all styles, and in the restorations it was felt that all must be left to tell their own stories of the changes which passed over the chancel; but with the roof it was different, for this was nearly flat and very modern. A new roof of oak has therefore been put on, of a high pitch, and covered with lead, and with new stone parapets and corbel table to harmonise with the thirteenth-century work. This roof has moulded beams and king-posts, and is boarded to eaves with rib mouldings at and between the arched ribs of the trusses. On the north side a new vestry has been built with red and white stone courses, as the ancient work in the aisles. This has a low pitched roof, so as to finish under the corbel table of the chancel.

The cleaning of the internal stonework is not yet done, nor any fitting or floors. The magnificent painted oak roof screen has been carefully preserved in its old position. Some remnants of the old wall paintings have been discovered, and will be preserved. The builder employed is Mr. Allen, of Irthingborough, and the clerk of the works is Mr. Lucas. Stained glass is in hand by Messrs. Bell & Almond for the three eastern lancets.

SCHOOLS OF ART AND SCIENCE.

Keighley Schools of Science and Art.—The annual meeting in connexion with these schools has been held, and the prizes distributed to the successful students. There was a fair attendance, but not so numerous as the important object of the meeting justified those interested in the school to expect. The chair was occupied by Mr. John Briggs, J.P. The report, in speaking of the new building, said,—

"As is well known, the superior and extensive accommodation of this building was provided with the definite purpose of supplying, as far as possible, many educational wants which had long been felt by the people of Keighley; and in order to show the importance of the undertaking, the extent of its development, and the influence which it must exert upon this community, it is desirable that we should revert to the educational position of the Institute a little over a year ago, and in a few words describe the means that were adopted to awaken public interest in the new system."

In reference to the Science School the report said,—

"It is very pleasing to announce that, although the school has but been in operation for eleven months, there are ninety-two boys attending it. It is largely taken advantage of by the leading manufacturers and employers of labour in the district; and yet, of the whole number, fifty-one are the sons of artisans. In order to keep up the scholastic requirements of so many, there are the following masters, and another is at present being advertised:—Head-master, Mr. J. Spencer, M.R.C.P.; teacher of chemistry, Mr. G. Ward, F.C.S.; art-master, Mr. A. Stevenson; French and German master, Mr. T. A. Cawley; assistant master, Mr. G. H. Rollason; teacher of music, Mr. J. Midgley; drilling and physical exercise, Staff-Sergeant Atty."

Of the School of Art, Mr. Stevenson (head master) reports:—

"During the year ending Midsummer, 1871, there had entered the classes 145 students; 129 of these being in the evening classes and sixteen in the morning class. The works (numbering 460) produced by 100 students, were sent to the Department of Science and Art for examination on the 9th April last. The result of that examination was satisfactory, the names of twenty-eight students being returned as having executed their work in a meritorious manner, ten of them being awarded prizes by the Government Examiner for the superior excellence of their productions. It is certain that at no former time have drawings of so high an order of merit been produced in Keighley. The excellent accommodation afforded in the new rooms, the extensive stock of examples and casts, and the valuable loans of works from the South Kensington Museum, have contributed to this result. Two free students have been appointed by the department and two by the council of the school."

In reviewing the rapid strides made in education since the new building was completed, the members of the council state that they are encouraged to continue the work which they have undertaken by the generous assistance which they have received from all classes in the town and by the hearty co-operation and assistance in carrying out their plans, of all the teachers and secretary of the Institute. Especially are thanks due to Mr. Spencer, who has entered into and undertaken the work of organising and conducting the teaching of the trade school and evening classes with great enthusiasm and ability.

Mr. Mundella, M.P., addressed the meeting. He said he had heard before coming to Keighley from several impartial sources that the institution which he was going to see was almost without a parallel in England. Taking, as he did, a deep interest in mechanics' institutes, and desiring to see them the universities of the

working classes, he could not express to them the pleasure and satisfaction with which he had gone through that handsome building. He found that a town where there were little more than 20,000 inhabitants had built an institution like that, costing about 14,000*l.*, and that there were between 1,800 and 1,400 persons receiving some advantages from the institution—a great proportion very important advantages in the way of instruction. After all his experience of mechanics' institutes, that was the most spirited and most creditable undertaking he had ever witnessed. He could not help feeling, as he went from classroom to classroom and examined the models and the classes and the laboratories and all the auxiliaries of a scientific training, that although Kichley was a small town, it had got some people in it who had got long heads and large hearts. The annual exhibition of the work of the students of the art school has just taken place. The subjects shown are 113 in number, and are composed of the choice of 466 examples which were sent up to the Kensington department for examination.

The Derby School of Art.—The prizes and certificates obtained by the students of this school at the last Government examination have been distributed in the Lecture-hall, Derby. The chair was occupied by the president, Lord Belper. The Rev. A. L. Simpson read an address on "The Importance to Society of the Study and Culture of Art." The paper dwelt at length on the influence of art upon the mind and aspirations of men, and further expressed the belief of its writer that the realization of the sublime of art by man was the means of elevating his tone and character, and of leading him to look forward to the perfections of heavenly eternity, of which the fanciful dreams and longing aspirations excited in his mind by the study of art were but the dim foreshadowings. Mr. Jno. Rickards (hon. sec.) then read the report, which stated that—

"The Derby Central School of Art was opened on the 3rd of May, 1870; and the total number of students placed on the register for the year was 215. Of these, 24 joined the morning classes, and 19 the evening classes. Referring to a table recently issued by the department, it will be found that out of 113 Art Schools in the United Kingdom, at the last examination, only 49 obtained a place in the National Competition, and of these only 23 obtained more important prizes than Derby, so that in its first year the school has taken a distinguished position in the higher competition of the whole Kingdom."

Mr. Simmonds, the head master, gave a brief outline of the course of instruction given in the School of Art. He condemned in strong terms the system of cheating adopted by many teachers of drawing throughout the country, who, in order to get a removal of their lessons for the next quarter, systematically "coloured up," and in some cases even filled up the outlines of their pupils' drawings. The system, he concluded, which prevailed in his school was that recommended by Mr. Redgrave and other eminent members of the Royal Academy, and of these authorities he was but a humble, though he trusted successful, mouth-piece.

Books Received.

Strange Duellings, being a Description of the Habitations of Animals. By the Rev. J. G. Wood, M.A. London: Longmans, Green, & Co. 1871.

This abridgment, by the Rev. J. G. Wood, from his "Homes without Hands," makes a very pleasant little volume, calculated to interest, whether the reader has entomological tastes or not. We make an extract from Mr. Wood's account of wood-boring insects, which will serve to show the character of the book, while it conveys information:—

"The well-known worm-eaten appearance of furniture is caused by certain beetles belonging to another family. As may be seen from the dimensions of the tunnels, the insects are very small, and their bodies are nearly cylindrical. The ravages which these beetles cause are fatal to all who happen to possess old furniture; but Mr. Westwood mentions that one common species, *Pissinus pectinicornis*, completely destroyed a new bedstead in the short space of three years. There is but one known method of killing the insects which have already taken possession, and of preventing others from following their example; namely, by injecting a solution of corrosive sublimate into the holes, and then treating the whole of the surface with the same poisonous liquid. I need, perhaps, scarcely mention, that insects which are popularly called death-watches belong to this family. Not only do furniture and timber suffer from the attacks of the *pellinus*, but articles of dress and food are also injured by them. Specimens of natural history are often spoiled by the holes which are drilled through them by the beetles; and stationers sometimes suffer from the voracious insects, which

bore holes through their wafers, fix them together, and there undergo their transformations within them. One species is obnoxious to wholesale druggists, on account of the damage which it does to the ginger. In some cases, half the ginger is drilled with holes, and rendered quite unsaleable. It is not, however, lost entirely, because it is reserved for the mill, and is then sold as ground ginger, the insects and their grub being rendered quite powerless, together with the ginger which they have not consumed. Such specimens are of course not exhibited to the general gaze, as the public would be very cautious of purchasing ground ginger if they knew what it contained."

Rudimentary Magnetism. By Sir W. SNOW HARRIS, F.R.S., &c. Second Edition, revised and enlarged by HENRY M. NOAD, Ph.D., F.R.S. London: Lockwood & Co.

This second edition of a standard work has been posted up to the present state of the science of which it treats, by the Vice-President of the Chemical Society, who has so particularized what he has added that it can always be distinguished from the author's remarks. The volume is illustrated by 165 engravings, and forms a complete treatise on rudimentary magnetism. The editor's new matter relates chiefly to Faraday's latest researches, and to the recent important investigations by the Astronomer Royal and others respecting the deviations of the compass in iron ships. The eighth chapter is the editor's wholly, and gives a succinct account of the progress of terrestrial magnetism, during the last twenty years.

Theory of Heat. By J. CLARK MAXWELL, M.A., F.R.S. London: Longmans, Green, & Co.

The aim of this book is to exhibit the scientific connexion of the various steps by which our knowledge of the phenomena of heat has been extended. It shows that the whole science of heat is founded on Thermometry and Calorimetry, and issues in Thermodynamic Energy and the Dissipation of Energy are pretty fully treated of; but still, although this branch of the subject is dealt with in a suggestive and interesting manner, our objection to Dr. Tyndall's definition of heat here also holds. When the author speaks of "the hypothesis that bodies consist of molecules, the motion of which constitutes the heat of those bodies," he does not give us a definite idea of what heat as a force really is. Suppose "the motion" of a mass of molecules is towards each other, or concentrative, surely that is not heat in the mass, but is like cold. And yet there is here a powerful force. Were the motion of the molecules mutually repulsive, or radiative, that would be like one's idea of heat in a mass, expanding, and even dissipating it; but this only shows that to speak of heat as being "the motion" of molecules or minute particles in a mass, is indefinite and incorrect. And, moreover, is not motion of any kind rather an expenditure of force than the force itself which causes the motion? Nevertheless, the volume before us is an able, and, as we have said, a suggestive one.

VARIORUM.

"A First Appearance," by Mrs. Evans Bell (*née Magnus*), is a very amusing and not uninteresting novel, recently published by Hurst & Blackett, and it has a claim on us for a sentence or two by its exposition of the loss and privation which poor weekly tenants suffer when they are obliged to leave houses condemned to be pulled down to make way for improvements. Too little consideration is usually shown for this class of tenants. If we had room, we would quote, too, a vigorous conversation the value of the "Trattoria" system, especially as carried on in Rome, in the hope that it might lead to the establishment of some houses of the kind in London,—houses where a dinner can be ordered by day for one person or for a family, cheap and good.

"You call at an establishment, order a dinner, say, for two persons, of six plates, soup, fish, *hors d'œuvre*, joint, game, and some sweet dish, besides vegetables and salad, to be sent every day. Henceforth at the appointed hour you find yourself, as if by magic, supplied with a perfect meal, beautifully brought to table, and served as hot as if brought straight from your own kitchen; for the dishes are sent ready garnished and fully prepared on an iron tray, with a cover, round a charcoal fire placed in the middle of it, in a large tin-box."

and this for about 2½ francs each person. Mrs. Evans Bell has shown in her book, with a pleasant and a knowing pen, the troubles and dangers that beset a theatrical *débütante* in our many-sided metropolis. The story is dedicated to the ingenious author of "Domestic Life in Palestine," Miss Mary Eliza Rogers.

Miscellaneous.

Sale of Woolwich Dockyard.—The portion of the dockyard sold is on the east side, adjacent to the centre of the town, and comprises upwards of four acres, including wharfage and warehouses, with a frontage to the river of 800 ft., approached by a new incline road about to be made in connexion with a public wharf which has been ceded to the local authorities by the Government. The property was divided into four lots, the first lot consisting of wharf property upwards of an acre and a half in extent, together with the mast-pond, a water area of 2 roods 29 perches, forming a complete dock and gates, which can be enlarged without difficulty, together with several buildings on the land, the whole having a river frontage of 303 ft. The upset price of this lot was 5,045*l.*; the lot was finally knocked down for 6,750*l.* Lot 2 comprised an area of 3 roods 33 perches, with a river frontage of 177 ft., and contains a shipbuilding slip 203 ft. in length. The upset price for this lot was 3,000*l.*, but there were no offers, and it was withdrawn. Lot 3, comprising nearly an acre and a half, with a river frontage of 220 ft., and a shipbuilding slip 253 ft. in length, was next submitted. The upset price was 3,150*l.* The lot was eventually sold for 3,950*l.*

Town Dwellings for the Working Classes of Manchester.—Mr. G. T. Robinson, F.R.I.B.A., has read a paper on "Town Dwellings for the Working Classes," before the members of the Manchester Statistical Society. Mr. Robinson said that, pre-eminently as Manchester had been for originating political and educational reforms, it was a striking anomaly that in this most urgent of social reforms it had hitherto taken no step. A great portion of the paper was devoted to the experiments made by the Metropolitan Association for Improving the Dwellings of the Working Classes, which endeavoured to secure a return for the capital invested. It also adverted to the Improved Industrial Dwellings Company, which had abandoned the open staircase system for the gallery system. To such a town as Manchester the gallery system, it remarked, was particularly applicable. What had been done by Sir Titus Salt in Saltaire, the Messrs. Crossley and Mr. Akroyd in Halifax, Mr. Hugh Mason at Ashton, and many elsewhere, was referred to. That which they, as individuals, had done from a sense of their responsibility ought, said Mr. Robinson, to be followed by collective effort in our towns. One attempt—and he sincerely hoped that it might be successful—had been made in Salford, but assistance on a much larger scale was urgently needed.

University College School Buildings.—At a recent session of the council of the College, the school committee represented the urgent necessity of an extension of the school buildings, in order to accommodate the rapidly increasing number of pupils. Mr. Samuel Sharpe, a member of the council and of the committee, announced his intention to present the College with 4,000*l.* towards the cost of the required buildings. Mr. Sharpe had already given two sums of 1,000*l.* each to the School-Building Fund, besides 1,000*l.* to the Retired Professors Fund, and 600*l.* to the Fine-Art Building Fund. The College has recently received from Mr. J. Pemberton Heywood a second donation of 1,000*l.* to the School-Building Fund, besides 500*l.* to the Fine-Art Building Fund. At the same session, Mr. Felix Slade's executors stated that, as further aid was needed to defray the cost of the Fine-Art Buildings at the College, and to provide easts, &c., they would give 1,600*l.* for these purposes. About two years ago these executors gave 5,000*l.* towards the Building Fund.

The Crystal Palace Aquarium.—On the 12th inst. a *soirée* was given in the aquarium of the Crystal Palace, when some shareholders and their friends assembled in the tropical department to interchange congratulations on the success of the undertaking which has achieved since its establishment, to witness the additions made to the collection, and to listen to a lecture by Professor Flower "On the Structure and Habits of Fishes." The corridor, with its black marble tanks, containing many varieties of fish of large size, was illuminated from above. It was a study of sea-life under highly favourable circumstances.

The Registration of Trade Unions.—For the first time since the passing of the Trade Union Act (1871), 34 & 35 Vict., cap. 31, the Registrar of Friendly Societies, Mr. A. K. Stephenson, holds courts for the reception of evidence with reference to the registration of trade-unions. Mr. Secretary Bruce has just issued regulations by which the registrar is now allowed to register a trade-union under a name identical with that of any other existing trade-union known to him, whether registered or not registered, or so nearly resembling such name as to be likely to deceive the members or the public. Mr. Bruce has issued another regulation to the effect that upon an application for the registration of a trade-union which is already in operation, the registrar, if he has reason to believe that the applicants have not been duly authorised by the trade-union to make the same, may, for the purpose of ascertaining the fact, require from the applicants such evidence as may seem to him necessary. The split in the Amalgamated Society of Carpenters and Joiners, which took place last May, is the first case calling for the latter regulation to be carried into effect.

The State of the Thames at Richmond. A numerous and influential deputation from the Local Boards and vestries of Richmond, Twickenham, Isleworth, and Brentford, has waited upon the Thames Conservancy Board, at their offices, Trinity-square, Tower-hill, to urge the desirability of constructing a dock and weir at Isleworth, to improve the river between Brentford and Teddington. Strong representations were made by gentlemen connected with the district, as to the reduced and polluted state of the stream, especially at Richmond, occasioned, it was alleged, by the action of the Thames Embankment, the dredgings below bridge, and absorptions by the water companies. Mr. J. Thorp, deputy-chairman of the Board, said he favoured that the object desired was a high or low water level. That had been discussed at the Board over and over again, but it was difficult to find the means of accomplishing it without injury to the navigation. It was the duty of the Board to do their best for the whole river, not a part, and he could only say now that the subject should be further considered.

Geometrical Teaching.—The annual meeting of the Association for the Improvement of Geometrical Teaching has been held at the University College, Gower-street. The president, Prof. Hirst, F.R.S., referred chiefly to the superiority of the method of teaching geometry pursued in Italy over that practised in England. The object of the association, he said, was to bring up to the level of geometrical teaching to the science of our day, and to endeavour to discover what unanimity there is among teachers by inviting contributions to the forming of a programme of a greatly improved method of teaching. He remarked that a perfect text-book was required, but such a book must be the work of a master, and that he had devoted itself four years to the subject. All teachers should aim chiefly at their own advancement; for only from a highly-cultivated instructor could proceed efficient teaching.

The Baroness Burdett-Coutts's Memorial. A public meeting has been held in the Hall of Columbia Market, in order that the proposed memorial to the Baroness Burdett-Coutts might be considered, and that the working men of Bethnal-green and Spitalfields might give expression to their wishes on the subject. The chair was taken by Alderman Sir Thomas Dakin. There was a good attendance, chiefly of working men. It was unanimously resolved, "That this meeting pledges itself generally to support the movement, and to confirm what the committee has done;" "That a committee be formed to collect subscriptions;" and "That an acceptable memorial be presented to the Baroness Burdett-Coutts." It is to be hoped that only those who can afford it will be asked to subscribe.

Benhar Coal Company.—This Company has been formed for working the well-known valuable Benhar Coal-field, comprising more than 2,000 acres, held in lease by Mr. George Simpson, coal-master, Benhar, Lanarkshire and Linlithgowshire, with the pits and mineral plant connected therewith. The mineral field is a nearly equidistant between Edinburgh and Glasgow, and is intersected by branches of the North British and of the Caledonian Railways. The field is said to present the advantages of a superior coal at very moderate depth, little water in the workings, and easy access to many markets.

The Labour Question in the United States.—We read in the *New York Times*, of December 21:—"The House of Representatives yesterday passed the Bill introduced by Mr. Hoar, of Massachusetts, to provide for an investigation of what may be broadly called the labour question in the United States. Mr. Hoar proposes a commission of three members, to be appointed by the President, with the consent of the Senate, to hold office for one year, unless their labours are sooner completed. The Commissioners are authorised to employ a clerk, and are to receive a salary of 5,000 dollars each. The subjects to which they are to direct their inquiries are, the wages and hours of labour of the labouring classes; the division of the joint profits of labour and capital between labourers and capitalists; and the effect of existing laws regulating commerce, finance, and currency on the social, educational, and sanitary condition of the labourers."

New Lunatic Asylum for Kent.—The magistrates of the county of Kent have just determined to erect a new lunatic asylum, capable of accommodating 1,000 inmates. The county already possesses an asylum at Barming-heath, and there are upwards of 1,250 patients located there; but lunacy has so rapidly increased during the last ten years, and the operation of the Metropolitan Poor Act, 1867, having thrown large numbers of inmates hitherto maintained in workhouses upon the county rates, the justices, to whom the matter had been referred, reported that there was no alternative but to build a new asylum. It has been decided to erect the new establishment in East Kent; and it is computed that the outlay will be from 150,000l. to 200,000l.

The Proposed new Surrey Chapel.—Some stir was produced at Surrey Chapel on Sunday morning, in consequence of an announcement by the Rev. Newman Hall, that the offer of a portion of the ground on which the Female Orphan Asylum, Westminster Bridge-road, stands, had been accepted for the sum of 8,000l., so as to erect the new chapel thereon. Cards had been left in the pews, and by the evening 2,500l. had been collected. Mr. Samuel Morley, M.P., had given 500l. There is also a reserve fund of 12,000l., which has been in the course of collection for many years. The new chapel will be commenced as early as possible, and is to have a lofty tower. According to the *Parochial Critic*, Mr. Ruskin is to be the architect.

Chester Workhouse.—The local guardians have resolved upon the purchase of a site for their new workhouse. Sixteen acres are to be taken, the place selected being in Hoole-lane, and the price 3,500l. The locality, says the local *Chronicle*, is not an undesirable one, and the price is not high. Some little doubt had been expressed about the drainage; but members of the board present stated that there was a good fall and that no danger need be apprehended on that score. The site was the unanimous choice of the guardians; and, considering the long delay which occurred in the erection of the Town-hall from a division of counsels upon this point, that must be regarded as a fortunate and satisfactory circumstance.

Value of Property in London.—At the Auction Mart last week, Messrs. Fox & Bousfield, submitted to competition the freehold premises, No. 53, St. Mary-axe, containing an area of 2,000 superficial feet, in the occupation of the Board of Guardians of the City of London Union, under a lease granted some twenty years ago, and at a rent of 120l. a year. A keen competition ensued, which resulted in the sale of the property for 7,700l., being at the rate of nearly 4l. per foot, equal to sixty-four years' purchase on the old rent. According to the *City Press*, a piece of land adjoining the Lombard Exchange, in Lombard-street, has been sold for 9,000l., or about 19l. 4s. 6d. per foot super.

A Gasometer Destroyed.—One of the large gasometers at the Northampton Gasworks has been totally destroyed by wind, and upwards of 2,000l. worth of damage done. The wind was blowing a terrific gale, and caught the gas-holder, and caused it to tilt on one side, when the east-iron columns, which are 2 ft. 6 in. in diameter, broke off, and one of the falling columns fell upon the top of the holder and made a large hole, through which the gas escaped, and the holder as soon as empty fell into the tank one mass of fragments.

New Docks at Milford Haven.—A movement has been started for the purpose of constructing docks at Milford, of such a size as will provide accommodation at neap-tides for a class of vessels similar to the Spain and other new steamers belonging to the National Steamship Company. It is stated that vessels of this class could make to New York two more passages per annum from Milford than from Liverpool. The necessary Parliamentary powers by which the construction of the works may be proceeded with are in existence. The cost, as estimated by Mr. Hamilton Fulton, the engineer, is 600,000l.

Trade Halls and Social Clubs.—An interesting paper on the subject of "Trade Halls and Social Clubs for the Operative Classes" was read by the Rev. Mr. Solly, on Thursday in last week, at the National Congress of Trade Societies, at Nottingham. An opinion was expressed by the writer that the great obstacle to the establishment of such associations was the want of mutual confidence among working men. A resolution was adopted approving of the scheme propounded in the paper, as tending to promote social reform, and recommending its adoption.

A Town Sinking.—The Northwich Local Board have had a discussion as to the sinking of the town and the salt-producing districts around. The trustees are about to deepen the River Weaver to Winsford Bridge, and it is said that if they do not get an invert or a plank piling of the river round the town, the whole town would fall, or there would be an immediate subsidence, and eventually a collapse of the greater portion of the property of the town. The sinking in many places is caused by the river running through the quicksand into the old rock shafts.

The Sanitary State of Scarborough.—In consequence of the notoriety obtained by Scarborough through the remarks of the medical press with respect to the illness of the Prince of Wales, the Local Board have resolved to inquire into the sanitary condition of the borough, and have addressed a circular with schedule of questions to each household. Information thus obtained will be used collectively, with a view to sanitary improvement; but particulars relating to houses individually will be kept in confidence. It is quite time something was done.

Hampstead Heath.—On Saturday, 13th the Metropolitan Board of Works took formal possession of Hampstead-heath, and dedicated it to the public. By the arrangement effected, the great bulk of the heath—that is to say, land consisting of the upper and lower heath proper, to the extent of, it is said, some 225 acres, is secured to the public for ever, at a cost of 45,000l. It is already being asserted that some of the most picturesque spots have been omitted in the purchase, and complaints are made.

Chester Walls.—The local *Chronicle* says,—"The foundations of some cottages are being laid at a spot which may be emphatically described as one of the very best sites in Chester. Outside the Casto walls, near the Grosvenor Bridge, and at a point singularly conspicuous, it has been considered a proper thing by the War Office to plant these small houses. They are intended for married soldiers." A pressing representation is to be made on behalf of the Town Council to the War Office against this senseless performance.

Church Struck by Lightning.—During a recent fearful storm of hailstones and thunder, which raged over the estuary of Leughor, the church at Penclawdd was struck by lightning, and much damage was done to the fabric. About 3 ft. of the point of the spire was knocked off, and a large hole was made through it lower down, close to the roof. Two windows at the west end were reduced to fragments, and a great part of the roof was either carried off or knocked in.

Opening a Public Hall in Sunderland. A large public hall, erected mainly by the friends of temperance, has been formally opened by the Mayor of Sunderland. The hall supplies a want which has long been felt in that town, namely, that of possessing a commodious building for political and other purposes. The hall is capable of holding 3,000 persons comfortably, and has been erected from designs by Mr. G. Gordon Hoskins, of Darlington, at a total cost of 9,500l.

Proposed Railway and other Works affecting the Holborn District.—The Surveyor to the Holborn Board, Mr. Lewis H. Isaacs, has reported on "the plans that have been deposited seeking for Parliamentary powers for railway and other works affecting the district." The report is published, and will be found interesting to those concerned. The value to the Holborn district of the proposed new thoroughfare from Vernon-place to Old-street is strongly dwelt on.

The Building Sites adjoining Finsbury and Southwark Parks.—At the last meeting of the Metropolitan Board of Works, on the motion of Mr. Newton, seconded by Mr. Savage, it was resolved—

"That the officers of the Board be instructed to take no further steps for the present towards letting land for building purposes in Finsbury and Southwark parks; and that it be referred to the Parks, Commons, and Open Spaces Committee to inquire and report on the best means of utilising the land in question for the public benefit."

An Artesian Well.—An artesian well has been sunk in the courtyard of the naval hospital at Rochefort to a depth of 816 metres (2,774 ft.). M. Roux, pharmacien to the hospital, reports that the temperature is 51 deg. cent. (about 105 Fahr.) Contrary to what is generally observed in artesian wells, the water contains a large quantity of saline matter, and is quite unfit for drinking or washing.

Club-houses for Working Men, Dundee.—Mr. Armstrong, one of the members for Dundee, has presented 5,000l. to be expended in providing two club-houses for the working men. Several gentlemen are to be appointed trustees, but it is intended to leave the working men who become members to make the arrangements of the institutions themselves.

Bruton, Somersetshire.—The Sanitary Committee of this town have engaged Messrs. Gotto & Besley, and Mr. A. W. Estridge, to prepare plans and estimates for the drainage of the town, and to report as to the best means of disposing of the sewage so as to prevent the pollution of the river.

The State of Yeovil.—The spasmodic endeavours now being made to remove some of the evil conditions that afflict Yeovil form a striking commentary on the reception given to our statements concerning the place made not long ago. An apology to us would not be out of place.

Royal Sanitary Commission.—On Monday evening, the 22nd inst., Mr. G. W. Hastings will open a discussion on the Report of the Royal Sanitary Commission, at a meeting of the Social Science Association, at their rooms in Adam-street, Adelphi, at eight o'clock.

The Wandsworth Mortuary.—At their last meeting, held this week, the Wandsworth Board of Works decided that the plans submitted for the proposed mortuary be approved, and that tenders be invited for the building from five local builders.

The New Instructional Institute.—The New Instructional Institute has been opened by his Royal Highness the Duke of Cambridge, in the presence of the principal inhabitants of the village.

The Floating Dock for Bermuda.—There appears to have been considerable bungling in placing this remarkable work in position. Considering that it cost a million of money, it has not hitherto received very careful treatment.

Park-lane Sewer.—Some abuse is being bandied about in connexion with the recent sewer works in Park-lane. Fresh inquiries are, rightly, to be made by the Vestry of St. George's, Hanover-square.

Drawing in Oxford.—Mr. Raskin's to offer 5,000l. for the purpose of an endowment pay of a master of drawing in the Taylor Galleries, has, with some modifications approved by Mr. Raskin, been accepted by the University of Oxford.

Halesworth Sewerage Competition.—The Sanitary Board has adopted the scheme proposed by Mr. Bennett Fitch, C.E. There were seven plans sent in.

Edinburgh.—Arrangements are in progress for providing a new cemetery for Edinburgh.

TENDERS

For new granary, Prince's-wharf, Prince's-stairs, Rotherhithe, for Messrs. T. & W. Easton. Mr. George Lor, architect—

Woodward	£5,650	0	0
Gammott & Son	6,213	0	0
Hill, Keddell, & Waldram	4,975	0	0
Crockett	4,960	0	0
Morter	4,910	0	0
Henshaw	4,315	0	0
Tarrant	4,797	0	0
Hart	4,786	0	0
Marringe	3,450	0	0

For excavator, a mason's, bricklayer's, carpenter's, and founder's work of Upsal Castle, near Thirsk, for Captain E. Tutton. Messrs. Goldie & Child, architects—

Hingworth & Sons	£10,306	0	0
Bulmer	9,367	0	0
L. H. & R. Roberts	8,847	0	0
Robson & Son	8,635	0	0
Keswick	8,670	0	0
Burnby	7,915	0	0
Hellerby	7,315	0	0
Shafloe & Barry	7,100	0	0
Weatherly & Rymer (accepted)	6,250	0	0

For the erection of a house, &c., for a gentleman, in Kent. Messrs. John Tarring & Son, architects—

General Estimate	£1,000	0	0
Principal For using Horse, Wainscot, Stables, instead of Lodge, & additional, additional.	434	0	0
Kimberley	£5,946	0	0
Dove, Brothers	5,375	0	0
Myers & Sons	5,339	0	0
Hill & Sons	5,234	0	0
Macey	5,258	0	0
Henshaw & Co.	5,017	0	0
Killy	4,999	0	0
Manley & Rogers	4,808	0	0
Perry & Co.	4,769	0	0

For the first portion of Messrs. Threlfall's new brewery, Liverpool. Mr. G. Stannell, architect. Quantities by Messrs. Curtis & Son—

Allowed for Old Materials.	£6,600	0	0
Kirkham	6,079	0	0
Tomkinson & Son	6,075	0	0
Haigh & Co.	5,795	0	0
Burrough & Son	5,640	0	0
Jones & Co.	5,428	0	0
Crmsou.	5,471	0	0
Holmes & Nichol	5,318	0	0

Ironwork.

T. H. Head & Co. (accepted)... £1,076 0 0

For the erection of Blewbury Vicarage, Mr. Edwin Dobby, architect—

Dedicated for Old House.	£20	0	0
Johnson	£1,918	0	0
Williams	1,760	0	0
Wheeler & Gregory	1,728	0	0
Kimberley	1,640	0	0
J. & T. Davis	1,630	0	0
G. Jones	1,620	0	0
T. Jones	1,620	0	0
Castle & Co.	1,565	0	0
Solly	1,558	0	0
Gibson, Brothers	1,547	0	0
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The Builder.

VOL. XXX.—No. 1512.

The New Project for a Channel Tunnel.

NCE more the question of constructing a tunnel under the Straits of Dover, which has so frequently been brought before the public, is upon the tapis. On the present occasion, it is right to admit, the previous projects have been pretty fairly reviewed. There is, moreover, a degree of diffidence, and a candid admission that many questions can be solved only by the test of actual experiment, that give evidence of a caution not always to be found in projectors. The subject, thus presented to the public, is by no means to be encountered with that ridicule which was very properly called for by some of the former schemes. Nor is it one to be met with a peremptory condemnation on positive engineering grounds. Investigation, however, of the proposed undertaking is desirable, whatever be the result of the best judgment that we may be able to bring to bear upon its principal features.

The first idea that occurs to the mind is, that the spirit of engineering enterprise, the absence or silence of which for so long a time too many of us have reason to regret, must have a more persistent vitality than has been generally supposed. Thirty thousand pounds, we are told, are asked for, and are found, or are expected to be found, for the purpose of experiment. Considering that the result of such an expenditure, if made as proposed, can be little more than to throw some additional light on the geology of a part of the English shore, with a distant hope, perhaps, that if anything should grow out of it the subscribers might be allowed to participate, the public spirit and disinterested magnificence displayed are calculated to inspire us with long dormant hope. If such a sum be forthcoming for the mere purposes of investigation, what may not be expected for the accomplishment of those numerous practical methods of employing money in agricultural engineering, which, not as matter of estimate, but as subject of demonstration, would yield such golden return?

The object of the Limited Company, we are told, is to sink a shaft on the English side of the Straits of Dover, and to drive a driftway about half a mile beyond low-water mark. One question concerning the engineering practicability, or otherwise, of constructing a submarine tunnel, depends on the continuity, or the reverse, of the strata which are known to exist on either shore. That these dip towards a junction is ascertained. The inclination on the opposite sides of the Channel varies considerably, being nearly three times as sharp on the French side as it is on our own. The mode in which these anticlinal lines meet, the existence of a more or less serious disruption of strata at the junction,—in fact, the geological cause of the formation of the Channel

itself, forms the real key to the engineering features of this part of the subject. What light is expected to be thrown upon this essential problem by the construction of a shaft and portions of a driftway at Dover we do not yet clearly make out.

The name of M. Thomé de Gamond is associated with that of several English engineers as concerned in the proposed enterprise. M. de Gamond, we are told, has for some thirty-seven years made a special study of the Straits of Dover. It scarcely justifies the scorn with which he speaks of competing projects, that the proposal, made by this gentleman in 1840, for a method of uninterrupted communication between Great Britain and the Continent, involved the filling up of the Straits of Dover. "*Point de Pyrénes*," was a joke to this. A solid and substantial mole was to be built from shore to shore. The modest sum of 34,000,000*l.* was allowed for the estimated cost; and the maritime power and supremacy of Great Britain were to be propitiated by the kind provision of leaving three gateways or navigable apertures through the mole. None but people who are ready to go to war for an idea could have been expected to originate such a scheme. More than that, no other people could be likely to appreciate it. The blind and incurable prejudices of the maritime interest could not be sufficiently enlightened to regard the grand project with favour. It shows a remarkable degree of confidence on the part of the promoters of the Limited company, that they should put forth the name of the projector of this mole as that of one of their engineers.

Whatever be the practical experience, or the sound judgment, of M. Thomé de Gamond as an engineer, he seems determined to add the laurels to be reaped in another profession to the credit due to the constructor of magnificent works on paper. In 1856, M. de Gamond was occupied with a project for a submarine tunnel. He dived several times to the bottom of the Channel to obtain specimens of the clay, on the last of which occasions he was attacked and severely bitten by conger-eels. It does not appear how either of these interesting facts sheds much light on the subject of the geological substructure of the trough of the Channel. But as two objections—one political, the other engineering—were urged against the advantage and the feasibility of M. de Gamond's scheme, he says, that he was content to meet them by what advocates call pleas. These are explained to be statements introduced in order to gain the success of a cause. It is not proposed that, this success once obtained, any further reference is to be made to the pleas. One of these pleas seems to have been a relic of the original idea of the mole. Twelve artificial islands were to be manufactured in the Channel, in each of which shafts were to be sunk, from which the excavation of the tunnel was to be carried on in each direction. We are aware that the construction of a shaft through a species of artificial island was successfully carried out as a part of the water-works of Chicago; but the idea of studding the Channel with artificial shoals and invented dangers could only occur to persons ignorant of, or hostile to, that maritime occupation which forms the very life of British power.

The other plea, in reply to the objection that we were not anxious to abandon the military defence of that wall of salt water which has kept our soil unprofaned by hostile foot for 800 years, was, that valves might be provided for the inundation of the tunnel in case of its being required for invasion. As it is well known that all the preliminaries of war between hostile nations are now invariably arranged on the courteous and considerate plan which requested the "gentlemen of the French guard to fire first," we must take the second plea also for what it is worth. We must further note that

the approbation which the ex-Emperor of the French is stated to have expressed of the project of uniting the two countries by a tunnel may be regarded under very different lights by French and by English eyes.

Mr. Low, of Wrexham, has brought to bear on the subject of the proposed submarine communication the experience of a practical miner; and has suggested, what we have ourselves more than once pointed out as a requisite of all lengthened tunnelling, that a double driftway connected by passages, and admitting of the mode of ventilation practised in ordinary coal mines, was the only method on which such an enterprise could with propriety be commenced. In reference to this, however, the improvements made in boring apparatus, and the aid to ventilation afforded by the escape of the compressed air by means of which such machinery is worked, have now to be taken into consideration.

For ourselves, we cannot but think that the political, or rather military, aspect of the case, is one that demands attentive consideration. Much may be said in favour of articulating our railway system with that of Continental Europe. Little doubt can be entertained that the international traffic that would be created by such a step would be very large. But other considerations must also be regarded. We have recently seen what large expenses the people of this country have incurred, and, as we think, wisely incurred, for making Portsmouth into an impregnable harbour for a war navy, intended to defend our coasts. Our annual budgets owe some three-fourths of their pressure to our efforts, past or present, to defend Great Britain from any possible attack. Works larger than any yet effected are known to be under consideration. The defence of London by a chain of detached forts is a subject on which military studies have been made, and as to which Parliament will probably be asked to provide means. There is no indication, at present, that it will be asked in vain. Unfounded security, and undue panics, have succeeded one another for some considerable time. Political capital has been made, at one time by shortsighted and eventually costly reductions of proper expenditure; at another by over zealous effort to repair these injuries to our power. The present feeling is, let us once for all put a stop to such discreditable vacillation. Let us see, since human nature is what it is, that our coasts are in a state of defence, our navy efficient, our army the very finest that can be formed out of such limited numbers, and then let us turn our attention to the conquests of peace. That, we think, is the common-sense outcome of all the long debates on the subject. It is matter, therefore, at least for consideration, whether we should be wise, at such a moment, to open in our ancient defences a new back-door, through which a robber might unawares break in. It is all very well to say that this postern shall be plated with iron, and provided with bars and locks. The question is, whether this is exactly the time to break through the wall to make it. The fortifications of Portsmouth and the Anglo-French Tunnel represent two opposite orders of ideas. Is it quite consistent to attempt the simultaneous prosecution of the two?

There is no doubt, were the incoming year to approach us, like the ambassador of Rome to Carthage, bearing peace and war beneath the folds of his toga, and asking which we would choose, what our reply would be. Peace and goodwill among mankind is, or ought to be, the aspiration of every good man. In none is that desire more strong than in those great military chieftains on whom has fallen the onerous responsibility of high command in actual service. There never was a man who had a keener sense of the horrors of war, or a more anxious, patriotic desire that his eyes might never witness their enactment in his native land, or indeed in



Europe, after his great struggle of 1815, than Arthur, Duke of Wellington. The blessings of peace, the growth of commerce, the augmentation of national wealth, the increase of human happiness, are matters which we not only desire, but in forwarding which to the utmost of our power we most of us pass great part of our lives.

For all that, we should be the worst of fools to forget the lessons of 1851, of 1866, and of 1870. Men whose philanthropy was much in advance of their knowledge of human nature, and whose acquaintance with the profits of commerce was much more accurate than their knowledge of history, had come to the conclusion that King Pickett's reign had come, and that the reign of King Pickett was peace. Our great brilliant summer palace of 1851,—that crystal and iron structure which had all the lustre, and something more than the permanence, of a bubble, was to be the temple of perpetual peace. Men's eyes were to be opened by education, their prejudices dispelled by mutual intercourse, and their peaceful relations secured by reciprocal interest. We know, however, what came of it. We have seen how an era of revolution and civil war, not ended, but suspended, by the most terrible military and national collapse on record, has been ascribed in by these cries of "Peace, peace." What we do not know,—what few of us have heard, and still fewer realised, is the unprecedented magnitude of the river of human blood that has flowed during the past decade.

That calculation which earned an American general the title of butcher,—the calculation that if his forces were twice those of his antagonist, he might expend man for man and have half of his army left,—has been distanced altogether by the more ghastly arithmetic of the German war. We never heard of less than 150 men coming unhurt out of a battle, as the sole representatives of a regiment which went under fire 3,000 strong. It is no exaggeration to say that, in the earliest encounters, when the French had the advantage of admirably chosen positions, and of the destructive fire of the mitrailleuse, and before courage, discipline, and military character had been exposed to the demoralising influence of defeat,—the terrible word,—the once terrible word, demerit, had to be spelled backwards with regard to German regiments. It was not a tenth that they lost, but nine tenths. It is true that no other generals in the world would have dared so to handle troops. It is true that no other troops in the world would so steadily have marched to certain death. Over and over again, as a line of soldiers reached the summit of a hill, exposed to the deadly fire of the defenders, they fell in line, like a sward of grass in a meadow before the mower. Let us remember these things, and let us ponder well before we attempt to bridge the Channel otherwise than by stone. The oracle of Delphos gave a reply to the Cretians, when they proposed to cut through the Isthmus of Corinth, that is not applicable to this question.—

"Delve not, nor towers upon the Isthmus pier,
Had Jove so willed, himself had made an ile."

Neither the military events of 1870 and 1871, nor the internal condition of France since the close of the war, have been such as to lead us to suppose that the present is the exact moment in which to seek to alter the geographical relations existing between the British Islands and the Continent.

It may, it is true, be urged in reply that, even if the scheme be at once taken up, and carried out with all possible despatch, we need be under no apprehension of any very proximate political or military consequence, as it will take up the lifetime of a generation to make both ends meet. There is some truth in this argument. The experience of the longest tunnel yet made in the world bears, more closely than do such small details as those of the driving headways of 600 or 700 yards long through the upper chalk, upon the anticipations we can form as to the rate of progress. That the actual rate, as we will show, would require the period of thirty-seven years for the completion of a tunnel beneath the Channel.

We do not treat this question as an engineering impossibility. Far less do we assume its practicability. We have made great advances within the last ten years in the art of mining. The success, engineering if not financial, of Mr. Barlow's little tunnel under the Thames, near the Tower, is a matter not to be ignored. Mr. Barlow, with commendable caution, constructed an iron tube

as the shield for his miners, and the lining of his tunnel. Yet such was the combination of skill and good fortune in the selection of the impervious stratum through which the little gallery was driven, that we can say, from personal examination, that a 6-ft. culvert might have been driven through the clay, and bricked within, without the use of any shield at all. This is, no doubt, an exceptional case. It was due to the existence of a bed of solid clay, such as the results of no less than thirty-nine borings led Brunel to anticipate in the line of his own tunnel, which could be pierced and lined before any action of a semi-fluid nature had appreciably commenced. It gives us no encouragement with regard to working through previous strata. Nor do we suggest that the favourable nature of the ground actually passed through would have justified any relaxation of the precautions adopted. Still, we have an important fact to set against the terrible difficulties which the genius of Brunel overcame in carrying his work through the loose and crumbling material of what was really the artificial bed of the Thames. We must take either experience for what it is worth. Each is a contribution to engineering science.

Again, we have had the experience of the completed Mont Cenis Tunnel. That is another point gained. We have information under separate heads from this great work. We have found it to be possible to drive a tunnel, from either end, without shafts, of a length never before attempted, so as to meet both as to line and as to level. We are told that the error in coincidence of the two lines, one of 7,000 yards in length, and the other of 6,800 yards, was under 3 ft. This is a great triumph of engineering skill. Secondly, we have the experience of the boring apparatus. We know the economy of time and of cost thus effected over the manual labour familiar to our early days. We have also important observations as to the reduction of temperature by the use of compressed air,—a matter of extreme importance in contemplating the possibility of making 11 miles of unventilated tunnel. The difference of temperature at the entrance and at the working face is stated at 22 degrees Fahrenheit. What the latter would have been but for the jets of air constantly issuing from the working cylinders, and causing a descent of the thermometer exposed to the jet to 7 degrees of frost, our mining friends can readily estimate.

Again, as to the rate of progress, we have valuable information. From the date of the commencement of the tunnel, August 15th, 1857, to that of the meeting of the workmen under Mont Frejus, December 26th, 1870, was 4,850 days. Taking the greater distance accomplished, which was that on the Bardonnèche, or Italian side, at 7,000 yards, we obtain an average progress of 1.43 yards per diem. The long period elapsing before the tunnel was open for the transit of trains must be added to the above-named period; but as that delay was the rather political than to engineering causes, it cannot be reduced to figures. Again, we have the element of cost. That of the Mont Cenis Tunnel, dividing the capital by the length, was somewhat under 200l. per yard. And rock of a very obstinate character occasionally occurred, which both retarded the progress and augmented the average cost.

A tunnel 22 miles long, executed at the rate and for the price of that under Mont Cenis, would thus require for its completion a period of thirty-seven years at a minimum cost of seven and a half millions sterling. We are not arguing that the cases are parallel, but merely giving the results of a comparison. To offer even an estimate of cost, or to rate the progress, not by days, but by years, we must know more than any one appears to do at present of the geological nature of the bed of the Channel. The exact length of the Thames Tunnel is not stated in the Life of Brunel. The expenditure was 454,000l.; which, divided over the approximate width of the river, gives a cost of about 1,300l. per yard.

It will be said that the progress through the dense strata that underlie the Alps was necessarily slower than would be the case through those of the submarine tunnel. That a passage would be made through a mountain barrier consisting of chalk more rapidly than through one of harder material, we admit. But it must be remembered that there are very special practical advantages attending the driving of an adit, or working of a gallery or tunnel from two ends, as

compared with working from shafts, which affect cost and rate of progress, as well as safety and comfort. A gallery thus driven in, or should be, always carried on a slight ascent, so that the drainage can be effected without engine power, and the material from the excavation is thus readily disposed of. The Alpine tunnel was constructed on a rising gradient from each end, although the so doing involved the introduction of a gradient of 1 in 43, instead of 1 in 90, which would have been attainable if the tunnel had been all on one inclination. In the Channel tunnel, on the contrary, we must commence by the sinking of a land shaft or shafts. The depth to be penetrated must be equal to that of the deepest part of the trough of the sea to be passed, plus the thickness of crust necessary to be left over the head of the workmen, plus the rise of an ascending gradient, steep enough to effect adequate drainage, of eleven miles. It will depend on the dryness or wetness of the strata pierced what this allowance is to be. Altogether we find that we must sink shafts of considerable depth,—in themselves matters of some expense,—up which every gallon of water that enters the tunnel must be pumped, and every ton of material excavated must be hauled. This may be fairly taken to counter-balance any presumed advantage from a less resisting medium.

On the important question of the geological character of the antiferrous beneath the trough of the Channel no light can be thrown by the proposed outline. M. de Gamond considers that this meeting is under the Varne bank. If it should be practicable to make any serious investigation in this locality, the results might be important. To reach this place by driftways was reported, in June, 1868, by the engineers now concerned in the scheme, to require from one million and a half to two millions sterling, or one fifth of the entire cost of the tunnel. The practical course, if the matter were seriously taken in hand, would be to drive a driftway from the shore nearest the point of supposed junction of the strata till that position was reached, or until reaching it was proved to be impossible. In that case we should have that positive information in the absence of which the scheme of a submarine tunnel can only be characterised as one that is extremely problematical.

There is, however, one primary consideration, in presence of which we must confess to some astonishment that the public should be asked to find 30,000l. without something like the same number of pence having been previously devoted to the purpose of showing that there exists even a *prima facie* case. One of the best known geological features of the earth is the riverless, streamless, condition of the great chalk downs. In valleys and hollows where, in other formations, brooks and lakes are found, the chalk formation is dry. The reason is the pervious nature of the material. The rain sinks through it as through a sieve, and descends until arrested by an impervious bed. Nothing but excessive evaporation (as in the case of the Dead Sea and of the Bitter Lakes) is known that can reduce the level of a great subterranean reservoir of water below that of low water in the sea. It is, therefore, our opinion, that the whole of the chalk below this level, without any assumption of infiltration through the bottom of the sea, is as full of water as a sponge. Through such a formation, subject, moreover, to a great hydraulic pressure, tunnelling would be extremely dangerous and costly, and the formation and maintenance of a driftway, unlined with masonry or with metal, would be an impossibility. We know that water is found at the level of the sea in chalk wells at Dover. We have reason to believe that the level of the subterranean lake which the chalk holds dips downwards from our inland chalk districts to the sea. The sinking of a single well far from 100 ft. to 300 ft. below the level of the sea through the chalk would be enough to verify or to correct this opinion. That, we take leave to point out, is the first step which ought to be taken by the promoters of a submarine tunnel. The information thus to be obtained would not, indeed, prove the practicability of the enterprise; but it might, on the other hand, demonstrate its utter impracticability. Engineering and geological theory are against that practicability.

We think no persons can with propriety appeal to the public for money until the simple step that we suggest shall have been taken. According to our best present knowledge we are asked for 30,000l. for an entirely impracticable scheme.

ON THE CONSTRUCTION OF THE ALBERT HALL.

At the ordinary general meeting of the Institute, held on Monday, the 22nd inst., Mr. T. H. Wyatt, president, in the chair, a paper "On the Construction of the Albert Hall," was read by Major-General Scott, C.B. We give that portion of it which relates more particularly to constructive details:—

The whole of the main wall was constructed of hard Cowley stocks set in Portland cement with three parts of sand. Portland cement was also in all cases used for the concrete necessary to bring the gravel surfaces which were to receive the foundations to a true level, and to fill in the excavation in the clay bottom, which extended on the south and south-east sides over one-third of the area occupied by the building. The outer wall, built in bricks made by the contractor, was also brought up to the level of the shallowest footings in Portland cement mortar of the above composition; but all above this, and all the cross walls and the walls within the main wall were executed in mortar made in a mill, with one measure of grey lime previously slaked, one measure of Portland cement, and six measures of sand. The set of this mixture was sufficiently rapid to prevent any settlement taking place which might bring an undue strain on the terra-cotta dressings. It also enabled the main wall to be completed to its full height, and the roof to be commenced before the outer wall and cross walls were brought up, and in no instance did any such inequality of settlement from this cause take place as to produce fracture. The outer wall was, of course, delayed for the terra-cotta. Delay in the supply of this material appears to be an ever irritating difficulty in its use.

The plastering used on the interior walls merits, perhaps, some attention. Instead of making the lime into coarse stuff, as is usually practised, and finishing with lime or gauged putty, the grey chalk lime of the Medway was ground to a powder and made into mortar on the following system:—One quarter of a cubic foot of plaster of Paris was stirred into a bucket of water and thrown into the pan of an ordinary mortar-mill, so as to make a milky fluid of the plaster of Paris; another bucket of water or so was then added, and 5 cubic feet of the ground grey lime gradually added, with the addition of more water; the mill continuing in action the whole time until the pan contained a thin slip of the lime and plaster. To this mixture 30 cubic feet of sand were added and thoroughly incorporated with it, and the mortar was then ready for use. This treated the lime sets without sinking, and makes what I have termed "scientific mortar."

For the finishing coat in rough stucco, the quantity of sand was reduced to 20 cubic feet, and after the first coat was put on the wall, the plasterers could in a few hours' time follow on with the finishing coat. For the first coating on lathwork the usual quantity of hair, but unbeaten, was added whilst the mortar was being incorporated, and the ceilings were finished with a mixture of slip prepared as before, with one part of chalk and two parts of sand for every part of lime used in the slip.

The whole of the outer corridors, staircases, and crush-rooms, and all the private and refreshment rooms round the building, are, as it is termed, fire-proof, no wood being used in their construction beyond that of the doors, windows, and the wood slips used to carry the concrete and tiled floors. Probably, in the case of a fire in the interior of the Hall, the tile would not be belied, for the inrush of fresh air would be so great as to keep all without the auditorium perfectly cool. Since also the audience empties itself into these corridors and crush-rooms in a few minutes, there is no great likelihood of loss of life in the event of a fire occurring. As precautions against fire, hydrants are fixed at several points on each floor level, the whole being in communication with thirty tanks on the picture-gallery roof, containing in all nearly 50,000 gallons of water. These tanks are supplied from a well sunk through the London clay into the chalk, in the rear of the building, and they also receive the rainfall on the large roof. The hydraulic lift is supplied from the same sources.

In the warming and ventilating arrangements I had the assistance of Mr. W. W. Phipson, who has had great and varied experience in the heating of large buildings. Coils of hot-water pipes are placed in three separate air-chambers, under the arena, the amphitheatre stalls and the main corridors of the building respectively. The

heated air from those in the arena ascends through the interstices of the floor; that from the coils under the amphitheatres through the risers of the steps on which the seats are placed; and that from beneath the main corridor finds its way through passages in the wall into the boxes, the picture-gallery, the corridors, the refreshment and private rooms and small lecture-theatres. The external fresh air is forced in by two fans, 5 ft. 9 in. in diameter, each worked by a 5-horse power engine, and blowing right and left through passages provided for the purpose into the three above-mentioned air-chambers. It may also be drawn through them by the ascension current of heated air in the Hall itself, which, when the gas is lighted, or the building warmed in cold weather, exerts an enormous force. The amphitheatre and corridor air-chambers, with their systems of coils of hot-water pipe can be together utilised for the Hall, or for the corridors and private and other rooms. In order to preserve equality of temperature in all parts of these chambers, the coils of hot-water pipe are divided into sections, each section having its own hot-water generator, in which the temperature is kept up by a supply of steam from three 25-horse power steam boilers at the back part of the building. There are sixteen such generators, each supplying its own system of pipes, with an admitting of hot water being put into action or thrown out at will. The total amount of heating surface in the various coils is represented by about 28,000 ft. of 4-in. hot-water pipe.

The chief difficulty in connexion with the management of the warming and ventilation of such a building is the control of the inward draft when the doors are open from the ingress and egress of the audience; but by carefully attending at these times to the closing of the louvers of the upper shaft through the centre ring of the roof, this draft can be controlled.

The conditions prescribed for the exterior were, as I have said, that the facade should consist of red brick, with terra-cotta dressings. The subject of terra-cotta as a decorative building material has been so fully treated of by Mr. C. Barry that it is unnecessary for me to do more in relation to its use in the Albert Hall, than refer briefly to the principles which guided us in its application and treatment. The terra-cotta material was considered simply as a superior description of brick, to be used in conjunction with plomo surfaces of a somewhat similar material, but of another colour. It was thought therefore unnecessary that the lines and edges should have the precision of stonework given them, or that the blocks should be of large size. It was further judged that delicate modelling would be out of character with a building which must be of very massive appearance, and which should depend more for its effect on the sweep of its lines than on exquisite finish. These opinions were held strongly by Mr. Townrose, to whom the Hall is indebted for the actual modelling or immediate superintendence of the whole of the modelling work, and I judged them to be correct. Many, undoubtedly, think that the modelling is too coarse, but I have been gratified to observe that the eye of the painter is generally pleased with the picturesque effect which this mode of treatment has imparted, an effect to which doubtless the varied and rich tints of the material itself have largely contributed.

The terra-cotta was all supplied by Messrs. Gibbs & Canning, of Tamworth. The blocks for the preparation of the moulds were supplied to them by us, and the terra-cotta work was fixed by masons furnished by the building contractors.

The terra-cotta of Messrs. Gibbs & Canning is prepared from fire-clay, without foreign admixture, and is burned at a high temperature, such as promises to render it very durable; the blocks are not made in the manner followed by Messrs. Blashfield & Blanchard, with cells which have to be filled in with concrete or grouting, but are chambered from behind, so that the brickwork of the wall can be built into them. It is necessary, therefore, in estimating the cost of fixing of this terra-cotta to allow for the extra brickwork necessary; but of course there is a saving of grouting and concrete, and it appears to me to make a better job than the blocks with the cells closed at the back.

The red bricks employed in conjunction with the terra-cotta were supplied by Mr. W. Cawte, of Farchim. They are very heavy and hard, having, if I may use the expression, a metallic-looking and slightly conchoidal fracture, are little absorbent, and are for beauty of tint unsur-

passed by any bricks in the kingdom. I was indebted to Mr. Gilbert Redgrave for the whole of the work connected with the preparation of the terra-cotta, as well as for his general advice and assistance in every part of the work; and Mr. Verity was charged with the preparation of the constructive working drawings.

It will be observed that on the exterior of the wall of the picture-gallery in the original design the surface was broken with decorative panels of Geometric design. It was suggested to me by Mr. Henry Cole that this wall gave a fine opportunity for a mosaic picture of figures which he thought should be considerably larger than life-size. My assistant, Mr. Townrose, on the other hand, while he approved of the notion as much as I did, was strongly in favour of reducing the figures to nearly half life-size; and Mr. Gamble, who was much consulted throughout, and who was my boldest adviser in most cases of doubt, supported him. In this conflict of views, I resorted to the counsels of the weak and prudent, and adopted the middle course, which had to my mind this recommendation. The first idea of a spectator would be that they were life-size, and although the apparent magnitude of the building might be enhanced by a reduction of the figures, it was better that such an expedient for producing effect should not be attempted, as the balcony immediately below it, with or without living persons standing on it, would certainly reveal the truth. On the other hand, I saw no reason to reduce the apparent size of the building for the sake of a fine mosaic picture. The figures, by the advice of some of the artists who undertook to prepare the designs, were finally made something over full life-size. It was at the same time arranged that the colours should be buff upon a chocolate ground, and that the outlines should be black. These points were settled in conjunction with Messrs. Pickersgill, R.A.; Marks, A.R.A.; and Yeames, A.R.A. The other artists who contributed designs were Messrs. Armitage, A.R.A.; Poynter, R.A.; Horsley, R.A.; and H. Armistead. The frieze was divided into sixteen lengths of about 60 ft. each, some artists taking two or three such lengths, and the sum accepted in payment for the work was so moderate as to entitle these gentlemen to the warm thanks of all who are interested in the application of pictorial art to architectural buildings.

This valuable series of designs is exhibited this evening on your walls. They are drawn on a scale of 6 ft. 6 in. to the foot, and the task of enlarging them to the size of the proposed mosaic reproductions was entrusted to Sergeant Spackman of the Royal Engineers, who was fortunate enough, as I believe, to make the enlargements to the entire satisfaction of the artists. He prepared small photographic negatives from the originals, and by means of a camera, illuminated with a lime-light, threw an image of the required size on to a screen covered with paper, upon which the necessary outlines were then put in with black lines. Sergeant Spackman, who is himself an artist, determined as a rule the thickness of the lines to be used, but on this point he consulted the artists whenever he was able to do so. The thicknesses of the tesserae employed in translating these enlarged pictures varied from $\frac{1}{8}$ of an inch to $\frac{1}{4}$ of an inch in five gradations.

It would occupy your attention too long to describe the process by which the mosaic workers produced the actual ceramic pictures on the walls of the building, and I have said sufficient to enable an opinion to be formed of the feasibility of the more general adoption of this species of mural decoration. I would only observe that the flat treatment in this case was not selected from a conviction that it is in itself superior to a treatment in relief for exterior decoration, but because the latter mode would have been very difficult or impossible, for two reasons:—First, it would have been hard to find a body of modellers who could have executed in the given time 800 ft. of full-size figures in relief, with the same degree of excellence as could be secured by adopting the work of the painter instead of availing one's self of the sculptor's art. Secondly, if this difficulty could have been got over, the means at my disposal were quite insufficient to have met the expense of executing the work by the assistance of the latter. The total cost of the frieze, including the designs, their enlargement and fixing, was 4,426*l.*, and its area is 5,200 square feet. Has this decoration been too dearly bought? To say that another mode of decoration would be more effective, if that mode be impossible under the

conditions of the case, will not settle the question of the mosaic flat treatment being or not being one that ought to be repeated. In discussing the question, the facility with which the artist's work can be effectually rendered in mosaic work without much artistic feeling or knowledge of the human figure on the part of the operator ought not to be lost sight of. For modelling in relief every workman employed must be an educated artist, unless the architect is satisfied that work of art shall be the characteristic of the work. May I be permitted to suggest, also, in favour of a flat treatment, that in London soot deposits and birds' nests have somewhat marred the effect of the sculptured figures in the pediments of our public buildings?

The Messrs. Lucas Brothers were the chief contractors, and the well-known character of their foremen, their boldness in meeting the views of the architect, and their ability in coping with the most formidable difficulties did not forsake them here. For clerks of the works I had Mr. Hensley, who showed the most zealous attention to his work; and Mr. Sankey, who superintended the preparation and fixing of the roof to my entire satisfaction. I was also much indebted for assistance to many other gentlemen, but I must not detain you by particularising the nature of the assistance they rendered. I ought not, however, to pass over the name of Mr. Charles Stephenson, who afforded me great assistance throughout the whole work.

DISCUSSION ON THE REPORT OF THE ROYAL SANITARY COMMISSION.

A MEETING was held at the Rooms of the Social Science Association, Adam-street, Adelphi, on Monday evening, January 22nd, when a discussion took place on the Report of the Royal Sanitary Commission. Mr. George Godwin presided.

The Chairman, in commencing the proceedings of the meeting, said that it was of the greatest importance that steps should be taken to keep the subject then to be considered before the public. We had just recovered from the alarm caused by the gloomy anticipations of what would have been a frightful loss to the whole community; and the cause of this was intimately connected with sanitary matters. Public opinion was in a state of excitement on the subject. Whether this excitement would speedily pass away with no definite result, as had been the case on many similar occasions, and whether the Legislature would act with effect, remained to be seen. It was their duty to urge the necessity for the consideration of sanitary measures, and of proper steps being taken to put matters on a better footing than now. He had heard, on other subjects, measures proposed in meetings of this Association, which at the time were not listened to by the general public, or were denounced as impracticable, but which afterwards had been generally adopted. He trusted that the present discussion, which he then invited Mr. Hastings to open, might have a good effect, and that in a matter which concerned the public good so much as the present, we might speedily see a great change.

Mr. G. W. Hastings said the Report of the Royal Sanitary Commission had a very wide scope; but in his opinion the chief points in it were, firstly, the constitution of the Board, to which it was proposed to entrust the carrying out of the measures to be adopted; and, secondly, the executive officers who were to be their agents. He was not sanguine that a complete measure of sanitary reform would be speedily passed, and he doubted if the subject could be dealt with satisfactorily in a short period of time. If one or two points could be settled in the next session, and those upon a right principle, we should have made more progress than if the whole subject were considered and settled hastily. The present arrangements in regard to sanitary matters were absurd, and often involved a conflict of authority between those who had charge of the different departments of the same work. To reconcile those conflicting local authorities, or supersede them by a better arrangement, was a very desirable thing. He had formerly expressed the opinion, which he still maintained, that in rural districts the proper authority in such matters as these was the county or its principal officers. In towns of some size the town councils might have the control, as being the best available body. In the rural districts the great obstacle in the way of improvement was the intervention of private

interests. The only way to eliminate this was to raise up an authority which would be superior to it. He thought that this authority might be confided to the Justices in Quarter Sessions. In addition to other qualifications, he believed the fact that they were not elected was an important one. The representative principle did not suit every case, and this was one to which he thought it wise not to apply it. The proposal that the present Boards of Guardians should exercise this authority in sanitary matters he did not agree with. He understood that Mr. Stansfeld was in favour of a County Board of Guardians to be chosen by the present Boards from among themselves. This plan would amount to a virtual disfranchisement of the present *ex officio* members of the Boards. Mr. Goschen's plan to give half the seats on the Board to the ratepayers, and half to the Justices, was more in harmony with his own ideas. This was a kind of revival of the old County Courts. The School Boards had been offered as a model, but these were far from being free from bias, and the objects for which they existed did not in every case have the first place in the minds of the members. He thought that should the election of sanitary Boards be confided to ratepayers, the efficiency of the arrangements would be not so much considered as the question of expense. The calm judicial mind which the Board of Justices would bring to bear upon such matters as questions of compensation, and other sources of dispute, would be highly useful. In matters which now come before these bodies, the impartial and impassive way in which they are considered, was a noteworthy fact. In the higher functions of politics, the necessity of separating the different departments was apparent, but this necessity did not exist in matters of local government. He, therefore, should not object to the union of legislative and judicial functions in the proposed Boards. In regard to the officials to be employed under the Boards, the wisest plan would be, he thought, to obtain the services of a few highly-trained men, and pay them well, rather than to endeavour to multiply officers with insufficient payments. One or two such officials would be able to serve each county efficiently. The geography of the Poor-law Unions was useless for sanitary purposes; to carry these out properly, we must follow the watersheds. There should be no such conflict as we have now; but all matters of irrigation, sewage, and such like should be brought under the notice of one authority. Each county can now appoint an analyst; and this appointment had been of great service. In like manner, the county might appoint its one or more health officers. If such a measure were enacted, it would be a step in the right direction, an instalment of a future more perfect measure. In conclusion, he hoped the meeting would not be content with the small areas proposed by the Report, but would recognise the principle that the wider the legislature the more likely it would be to work satisfactorily.

Mr. Webster, Q.C., condemned the proposed small areas, and agreed with the principle of making the watersheds the sanitary districts. He thought the Justices would make very bad sanitary administrators, and desired no half-measures, but a complete and comprehensive scheme of reform.

Dr. Rogers spoke of the impracticability of entrusting sanitary matters to Boards of Guardians. He favoured the idea of committing them to the Court of Quarter Sessions, and thought a system of sanitary inspection might be arranged with great effect.

Dr. Ramsey coincided with Mr. Hastings in nearly all his views. He thought the Commissioners had done a great work. If they had done nothing else, they had shown what was to be accomplished. He condemned the proposed multiplication of small bodies, as destructive of efficiency. The large centres of population might be treated as the counties, in regard to the establishment of local Boards. He thought, in a general way, it would be best to follow the old lines in the apportionment of districts.

Dr. Lankester agreed in the main with Mr. Hastings's remarks. He thought it was impossible to carry out the plans of the Commissioners. He could not say anything in favour of Boards of Guardians, but must confess that he was just as much afraid of justices. He thought there should be an independent Controlling Board, similar in its constitution to the Board of Works. The present action of sanitary authorities, as, for instance, in their doings in relation to the prevailing epidemic of small-pox, was highly un-

satisfactory. He desired to see a Central Board of Health established with power to enforce sanitary measures in every village.

Dr. Steward differed in several particulars from what had been said. All the arguments of Mr. Hastings were directed against the representative principle. But he thought people could not be taxed for the support of what they did not believe in. He thought we must take the present local machinery and use it as best we could. He preferred the Boards of Guardians to the Justices. The Controlling Boards should be elected directly, and not sifted through Boards of Guardians. The best area, he thought, was that of the present unions, of which combinations might be made, where requisite, by the central authority.

Dr. Little was not disposed to wait for a complete measure until people were educated.

Dr. Steward hoped whatever Acts might be passed that they would not clash the one with the other. He would refer the meeting to the joint report of the British Medical and the Social Science Associations in reference to the education question.

Mr. Frederic Hill made a few observations, concurring generally with Mr. Hastings's opinions.

Mr. Chadwick desired that the areas of districts should be extended, and these should follow the watershed. The engineer and the architect were important agents in the work of sanitary reform. We must look for improvement, in all the particulars, to the great hand-owners. He instanced the efforts of the late Duke of Northumberland in this direction as offering an example worthy of imitation. The officers he thought it was advisable to appoint by competitive examination, and not by nomination.

The Chairman said he thought no one could consider the report of the Commissioners as absurd, a term which had been used by one of the speakers, although we might not be able to agree with them in all their recommendations. There seemed to be in the meeting a unanimous opinion that Boards of Guardians were not the right bodies to trust for sanitary improvements, and that mixed Boards, consisting of magistrates and selected guardians, were preferable. He thought so too. Also that there should be superior officers of health, sufficiently paid to abandon private practice, with the Poor-law medical officers as assistants. One omission he might notice in the Report: the necessity of attention to good construction in sanitary works was not referred to. The ventilation of sewers, which should be made a law, was but just touched upon in the Report. He hoped the discussion would have some influence in the settlement of the question, especially as there was such unanimity on the main features. We could not wait till the education of the community was completed. Years had passed, and comparatively little progress had yet been made. The advancement of the human family should be the great aim of our efforts, and in our progress towards this end we should spare neither time nor money.

ON THE INFLUENCE OF GAS AND WATER PIPES IN DETERMINING THE DIRECTION OF A DISCHARGE OF LIGHTNING.*

ALTHOUGH the invention of the lightning conductor is one of the noblest applications of science to the wants of man, and its utility has been established in all parts of the world by the experience of more than a century, yet a sufficient number of instances are recorded of damage done by lightning to buildings armed with conductors to produce, in the minds of some, an impression that the protective influence of lightning conductors is of but questionable value.

The destruction, by fire, of the beautiful church at Crumspall during a thunderstorm on the morning of the 4th inst., has induced me to bring before the Society, with a view to their being known as widely as possible, some facts connected with the electric discharge which have guided me for some years in the recommendation of means by which disasters of this kind may be averted.

For the proper consideration of this subject it is necessary to make a distinction between the mechanical damage, which is the direct effect

* By Mr. Henry Wilds. Read at a meeting of the Manchester Literary and Philosophical Society.

of the lightning stroke, and the damage caused indirectly by the firing of inflammable materials which happen to be in the line of discharge.

Instances of mechanical injury to buildings, not provided with conductors, are still sufficiently numerous to illustrate the terrific force of the lightning stroke, and at the same time the ignorance and indifference which prevail in some quarters with respect to the means of averting such disasters; for wherever lofty buildings are furnished with conductors from the summit to the base, and thence into the earth, damage of the mechanical kind is now happily unknown.

Even in those cases where lightning conductors have not extended continuously through the whole height of a building, or where the lower extremity of the conductor has, from any cause, terminated abruptly at the base of the building, the severity of the stroke has been greatly mitigated, the damage being limited, in many cases, to the loosening of a few stones or bricks.

The ever-extending introduction of gas and water pipes into the interior of buildings armed with lightning conductors has, however, greatly altered the character of the protection which they formerly afforded, and the conviction has been long formed upon me that, while buildings so armed are effectually protected from injury of the mechanical kind, they are more subject to damage by fire.

The proximity of lightning conductors to gas and water mains, as an element of danger, has not yet, so far as I know, engaged the attention of electricians, and it was first brought under my notice at Ollham in 1861, by witnessing the effects of a lightning discharge from the end of a length of iron wire rope which had been fixed near to the top of a tall factory chimney, for the purpose of supporting a long length of telegraph wire. The chimney was provided with a copper lightning conductor terminating in the ground in the usual manner. In close proximity to the conductor, and parallel with it, the wire rope descended from near the top of the chimney, for a distance of 100 ft., and was finally secured to an iron bolt inserted in the chimney about 10 ft. from the ground. During a thunderstorm which occurred soon after the telegraph wire was fixed, the lightning descended the wire rope, and instead of discharging itself upon the neighbouring lightning conductor darted through the air for a distance of 16 ft. to a gas-meter in a cellar of an adjoining cotton warehouse, where it fused the lead pipe connections and ignited the gas. That the discharge had really passed between the end of the wire rope and the lead pipe connections, was abundantly evident from the marks made on the chimney by the fusion and rottilisation of the end of the wire rope, and by the fusion of the lead pipe. As the accident occurred in the daytime, the fire was soon detected and promptly extinguished.

Another and equally instructive instance of the inductive influence of gas-pipes in determining the direction of the lightning discharge occurred in the summer of 1863 at St. Paul's Church, Kersal Moor, during divine service. To the outside of the spire and tower of this church a copper lightning conductor was fixed, the lower extremity of which was extended under the soil for a distance of about 20 ft. The lightning descended this conductor, but instead of passing into the earth by the path provided for it, struck through the side of the tower to a small gas-pipe fixed to the inner wall. The point at which the lightning left the conductor was about 5 ft. above the level of the ground, and the thickness of the wall pierced was about 4 ft.; but beyond the fracture of one of the outer stones of the wall, and the slaking of the plaster near the gas-pipe, the building sustained no injury.

That the direction of the electric discharge had, in this case, been determined by the gas-pipes which passed under the floor of the church, was evident from the fact that the watches of several members of the congregation who were seated in the vicinity of the gas mains were so strongly magnetised as to be rendered unusable.

The church at Crumpsall is about a mile distant from that at Kersal Moor, and the ignition of the gas by lightning, which undoubtedly caused its destruction, is not so distinctly traceable as it is in other cases which have come under my observation, because the evidences of the passage of the electric discharge have been obliterated by the fire. From information, however, communicated to me by the clerk in charge of the building, as to the arrangement of the

gas-pipes, the most probable course of the electric discharge was ultimately found.

The church is provided with a copper lightning-conductor, which descends outside the spire and tower as far as the level of the roof. The conductor then enters a large iron down-spout, and thence is carried into the same drain as that in which the spent discharges itself. Immediately under the roof of the nave, and against the wall, a line of iron gas-pipe extended parallel with the horizontal lead gutter which conveyed the water from the roof to the iron spout in which the conductor was inclosed. This line of gas-piping, though not in use for some time previously to the fire, was in contact with the pipes connected with the meter in the vestry, where the fire originated, and was not more than 3 ft. distant from the lead gutter on the roof. As no indications of the electric discharge having taken place through the masonry were found, as in the case of the church at Kersal Moor, it seems highly probable that the lightning left the conductor at the point where the latter entered the iron spout, and by traversing the space between the leaden gutter and the line of gas-piping in the roof, found a more easy path to the earth by the gas-mains than was provided for it in the drain.

In my experiments on the electrical condition of the terrestrial globe* I have already directed attention to the powerful influence which lines of metal, extended in contact with moist ground, exercise in promoting the discharge of electric currents of comparatively low tension into the earth's substance, and also that the amount of the discharge from an electro-motor into the earth increases conjointly with the tension of the current and the length of the conductor extended in contact with the earth. It is not, therefore, surprising that atmospheric electricity, of a tension sufficient to strike through a stratum of air several hundred yards thick, should find an easier path to the earth by leaping from a lightning conductor through a few feet of air or stone to a great system of gas and water mains, extending in large towns for miles, than by the short line of metal extended in the ground which forms the usual termination of a lightning conductor.

It deserves to be noticed that in the cases of lightning discharge which I have cited the lightning conductors acted efficiently in protecting the buildings from damage of a mechanical nature, the trifling injury to the church tower at Kersal Moor being directly attributable to the presence of the gas-pipe in proximity to the conductor. Nor would there have been any danger from fire by the ignition of the gas if all the pipes used in the interior of the buildings had been made of iron or brass instead of lead; for all the cases of the ignition of gas by lightning which have come under my observation, have been brought about by the fusion of lead pipes in the line of discharge. The substitution of brass and iron, wherever lead is used in the construction of gas apparatus, would, however, be attended with great inconvenience and expense, and moreover, would not avert other dangers incident to the disruptive discharge from the conductor to the gas and water-pipes within a building. I have therefore recommended that in all cases where lightning conductors are attached to buildings, fitted up with gas and water pipes, the lower extremity of the lightning conductor should be bound in good metallic contact with one or other of such pipes outside the building. By attending to this precaution the disruptive discharge between the lightning conductor and the gas and water pipes is prevented, and the fusible metal pipes in the interior of the building are placed out of the influence of the lightning discharge.

Objections have been raised by some corporations to the establishment of metallic connexion between lightning conductors and gas mains, on the ground that damage might arise from ignition and explosion. These objections are most irrational, as gas will not ignite and explode unless mixed with atmospheric air, and the passage of lightning along continuous metallic conductors, will not ignite gas even when mixed with air. Moreover, in every case of the ignition of gas by lightning, the discharge is actually transmitted along the mains, such objections notwithstanding. A grave responsibility, therefore, rests upon those who, after introducing a source of danger into a building, raise obstacles to the adoption of measures for averting this danger.

LONDON AS IT IS, AND AS IT MIGHT BE.*

THE general aspect of the streets of London, even the principal ones, is commonplace, uninteresting, and even ugly; and, compared with the advantages gained, a very trifling expense would make an astonishing difference in this. What a difference, again, is there between London and Paris in this respect. There it is a pleasure in the best quarters to walk from one part of the city to the other: the fine broad boulevards, lined with trees, stretching in every direction; the fresh clear air; the white stone façades, rich with carving and sculpture; the tasteful shops, almost everywhere, make Paris the very pattern of a capital city. And this is my apology for referring to it so often in this paper.

The effect to Londoners coming back from Paris to their own dirty city, with its long rows of uninteresting brick-built streets, typified by Gower-street; its monotonous squares; its filth and its smoke, is disheartening in the extreme; in fact, it is only through the principal thoroughfares, such as Oxford-street, Regent-street, or the Strand, where the shops and the throngs of people afford some amusement, that the pedestrian would care to loiter in London. Those of us who live within the town usually rush about from point to point by cab, underground railroad, or omnibus, our only thought being to get to our destination as soon as possible. Thus what might be a healthful exercise, becomes a fatiguing strain on the nerves.

I do not mean to say that there is not more solid and finer architecture in some parts of London than in Paris itself, such as the clubs about Pall-mall, the mansions round Hyde Park, and several great public buildings; and in the City, too, there are whole streets of architecture which, for boldness and originality, and solidity of construction, are far superior to Parisian. But it is all hidden in narrow streets and courts, and if you were to turn up your head to look at it, you would be carried away or knocked over by the rushing crowds below; in fact, the only time to be able to really see it is on Sundays, or on the early morning or late evening of a summer's day, when those busy millions have left off their toil for a time, and drawn off to the suburbs. But all the street architecture of London, with very few exceptions, is isolated from the surrounding buildings in style and character; and very often placed where it can hardly be seen at all to advantage.

Where the Parisians have the advantage of us is in the arrangement of their towns and streets. Nothing is hidden; all can be well seen, and nothing seems monotonous or devoid of interest. Now, it is a great reproach to us that Paris should be so beautiful and London so ugly. We cannot have and we do not want here a Napoleon and Baron Haussmann, to cleave lines of street right and left, regardless of cost, and indifferent to private interest; but we ought, at least, to do our very best to find out some way to remedy the evil. Is it possible to suggest some plan, for instance, by which a walk from University College to Oxford-street, down Gower-street, might be a pleasant stroll; or a walk along either the Edgware-road or Euston-road a pleasant and interesting one? Some will say we ought to build in white stone instead of brick. This may sound very well in theory; but it is impossible and out of the question. If London cannot be made to look interesting in brick and plaster, it is pretty certain that it will have to remain in its present ugliness, unless there be some revolution in our systems of household and notions of economy. What we want is, to find some plan by which, without wholesale pulling down and building up, the existing London can be materially improved; and there are some improvements of this sort that seem to me to be obvious and easy of carrying out. The most important of these is a system of boulevards, lined with trees, in every direction, without, however, forming any new streets, or running to any great expense. No place could be more favourably circumstanced than London for constructing these useful and beautiful features of a large city. There are numerous, almost countless, broad roads in every quarter, of which I will take Euston-road or Pentonville-road as a familiar type, which has once been suburban, and have been lined in the main by private houses, with small gardens in front. As the town increases these roads become required for

* *Philosophical Magazine*, August, 1868.

* By Mr. Alexander Payne. See p. 40, ante.

shops, which are accordingly built out on the front gardens, one story high, and decorated on the top with all sorts of fantastic plaster casts, zinc-ware, &c., forming about as ugly a road as can well be imagined. Now, all that is wanted to turn these roads into magnificent boulevards would be to build the shops under the houses in the ordinary way, and to make use of the part now occupied by front gardens for wide foot-paths, bounded by trees. This might be attended with some expense in buying up the gardens; but this would be as nothing compared to the immense gain, which would entirely transform London into a new city; and it is highly probable that the property on each side of the roads would be so increased in value as to pay for the expense. Where there was much room to spare, as there would be in many cases, narrow gardens, with flower-beds and seats, might be formed under the trees; and where the underground railroad went underneath, shafts could be provided, by which that useful line would become less sulphurous and tunnel-like than at present.

It seems to me that, after clearing the air from smoke and dirt, the next urgent want is to introduce nature into London. We want nature's trees and flowers wherever we can find a place for them. The Embankment, with its gardens, and the beautiful flower-beds that have appeared of late years in the parks are steps in the right direction; but we want a great many more such steps. We want more public squares laid out as gardens, with fountains and seats. The parks are so far distant from one another that it is quite a journey to get at them; but if we had occasional public squares or gardens, however small, we could, in a long walk, put up with a dingy street or two for the sake of the gardens. I do not hesitate to say that it would be an immense gain to the occupiers of private squares themselves if they were all thrown open to the public; for instead of the privilege of paying a guinea or two for the right of entering one dingy square, and shutting everybody else out, they would have the right of entry into all for nothing; and they would also see hundreds enjoying a sniff of fresh air, and little healthy cheeks glowing, which but for that square would have been stived up in some pestiferous street, as they are now. This would be the way to educate the people, and do as much good as half a dozen British Museums. Why should not Leicester-square, for instance, be made a public garden? Is its present condition such a boon to its private owners or the neighbourhood that it cannot be given up? The lack of a place to sit down and rest your weary limbs is a terrible want in London, as at present. Let a stranger go down to the Embankment on a summer's day. He is, perhaps, tired, and wishes to sit down and watch the river; but there are no seats. Why on earth are there no seats along the Embankment? Happy thought,—ho will go into the gardens across the road: his only view, it is true, will be the well-known rinous brick buildings that uphold the architectural glory of London in this quarter; but, at least he can rest his weary limbs. He repairs to the garden, and he sees about five or six seats, each thickly studded with nursery-maids and children, who do not look as if they had the slightest intention of giving them up. A policeman, perhaps, tells him there are plenty of seats in Hyde Park; but, as he does not wish to walk three or four miles for a seat, he repairs either to the waiting-room of a railway-station or to some refreshment-room, where he purchases the luxury of a seat with a cup of coffee or a chop, which he does not want.

But, in the next place, we have many streets in London with and without shops which it would be impossible to turn into boulevards, and where we could not introduce trees or squares. Is there any way of improving this ordinary street architecture of London without pulling it down and rebuilding it. Most of our houses and shops have a facing of stone, stucco, or brick; those of stone are usually the aristocrats of the neighbourhood, of considerable architectural pretensions, and an example to the rest of the street: what is wanted is to "level up" the others (to use Mr. Disraeli's expression) to the same point. With regard to the stuccoed ones, I know of two examples, which prove that it is quite possible to make any ordinary brick house look artistic and interesting without facing it with stone or marble. I refer to Novello's music establishment in Berners-street, and to the confectioner's, in Oxford-street. Nothing could be plainer than the structural part of Novello's

warehouse, which is simple brick and stucco, but is so tastefully decorated in patterns in colour as to afford as much pleasure as many an elaborate stone building; and the same system might, of course, be pursued with any stuccoed building. The confectioner's is more elaborate structurally than the other, but far the greater part of its ornaments are in colours. This seems to me to be an entirely new and useful field for architects;—given an ordinary stuccoed house,—to make it look artistic and interesting; unless, indeed, we are to nitidly despise stucco, and decline to stoop to house-decoration of this sort as beneath our notice. If this be our line of action, we shall probably be deserted by the public, who will turn to engineers as a more useful body, and leave us to feed on the glory of our æsthetic ideas. I hold our true course to be to make the best of everything, even paint and stucco, and despise no materials, that are given us to work with; and by so doing I think we shall follow in the footsteps of the best of our predecessors. But, if stucco can be decorated, what can we do with brick? A little while since, a prize was offered to gentlemen of this Association for the best design for the front of an ordinary Gower-street house, and in answer several very pretty designs were sent in; but, I believe, in every case the idea was to pull down the front and rebuild it; and the objection to this is that it is very certain very few, if any, of the people in Gower-street will pull down the fronts of their houses and rebuild. But how are they to be made artistic and interesting without pulling them down? I confess this question seems to me a poser. I cannot imagine one of these houses in Gower-street looking interesting without pulling down the front and rebuilding it. I can only suggest,—put some flower-trays in front of every window; put some large pots or boxes in the basement area, and train creepers on trellises up the front if they will grow. Perhaps some one will be able to suggest a better way.

Time warns me I must pass on to my last point,—“That there is a want of general supervision in London from a fine-art point of view.” Nothing is more striking in London than the utter confusion and want of plan in the place taken as a whole; it is more like a collection of towns than one town, and the streets wind about and bend here and there in a sort of fortuitous manner, as if their position were the result of chance. The rights of separate individuals everywhere seem to override the public advantage, and the same is apparent in the motley architectural character of the streets. One man has his warehouse or shop built in Classic; his neighbour adjoins thereto a Gothic building, without the slightest attempt to make it accord in any way with the former one. I think Regent-street is the only street of any architectural pretensions in London which has anything like similarity or unity of design about it; in other cases the only attempt seems to be to make each separate building look well *per se*, without considering whether it is in harmony with the rest of the street of which it forms a part. Another thing most noticeable in London is the number of untidy uglinesses which mar almost every view.

If any man carries on any business in a town which is offensive to the sense of smell or hearing you can prosecute him as a public nuisance; but he is allowed to offend against your more subtle sense of sight, by putting up some monstrosity which is a perpetual eyesore, with impunity. I must say this seems to me quite as great a nuisance as the other.

Let any one, for instance, examine the different views of London on the north side of the river from the various bridges or points along the Embankment; he will hardly find a single view which is not spoiled by one of these eyesores, which would not be tolerated for an instant in the best parts of a Continental city.

What was the use of the consummate art with which Wren designed the beautiful spires of the City, in perfect harmony with his glorious masterpiece—St. Paul's—so aptly termed the “mother and daughters of London,” when every view is marred by the introduction of some factory chimney or huge gasometer, which might at least be banished to the other side of the river; or by such specimens of fine art as Charing-cross and Cannon-street Railway Stations?—the one adorned with a couple of sow's ears towards the river, and the other left in native ugliness.

I am sure I shall not be accused of exaggeration when I say that there are far more blotches, blemishes, and general untidiness about views

of London, and English cities generally, than Continental ones.

Are we to draw a deduction from this, that the English are naturally deficient in taste, as compared with other nations? This may be partly true, and the lack of unity of plan so discernible in English cities no doubt has its rise in that individuality and love of freedom which is one of the cardinal points of the English character; but I think more must be laid to the door of that strong current of Puritanism which has set in so strongly in Christendom for the last two centuries, and especially in England. If this age is anything, it is a utilitarian age. This, no doubt, is a virtue; but it has carried its utilitarianism so far as almost to despise beauty in its love for utility. Ornament of any sort, and all things beautiful, have been thought fit for Oriental and effeminate nations, or perhaps for the French, but quite beneath the notice of practical Englishmen. Fortunately for us, however, the love of beauty is a goddess and heavenly-born, and cannot be slain by any age, however fanatical,—not, at all events, while nature pays her such worship in her glorious architecture, where beauty and utility go hand in hand. Hence we see the strong reaction in favour of fine art that has undoubtedly set in. Large sums are annually spent at South Kensington and Schools of Art generally to educate the people in this important subject. So far so good; but surely the streets should not be allowed to counteract what is learnt at the School of Art.

There are several other points I should have liked to take up, in connection with this subject, such as the desirability of providing accommodation in flats for all classes; and the advantage of building houses higher, with wider streets and openings between. At present very many quarters of London are taken up with numbers of small houses, designed for only one family, but generally occupied by two or three; but these things have been amply dealt with elsewhere, and they are such large subjects of themselves that it would be quite impossible for me to go into them this evening. I will therefore close my paper simply by recapitulating what has been said,—namely, that London is dirty, smoky; that its streets are monotonous and devoid of interest; that there is a lack of arrangement and fine-art supervision; that it might become clean; that its air might be purified, and much of the smoke prevented; that the character of its streets might be entirely altered, by formation of boulevards and other improvements; and that, under proper supervision from sensible persons, its blemishes might be gradually removed, and it might become one of the grandest and finest, if not the grandest city of the world, instead of one of the dingiest; and my hope that it may and will become so must form my apology for taking up the time of the Association with a paper on “London as it is and as it might be.”

In the discussion which followed the reading of this paper at the Architectural Association, Mr. Blashill said he was afraid London could hardly be expected, as things stood, to be a clean place, even in the well-attended thoroughfares. It was a place of business of very heavy traffic, and looked upon as such by the influential people who belong to it. The English people, with power of choice, had not been a town-loving people, as our neighbours the Parisians are, for example; and this difference of sentiment had hitherto affected, and will continue to affect the question. No one, however, disputes that improvements may be usefully made. The City, for instance, seems likely to undertake the cleansing of footways within its jurisdiction; doubtless to be followed by other similar changes. As to the chimney-cowls, he was afraid that Continental cities were as badly off as ourselves. In a recent visit to Geneva, he had noticed that a chimney without its contorted piece of zinc was an exception. He was afraid Englishmen would never submit with any pleasure to dictation as to the appearance of their frechold houses; he for his part thought that attempts at uniformity in London streets were pretty generally failures, destroying the picturesque and individual character so much to be wished for, and unluckily dictating more often than not a by no means pleasing type of building for unmeaning repetition.

Mr. G. Herbert West said that one point with reference to works carried out in Paris necessary to be noted in any comparison with London was sometimes overlooked. People did not consider that the continuance of the Paris of Louis Phi-

lippe's time had become impossible; it was then a fortified city of the Middle Ages, with some modifications; change was absolutely necessary in order to open up the city and fit the communications to the traffic. Visitors to Paris saw what appeared on the surface; but those who knew it thoroughly, from living there and from long special investigation, did not feel inclined to compare it with London as in every respect superior. The main thoroughfares certainly are kept clean; but the back streets, with their narrow pavements, 1 ft. 6 in. to 2 ft. 6 in. across, and wide mud-filled gutters, are very bad; in these places Paris beats London hollow in bad weather. Again, in Paris, the street mud is washed into the sewers, a course hardly possible in those of London, which, in fact, convey little but water. Paris yet retains the cesspools that London has to a large extent got rid of, as is evident to the nose in walking in the streets after eleven o'clock at night,—perhaps the worst evil of the two. Asphaltic roads, with proper attention, may be kept clean with less difficulty than granite or macadam; but the at times dangerous slipperiness,—the impossibility of stopping in any reasonable distance a vehicle driven at a fair pace,—is a drawback felt much at Paris, as no doubt it will be here, unless in some way avoided. The old regulation in Paris that houses should be cleaned once in every ten years, might be applied to London. A jet of steam and water were used for some time, with the effect of removing about one-eighth inch of stone on each occasion. The custom now seems to be to use a sort of hearth-stoning process, and soap and water. He called attention to the portico of the Athenæum Club-house as a sample of work in London cleaned at intervals; the process pursued was, he believed, to rework all faces and mouldings, a method that must be stopped at some time. As to the smoke in Paris, it certainly was less than in London, in consequence of the different habits of the people. For 6,000 or 7,000 francs a year, an apartment would be rented containing a couple of reception-rooms, one not large bedroom, two smaller, and a kitchen; of course the accommodation for such a rental in London would be much larger, but the French have smaller families than the English, and with the smaller number of rooms fewer fires for warmth are required. For cooking, charcoal in a pan, put out when done with, is the substitute for the kitchen fire in England. Coal is burnt much more now than formerly, but wood always by preference; the ashes are habitually heaped up at the back, maintaining a fire at once economical and producing little smoke. Up to the 1st of January, 1860, when the fortifications were made the municipal boundary, instead of the octroi wall of 1784, as formerly, the city of Paris contained hardly any manufactories; and, since 1850, many have been removed, in order to avoid the octroi; thus their smoke and fumes are kept away. On the question of general aspect he could say but little for London,—he perhaps deserved all that had been said of it; but he could not praise new Paris without reserve; after a time the regularity, the long level lines of its cornices, the repetition without ceasing of similar features, coupled with painfully bad masonry construction, all tended to make even the most favourable critic heartily sick of the whole,—as a mass of pretentious mediocrity, for which had been destroyed too many of the features of the city, that, of all modern cities, possessed at one time the most noteworthy collection of sites and buildings,—lodged in the minds of all cultured people for their historical or intrinsic interest. The site of the Hôtel de la Trémouille, one of the most splendid works of the fourteenth century, is all that the inquirer after such buildings finds now. The passion for perfectly straight streets became, a while ago, a perfect mania; the Hôtel de Cluny was, it is true, saved by a *débour*,—a rare example; buildings newly illustrated in books five years before are now almost forgotten altogether. The process so thoroughly carried on in Paris could not be looked, perhaps not wished, for in London;—a personal, almost uncontrolled, direction of finances and public works like that of Baron Haussmann would not be allowed. The Project of the Seine, named directly by the Emperor, chose, subject to the Emperor's approval, the members of the municipal commission. The financial questions may be illustrated by the fact that the ordinary receipts of the city from 1852 to 1869,—from octroi, centimes communaux, estates, markets, &c.,—amounted to 40,000,000. The outlay on

works in the annexation and new parts of Paris has been 14,000,000; of the works in old Paris, 18,680,000; of the extraordinary works (the large new streets, &c.), 52,000,000; making in all, 85,000,000. In 1854, Baron Haussmann ceased to ask aid from the State; the Central Office of Works began the issue of bonds, which gave an available income of from 4,000,000 to 6,000,000, subject to the yearly consent of the Corps Législatif. This, however, was not found sufficient, and the new streets were mortgaged to contractors as they were made, and also the future income of the city. The law of expropriation, pressed well into the service by Baron Haussmann, gave his autocratic power still more scope. He had the power of taking all the property required for a new street, and a great space on either side of it. Formerly (by the law of 1841) the Corps Législatif decided on the question of "Public Utility;" but after the decree of 1852 this was decided by the Emperor alone. These few facts, and many more could be cited with the same tendency, would illustrate the arguments that might be used to show that Paris, and the public works there, in the views at least of Englishmen, might fairly perhaps be spoken of with less thorough respect, both as to the works themselves and some of the processes of effecting them, than was the almost universal custom.

DOINGS IN EDINBURGH.

There is not much appearance of activity in the building trade here at present. The demand for private residences has fallen short of the supply; and the other works on hand are few, and of no great magnitude; but there is a good prospect of a considerable number of important works being inaugurated in the course of the year.

The Gilmore-place Free Church is being roofed in; but the tower is still incomplete. Mr. Pilkington has in this instance refrained from freaks and eccentricities; there is a breadth and masculine simplicity about this church much more satisfactory than the restless efforts at originality which characterised his former works.

An Independent Church at Caltonian Crescent, Dalry, is nearly completed. It is the first effort of Mr. Alexander Heron. Funds do not seem to have been plentiful, and the building appears somewhat weak and superficial. The outline of the spire is far from pleasing. It would have been better had that feature been dispensed with, and more depth and solidity imparted to the body of the church.

The foundations for the new Infirmary have been taken out, and building operations will be commenced forthwith. This building will be of considerable magnitude, and the ultimate cost is estimated at about 200,000.

The line of new thoroughfare from the Waverley Station to Canongate, to be known as Jeffrey-street, is nearly cleared out. In this street the long-delayed Trinity College Church is to be built. The plans have been prepared by Mr. Lessels, after the style of the ancient edifice, which was erased to make way for the extension of the North British Railway Terminus. The building will be oblong in form, having a tower and spire rising to the height of 115 ft. at one angle of the main gable, and a turret starting from the ground, and roofed with stone, at the other. The chief doorway is a reproduction of that in the transept of the original, and the window above is from the same source.

The apse and two bays of the original choir, together with the clearstory and vaulted roof, will be re-erected at the rear of the new portion, to serve as a hall for congregational purposes. It is to be placed diagonally to the church proper, from which it will be separated by an ornamental wooden screen, the upper portion of the two arches being left open. The interior of the church itself will be of a common-place description, with galleries supported by iron columns ranging round three sides of it.

Another new church is talked of as being likely to be erected in Chambers-street, the new thoroughfare to the north of the college. In the formation of this street it was found necessary to demolish the School of Arts, and a new and superior building, designed by Mr. David Rhind, is to be erected, at a cost of 8,000, upon a site to the west of that occupied by the premises which have been erased. At the east end of this street it is proposed to erect a hall for the use of the University, to be dedicated to Sir Walter Scott; and a scheme for a new theatre in the same locality has been mooted. A movement

has been set on foot to have a town-hall, which is greatly needed in this city; it may also form one of the group of public buildings in this locality. Altogether Chambers-street is likely to be the centre of attraction in the old town.

The new Waverley Bridge is being actively pushed on, and when it is completed the new station will be proceeded with. This is a very desirable improvement, for the existing station is in every respect quite unworthy of the city. As the large piers of the North Bridge interfere greatly with the platform arrangement, it has been proposed to substitute an iron girder bridge for the stone one, but funds are not forthcoming. At all events, the roadway of the bridge is to be widened, and, if a new bridge be not constructed, this is to be done by throwing out projecting footpaths on either side, and adding the present footpaths to the driftway.

The trustees under the Walker bequest have at a late meeting set aside 45,000, for building the new cathedral. In this sum the cost of an organ, stained-glass windows, peal of bells, &c., is not included, so that it is not improbable that the ultimate expenditure may be double that sum. Six architects,—three from each side of the border,—have been invited to submit designs. The competing architects are Messrs. Scott, Street, and Burgess; Messrs. Peddie & Kinnear, and Lessels, of Edinburgh, and Mr. Ross, Inverness. We trust that this competition may lead to a more satisfactory result than has been the case in some recent instances of a like nature. A complete scheme for the allocation of the remaining part of the trust funds, which are to be employed in erecting and endowing additional churches, has been agreed on, but it has been thought desirable, before taking further steps, to have the opinion of counsel upon certain doubtful points.

The Union Bank of Scotland have acquired an extensive frontage in George-street with the view of building new premises there, which, it is said, are intended to equal if not to surpass in grandeur the other banks in this city; and probably no city in the world can show such an array of palatial edifices devoted to this purpose. Mr. David Bryce is, we believe, likely to be employed as architect.

Ramour has it that a new insurance office is to be erected at the angle of St. Andrew-street and Register-street, an excellent site for architectural effect.

The Tramway Company are anxious to push on the remaining portions of the line of rails, but they are not at one with the local authority. The steep gradients in many parts of the city have proved obstacles to the satisfactory working of the tramways; during the existence of hard frost it was with great difficulty that the large carriages were drawn up Leith-street, even with the aid of extra horses; lighter cars should be provided.

THE DUKE OF EDINBURGH'S COLLECTION, SOUTH KENSINGTON.

His Royal Highness the Duke of Edinburgh has obligingly sent to the South Kensington Museum the drawings made in illustration of his cruise round the world in the *Galatea*, by Mr. Brierly and Mr. Chevalier, together with selections from the objects of science, art, and curiosity collected in the course of it. The catalogue which has been prepared shows that there are 37 sketches by Mr. Brierly, 36 drawings by Mr. Chevalier (both the artists have done their work well), and 781 objects in the general exhibition. The collection, as a whole, is full of interest, regarded from many points. Some will be struck with the evidence it affords of the eager kindness with which the Queen's son was received throughout the colonies and dependencies of the empire; others will regard it as a valuable indication of the disposition and tastes of the owner, and of his consideration for the general pleasure; those who look closer will see that it affords many important lessons to our own people; while all will find it an interesting exhibition of things curious and beautiful. It has been well set forth by Mr. T. Clark and Mr. C. Fowleshand, of the Department; the birds, of which there are two grand cases, were arranged by Mr. Ward, the naturalist, and the arms, a beautiful collection, are shown in the shape of trophies, at the suggestion of the Duke himself, Messrs. Wilkinson & Co., of Pall Mall, assisting. Some of these arms present exquisite specimens of enamelling, metal chasing, mechanical ingenuity, and coloured decoration.

The articles from Japan include works in bronze, black and gold lacquer, and textile fabrics, unapproachable in this country. Notice, for example, the bronze incense-burner in three stages, given to the Duke by the Mikado (102); the box, of black and gold lacquer, containing various graces (559); and the remarkable dress of blue crapes representing the sky, and graduating downwards to a sedge landscape at bottom, with birds flying. However, we have no intention now of pointing to all that is noticeable in the exhibition; our object is to send our readers to study it for themselves. We will only add that the collection of gold and silver trawls, jewelled and mother-of-pearl and malachite, with which first stones of public buildings were laid in our colonies, is a marvel; and in viewing the engrossed addresses that chronicle the events the expert will notice with surprise the skill with which some of them are illuminated.

ALTAR VESSELS FOR ST. PAUL'S CATHEDRAL.

In 1810 the altar-plate belonging to St. Paul's Cathedral was stolen, and from that time to this copper gilt vessels have been used. At the cost of several persons, silver gilt vessels have now been prepared by Messrs. Lias & Son, of Salisbury-court, Fleet-street;—a large chalice, the gift of the Rev. W. J. Hall; two chalices and patens, presented by the Rev. W. Sparrow Simpson, F.S.A., who has taken particular interest in the work; other chalices and patens given by Miss Hale and Mrs. Melvill; and a large and costly alms-dish, presented by Mr. Joshua W. Butterworth, F.S.A., in memory of his late father; and some of the other gifts, we should say, are also in memoriam. The chalice (No. 16) is high, chased with wheat and grapes, relieved by bright flutes, in the style of the Renaissance; the body enriched with six medallions, containing the symbols of the Passion—the Cross, the Agnus Dei, the Scourge, the three Nails, the Crown of Thorns, and the Sponge and Spear; the foot ornamented to correspond with the body, with six medallions, containing the sacred monogram, the Chi-Rho, the open scroll, the pelican, the arms of the cathedral, and the crest of the donor* and the chalices are handsome and appropriate; the art a little weak, but the manufacture very good.

By far the most important production is Mr. Butterworth's Alms-dish, which is 2 ft. 3 in. in diameter. The centre subject is after Raffaele's cartoon, St. Paul preaching at Athens, chased in high relief; the border being after a guilloché in the chancel of the cathedral, with medallions containing scenes in the life of St. Paul.—1. St. Paul healed by Ananias. 2. St. Paul healing a cripple. 3. St. Paul raising Eutychus. 4. St. Paul before Agrippa. 5. St. Paul at Melita; and the arms of the donor. The work is *reposé*. The least satisfactory parts of the central subject, are the head of Paul, and the circular temple in the background. The right-hand side of the latter is so messed by the modeller, that it ought certainly to be altered before this otherwise fine dish be transmitted to its destination.

NOTTINGHAM SCHOOL OF ART.

The annual distribution of prizes in connexion with this school has taken place in the Exchange Hall. The Mayor (Mr. W. G. Ward) presided, and there was a large attendance.

A letter from Mr. Cole, of the Science and Art Department, who was to have presided himself, was read, in which

"he congratulated the town of Nottingham on possessing one of the very best Schools of Art in the country; and also said:—The town must adopt further measures for maintaining this position and extending the influence and advantages of further art-education, by the establishment of a Museum of Science and Art especially illustrative of those industries which have given to the town an eminent position it holds among the great manufacturing centres of the United Kingdom. . . . The School of Art already possesses suitable space for the commencement of such a museum. . . . The municipal authorities must incur the liability for the cost of watching, cleaning, and lighting the museum; and if this be done, Nottingham, within a few weeks from this time, might have a South Kensington Museum in its town, open daily, and for three evenings a week for the instruction and ennobling recreation of all classes. I say 'liability,' because the fees for admission on three days in the week would certainly yield some revenue. This revenue might be made adequate for all purposes without, perhaps, drawing upon the rates, if the entry and the manufacturers of the town would take a

* Since this was written, we have been informed by Messrs. Lias that, recognising the correctness of the objection we took on examining the work, the parts in question will be altered,—a determination very creditable to them.

sufficient number of annual tickets of admission for the students' day, say at 1s. and 10s."

The Mayor, in reading this part of the Report, said he could not sit down without bearing his testimony to the able services rendered by their excellent head master, Mr. Rawlin. From the Report, it appeared that,—

"In the annual Government examination, held last May, the Nottingham school again headed the list, making the fourth consecutive year that Nottingham has obtained the highest number of prizes among all provincial schools. In May last, however, the school took a much higher place, having not only beaten all provincial schools, but all the London schools, taking two more prizes than were taken at the National Art Training Schools, South Kensington Museum. In the prize bonus awards to art-masters this year Nottingham has taken the highest prize among all provincial schools. The first two prizes were taken by London schools; then the next eight were in the following order:—Nottingham, Manchester, Edinburgh, West London, Birmingham, Salisbury, Sheffield, and Glasgow. During the four years that bonuses have been given to head masters, it will show how greatly Nottingham had done its work when they found that in that time the master of the Nottingham school had taken 1701, in prizes, or 29¢ more than any other school in the kingdom, including the London schools."

Mr. Bowler and the head-master also addressed the meeting. The latter said:—

"It has ever been a source of regret to me that employers of labour and artisans could not feel more alive to the necessity and importance of a more widely-spread art-education. The race for pre-eminence between certain nationalities is now a very close one. We do not bridle ourselves up for the contest, we shall perhaps by-and-by, find that the laurels of success have been won by others. We are now enjoying unparalleled prosperity, and yet as a nation we are doing far less for art, in position and means would justify quite us to do. True, the country has one thing to be proud of, and that is the existence of that palace of art-treasures, the South Kensington Museum; and for the possession of which we are so deeply indebted to Mr. Cole, for it is in a very great measure owing to his efforts that the museum holds the proud position which it does. But we need more than that; the country should aid the action of the Science and Art Department still further, and not only give ungrudgingly that is necessary for the improvement of that museum, but also give with a bounteous hand for the purpose of erecting a young South Kensington Museum in each of our great provincial towns, that the seeds of art and refinement might be sown in many a soil now comparatively barren."

TRAVELLING IN RUSSIA.

COL. RICHARDSON GARDINER, whose handsome offer in respect of the one-day-to-be-misused statue of Shakespeare we had occasion to mention some time ago, has sent us notes of a journey recently made by him to the Russian capital, which will doubtless interest some of our readers:—

"At eleven p.m. we took our places from Berlin to St. Petersburg,—two nights' and two days' travel. Let us look about us and see what our arrangements are. L. and I have a double compartment-carriage, each opening out into the other by a door between; the one making up into beds for the night, and the other forming our compartment for day, all headed most genteelly by hot-water pipes laid on from the engine boiler. Good. Our commissionaire, whom we sent to engage this extra comfort for us, carried out his instructions well. Our companions have a large saloon carriage, heated by a wood-burning stove, and all of them are seated round it smoking their cigars.

Now, I have no doubt hundreds of English railway directors have travelled on these German lines, and if they are not deprived of the means of observation they must have noticed many little things,—small in their way,—but calculated to be of great service and convenience to railway travellers, which they might have very easily introduced on their own railways. *Here's one!*—In this North Prussian carriage there is a partition-board card, about 1 ft. square, headed "Fahrplausung" (travelling plan regulations), and underneath, "Aufenthaltszeiten" (stopping times), and it proceeds to give you, for the train you are in, its time of arrival at the stations, time of departure, difference carried out in another column as stopping time, and all times between six p.m. and six a.m., have a blue shade painted across them, leaving them quite legible, but not ended to show you that those are night times, without adding the p.m. or a.m., which sometimes carried through two or three days and nights, confuses you. It is well known that the Jews begin their day at six a.m., and their night at six p.m., each lasting twelve hours. The recurrence to this old mode of dividing the day and night, and the darkening of our railway time-tables. On another side you are informed where there is to be a *table d'hôte*, and other species of refreshment, what are the "Schlafvorrichtungen," or sleeping arrangements in the carriages, and the "Zollabfertigung," or revision

of luggage in the custom-houses, besides other information valuable to the traveller on the line.

Here we are at Dirschau, a town in ancient Poland, and crossing the frozen Vistula, a river familiar to my school days, and now we are going over its magnificent bridge, half a mile long, leaving Dantzag on our left, where the deals come from; and now we look out for Marienburg, and its Palace of the Ancient Grand Masters of the Teutonic Order, who nearly had their own house about their ears on one occasion when they were besieged in it. The *Meisters Kenter*, or chapter-house of the order, in which assemblies of the order were held and foreign ambassadors received, for they were great Swells in those times, rests on a single pillar of granite in the centre. The Poles, while besieging the city in 1410, endeavoured to aim a cannon ball so as to shoot away this pillar, and overwhelm at one blow beneath the ruins, the Grand Master and all his Knights, whom they knew from information of a deserter, to be at the time assembled in conclave. *The ball missed its aim, but lodged in a corner of the chimney, where it still remains.*

Königsberg, once the capital of Prussia—proper, and now third city in the Prussian dominions. There in the *Schlosskirche*, Frederick, Elector of Brandenburg, in 1701, placed the Crown on his own head, assuming the title of Frederick I., King of Prussia, just as the present King William of Prussia, and now Emperor of Germany, is reported to have done when he came to the Throne, and coroneted himself by the Divine will, following the example of his ancestor. I am informed there is a considerable quantity of amber found all along the coast near Königsberg, and this is how they get it. The high winds throw up a vast accumulation of sea weed. The amber-fishers go up to their necks, provided with nets, by which they draw the weeds to land. The amber occurs in the lower beds of the sea sand extending under the Baltic, and when the storms bear up the amber earth, the amber is carried to the surface.

My observation (limited, certainly, but, as far as it goes, trustworthy) is that the Russians are beginning to be jealous of the Prussians and their late doings, as the Prussians seem to be giving themselves 'airs' everywhere, which creates an antagonistic feeling in the persons 'aired,' and is not calculated to inspire them with a peaceful feeling towards their 'airers';—so do not let us be so sure that the French people and the French press are insane in imagining that some day or other the Russians and French may become allies; but here is the *bona fide* frontier at last, and we step out on Russian soil at Bierzobolow. Bravo, you Russian Tartars! I like the look of you! 'Good buffet, and plenty of time for refreshment!' 'Change carriages; passports and luggage examined.' All right; we have only nine large portmanteaus and boxes in the van, and twelve little parcels in the carriage, which have altogether cost to St. Petersburg a mere trifle of 18l. or so in excess of the allowance. I would not be so mean as to say that L. had had anything to do with this 'limited' baggage; however, business first and pleasure afterwards, so we at once go about our luggage. Before I go into that buffet, I will perform my first duty towards the Russians, by suggesting to any English custom-house officer, that *here*, in what our true-born Briton might call an outlandish place, he would learn a good lesson as to how his duty ought to be performed. First of all, everything in Russia is colossal and yet convenient, and we find that in a spacious *douane*, surrounded by a circular counter, numbered in divisions, without any hurry, bustle, or confusion, all our luggage is taken by the porters to a certain definite place, corresponding in duplicate to our numbered register-ticket; there the van luggage is deposited, and to the same place all the small parcels find their way; the officer on duty specifies to his *douaniers* what his requirements are, and, finding that we are a party of British subjects travelling for pleasure and not for trade, he deals most gently with our wardrobe, barely regarding even some new ball-dresses, which L. had had separately packed by the milliner, fresh from her establishment, in large deal boxes.

In to the 'refreshment department,' as poor Charles Dickens called it, and found there yet another example for our English 'Mugby Junction.' Half a dozen hot viands to choose from, accompanied by soup, coffee, or wine, and all of the best quality and description, served at a moment's notice, on table-cloths white as snow, with most attentive and respectful waiters; add

to this lavatories, with the requisite accompaniments of soap, towels, &c., and I leave you to judge of what has been talked about as barbarous Russia. Here we are, on our first introduction at a frontier station, finding more civilisation than has happened to my lot in many an old country through which I have travelled.

Wierzbolow, I find, is 560 miles from the capital, where we shall arrive to-morrow evening: so we are beginning to be near the end. And now time is up, and we must get ourselves into Russian railway quarters for the first time. Now let me next make a survey of a first-class railway carriage: here it is before me, and it appears to be something entirely novel. It has two ends and a middle. Well, so have most things; but how are they arranged? At each end there is a compartment for say, five sitters, but comfortably containing only three passengers, and the middle has four small square compartments (two on each side of the centre passage), large enough for one comfortably to curl up and sleep in, although evidently intended for more. Well, now outside, just in advance of the end compartments, there are doors by which you enter a cross passage, leading to a centre passage, which leads to your respective departments, so that by taking for L, her mail, and myself, one end compartment and the others taking out themselves the four centre small compartments, we leave the other end for stray passengers on the way, or others getting in at Wierzbolow. There are two stoves, one of which is fixed in the interior division of each of the end departments, so that half the stove is in the carriage, and the other half in the cross passage, and as the temperature was about 70° Fahr. on entering, we began to think we should not, at all events, suffer from cold on our journey.

If you can follow this plan you will perceive that our party were all, as it were, together under one roof, and that we could pay each other visits in our respective cabins, as our lumbering, oil, rolling, but still comfortable carriage, put me much in mind of a steamer of the olden time; and its wheels, as they rolled over the frozen rails, sounded just like the paddles beating against the waves.

We strongly objected to be stifled with heat in Russia, where we had expected to have met our fate by frost, and I addressed myself to the "storekeeper," who accompanies every first-class carriage, to reduce it by machinery which they have for that purpose; so I "unearthed" our Russian fireman from a corner of the cross passage, in which he had doubled himself up for a nap; and now began a series of amusing signs and symbols, which continued, with varied intermission, between this interesting old man and myself during the next twenty-four hours of our journey. He was a character in his way, and seemed to be a Russian originally from the far interior of Siberia, of the Tartar race,—brawny and muscular, with high cheek-bones, small bright eyes, terribly shaggy hair, and a face as broad as it was long,—a complete parallelogram. We soon got friends after arranging the stove.

550 miles from St. Petersburg, at 'Kuwno,' where, on the 22nd June, 1812, the French army crossed the Niemen on their advance to Moscow, and some rising ground on the opposite bank is still called Napoleon's hill. The town of Kuwno was occupied by a large corps *d'armée*, and suffered considerably. The remnants of the army recrossed the river at the same spot on the 13th December, in a very bad state of discipline. There is a monument existing commemorating this retreat, and bearing the following inscription in Russian, which, translated, is as follows:—"In 1812 Russia was invaded by an army numbering 700,000 men. The army recrossed the frontier numbering 70,000."

111 miles from St. Petersburg, at 'Wilna,' occupied by the French on the 28th of June, 1812. It had been evacuated by the Russians during the night. The Emperor Napoleon occupied in the Episcopal Palace the rooms which the Emperor Alexander had left the previous day. The country all along here is covered with snow, so I cannot form an idea as to its cultivation; but the villages are few and far between, and those do not exhibit any high degree of prosperity. They are mostly composed of wood, somewhat resembling, only in a poorer degree, the Swiss mountain chalets. Birds are scarce, not liking, probably, to face the deep snow. We have only seen two magpies for miles; but as the old couplet says, one magpie is sorrow, two mirth, three a wedding, and four a birth.

Between stations separated by long distances,

we amuse ourselves with the contents of the picnic-basket, and having Liebig's essence and Fortnum & Mason's compressed beef tea, with other delicacies, our Ena boils up some water, and we get a capital entertainment in the Swiss Family Robinson style. Our cabins are now kept by our old friend at a delicious temperature; but when we issue forth at a station, we all don our complete suits of furs, as the air is nipping cold, but full of oxygen and ozone, as the country is overlaid for hundreds, and even thousands, of miles with its wintry covering of snow, and we are warned by a notice not to put our heads out of the little window of our cabin, which is only 1 ft. square, as '*Cette impudence pouvait avoir des conséquences graves.*' But with our shubas, caps, boots, and gloves, it would be impossible even to feel a shiver with many more degrees of frost than we have had yet.

We get most delicious coffee at the buffets, and still more delicious tea, served in tumblers for the gentlemen, and cups for the ladies, with milk that the Russians are not yet sufficiently civilised to adulterate with unwholesome materials; and notice is given you of the starting of the train by three bells first pealing outside the station, and repeated by an official at the refreshment-room door, rung successively at intervals of a few minutes,—the first, a notice; the second, a warning; and the third, we're off. All along the line the men live in wood huts, which are all numbered outside with white paint, starting from the capital, so you can count off your approximation to the end of your journey as you get along. And now the numbers are gradually diminishing, until, at length, St. Petersburg bursts upon our view, with its colossal public buildings, its gorgeous palaces, churches with gilded cupolas, and sleighs with fast-trotting horses are awaiting us, into which we get with alacrity, leaving our luggage to the commis-sionaire of the hotel to bring after us, and drive off at the rate of twelve miles an hour over the frozen snow to the Hôtel de Russie, where we find, as we ordered by telegram, warm baths, comfortably-heated rooms, a dinner *à la Russe*, all awaiting our kind attention."

HOSPITAL FOR SICK CHILDREN, GREAT ORMOND STREET, BLOOMSBURY.

The Hospital for Sick Children, now about to be rebuilt, from the designs of Mr. Edward M. Barry, R.A., occupies a site of historic interest, and is peculiarly appropriate for a medical charity. The old house was the dwelling of Dr. Meade, the county Court physician, the Mæcenas of the men of letters of his day, and that of Addison, himself a wit, as well as a doctor of great repute, whose name, however, lives in Sir C. Hanbury Williams's line.

"Health waits on Meade's prescriptions still," as much as, or perhaps more, than in his medical works, now seldom read, although well worth the reading.

The house had a spacious garden twenty years ago, well furnished with shrubs and fruit-trees. The vines bore grapes, and the large hothouse was still standing when the new era in the history of the place began. The marble-flagged dairy exists still. The stables opened to the fields, and less than 100 years ago the horseman could mount and ride through green hedges all the way to Highgate, whose village steeple still forms the most striking object seen from the upper windows.

Bit by bit the old house has put on a soberness as it has longer served its present purpose. The gilded cornices have been discompered, the pictured panels of flowers and shepherdesses have been exchanged for a modest grey; but yet an incongruity has been unavoidable between the style of the building and its uses; for it has not grown fitter for its present purpose in the same proportion as it has lost its old quaint beauty. Deep cornices collect dust; wooden and painted walls are difficult to clean; warming and ventilation are hard to carry out properly; and, worse than all, a life of 170 years tells upon houses just as the customary three score years and ten do upon man. And so, with ever-increasing demands from the poor, which are not nearly met by the increase of beds from twelve to seventy-five, and with the constant need of yearly repairs, to keep the old hospital even habitable, the committee have determined to rebuild by degrees, as means are afforded them by the generosity of the public. That which it is now proposed to build is the

central block, which will contain most of the offices, the dispensary, operating theatre, chapel, and arrangements for the extensive out-patient department, on the basement-floor; and this plan has the great advantage of leaving the existing buildings almost completely undisturbed, and so of allowing the internal working of the hospital to go on without interruption.

Had the site been a larger one, the arrangement would in many respects have been different, and the problem to be solved by the architect much easier.

Before describing the details of the building, a few peculiarities may be mentioned as required in a children's hospital, which would be less necessary in a hospital for adults.

First. The out-patient accommodation needs to be more extensive and more complete in a hospital for children, because each patient requires a grown person to take charge of him, which, even if two or three should be brought by the same adult, the increased risk of confusion more than makes up for the saving in space occupied. Hence the need for special arrangements to prevent crowding, and to avoid the meeting of a double current of patients.

Secondly. Considering the liability of children to some forms of contagious illness, it becomes necessary to provide a separate waiting-room for patients on their first application, in order that as they come they may be immediately inspected by one of the medical officers, and thus will contagious ailments be separated from the others, who will be at once sent to one or other of the two large waiting-rooms, according to the physician or surgeon under whose care they are to be placed.

Thirdly. In connexion with the wards themselves, in addition to the bath-room and water-closets which are needed in all hospitals alike, it is very important to provide a ward-kitchen, where milk, beef-tea, and the various little articles of food so much needed for children can be kept in readiness day and night without the necessity of sending to the kitchen. It is also necessary to provide a vestuary in connexion with each ward, in which not only the ward linen, but also the children's own clothes can be kept, so as to secure perfect neatness and order.

It will be observed that there are no nurses' rooms in communication with the wards, because in children's wards nurses when present are always on duty; while they take their meals in a common room, and sleep away from the wards. The allowance of cubic space to each patient in the wards is in no case less than 1,000 ft.

The small separate wards speak for themselves, as being needed for special cases, while the quarantine ward at one end of the north wing is intended for the reception of cases of doubtful illness until the question of their nature is answered, when they will either be removed to the adjacent but detached fever ward not yet erected, or be restored to the general wards of the hospital.

The centre portion of the building in Powis-place is now in progress.

The out-patients' baths, the special arrangements for convalescents, and many obvious wants, are intended to be supplied, as shown in the plan, as soon as funds enable the committee to pull down and rebuild the two houses, 18 and 19, Great Ormond-street, which, as already said, are left for the present untouched.

Mr. John Walter, M.P., always ready for a good work, has consented to preside at a dinner in aid of the funds of this Institution, on the 7th of next month, and will, we hope, be well supported in his appeal for help.

The Princess of Wales has visited the hospital, and has sent presents of toys, &c., as have others of the Royal Princesses.

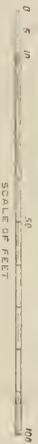
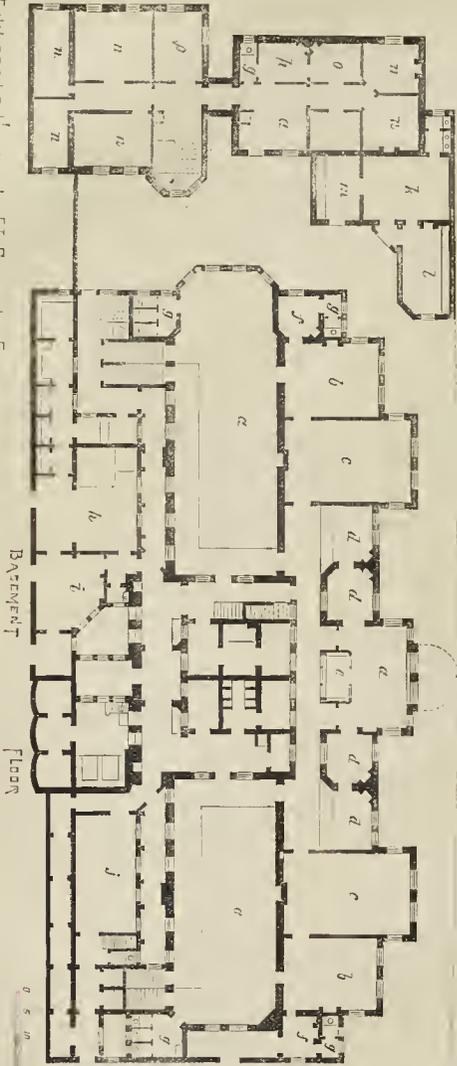
REFERENCE TO GROUND FLOOR.

- | | |
|-----------------------|--------------------------|
| A.A. Hall and Stairs. | J.J. Separate Wards. |
| B. Chapel. | K. Lady Superintendent. |
| C.C. Wards. | L. Ladies' Common Room. |
| D.D. Ward Kitchens. | M. Housekeeper's Office. |
| E.E. Vestibules. | N. Secretary's Office. |
| F.F. W.C.s. | O. Nurses' Day-room. |
| G.G. Bath-rooms. | P. Committee-room. |
| H. Porch. | |
| I. Nurse's Room. | |

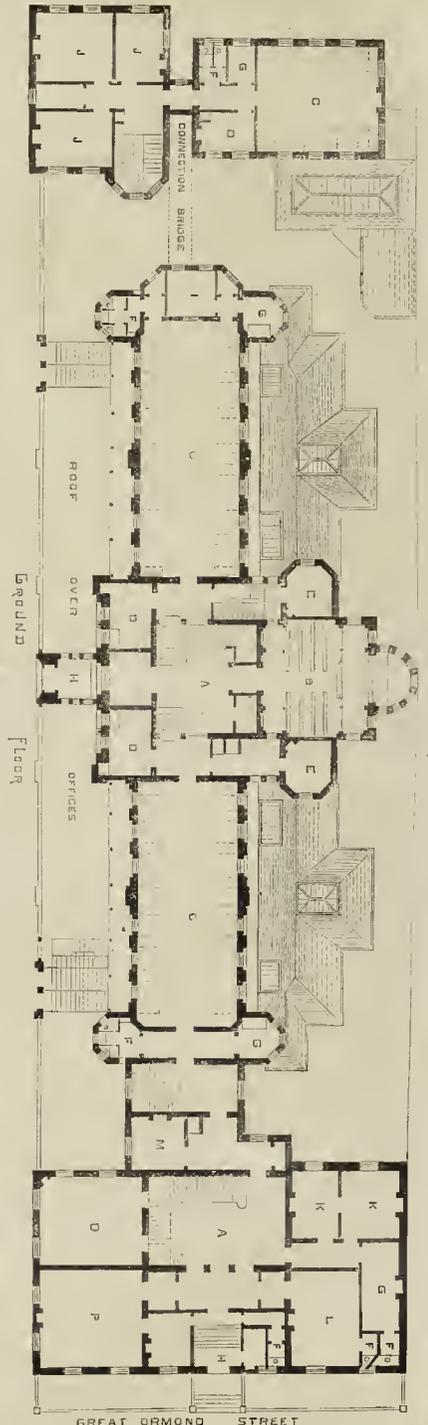
BASEMENT FLOOR.

- | | |
|----------------------------------|--------------------------------|
| a.a. Out Patients' Waiting Hall. | j. New Patients' Waiting Room. |
| b.b. Consulting-room. | k. Post-mortem. |
| c.c. Second Waiting-room. | l. Study and Museum. |
| d.d. Dispensaries. | m. Dead House. |
| e. Stairs. | n.n. Servants. |
| f.f. Medical Officer. | o. Dispensary. |
| g.g. W.C.s. | p. Medical Officer. |
| h. Kitchen. | q. Lobby. |
| i. Scullery. | |

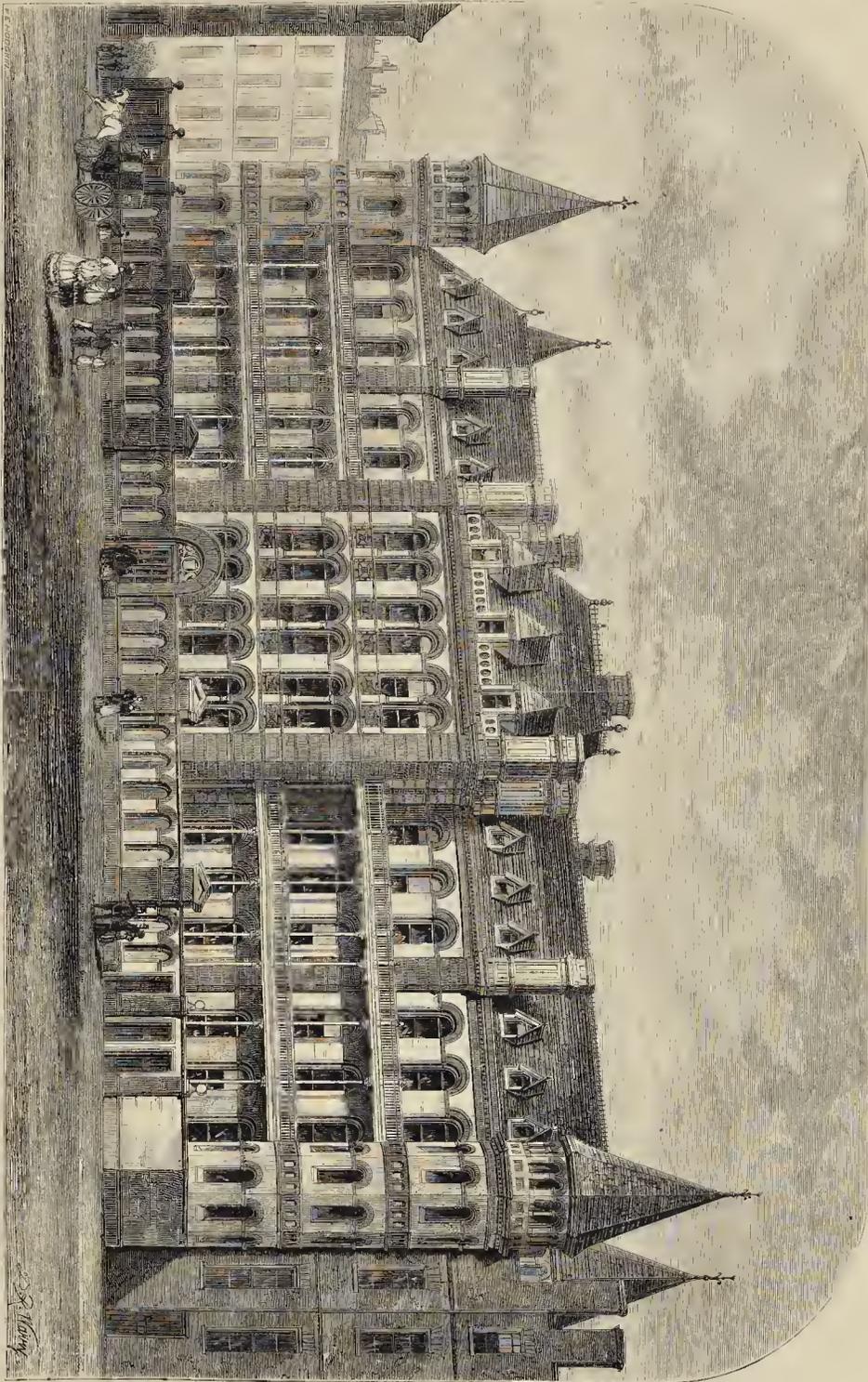
CHILDREN'S HOSPITAL, 17, GRAFTON STREET



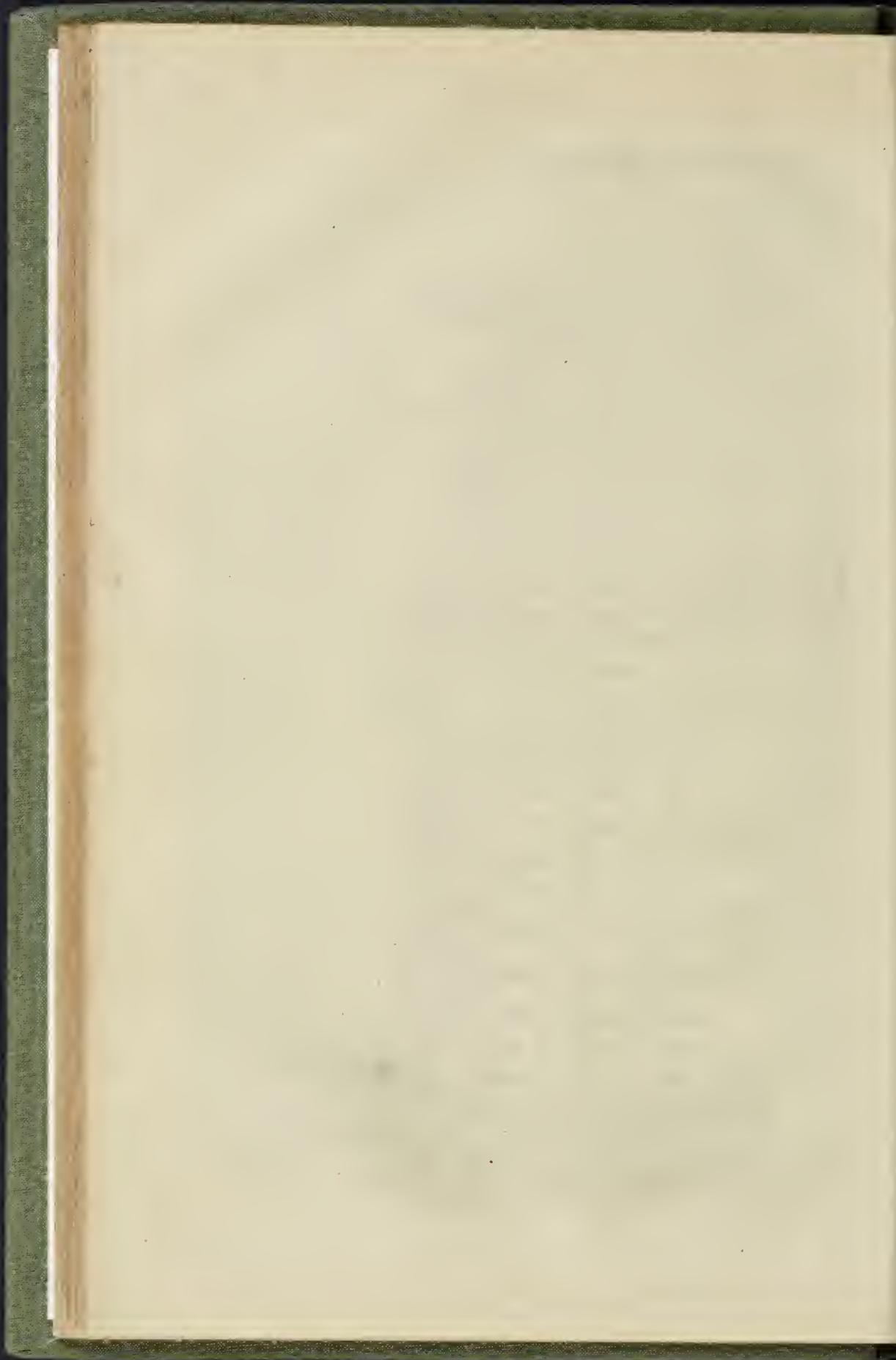
GREAT ORMOND STREET



GREAT ORMOND STREET



THE HOSPITAL FOR SICK CHILDREN, GREAT ORMOND STREET, BLOOMSBURY.—MR. EDWARD M. BARRY, R.A., ARCHITECT



BUILDING ON THE PEABODY ESTATE AT BRIXTON.

BUILDING on a large scale is now going forward on the Peabody estate, at Shopberd's-lane, Brixton. This estate, comprising sixteen acres of land, which was purchased, some seven years ago, by the late Mr. Peabody himself, in connexion with his philanthropic intentions of erecting dwellings for the working classes, has for some time remained a waste, but recently the trustees, instead of building upon it themselves, have commenced letting it on ground-rents, and dwellings of a class somewhat above those known as for the poor are being erected in large numbers, according to plans and conditions laid down by the trustees. Several streets have been laid out, and we understand that the entire number of houses on the estate will shortly be about 500, being equal to a population of something like 3,000. It is stated that the trustees have decided to spend the large income which these ground-rents will produce in erecting, from time to time, blocks of houses in different parts of the metropolis, similar to those in Blackfriars-road.

MR. EDWARD WALTERS, ARCHITECT.

We hear with regret that Mr. Edward Walters, of Manchester, died on the 22nd inst., at Brighton, after a few days' illness. He was architect of the Free Trade Hall, Manchester, and had a very extensive business, chiefly in the building of warehouses, many of which, as we have before had occasion to say, are of considerable merit. Mr. Walters had retired from the active pursuit of his profession for the last few years, but his business is still carried on by some of his former pupils. We shall give particulars of his career on another occasion.

NEW METROPOLITAN RAILWAYS, TRAMWAYS, AND MISCELLANEOUS IMPROVEMENTS.*

FROM year to year the number of permanent lines of railways, and in recent years of tramways, sanctioned, or actually opened, in the metropolitan district, increase in the aggregate mileage; but many of the proposed improvements shown in parti-colours, one year after another, disappear in succession, or the map of proposed improvements published annually by Mr Stanford would become so thickly lined as to be illegible. In recent years a notable change has occurred in some of the principal features of the publication. The lines of colour that ran abtwart the map in various directions related almost exclusively to railways, with portions of colour in one place and another indicating miscellaneous improvements. This year the tramway lines opened, sanctioned, and proposed, are distinctively indicated in blue colour, and, in the aggregate preponderate greatly over the proposed railways. The most obtrusive indications in red colour in this year's map relate to street and other improvements, chiefly public thoroughfares and markets, and are proposed by the Metropolitan Board of Works.

The most important new railway proposed, as shown in the map, is the Mid-London, of nearly nine miles in length, traversing London between east and west. For this important scheme the large amount required by standing orders to be deposited, has been, we learn, duly lodged. The other new railways proposed, include a London & North-Western extension from West Ham to the Victoria Docks; alterations in the South-Eastern direct line between Greenwich and Woolwich, including a diversion of the southern outfall main sewer at Greenwich; also a connecting curve between the South-Eastern and the London, Chatham, and Dover lines at Blackfriars; a junction between the Waterloo Station of the South-Western and the Blackfriars Station of the Chatham and Dover; with a few other projects, some of which are not likely to be further heard of, more than one of them being already, indeed, defunct. The plans for new railways, as lodged Nov. 30, embrace twenty-nine branches, and about thirty-nine miles of new lines.

The metropolitan tramways that will come under the consideration of Parliament embrace 185 branches and 116 miles of line. Three of

the projects are to be proceeded with by Bill. These are the Exhibition subway; London, Streatham, and Croydon; and the London Street Extensions; &c.; including the Oxford-street route, and eighteen miles of street tramway, in all. The London and Croydon Bill is for 9½ miles of line. One new provisional order tramway scheme is indicated for six branches and nearly two miles of new lines. Three Tramway Bills, which were suspended by order of the House of Commons, July 18th last, will be revived. They are for 57 branches and 22 miles of tramway. The consideration will also be resumed of eight other tramway projects that came under the Provisional Orders Suspension Act, 1871. They are for 86 branch tramways and 65 miles of line. The tramways of the longest mileage are, to Watford, by the Common Road Conveyance Company; to Croydon; to Southam, Ealing, and Shepherd's Bush; to Kensal Green, and to Fulham. The North Metropolitan Company has received Parliamentary sanction for the laying of many miles of tramway, as shown by the map, that are not yet constructed.

The miscellaneous improvements include, amongst others, the Admiralty and War Office rebuilding; Brighton and London sea-water supply; Holborn Valley and Farringdon Market improvement; Leicester-square Market and improvement; Newport Market and approaches; New Mint building site; metropolitan street improvements; Serle's-court and Cook-street improvements; and the Temple Subway.

The map is one of the most interesting that has appeared.

ABOUT A NEW STYLE.

SIR,—The cry for a "new style" is so loud and continuous that it cannot be passed by without notice, and hence we find that almost as often as the cry is raised has the attempt been made to satisfy it. How far successful, the greater part of your readers know. Now, although I am going to lay a plan down for this nineteenth-century English want,—we do not find it abroad,—I must say that the cry and the response are equally the offspring of ignorance of all history, as well as ignorance of and feeling for art. As well may the Bojesmen be able to spring at once into a high state of cultivation without the necessity of passing through those intermediate stages, as much required by a reasonable being before being convinced, as by the necessity for the convincing example of others more civilised than himself, as that a new style can at once be invented possessing all those æsthetic qualities required by the true canons of art, without the blast of ages and the refining influences of many workers.

In this age of iron and glass it has been suggested that those materials should form the foundation of an original architecture. To some extent they will, but iron for art is a terribly hard substance, and glass is a brittle one. The former for the purposes of art is little superior to the latter. Architecture, to be worthy of the name, should be unornamental, should last for ages, should upon every portion bear the mind of the different artists employed, should be fashioned by the hand of the cunning workman in stone, embellished by the sculptor, and glorified by the colourist. Iron and glass will never fulfil the conditions required by art, nor can wood, since it is too easily destroyed for any great art-work to be devoted to it. This more especially as regards edifices. Wood-carving, we know, was raised to a high pitch by our old Mediaeval workers, and in modern times by Grinling Gibbons; but much of the former has been devoured by time and destroyed by man, whilst the edifices which once contained much are now empty.

Stone presents more favourable conditions than anything else in building materials for the architect. Terra-cotta, and all burnt earths, whether called bricks or any other name, since their production entails mechanical processes, and these mechanical processes imply or determine repetition of parts or wholes, should never be used for monumental purposes, except for solid unadorned surfaces. A reason can easily be given. The designer produces a portion of the building in clay or stone; it is reproduced in terra-cotta; it may be ten, it may be a hundred,—ay, ten thousand times; and every time that such art work is produced more than once it loses value, as surely as a painting, if it could be reproduced as many times, would. It might be said, "Yes, it is none the less a work of art. You cannot make a thing less beautiful by repetition." I say you

can. If every beautiful woman were similar, and all women were beautiful, then would the eye see no beauty, but long for a change. The mind and the eye must be equally impressed, must teach art in concert, either for pleasure or pain. Thus, I argue, our new style of architecture must be a creation in stone, and that no new style can be revealed upon the spur of the moment, but must be the work of ages, and yet I come and say, "Hère is a new style; behold the clamouring hath its want, the agitator his will." Certainly "with reservations." Before producing this wonderful child, maybe I may ask the number of styles now extant. Shall we start with Syrian, or Egyptian? Shall we follow them with Grecian? and shall we divide Grecian into three, and then deny that the Romans had any architecture at all? If we do, our premises are narrowed considerably, and the more we try to work upon them the more they contract, until we find ourselves back in some remote age when the upright post and horizontal lintel are magnified to such an extent as to dwarf all after productions; but, not to be beaten, we start again. We argue there are only three roots, if I may so say, which have produced all ramifications, the greater of the ramifications being called styles. The three roots are the post and lintel, or horizontal root; the semicircular arch root; and the pointed arch root, each root nevertheless primarily shooting from the same plant.

Now, these roots and ramifications being admitted as necessary, if we admit that Greek art owed its origin to some previous growth, then the previous growth of Roman being Greek, Roman art has as much right to be classed as a style as Greek art, especially as the arch became an important feature. All styles are not, of course, equally distinct or well marked; in fact, the growth from the Roman for centuries was both laboured and slow. Scarcely do those phases popularly called Romanesque or Byzantine deserve the name of style. They really bear the same relation to Roman or Greek art which our Tudor or later Gothic, rightly termed debased, bears to the First, Second, or Third Pointed, with this difference,—the Romanesque led to one of the healthiest roots, or branches, if you will—the Pointed style,—our Norman being a description of Romanesque. The Tudor ends with rottenness and death. It has led to no art, and at the present time it seems that it never will. Taking real architectural art as commencing with the Grecian, tracing it through Roman, Byzantine, Norman, and the Pointed, we find many off-shoots almost as strong as the main trunk. Arabesque deserves a place to itself, as being a mixture of Romanesque and Hindoo; but, for the sake of my present argument, I had better not touch upon Hindoo art as China, with her early origin, would certainly claim precedence and continuing influence, as it is not unlikely that, although she kept so exclusively to herself, some wanderers had seen her architecture, and bore the knowledge of it westward.

We can now pretty well ascertain the number of admitted styles. We can see that one style was the off-shoot or continuance of a former, or many former styles. That, in fact, Roman art proper was a simple continuance of Greek. I do not mean Roman temples, for they were simply transplants, but their civil buildings: and here I will instance the Coliseum, and deduce from its treatment the production of a style—the Italian style. The manner in which this style was moulded and fashioned is both curious and instructive. An age of magnificence had arisen in the history of Rome, when the people had to be considered as well as the warriors and priests. Places of amusement had to be provided for vast numbers, and architecture seemed wanting, for several reasons. Had Doric, Ionic, or Corinthian buildings been erected as heretofore, no known material could have been obtained sufficiently large to span intercolumniations in such numbers as were required. Truly, blocks of granite might have been found, but the time and expense in the quarrying, in the carriage and in the erection of such monoliths, would have entailed a never-ending task. A building had, therefore, to be provided containing the increased space without necessarily increasing the size of the materials employed. Knowing as we now do the course pursued, we can hardly appreciate the difficulties to be overcome, or the success and applause which followed the achievement. The employment of one order in height having been found impracticable, the dogto or alternative was to use two orders. Common sense as well as mathematical and practical

* New Maps [of Plans, &c.] deposited in the Private Bill Office, November 30th, 1871, for Session 1872. London: Edward Stanford, Charing-cross.

knowledge, without much reference to art, would at once dictate the position of the orders; the strong to support the weak, the heavy below the light, the elegant and slender above the severe and robust.

My argument, therefore, is this: the Romans, who were certainly a wise people in their generation, did not rave about, did not attempt to produce, an entirely new style, however much they, as conquerors of the known world, might have deemed it incumbent to produce one; but sensibly took up a style which they found, and modified it in the manner before hinted at, taking the Greek orders almost as they found them, and clapping one upon another.

This, with the introduction of the round arch, led eventually to our own Mediæval orders—Norman, Early English, and Geometrical,—which mutually I will term chords of Doric, Ionic, and Corinthian, in the Greek. Perpendicular may be sympathetic with the Roman composite,—I mean no parallel. Why, therefore, should we not copy the Romans in this instance, as we seem to be doing in others? and, having already to our hand Norman, Early English, and Edwardian, treat them as the great colonisers treated the Greek,—using the first, second, and third as ingredients in the same building? The Norman heavy, stable, and bold for the main support; the Early English as lighter, less heavy, and more pliable above it; and Edwardian as richer, more elegant, and more varied above that. The best phases of Perpendicular (I cannot say Henryvillian, being no Welshman), in case of a very lofty building, might be pressed into the service. With the three or four phases of Gothic used in the same building,—the eternal sameness which so falls upon the taste in all our modern Gothic secular buildings, would be got rid of. The terrible nightmarish striving-after novelty—change—any thing—for variety sake would be less needed; and these old breeds being all grafted together upon one stem, would not unlikely bear a description of architectural plum before unknown, which would satisfy the craving for a new style, now amounting to a disease, which possesses seven-eighths of the community.

I am not joking, sir. I know that much of the beauty of our old Ecclesiastical edifices results from the juxtaposition of the different phases of Gothic art. There is one noble building which disappoints me the more I examine it, and I think the absence of this interweaving of styles is the cause. I mean Salisbury Cathedral. Admitting its splendid proportions, the harmony and beauty of its grouping, as seen from the east on a moonlight night, upon examination there is a stringiness, a poverty, a weakness solely attributable to the constant—and too constant—repetition. Examine the window above window in the transepts, one flight above another, which from the outside impress you as lighting different chambers, but from the inside utterly confuse you, and tell me if there is not some reason for my assertion.

In modern buildings of large dimensions, I may mention the Houses of Parliament, which have caused their designer and all connected with their infinite labour and pain from the use in their design of only one phase of Gothic,—twist it, repeat it, pile it up as you may. Enrich it—fill, if worked, it should turn out one of the best gold-mines ever discovered.—From the amount of ore thrown into it. Still is there a certain poverty, undiscoverable in one of our plainest old Gothic buildings with the exception of some few which have had the misfortune to be erected in one style. And so surely as the new Law Courts are put up will they also be a failure from the same cause.

The reason is this. We, as well as the Romans, indulge in monster buildings. Now these gigantic affairs are beyond the range either of Doric or Decorated; for consider, had the Romans, instead of using five orders in the Coliseum, used only one, what description of affair would it have turned out. Should they have employed but one order for the entire height, then behold Doric above Doric, then should they have used Doric above Doric, then look up at the maddening repetition. The Greek buildings were small and compact; one order thought out was sufficient, and then in some of their largest buildings I have no doubt the architects and builders had as much to do as they well know how.

Why, then, should we not do as the Romans did,—cast from us the desire to achieve the impossible, by endeavouring to make either

* *Pron. Henrikin.*

Roman, Early English, or Decorated do singly what a Greek order could not and cannot do; and take into our hands all our Gothic styles, and mould them into a whole as harmonious as any Italian building under the sun. I for one will, the first opportunity I have, try the effect of such a building, and I dare swear it will not be one of the most insignificant.

MARTIN UNDERWOOD.

WORCESTER GUILDHALL COMPETITION.

At a special meeting of the Worcester Town Council, a Report from the Survey, Buildings, and Property Committee, on the state of the Guildhall, was read. It contained, among others, the following resolutions:—

“That it be recommended to the Council to authorise this committee to obtain plans for the reconstruction of the Guildhall, giving the requisite additional accommodation, and that architects preparing plans be requested to limit the expenditure to 5,000*l.*.”

“That, in the opinion of this Committee, the wings of the Guildhall are in such a bad state of repair that they must at some early date be entirely rebuilt; and that the committee, having regard to this, be authorised to obtain estimates (in addition to the plans recommended by the foregoing resolution) plans for the entire rebuilding of the Guildhall and wings and offices, at a total expenditure not exceeding 18,000*l.*, in order that the Council and the citizens generally may be in a position to judge whether it would be better to reconstruct or entirely rebuild, and that it may be ascertained whether any large portion of the amount can be provided by voluntary contributions.”

The report was received and adopted; and the Council also resolved that the competition be thrown open, instead of being limited to architects of the city and county of Worcester, or the city architect (Mr. Rowe), as proposed by amendments.

It was agreed that premiums of 60*l.* for the best and 30*l.* for the second best plan for the reconstruction be offered; and premiums of 100*l.* and 50*l.* for the best and second best, respectively, for rebuilding.

The committee were directed to prepare instructions for the architects, and lay the same before the Council.

THE DECISION IN THE WORCESTER SCHOOL BOARD SCHOOLS COMPETITION.

Sir,—With this I send a copy of a protest which has been lodged by me against the recent decision of the Worcester School Board, by which they placed Mr. E. A. Day, of Worcester, with motto “De Dio” first; and myself, with motto, the arms, and “No Extras,” second, in competition for their schools.

As the reception of drawings after advertised date is an unheard-of proceeding, which, if allowed to pass unchallenged, will operate most seriously against every member of the profession, I politely request every architect, whether a competitor or not, to at once write me to London address (135, Chapside), an endorsement of my protest, as I consider in acting as I am doing I do so as much in the interest of the profession generally as for my own benefit.

The next ordinary meeting of the Board takes place on Thursday, the 1st of February, and letters posted on Wednesday will reach me at Worcester.

As I consider the matter one of vital interest to us all, I trust you will find room for a copy of the protest.

W. SEKHAM WITHERINGTON.

To G. W. Hastings, esq. chairman,
Worcester School Board.

PROTEST.

Sir,—Having received intimation that your Board have placed Mr. E. A. Day first in the school competition, and have awarded the premium of 30*l.* to myself, I beg respectfully to enter the following protest against Mr. Day's plans being carried out:—

1. The motto “De Dio” is a palpable play upon his own name.
2. That two or three days previously to the 30th, being extremely pressed for time, I sent to Mr. Marcus (the secretary), to say that, as the 31st (the day named in the advertisement for sending in the drawings) fell upon the Sunday, I should be glad to know when plans were to be delivered. The answer returned was, “Plans must be delivered before the 31st.”
3. On Saturday, the 30th, I sent to the Guildhall, to know what was the latest hour for the delivery of the plans, and the answer was, “Five o'clock to-day,” and although any extension of time would have been invaluable to me, my plans were deposited before that hour.
4. Though this information was given officially, of my own private knowledge I know that Mr. Day's plans were not delivered on Saturday; whilst I have positive proof that his drawings did not leave his office till after eight o'clock on Monday night, the 1st inst., at which hour, it would be only reasonable to suppose, the Guildhall offices were closed.
5. I need only say that the great principle of all compe-

titions is a certain time of delivery for all, and I am confident that it will be only necessary to explain to you and to your committee these facts, of which you have, of course, been hitherto ignorant, to insure that justice shall be done to me, and Mr. Day's plans disqualified.”

Mr. Henry Haddon, of Messrs. Haddon, Bros., Malvern and Hereford, whose design, “Idoncum,” was third, endorses the foregoing protest.

* * If the circumstances be as stated, the inappropriateness of the proceedings is manifest. Such a course admits the possibility of a favoured competitor being enabled to see the designs of other competitors before completing his own. Beyond this, however, it can scarcely be doubted that the decision is illegal; it is a breach of contract. If the matter be properly brought to the notice of Mr. Hastings, we have no doubt it will be set right.

TECHNICAL EDUCATION.

THERE has been a general meeting at Sir Antonio Brady's chambers, of the gentlemen who have taken a prominent part in the movement having for its object the establishment of a national technical university, for the purpose of completing the arrangements to establish an association representing all the interested involved.

It was stated that Colonel Gourley, M.P., had offered 500*l.* towards the establishment of the university. The result of the debate was the passing of resolutions deciding that the name of the amalgamated organisation should be the National Technical University and Trades' Education Association; that Sir Antonio Brady be the chairman of the council, and Colonel Gourley, M.P., chairman of the executive; that Mr. Scott Russell and Mr. R. M. Latham act as vice-chairmen of the council; that Mr. Thomas Brassey continue to act as treasurer; and that the hon. secretaries should be Dr. Mill, representing the original Technical Education University Committee; Mr. Campin, representing the Inventors' Institute; and Mr. Paterson, representing the working men.

It was understood that these appointments were provisional. An executive committee was also elected.

CITY SEWERS STILL DRAINING INTO THE THAMES.

At a recent meeting of the City Sewers Commission a report was received from Mr. Haywood, showing that no less than nine main sewers and nineteen smaller ones still drain into the Thames within the limits of the City; although in the last report of Mr. Bazalgette it was stated that there only remained certain portions of the lower outfall to be finished, and that the whole of the works were complete with the exception of a short piece at Blackfriars Bridge connected with the Fleet outlet.

Mr. Hora said that such a report as that just presented might well astonish the people of London, after spending 44,000*l.*, and it should be borne in mind that there were something like twenty or thirty inundations every year.

The Chairman observed that this was one of the most important subjects that court had had before it for some time. As an evidence of this he read an extract from a report of a deputation from King's-cross and neighborhood which waited upon the Metropolitan Board of Works on the 20th of last December. The extract had relation to the periodical inundation of the lower and basement premises.

MEETING OF BUILDERS.

A MEETING of master builders of the metropolis has been held during the past week, to consider the requisition of the Operative Stone Masons' Society to work uniformly all the year round 51 hours per week, and for a rise of wages from 8*l.* per hour to 9*l.* per hour from the 1st of July next. The proceedings have not been made public; but we understand that a unanimous opinion was expressed that 51 hours per week could not be agreed to by the engineers and other trades having just settled on 51 hours per week.

It was also generally agreed that it was an absurdity on the part of the masons to ask to work the same hours in summer as in winter, when dark days, frost, and bad weather interfere so very much with all building operations; and several masters expressed their opinion that no mason in their employ was able, under the present rule, to make an average of 54 hours per week all the year round.

It was also generally agreed that it would be almost an impossibility for masons to come and go at different hours to the bricklayers and other men on a building, and that to reduce all other trades down to 51 hours per week, in order to meet the demands of the masons, would be an act of injustice. The meeting was also of opinion that the present rate of 8d. per hour for an ordinary mechanic was a good rate of wages, and that the state of trade in London did not appear to warrant any increase. Ultimately it was determined to adjourn the meeting in order that some other builders not then present might be consulted before a decision was arrived at.

STAIRCASE AT THE LONDON TAVERN.

Sir,—Having just returned from the London Tavern, after two days' polling in behalf of candidates for admission into the London Orphan Asylum, I cannot but draw your attention to the state of the pieced stone staircase there. You did good service some years ago in drawing attention to mended stone staircases and cracked landings after the fatal calamity at the Polytechnic Institution. I am not an unnecessary alarmist, but most people who have visited the London Tavern on occasions such as I allude to know well how many persons spend the day on this staircase. The distress amongst widows and children, draped in black, on this staircase is always evident on these occasions, and there should be no possibility of a harrowing accident. I need not state that there is such a possibility, but I must say that any professional man visiting this staircase cannot but be struck with its apparent insecurity as the trends have been eased. Prevention is better than cure.

F.R.I.B.A.

DRAIN PIPES.

Will you allow me to express an opinion upon the paragraph,—“Iron Pipes for House Drainage,” page 43, of your last week's impression?—No cleaner, cheaper, more durable, or better adapted article can be used for house drainage than socketed, glazed stoneware pipes, jointed in cement. If the joints are left imperfect, gross carelessness is denoted on the part of those superintending, which need not occur where due vigilance is exercised. Iron pipes are more costly, to begin with; they oxidize, become filthy, and from the chemical action of the sewage soon wear out. Iron pipes should only be used where a sewer is out through a quicksand, or in similar exceptional cases where the cement joints of stoneware pipes cannot be made.

R. Y.

BETHNAL-GREEN.

Sir,—The remarks in your paper of last week concerning Bethnal-green are so much in accordance with a recent letter of mine, that I send you a copy for your use.

I may add that while the population of Bethnal-green is about 1.27th of the population of the metropolis, the pauperism is about 1.36th, but the rateable value is only about 1.61th. In consequence of this state of things, Bethnal-green receives from the Metropolitan Common Fund nearly 11,000*l.* yearly, or about 30*l.* per day, while the two (so-called) improvements in High-street, Shoreditch; and Bethnal-green will saddle the metropolis with a tax of more than 40*l.* per day for the next sixty years. I know of only two ways of bettering either a man's or a parish's condition. Either increase his income or lessen his expenditure. In Bethnal-green the latter is next kin to starvation. The former plan has yet to be tried.

T. G. ATKINS.

HEREFORD PASTORAL STAFF.

The clergy and laity of the diocese of Hereford intend presenting their bishop with a pastoral staff, and have selected a design submitted by Messrs. Cox & Sons, of Southampton-street.

It will be carved out of a piece of oak which recently formed part of one of the ancient pillars of the bishop's residence at Hereford,—a twelfth-century building,—and will be surmounted by a crook of the usual form, enclosing a carved figure of our Lord, seated as a king, holding an orb and cross in the left hand, the right hand erect in the act of blessing.

The crook will be mounted in silver, with

crockets also in silver, jewelled and embossed; and from the lower part of the crook there is a floriated bracket supporting an angel with displayed wings, carrying a silver shield bearing the name of the diocese, in enamel. The bands, crockets, and bases will be enriched with carvances in ornamental settings, and cut in the ancient form, the general style of the work being that of the thirteenth century. The fashion of presenting a staff to bishops has spread: this is the ninth, we believe, given within the last few years.

RAIN-WATER TANKS.

“STAGNUM,” in a recent issue, asks for more information as to coating brickwork of tanks. If good Portland cement be used with one-sixth sand a sufficient thickness is one quarter of an inch, but it should stand about fourteen days to harden properly before water is admitted. Each side should be laid on without a jointing, and the angles rounded out. The bricks on which the cement is laid should be damp, and the surface clean. The cement should be well rubbed, too, and not allowed to slide while soft. Neat cement, three-quarters of an inch thick, will be more apt to crack and blow out than a thin coat. The walls of the tanks should be built with equal parts of cement and sharp sand. If in a dry situation, and lime is used for building, the lime in the joints should be well raked out, and the walls should be firm enough to resist the pressure of the water.

W. B. WILKINSON.

DAMP WALLS.

Sir,—Having erected several buildings in exposed situations in Lancashire and Yorkshire where the driving rains will often penetrate the hardest stone, I am willing to give your correspondent “Devonia” the benefit of my experience.

Walls built with rubble or coursed wall-stones consist of an inner and outer casing, which is usually filled up in the middle with small pieces or scraps of stones, and then grouted with mortar so as to make a solid mass, bond-stones being introduced to hold the two casings together. In very wet situations the rain penetrates the outer casing, either through the mortar joints or the stones themselves, and is then drawn by capillary attraction to the inside casing. To prevent this the centre should be filled in with *dry* scraps and not grouted; the water then penetrates the outer casing and runs down the middle of the wall to the foundations, so that the inner casing is left dry. The bond-stones must also be weathered or tilted outwards, so as to throw off any wet that may enter at their top bed. Window-heads should also have a thin sheet of lead or zinc laid on the top bed and turned up inside the wall, so as to prevent wet from driving in over them.

If the building is in the neighbourhood of gas-works, a grouting of hot gas-tar boiled up with some pitch, and poured into the middle of the wall as it goes up, will make it thoroughly watertight, and impart a great amount of strength and solidity; this process adds considerably to the cost of the walling, but I have found it thoroughly efficient where other methods have failed.

A coating of Portland cement gauged with two parts of sharp sand *ought* to keep the weather out in any situation, and I expect the failure has arisen from using too much sand, or some other fault in the mixing or materials.

In building with brick in an exposed situation a similar plan should be adopted; an outer casing 9 in. thick, and an inner one 4½ in. thick, are carried up together but quite distinct, leaving 2 in. between, and tying them together by means of wrought-iron bands 9 in. long bent downwards in the middle, and spread out flat at each end so as to have a hold on the wall. This method is much used in the neighbourhood of Southampton.

Inside walls and partitions, if built of stone, will often show damp for a long time after they are built, as all stone contains in its natural state a considerable quantity of water, which is evaporated by the internal warmth of the building, and will appear like a sweat over the surface, through any number of coats of paint. It is therefore advisable to use brick for internal linings and partitions in preference to stone.

E. WYNDHAM TARN, Architect.

CARBONIFEROUS limestone, some beds of the lias, slate rubble, and a few other stones, where used for walling, have a tendency to condense the atmospheric vapour, causing it to trickle

down the face of the work, and prevent the use of paper.

A wall, properly coated outside with Portland cement, cannot admit rain. The defect is doubtless in the nature of the rubble backing, and the only remedy is to batter the inner face of the wall, using iron holdfasts to fix the battens, and packing them off the wall about ½ in., the wall to be pierced by a few interstices left in the joints under the eaves course and under the floor-line, to allow a current of outer air to circulate behind the battening, to preserve the wood and, as far as possible, to dry the moisture from the face of the rubble. The joints of the floor-boards should be grooved and tongued, and the wood skirtings tongued into the floor-boards, to prevent undue draughts of air in the rooms.

A SUB.

Sir,—To either paint or cement the exterior of any building generally interferes with the design. I consider the best plan is to deal with the inside walls in the following manner:—Take off the old plaster from the walls that are damp, and put on a rendering coat of the best Portland cement, without sand, about ½ in. thick; then put on a coat of equal parts of Parian cement and sand, to bring the wall to a level surface; and afterwards a finishing coat of Parian cement alone, of about the thickness of one-eighth of an inch; and when this last coat is setting, which you will notice by its changing colour, give it a coat of paint mixed up with very little oil in it, the object of which is to keep the chemicals used in the manufacturing of it from rising to the surface, often throwing off the paper if this is not done. This plan I have tried many times, and have never found it to fail. Of course, a great deal depends upon the cement being used properly, and it being of the best quality.

JOHN RUSCOE.

AN ODD OBJECTION.

LAMBETH WORKHOUSE.

At the last meeting of the Lambeth Board of Guardians, Mr. R. Taylor complained that although Mr. Parris was the architect of the new workhouse, yet his partner interfered in various matters. He thought if this course was pursued, they might involve themselves in some difficulties.

Mr. Higgs said no order for work could be given by the architect for a sum exceeding 25*l.* without the sanction of the Board.

After a discussion, it was agreed that the clerk should write to the architect, and request him to attend the Board personally upon all matters connected with the new workhouse.

SCHOOL-BOARDS.

London.—At the last meeting, on the 24th inst., Mr. Reed, M.P., moved the adoption of a Report from the Works Committee, calling to mind that the Board, on the 9th of August, requested the Works Committee to consider and report upon the question of obtaining architects and securing designs. The Board further resolved, on the 10th of January, 1872, that the system of class division should be tried on the Essex site, in Stepney. The Works Committee now recommended that, for the erection of this school, there should be a competition of architects, not exceeding twelve in number; that it should be referred back to the Works Committee to advertise for candidates, to select a number not exceeding twelve, and to submit the plans prepared by the competing architects to the Board. This recommendation gave rise to a long discussion, the result of which was that the whole matter was referred back to the committee, principally for the purpose of their finding out a larger site. On the motion of Mr. Reed, M.P., the Works Committee were empowered to recommend the engagement of four agents for two months, at a salary not exceeding 2*l.* per week, to assist the architect in looking out for sites, and premises to be hired, in those blocks in which the Board has decided, or shall hereafter decide, on the recommendation of the Statistical Committee, to erect schools.

Leicester.—At a meeting of the Board for discussion with Mr. J. R. Blackburn, Her Majesty's Inspector of Schools, Alderman Burgess said he wished to ask a question with reference to the sort of schools for which they would require architects. It seemed to him that they could not stir a step with the architects till they had

settled what kind of schools they were to build, as they must give them instructions. Their British Schools were built exactly in accordance with the plan recommended by the British and Foreign School Society. They had not been built above ten years before they found they had made a great mistake; they had altered and altered four times since the schools were built, and it had involved them in great expense. Of course they all felt that it was exceedingly desirable that they should start well, on the best possible system; and perhaps the inspector would give them his idea how they could get the best possible system of laying out their schools, and have them built so as to accommodate the children in the best possible way. The British schools at present wanted another remodelling, as the inspector would agree, but how to do it he did not know. He thought they would have most carefully to consider the plans of their schools, and he should like to ask whether the Department had arrived at any conclusion on this point, or issued any direction or suggestion to the School Boards on this subject. Mr. Blakiston said he thought not. If they adopted the present system of pupil teachers they had hundreds of models to go by; and if they adopted the Prussian system they must inquire abroad. The Rev. R. Hawley said he understood the inspector to mean that if they adopted the Prussian system they would have to be grieved very much less by the experience of the past than otherwise; but if they adopted the old system he was in favour of large schools,—at least, large schools were more economical, and that if they put in thoroughly efficient men they were the most efficient schools, but the difficulty was to get the men to manage them. Mr. Blakiston said, the largest school he had in his department was a school of 300 boys, but not many masters could manage it.

Derby.—At a meeting of the local School Board a report of the School Plans Committee was read. It stated that,—

"On Monday, the 9th of January, your committee met to receive the plans of the clerk, reported to have had received eleven sets of plans under seven different marks or mottoes, viz., three plans marked 'Alpha,' two marked 'Education,' one marked 'Latus Honore,' one marked with a 'Red Spot,' two marked 'Nota Bene,' one marked 'Prodesse quia conspici,' and one marked 'Non Semper.'"

"At the adjourned meeting on Wednesday, the clerk reported that he had received on Monday evening three other sets of plans marked 'In Spe,' as these were sent in after the time appointed they were not admitted for competition. In making the selection which they submit to the Board for adoption, your committee have been guided by the consideration of light, ventilation, and internal fitness for school work, rather than by the external appearance of building. The question of cost also has been duly considered by the committee in their selection. After very mature deliberation your committee resolved to recommend the plan marked with a 'Red Spot' as the first; 'Nota Bene' as the second; and 'Latus Honore' as the third. On opening the sealed envelopes, it was found that the selected plan had been prepared by Mr. A. Coulhurst, architect and surveyor, No. 10, Wilnot-street; the second by Messrs. Giles & Brookhouse, architects, St. James's-street; the third by Mr. G. Sheffield, architect, Bank-chambers, Derby."

The confirmation of the committee's report was unanimously agreed to. Mr. Bewick then read, as a substantive motion, that Mr. Coulhurst be appointed the architect for the superintendence of the erection of the new schools in Gerard-street, and that the premium of 10l. offered for the second best plan be awarded to Messrs. Giles & Brookhouse. The proposition was carried unanimously. A building committee was also appointed to carry out all needful measures in connexion with the erection of the new schools in Gerard-street, the committee to consist of the chairman, the vice-chairman, Mr. Thompson, Mr. Shaw, Mr. Holmes, and Mr. Roe. The clerk was empowered to apply to the Education Department for a loan of money needful to erect the new schools in Gerard-street, so soon as it should be ascertained what was the sum required for that purpose.

CARRIAGE ACCESS TO THE THAMES EMBANKMENT.

In the Vice-Chancellor's Courts (before Vice-Chancellor Sir John Wickes), The Marquis of Salisbury v. The Metropolitan Board of Works, is a suit instituted in reference to certain land reclaimed on the Thames Embankment, opposite the end of Salisbury-street and Cecil-street, and which has been laid out as a garden. The garden is surrounded by railings, the gates being locked at night, and the question turns on the construction of the Act of Parliament authorising the construction of the Embankment, under which rights of access are reserved to the Marquis and his tenants. The case was being heard on an interlocutory application for a motion for an interim injunction. It appears that the Marquis has in contemplation the erection of a large and important class of buildings upon this low level ground, and it is in respect to the erection of these that he seeks immediate relief, by injunction, for the purpose of enforcing

his right of road from the Embankment-road across the ornamental gardens. The question mainly depends upon the interpretation to be put upon Section 62 of the Thames Embankment Act, 1856, which has special reference to this property.

The Vice-Chancellor, in delivering judgment, said, the question was whether the property to which the reservation contained in the 62nd section referred is limited to Cecil-street and Salisbury-street, or whether it includes the low-level ground also. Without desiring to express any final opinion on the point, his Honour intimated his view that the reservation was solely for the benefit of the owners and occupiers of Cecil-street and Salisbury-street. The word "tenants" must be held to mean future tenants of houses in those streets. If it had been intended to comprise future tenants of the low-level also, he could not see why the low-level should not have been specifically mentioned. The right of the plaintiff to a carriage-way from the Embankment to the low-level ground was too doubtful to be enforced on motion for a mandatory injunction; but, as at present advised, his Honour thought that the inhabitants of Cecil and Salisbury streets had a right, at least, to a footway at all times across the ornamental gardens to the Embankment-road. Holding this view, he directed the motion to stand over until the hearing of the cause.

INDEX TO THE "BUILDER."

Sir,—I cordially second the proposition of your correspondent, that you should publish a useful Index and Reference to the *Builder* (at the end of the year) from the commencement—the same to form a volume of itself,—and will most willingly contribute towards its production, having been a subscriber from your No. 1 to the present time, and having all the volumes bound up.

I freely contribute towards its obtaining information required without loss of time in long searches, is my reason for troubling you with this. F. E.

THE "STANDARD" OFFICE NEW BUILDINGS.

AMONGST the improvements at present in progress in Shoe-lane, the extensive buildings which have for some time been in progress for the *Standard* newspaper, and which are now approaching completion, attract notice. The premises, which have been erected from designs furnished by Mr. Parkinson, architect, form a prominent feature amongst the surrounding buildings, and altogether occupy an area of about 700 square yards, extending in rear to a depth of 100 ft. The main elevation in Shoe-lane is 60 ft. high to the parapet, and contains a frontage of 61 ft. in length. The materials used in the ground-floor and first floor of the elevation are stone, the upper stories consisting of brick, with bold stone facings. The several entrances and windows on the ground-floor, as also the first floor, are semicircular-headed, ornamented with carving, whilst the windows of the second, third, and fourth stories, in number eight each, are segment-headed. The principal entrance is wide and massive, surmounted in the centre by a carved hood, whilst between the windows of the first floor are two similar curved figures, somewhat smaller in size, with the words "*The Standard*" in large characters, cut out of the stonework. The interior arrangements and fittings of the structure are, on paper, to be very complete. Apartments in the third story are specially devoted to a large library and reading-room for the use of the employés on the establishment. Immediately adjoining are the new premises erected for Messrs. Dellagana, for stereo- and electro-type purposes, and which are also approaching completion, under the same architect; Mr. John Anley, of Brunswick-place, City-road, being the contractor for both.

CHURCH-BUILDING NEWS.

Godstone.—The parish church has been enlarged and re-opened. The work was done by Mr. Carruthers, of Reigate, after the designs of Mr. Gilbert Scott, architect, who has retained all the relics of antiquity found during the work. The cost of the restoration amounted to about 4,000l., of which sum 1,000l. were given anonymously by "A Friend." Mr. Macleney, of Pencil, also contributed 800l. On the opening day the sum required only amounted to about 300l. The works carried out included the removal of a south transept, the galleries and pews also being swept away, the building of a south aisle, restoration of tower, including the raising of the steeple 16 ft., the opening of the roof of nave, the insertion of a west window, and west and south doorways according to remains found. The west doorway (as also the south) is Norman. This is formed of stone given by Mr. F. M. H. Turner, of Leigh-place, who also gave the stone used for the external work. Stone from the quarries here (of which Henry VII.'s chapel at Westminster is built) is used for the arches, columns, &c., the walls being lined with stone from Kent. The seats are open, and of oak.

The pulpit remains the same, but the stone base has been carved. A porch of oak has been built on the south side, near to which door the font is placed. It was intended at first to have a winding staircase to the ringing-floor at the south-west corner of the tower; but on the removal of the old vestry, &c., traces were found of the original staircase at the south-east corner. This had been at some time completely cut in two from top to bottom; it has been restored. The tower, which is now open to the church, has a low carved stone screen separating it from the chancel: in it is placed an effigy, executed in white marble, of the late Mrs. Macleney. A groined oak roof has been placed in it, and the quaint windows are filled with stained glass. The paving is, we believe, to be of coloured marbles. This is at the cost of Mr. Macleney. A new treble bell has been given by Mr. Thomas Rose. A three-light window on the south side has been filled with stained glass, representing the "Good Shepherd," by the family of the late Mr. W. Steming, of Godstone Court. The east window was already of stained glass, put in by subscription to the memory of the late Archdeacon Hoare. The window on the south of the chancel has been put in by Mrs. Hoare as a memorial to the same: it contains figures of King David and St. Cecilia. The reredos, of stone, has seven arches, the columns being of red marble: it is carved. The east wall on either side is lined with encaustic tiles, and above is the legend on a gold ground, "Holy, Holy, Holy, is the Lord of Hosts; the whole church is filled with His glory." Above this is a cornice of quarry stone, carved by the rector. The pulpit was carved by him when the chancel was restored a short time since.

Pateley Bridge.—The Church of St. Cathbert was re-opened on Thursday, December 21st, by the Rev. Bishop Ryan, of Bradford, after having been closed for some time during alterations. The gallery has been removed, and the old pews have been replaced by stalls. A stone pulpit and reading-desk have been erected. The alterations have been carried out by Mr. Grange, of Pateley, from the designs by Messrs. T. H. & F. Henley, architects, Bradford. This is one of the Parliametary churches of the early part of the present century. A system of decoration has been employed in order to deal with the unbroken monotony of the interior. The wall of the nave has been arranged in three divisions of colour. The dado is brown; forward to the springing of the window arches, it is citrine, relieved between each window by a centre ornament containing Christian emblems; above that it is of a deep buff powdered, with conventional roses and *flurs-de-lis* in brown. These divisions are marked by borders on yellow grounds. The chancel, reredos, and tablets are illuminated in both stencilled and painted ornament. The whole of the decoration was done by Messrs. S. Bottomley & Sons, of Crosshills, *vic* Leeds.

Beddington.—The most recent additions to St. Mary's Church consist of a new east window. The window and reredos erected at the same time as the north wing, and which were there during the Rev. J. Hamilton's rectorship, have been removed. The new window is not so deep by about 2 ft. as the one it replaces; the object being seemingly to allow the new reredos being raised. Cut in the basement stones of the arch over the window outside are *fac simile* heads of the present Bishop of Winchester (on the left hand), and on the right that of the present rector of Beddington—taken from portraits. The chancel screen has also had unmounted upon it a carved oak cross. The screen on the west wall of the north wing is also completed, and is formed of a carved oak frame gilt, filled in with a painting of the Last Judgment. The chapel, which is undergoing repairs, is also nearly completed.

Great Yarmouth.—The topstone of the new north-west pinnacle of the south-west aisle of the parish church has been completed. The pinnacle has been finished at an expense of about 200l. the cost being defrayed for the most part by the ladies of the congregation.

Romiley.—The design of St. Chad's Church, Romiley, has just been completed externally by the erection of the spire. The new spire rises to a height of 130 ft. It is octagonal in shape, rising with brackets from the top of the tower and belfry-stage. It is surmounted by an iron cross and a gilt cock. The work has been carried out by Mr. S. Norcross, from the designs and under the superintendence of Messrs. Medland & Henry Taylor, the architects for the church. The cost has been only 260l.

Maryport.—The foundation-stone of a new church has been laid at Maryport. The proposed building is intended for a Mission Church in connexion with St. Mary's Church at Maryport. The site is on the north side of the harbour. The church, when completed, will seat about 100; and the estimated cost of erection is, we understand, from 1,200l. to 1,100l. It has been designed by Mr. Eaglesfield, of Maryport, architect.

Snargate.—The old parish church of Snargate is been re-opened, after its repair and restoration. The arches of the aisles and tower were hidden by unsightly boardings, and the old interior was a sad picture of what in so many of our churches has been the result of many generations of niggardly neglect and bad taste. All is here changed, and the dimensions of the building are opened up, the nave and aisles are laid out with appropriate fittings, still leaving an open space to the west, from the font to the tower arch. The architect, whose plans have been adopted throughout, is Mr. C. T. Whitley.

Dover. The work of the chancel was executed by Mr. Ames, of Brenzett, and that of the body of the church by Messrs. Adcock & Rees, of Dover.

Bishopsgate, London.—A new chapel and schools for the district of Bishopsgate have been opened. The new chapel has been erected on the site of the Church of All Saints, Skinner-street, Bishopsgate-street Without, and, with the underlying schools, is capable of accommodating 500 boys. There are 300 sittings in the chapel, and 200 in the class-rooms underneath. Gothic of the plainest and most useful possible kind is the style of architecture of the new chapel and schools, and Mr. E. N. Clifton was the architect, and Mr. Brass the builder. Every few persons beyond those immediately concerned, says the *Clerkenwell News*, know anything about the Great Eastern Railway Additional Powers Act. It empowered the Great Eastern Railway Company to take down the Church of All Saints, Skinner-street, in consideration of the payment of a certain amount of money compensation to the parish in which the church was situated. In due time the money was forthcoming. Then came the question, what should be done with it? Should a new church be built, or what? After a good deal of deliberation on the part of the parochial authorities, they came to the conclusion that, in consequence of the great diminution of the population caused by railway incursions, and the consequent sweeping away of thickly-populated districts, it was unadvisable to build another church in a thoroughfare so near the parish church, and a chapel, in which religious services, school business, and meetings and entertainments might be carried on, was decided upon. To do this, an Act of Parliament was necessary. A Bill on the subject was introduced into Parliament in 1869, which was supported by the Archbishop of Canterbury and the Bishop of London, and which, after some opposition, became law. The result is the chapel and schools which were opened on Friday last.

SCHOOL-BUILDING NEWS.

Birball.—The new pile of buildings, including school and master's residence, situated near the entrance to the park at Birball, have been opened by Lady Middleton, who laid the foundation-stone on the 8th of May last. The school is built from designs superintended by Mr. Parsons, his lordship's agent; the contractors being Messrs. Dodsworth & Wood, Malton, for the masonry and joinery work, and Mr. Smiddy, Malton, for the plumbing.

Reedham.—A new infants' and mixed school, with a master's house attached, has been opened at Reedham. It is conveniently situated on Maypole-hill, the land on which it stands having been given by Mr. W. Jary, of Reedham Hall. The external walls of the building are constructed of red brick, with black and white brick and stone dressings, and a large stone window is inserted in the north end of the school-room, smaller windows being introduced on the western side. The building, which has a lofty, open stained roof, costs, with the fencing, about 800l., and will accommodate 200 children. Mr. W. P. Pearce, of Orford-hill, Norwich, is the architect; and the contractor is Mr. J. Withers, of Blofield.

Langport.—The new schools at Aller, near Langport, have been opened. The building is composed of white lias, and occupies an elevated

site on the slope of a hill above the rectory grounds. It consists of a general school-room, 33 ft. 6 in. long by 17 ft. wide, plastered, ceiled, ventilated, and lighted; a class-room, 13 ft. by 12 ft.; and cloak-room, 8 ft. by 6 ft. 6 in. At the southern end is a cottage for the school-mistress.

Bosford.—A new schoolroom, which has been planned and built by Mr. Woodbridge, of Hungerford, has been opened here. The Rev. G. F. Wells, at the opening, said,—For thirty years your rector, Mr. Wells, has endeavoured to obtain such a room as this. Last year the Government ordered that such a room should be built, for remember that, however good it looks, owing to the skill and care Mr. Woodbridge has shown, it is only built according to the requirements of Government for ninety children. The owners of property agreed to provide part of the means to build this school, the Government, the National Society, and the Diocesan Board to supplement that sum, so that now the room in which we are assembled is completed, and the cost of it will soon be paid.

Chester.—The new schools which have been erected in connexion with the Roman Catholic Church of St. Werburgh, in Queen-street, have been formally opened. There was sufficient ground, without infringing on the old graveyard, to admit of the erection of new schools without destroying the old school, that having been converted into an infants' schoolroom. The new building is a plain one, brick-built, covering an area 55 ft. by 45 ft. On the basement is the boys' school, which may be entered by two different doors from Union-walk. The principal room would be square, but for the projection of two buttresses, which are necessary to carry the timber supports of the upper school. Although these buttresses would be found to be objectionable when holding a meeting or entertainment, as they are continued upwards to the cross timbers of the roof, yet they afford corners for classes, which the teachers will know how to utilise. To each large room a smaller class-room is attached. All the rooms are lofty, well-lighted and ventilated, and will be warmed, the larger rooms by two Gill stoves in each, and the class-rooms by a fireplace in each. The entrance to the girls' school and also the infants' school, which, as already said, is the old school, is from Queen-street; and the upper school-room of the girls is reached by a broad winding staircase. Separate play-grounds and out-offices are attached to each school; and the internal fittings include new patent desks, which serve the threefold purpose of form and desk, form and table, and seat with sloping back. The schools were designed by Mr. Edmund, of Liverpool, and the builder was Mr. Andrews, of this city. The total cost is about 1,400l. It is estimated that the schools will accommodate 600 children.

Books Received.

"BRICKYARD CHILDREN: an Answer to the Charges of Mr. George Smith against the 'Tories,' Tinstall. By Jno. N. Peake. Grant & Co." In this pamphlet Mr. Peake makes a vigorous, indeed over-vigorous, reply to the allegations lodged against his own establishment, and adduces evidence to show that it is well managed. Our own observations, however, on the miserable condition of brickyard children as a class were founded on the examination of many yards, and are indisputable. The interference of the legislature was loudly called for.—"The Illustrated Price Book for 1872 (Sprigs, Great Russell-street)." includes a considerable amount of useful information appended to the lists of prices.—"Mechanical Arithmetic and Mensuration. By Charles W. Merrifield, F.R.S. London: Longmans, Green, & Co. 1872." This treatise has been written as one of a series of textbooks on science. It is not meant to be the first book of one wholly unacquainted in the elements of arithmetic. It gives elementary rules the precision and illustration which they need for the farther pursuit of the subject, and to the higher rules a gradual induction. The previous knowledge, however, assumed to be possessed by the student need not be great in quantity or high in quality, and all that the book contains is well known and established. There is a chapter on mechanical work, but nothing in the way of mathematical invention or discovery. The work is adapted to the use of artisans and students in public and other schools. The author is principal of the Royal School of Naval archi-

ture and Marine Engineering. —"The Transfer of Gas-Works to Local Authorities." By Arthur Silverthorne, C.E. London: Livermore & Robinson, Bedford-street.—The purpose of this pamphlet appears to be, to advocate the adoption of gas-works by corporate and other local public authorities,—a purpose which harmonises with our own efforts while engaged in past years in getting up and supporting the gas movement for the reduction in price and improvement in quality of the gas supplied by companies to the public. We are glad to be able to give so promising a list as the following of towns throughout England, where the exclusive control of the gasworks is now vested in the Local Board, Corporation, or Improvement Commissioners, for the time being, namely:—

Aberavon, Abergavenny, Beverley, Bingley, Birkenhead, Bradford, Blackpool, Burnley, Burton-on-Trent, Bury (Lancashire), Burton, Carlisle, Chorley, Clackhaston, Darlington, Dewes, Doncaster, Malvern, Halifax, Haverfordwest, Keighley, Knaresborough, Leeds, Leek, Lytham (Lancashire), Macclesfield, Manchester, Middlesbrough, Newton (Lancashire), Oldham, Richmond (Yorkshire), Ripon, Rochdale, Rotherham, Salford, Southport, Spalding, Stockport, Stockton, Teignmouth, Tenby, Wallasey, Walsall, Widness.

Thus it will be seen that the number of towns that have adopted the system of directing their own gasworks does not bear an inconsiderable proportion now even to the number of companies incorporated under special Acts of Parliament. The latter reckon at the present moment, in England and Wales, about 250, and the proportion of unincorporated gas companies to the former is in the ratio of 4 to 1. In Scotland, the towns in which the gasworks have been vested almost all lately are, Dundee, Glasgow, Perth, Paisley, Renfrew, Greenock, Arbroath, Kilmarnock, Forfar, Aberdeen.

Miscellaneous.

Metropolitan Fire Accidents.—According to the usual annual report just laid before the Metropolitan Board of Works by Captain Shaw, the total number of fires to which the members of the Fire Brigade were called during the past year was 2,056. As compared with the previous year, this shows a decrease of 101. No fewer than 38 lives were lost by fire during the year. The strength of the brigade at present is as follows:—50 fire-engine stations; 93 fire-escape stations; 4 floating stations; 51 telegraph lines; 82 miles of telegraph lines; 3 floating steam fire-engines; 1 iron barge to carry a land steam fire-engine; 8 large land steam fire-engines; 17 small land steam fire-engines; 16 7-in. manual fire-engines; 56 6-in. manual fire-engines; 13 under 6-in. manual fire-engines; 104 fire-escapes; 387 firemen. The number of firemen employed on the several watches kept up throughout the metropolis is at present 107 by day, and 169 by night, making a total of 276 in every 24 hours; the number of those sick, injured, on leave, or under instruction, is generally about 40; the remaining men are available for general work at fires. It remains to be seen what the result of the Metropolitan Water Act of last session will be, but it may be hoped that the provision for constant service, which comes into force on the 21st of April this year, will have the effect of at least making every fire-plug represent an immediate supply of water.

Adulteration of Gas.—The amalgamation of the gas companies does not appear to have been beneficial so far as the citizens are concerned. No doubt the amalgamated companies could, if they would, sell good gas cheaper than if they were not amalgamated; but, as we predicted at the time, they would not though they could. They are up to all such nefarious devices as tradesmen and manufacturers practise in the adulteration of their goods; anything, in their opinion, seemingly, being good enough for the stolid fools who allowed them to "amalgamate." Their gas, we should think, is common air illuminated by a little carburetted hydrogen, just as London milk is water tintured with the product of the cow; and it saves cost to allow the sulphurous and other abominations of the vilest coal to go along with it, and so the public have their supply of brimstone gratis direct from the manufactory. As appears from the Court of Common Council proceedings, sulphur is more prevalent than ever it was in the gas supplied to the City; and in many instances the consumers' bills, notwithstanding the reduction of price from 4s. to 3s. 9d. per 1,000 ft., are larger than formerly.

Accident at a National School in Salford.—An accident of an alarming nature has taken place at the National School-room in St. George-street, Salford, by which a number of young children sustained injury, and narrowly escaped losing their lives. Several workmen have been engaged in making alterations and additions in the school-rooms, and this work had not been fully completed when the children resumed their attendance at school for the first time. While the children in the infants' department were assembled, two gasfitters employed by Mr. Livingstone had passed through a trap-door to the ceiling under the roof, and continued their work immediately over the heads of the children. They were walking about, when all of a sudden the weak materials upon which they were standing gave way, and carried the two men, along with a large quantity of debris, down upon the children below, some of whom were for a time completely buried underneath it. The dimensions of the part of the ceiling which fell were about 18 ft. by 11 ft., and it was estimated that it weighs nearly a ton. The children were got out bruised and bleeding, but fortunately it was found that, with one or two exceptions, the injuries were not so serious as to excite apprehensions of grave results. The teacher was badly hurt.

Perils of Timber Stacks.—Last Sunday afternoon an accident, which unfortunately resulted in the instantaneous death of two little children, occurred at Mr. Bowman's timber-yard, adjoining the river at Low Elswick, Newcastle. Elizabeth Muckle, aged six years, and Thomas Henry Charlton, aged four years, had strayed from the house of their parents into the yard adjoining, in which a large quantity of thick, heavy batons were piled up in stacks. How long they were there is not known, but within a few minutes of three o'clock passers-by were startled by the crash of falling timber and a loud scream. This was enough to rive the charm, and several gentlemen at once climbed the rails into the enclosure, and then discovered that about a couple of tons of timber had toppled over, burying the two poor little companions beneath the mass. When the timber was removed, a frightful sight presented itself, and both the children were dead. It is supposed that they had been playing on the top of the timber, when the stack fell over and buried them beneath it.

The Work of the Telegraph.—It appears with regard to the progress of the telegraph system under the Government management, that while in the financial year ended the 31st of March, 1871, the messages amounted to 9,850,177, those for the current financial year ending the 31st of March next (estimating the remaining quarter according to the average of the preceding quarters) will reach 12,410,726,—an increase of 26 per cent. The total number of offices open on the 5th of February, 1870, when the business was taken over by the State was 2,932, and it is now 5,098. These 5,098 consisted of 3,291 postal offices and 1,807 railway telegraph offices. The great augmentation has been in the postal offices, which have risen from 1,658 to 3,291; those in the London district having increased from 177 to 361, in the West of England and Wales from 605 to 1,979, in Scotland from 155 to 321, and in Ireland from 122 to 560.

The Theatre in Shakspeare's Time.—On Saturday afternoon last Mr. W. B. Donne, the examiner of plays, commenced a course of lectures in the theatre of the Royal Institution, "On the Theatre in Shakspeare's Time." Mr. Donne started at almost the very birth of dramatic writing, and traced in an interesting and instructive manner the various improvements noticeable from time to time in the construction and the general treatment of the English language. The writers of Elizabeth's time and their works were particularly dwelt upon. Some extracts from the latter were read, for the purpose of showing the point of improvement at which English literature and the drama had arrived immediately before Shakspeare made his first appearance on the scene.

State of Dwellings in Limehouse.—A report laid before the last meeting of the Limehouse Board of Works by the medical officer of health for the district describes the houses in Victoria-place, Limehouse, as being in a condition unfit for human habitation, and the Board has resolved to proceed against the owners of the property under the provisions of the Artizans' and Labourers' Dwellings Act.

The Titeley and Presteign Railway.—The first sod of the projected railway from Titeley to Presteign has been turned at Presteign, amidst general rejoicing. Presteign is the county town of Radnorshire, and an important centre of business for the county. The projected line, when completed, will be about five miles in length, and will cost about 23,000*l.* It will form a junction with the Leominster and Kington Railway, near Titeley. It will probably in a short time be continued on towards Rhayader and the Central Wales line. Another line has been partly constructed from Eardisley to Kington. Direct communication will then be made with the immense fields of industry in South Wales. Lino will then find a ready demand at the hands of the South Wales ironmasters, and coal will be cheapened. The contractors for the line are Messrs. Perry & Sons, of Stratford, London; and the engineer, Mr. W. Clarke, C.E., of London.

Proposed Trades Hall for Manchester.—A meeting of delegates from the various trade societies in Manchester has been held at the Typographical Institute, Water-street. Mr. S. C. Nicholson occupied the chair. The Rev. H. Solly having addressed the meeting, the following resolution, proposed by Mr. W. H. Wood, and seconded by Mr. J. McKenna, secretary of the Coachbuilders' Society, was adopted:—"That premises be secured for a social club for the accommodation of the trade unionists of Manchester and Salford as near the centre of the city as possible, to be opened to members contributing 5*s.* per annum, rooms in the same to be let for the accommodation of trade societies at reasonable rentals." Mr. W. H. Wood, in support of the scheme, urged that such a club would answer exactly the same purpose as those occupying a higher grade in the social scale.

Removal of a Toll.—The *South London Chronicle* says,—"That obnoxious obstruction, the halfpenny-hatch in Balclayon-street, which so long placed a barrier to free communication between Bermondsey and Newington, has at length been removed; and now the hundreds of workmen whose nearest route to their daily labour lay through the hatch can take the nearest cut, and laugh at all that remains of almost the last remnant of a bygone system of tollage. We may add that the Bermondsey vestry, sensible of their position as non-obstructors, have determined to remove the only public bar which now exists in the parish,—*i.e.*, the one that blocks up Smith's-buildings, Edward-street. There still remains the toll on Waterloo Bridge. Now that the City has done thus much for Bermondsey, is it not time that the Metropolitan Board tried to give a like relief to the whole of London?"

Royal Dublin Society's School of Art.—The annual exhibition of the students' works of this school has been opened to the public free daily. The grand staircase, long staircase, and adjoining rooms are filled with art works handsome and catalogued to the unprecedented number of 607, comprising drawings of the human figure, landscapes from nature, architectural drawings, and surface designs. The silver medal for architecture was awarded to Mr. J. Bouchier for a drawing made from actual measurement of the Royal Dublin Society's House; also in orthographic projection and perspective and practical geometry bronze medals were awarded, the recipients being Mr. Beardwood, Mr. Robert Smith, and Mr. Tighe. For some of the designs for cabinet, damask, fans, dinner-plates, lace, surface decoration, carpeting, and wall paper, the leading manufacturers offered first and second prizes of 5*l.* and 3*l.* Mr. Lyne is the head master, and his assistants are Mr. Byrne and Mr. Murray.

The Park-lane Sewer.—In the St. George's, Hanover-square, Committee of Works, General Sir William Codrington, according to notice, moved "That the surveyor lay before the Committee of Works and the Vestry a plan and sections of the main drains of Park-lane and Piccadilly towards the south end of Park-lane; also of plans and levels of any house-drains in that neighbourhood which communicate with the main sewers, and of which complaint has been made." His only object in this motion was to obtain the requisite information. Mr. Walker seconded. Mr. John Morris suggested that a plan of the basement of Gloucester House should be added. Mr. Cove thought, now that the sewer in Park-lane was working in a satisfactory manner, the motion seemed unnecessary. The motion, being put, was carried.

Effects of the Gale.—A very heavy gale visited the metropolis on Tuesday night, accompanied with torrents of rain. Many accidents are reported, and amongst them is the fall of one of the large chimneys from the central tower of the Westminster Palace. Destructive floods are reported from many parts of the provinces. At Chelsea the gale was severely felt, and a stack of chimneys fell down in Lower Sloane-street, causing the death of a lady named McGarth, who resided at No. 77. It appears that between the house in question and No. 76, which was occupied by Mr. Bancks, the well-known dyer, was a high stack of chimneys, and about half-past five, when the gale was at its height, the stack fell with a tremendous crash, half falling through the roof of No. 76, and the other half through 77. The storm raged with great fury at Cambridge. In fact, there was a perfect hurricane of wind and rain. Buildings in course of erection in various parts of the town were blown down.

Tradesmen and International Bazaars and Exhibitions.—A public meeting, convened by the Metropolitan and Provincial Association for the Defence and Advancement of Trade Interests, has been held in the Egyptian-hall, at the Mansion House. The chair was occupied by the Lord Mayor and Mr. Alderman Finnis successively. The meeting was numerously and respectfully attended. The following resolutions—

"That this meeting views with regret and alarm the determination of the Royal Commissioners to convert the International Exhibitions at South Kensington into enormous retail shops; and pledges itself to use every lawful means to prevent the intended scheme being carried into effect."

"That the following gentlemen, with power to add to their number, do form a standing committee for the purpose of removing the grievances already complained of, by a humble address to her Majesty, petitions to the Houses of Parliament, and by using all other available means to oppose this objectionable scheme.—The Lord Mayor, Mr. Alderman Finnis, Mr. R. Crawford, M.P., Sir Robert Carden, and Messrs. Attenborough, Daniell, Copeland, Gatto, Blackwell, Podder, Harrison, and P. Orbanau, with power to add to their number."

were separately moved, and unanimously passed, by the meeting.

A "Quarter-Turn Full-Way High-Pressure Water Valve."—In reference to a valve so named the inventors, Messrs. Carr & Claret, sanitary engineers, state that it "opens full bore with a $\frac{1}{4}$ turn, and can thus be used in all situations in which the ordinary cock is applicable," so disposing of the objection (often raised with respect to valves) of a number of turns, and that, "unlike all previous valves, it is *actually* a full-way valve," whereas, "even the so-called round way cocks are not *absolutely* full way, while most valves and common cocks are little more than half full way." The disc which closes the aperture (in other words, the valve proper) is fitted with $\frac{1}{4}$ -in. solid mineralised indiarubber, which is said to be, in practice, almost impishishable, when used even for boiling water. The cost of the valve is said to be much lower than even the common valves yet made. It ought to come into use.

The Park-lane Improvement.—At the St. George's (Hanover-square) Committee of Works, a letter was read from the Metropolitan Board of Works, asking the vestry to assume the charge of the new foot and carriage ways in connexion with the Park-lane improvement. The surveyor (Mr. Tomkins), in answer to questions, said that the roadway in Hamilton-place was now in excellent condition. A short time ago, 3 in. of granite kerb were laid down. Mr. Walker said the road was as good a road as any in the parish. The committee decided to take to the road in accordance with the request of the Board; and it was understood that the refuge at the top of Hamilton-place would be removed, it being considered dangerous.

Masters and Men.—The proprietor of the West Central Iron-works, Drury-lane, and the South-Western Iron Foundry, Paradise-street, Lambeth, Mr. George B. Cooper, having concluded the nine hours per day to his workmen, from January 1st last, they presented him, on Monday evening, January 15th, with an address, accompanied by a silver inkstand, designed and manufactured specially by Messrs. Elkington. Mr. Cooper received the present with much feeling, and in speaking of the movement, said it had his support, and he hoped that the time acquired by his men would be used for their moral and mental improvement. His son, Mr. L. E. Cooper, afterwards read an address to the workmen.

Value of Land in London.—The freehold property, Nos. 27 and 28, Milk-street, Cheap-side, as sold at the Mart by Messrs. Debenham, Lawson, & Farmer. It consisted of two old houses, covering a site of 1,780 ft., and realised £501., or over 4s. 17s. per foot.—With reference to a paragraph we quoted in our last from City paper, as to a sale of land in Lombard-street, a correspondent acquainted with the circumstances writes to say that "it gives a also impression as to the value of land per foot. The amount in question comprised compensation for a retail business, and there are other exceptional matters connected therewith, which would reduce the value referred to, which I, as one having taken a prominent part therein, can well testify to."

Instruction in Science and Art for Women.—By permission of the Lord President of the Council, a course of six lectures, on the most celebrated and influential composers of Italy, France, England, and Germany, for the violin and the pianoforte, in connexion with the general history of music of the eighteenth and nineteenth centuries (illustrated by performances on the pianoforte), will be delivered on Monday afternoon, the 5th, 12th, 19th, and 26th of February, and the 4th and 11th of March, at half-past two o'clock precisely, by Mr. Ernstauer, in the Lecture Theatre, South Kensington Museum.

Junior United Service Club House.—This building, situate in Charles-street, St. James's-square, had a narrow escape from being destroyed by fire on Monday night. It appears that the members, during the whole of the day, had experienced a smell of burning wood, and at last names were seen playing round one of the pillars in the coffee-room on the ground floor. On making a closer inspection it was found that the ceiling, to the extent of 35 ft., with the wood work and supports, was on fire, and that the flames had actually penetrated the flooring in the first floor. With the aid of a number of hand & Mason's hand-pumps the fire was extinguished. The cause of the fire has been ascribed to a defective flue.

The "Abbotsford Grate."—The bars are closed close down upon the hearth, the space for the fire being lined at the sides and back with fire-brick, and instead of a grate forming the bottom, a fire-brick lump, fitting into and resting on a cast-iron tray, forms the bed upon which the coal is burnt, and all are so constructed to be renewable at any time without unsettling the grate. It is said that "the warming power of the grate is in excess of the ordinary construction, in proportion to the amount of fuel burnt, and the fire-brick lump at the bottom causes the most complete combustion."

A New Theatre in South London.—We understand that a new theatre is about to be erected in Newington-causeway, not far from the Elephant and Castle inn. The site is said to be extensive premises, situated on the western side of the road, and until recently occupied and known as the Steam Wheel Works. It is stated that the new building, the erection of which is immediately to be commenced, will be on a very extensive scale, and large enough to hold an audience of more than 3,000 persons.

The Kull Water Supply.—A report to the Kull Corporation Waterworks Committee on the proposed additional works for the supply of the water from Springhead, by the engineer to the waterworks, Mr. Thomas Dule, has been printed by authority. It develops three several plans, one for pumping all the water for the town's use direct from Springhead, at a cost of 79,814l.; the second, for supplying the west district direct from Springhead, at a cost of 61,372l.; and the third, for supplying water to the Stoneferry works from Springhead, at a cost of 26,977l.

Endowment of the Convallescent Hospital, Dundee.—Sir David Baxter, bart., of Kilmarnock, has been named by the directors of the Dundee Infirmary, a few weeks ago, to build a convalescent hospital for from fifty to sixty inmates, at a cost of from 2,000l. to 8,000l. He also promised to give the sum of 10,000l., provided an equal amount were given by others, for its endowment. Sir David has now written to the chairman of the infirmary, estimating that the other 10,000l. has been subscribed by his private friends, and that Messrs. Hill & Small are preparing the deed of constitution.

Church-Building at Aldershot.—It is proposed to build a new church at Aldershot capable of accommodating 1,000 persons.

Ventilation of the Court of Queen's Bench.—The bench, the bar, and the reporters at the Court of Queen's Bench joined in complaining on Saturday of the ventilation of that court. Mr. Manisty having to apologise for the loss of his voice through a severe cold caught in the court, Mr. Justice Blackburn wished that matters might be re-arranged, so as to give the bench a little of the air of which the bar appeared to have too much. From other parts of the court there were equally emphatic complaints on the same subject.

The Royal Academy.—The election of two Associates to fill the places of those who were admitted into the rank of Academicians Elect in November last,—viz., Mr. Dobson, the painter, and Mr. Lumb Stocks, the engraver, is to take place on the 29th of the present month. The candidates whose names have for a length of time been on the list of those who desire to belong to the Academy and have put down their names in accordance with the custom adopted, number, according to the *Daily News*, no fewer than 64 painters, 15 sculptors, and 13 architects.

Institution of Surveyors.—At the ordinary general meeting, held on Monday, January 15th, the adjourned discussion on Mr. Clutton's paper, entitled "The Cost of Conversion of Forest and Wood Land into Cultivated Land," and Mr. Grantham's paper, entitled "Agricultural Pipe Drainage in connexion with Arterial Drainage and Outfalls," was resumed, and, after a long debate, concluded. At the next meeting, January 29th, a paper will be read by Mr. E. J. Smith, entitled "Land."

Concrete Gas-holder Tank.—We have been informed that there is now in course of construction at the South Metropolitan Gas Company's premises, Old Kent-road, a concrete gas-holder tank, 152 ft. in diameter, by 38 ft. 6 in. deep to top of rest stones. We believe that this is the first instance of concrete being adapted for this purpose. The work is being carried out by Messrs. Thos. Docwra & Son, from designs by and under the direction of Mr. G. Livesay, the company's engineer.

The Leicester Municipal Buildings.—No official reply comes to our inquiry as to carrying out the selected design, but we have received several letters reiterating it, and expressing hope that the council intends acting fairly. The selected design, it should be understood, is the joint work of Mr. T. Barnard, of Leicester, and Mr. William Smith, of John-street, Adelphi, London.

Islington Workhouse.—The plans for the alteration of the old workhouse in Liverpool-road, Islington, have been laid before the Local Government Board, who have replied, through their architect, to the effect that no answer can be given for some weeks to come. In the mean time, the guardians have resolved to proceed with the demolition of the old buildings, so that they shall be ready to proceed with the new ones as soon as the plans are approved.

Luxembourg Cathedral.—This building has been lighted with gas by Messrs. Cox & Sons, of Southampton-street. Massive standards, the bases iron, and the upper parts in polished brass, with foliations, introducing coloured crystal jewels are used for the nave, and a number of polished brass brackets, of a design to correspond with the standards, have been supplied for various parts of the building.

Bangor Cathedral.—The restoration of the Bangor Cathedral, says the *Rock*, has come to a standstill. About 5,000l. are still required, and the means at the disposal of the committee are exhausted. Lord Penrhyn, who has contributed 3,000l., has undertaken works which will cost 2,000l. more. Mr. Kneeshall offered 1,000l. if mine owners will give a like amount. The bishop, Mrs. Campbell, the dean, and Lord Boston have already given in their names.

Aberdeen Builders.—At a meeting of the representatives of the employers of the building trade (with the exception of the masons) in Aberdeen, it has been resolved to intimate to the men their willingness to concede that the hours of labour, after the 1st of June, be fifty-two per week, without reduction of pay.

Utilisation of Sewage.—The Banbury Board of Health has agreed to purchase an estate, at a cost of 23,400l., for the purpose of utilising the sewage of the district. An examination has been held by a Government commissioner, no opposition being offered.

Sculpture in Spain.—The municipal council of Madrid have invited a competition among the artists of Spain to decorate the Plaza de la Independencia with six or eight statues of the heroes of the War of Independence.

TENDERS

For building new rectory house, at March, Cambridgeshire. Mr. William Smith, architect.—

Swann, jun.	£2,590 0 0
Broadhurst	2,468 0 0
Law & Son	2,378 0 0
Hutchinson	2,369 0 0
Bennett	2,160 0 0
Brown (accepted)	2,029 0 0

For rebuilding rectory house, at Dodington, Cambridgeshire (destroyed by fire). Mr. William Smith, architect.—

Richardson & Son	£4,249 0 0
Thompson	3,983 0 0
Brown	3,962 0 0
Law & Sons	3,967 0 0
Hill & Sons	3,954 0 0
Fast (accepted)	3,550 0 0

For erecting new farm buildings, &c., on Dodd's Charity Estate, at Kimblewick, Bucks. Messrs. Brown & Foulkes, architects.—

Sved	2,478 0 0
White	473 5 0
Fitkin	441 5 0
Callam	409 10 0
Batting	403 10 0
Mayne & Son	332 0 0
Snell	321 13 3

For the erection of a house, Elmfield, Leicester, for Mr. John Stafford. Messrs. Pargeton, Chambers, & Bradley, architects. Quantities supplied.—

Hobson & Taylor	£8,777 0 0
Bayes & Ramage	8,152 0 0
Thompson	8,110 0 0
Hughes	7,900 0 0
Urison	7,787 0 0
Svenson & Weston	7,770 0 0
Engle	7,197 0 0
Lovelsay	7,350 0 0
Messrs. Herbert	7,043 0 0
Osborn, Brothers	6,780 0 0
Harves & Moody	6,525 0 0
Neale & Sons (accepted)	6,490 0 0

For rebuilding a warehouse, in Cannon-street, City, and alterations and additions to five adjoining, Mr. Herbert Ford, architect. Quantities supplied by Messrs. Karalate & Morimer.—

Meyers & Son	£11,891 0 0
Higgs & Son	11,185 0 0
Hill, Kettle, & Waldram	11,170 0 0
Brass	10,710 0 0
Conder	10,529 0 0
Perry & Co.	10,335 0 0
Gammion & Son	10,063 0 0
Timper	9,963 15 0
Sturton & Son	9,638 0 0
Schreyer & White	9,553 0 0
Williams & Son	9,489 0 0
Brown & Robinson	9,484 0 0
Henshaw	9,261 0 0
Killy	9,200 0 0
Perry, Brothers	9,173 0 0

For alterations to union workhouse, at Pwllheli. Mr. R. G. Thomas, architect.—

Lloyd	£1,194 0 0
D. Williams	909 0 0
Griffith	890 0 0
Messrs. Roberts	947 0 0
J. Jones	854 0 0
W. Jones	800 0 0
R. Jones	752 0 0
Griffiths (accepted)	721 0 0

For new house, at Menai Bridge, for Mr. R. G. Thomas, architect.—

J. Williams	£718 17 2
E. Williams	690 0 0
Thomas	690 0 0
J. Williams	680 0 0
R. Jones	662 0 0

For the erection of new tavern and outbuildings, on the new Sussex Cricket-ground, Hove. Mr. J. Woodman, architect. Quantities supplied by Mr. B. H. Nunn.—

Cheesman & Co.	£4,329 0 0
Parsons	2,690 0 0
Nash & Co.	2,081 0 0
Patching & Son	2,076 0 0
Leicester	2,047 0 0
Blackmore & Howard	1,995 0 0
Lockyer	1,955 0 0
Ansonbath	1,949 0 0
Barnes	1,824 0 0

For new house and business premises, on the Stoke Lodge Estate, Guildford, for Mr. W. Tucker. Mr. Henry Peak, architect.—

Burdett	£690 15 6 1
Moon	690 10 0
Mason	695 0 0
Strudwick	690 0 0
Garnett (accepted)	553 12 0
Swayne	388 11 0

For teacher's house, and enlarging the national school buildings, at Compton, Surrey. Mr. Henry Peak, architect.—

Messrs. Loe	£295 0 0 1
Hubbins & Co.	628 0 0
Moon & Son	495 0 0
A. Moon	480 0 0
Sturly	475 0 0
Mitchell (accepted)	475 0 0
Strudwick	469 0 0
Massey	464 5 0
Lucas	410 12 0
Cooper	313 0 0

For Bexley Bridge, Kent. Mr. Martin Bulmer, architect.

Booker	475	0	0
Lacy & Co.	451	0	0
Lewis	422	0	0
Webb	412	0	0
Featherstone	460	0	0
Blake	303	0	0
Dwyer & Co.	357	0	0
Allard (accepted)	340	0	0

For Drayton Schools, near Abingdon.—

House	.....	School.	.....
Whiting & Toxland	£471	0	0
King	408	0	0
Wheeler & Gregory	397	0	0
Williams	311	0	0
Bryan (accepted)	300	0	0

For repairs and alterations at the St. George's Baths and Wash-houses, Buckingham Palace-road. Mr. W. R. Gritten, architect. Quantities supplied:—

Colwill	2,785	0	0
Thomas	728	10	0
Allard	687	16	0
King & Son	670	0	0
Wright	628	10	0
Sale	621	0	0
Nichols & Goodair	602	0	0
Bennett	596	10	0
Erzge	580	0	0
Jenner	560	0	0
Pullen	555	0	0
Rogers	530	0	0
Kearly	530	0	0
Woodcock	530	0	0
Carter & Son	457	0	0

For the erection of St. John's District Projected Schools, Woolwich:—

Wagner	2,995	0	0
Messrs. Hosking	2,987	0	0
Lord	2,981	10	0
Johnson	2,796	0	0
Mann	2,727	0	0
Priestley	2,680	0	0
Gibson	2,677	0	0
Lozerman	2,572	0	0
Waterson & Co.	2,450	0	0
Kirk (conditionally accepted)	2,464	0	0
Shepherd	2,404	0	0
Hughes	2,361	0	0

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We are compelled to decline pointing out books and giving addresses.

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NOTE.—The responsibility of signed articles, and papers read at public meetings, rests of course with the author.

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VOL. XXX.—No. 1513.



The Rude Stone Monuments of all Countries.

It is something new to see Stonehenge and monuments composed of unhewn stones regarded as specimens of a style of architecture, divided into periods, and credited with architects. Hitherto, antiquaries have looked upon un-tooled monuments as mainly pre-architectural and possibly pre-historic. But Mr. James Fergusson has now elaborated an idea, slightly outlined by him about ten years ago, and, in a copiously illustrated work on "Rude Stone Monuments," endeavours to draw these wonderful relics within the confines of architecture and history, and arrange them in a sequence.* His

creed is that all groups of un-tooled stone are comparatively modern; and that those of the East, especially, are very late attempts to imitate ancient magnificence.

Our own great circles of unhewn stones he attributes to King Arthur. Their use or meaning has been a puzzle to antiquaries for centuries. Many conjectures have been made, from the days of Tudor and Stuart archaeologists to our own, concerning them, but these are all folded up and neatly shelved by Mr. Fergusson, who insists that these monuments are trophies raised on the battlefield in the strong hour of victory. With a victorious army on the spot, it would have been easy to raise a monument of this kind in a week, he urges; and then he proceeds to identify the sites of several of our largest circles with Arthur's famous battles. Curiously, from want of knowledge of the locality, probably, he is inclined to shift the site of the first battle from the Glen mentioned in the old writings into Dumfriesshire, near Lochmaben, where there happens to be a circular inclosure corresponding in particulars with that at Peurith, known as Arthur's Round Table. But Northumbrian antiquaries boast that there are few districts in the United Kingdom so rich in ancient camps, fortlets, incised rocks, cultivated terraces, and other signs of an early and numerous population as that through which the Glen flows; and, consequently, as the army was composed of the population in those days, none more likely to have been the scene of a great gathering in momentous times. The sites of the second, third, and fourth battles are unidentified, but the fifth is thought likely to be represented by one of the Cumberland circles, near Penrith; the sixth is associated with remains at Bas Lowe, in Derbyshire; the seventh with the Salkeld circle, or else with the Grey Yawds, near Cumrow; the eighth is laid in Wales, from its Welsh name, Guin; the ninth is thought likely to have been Caerleon, in South

Wales; the tenth, on the River Ribroit, is unidentified; the eleventh is supposed to have been at Stanton Drew, where stands a set of monoliths so impressive as to be chosen by Mr. Fergusson for the frontispiece of his work, and which we are enabled to reproduce; and the twelfth is represented by the great circles and lines of huge stones at Avebury. It is said of many things that they are too good to be true; and this association of our most mysterious monuments with our most mythical monarch is so delightful that we are afraid it must be another of those superlatively good fictions.

Before going further into the author's array of facts brought forward in support of his view of the recent date of rude monuments, we would throw out the hint that, without including the mention of the circular temple by Diodorus, some of the old Greek legends seem to indicate the presence of huge stones in artificial groups at a period prior to the writings of the Greek poets. Whosoever looked upon the head of Medusa, for instance, is said to have been changed into stone. As Perseus travelled homewards with it, he is recorded to have turned a whole army into stones by exposing it to view; and when he arrived at the court of Polydectes, he only held it up before the eyes of that monarch and his scoffing courtiers and they were instantly changed into stones. Could it be shown that there are, in Greece, circles and groups of stones similar to those of which Mr. Fergusson treats, we should have to consider whether or not it was their presence that dictated such fables to the poets. If we found there was a circle of stones in the island of Sirephos, where Polydectes kept his court, and rows, or groups, either drawn up in battle array or scattered in apparent confusion, on the spot associated with the rescue of Andromeda, and the subsequent battle with her suitor Phineus, should we not have grounds for believing that the legends were adapted to these relics? If these rude stones were known to the builders of the polished stone buildings of ancient Greece, the theory of their recent date must fall to the ground.

We would, too, remove a misconception concerning the absence of circles in Wales. Mr. Fergusson assumes there are none either in Anglesey or in any other part of the Principality,

although there are many dolmens. We refer to the work of the Rev. Henry Rowlands, entitled "Mona Antiqua Restaurata, 1766," and find he illustrates the remains of a stone circle in the township of Tre'r Dryw, Anglesey, and mentions a finer one of forty-two stones as situated between two mountains near Cesall Gyfarch, in Carnarvonshire. And this painstaking author wrote of Anglesey, "There are also up and down many remains of pillars and erected columns in all these precincts; some single and some ranged in circles; most of them broken and cast down." Furthermore, he endeavoured to ascertain whether there were any particular traditions attached to them by the simple Welsh people, and could find none but what was represented by their familiar name, Arthur's Quoits. This last fact is especially worthy of note, because a similar term popularly applied to another group of rude remains, at Gower, near Swansea, assists Mr. Fergusson to settle the site of one of Arthur's battles.

With regard to Stonehenge, we are assured there is no reason to doubt the truth of the statement of Geoffrey of Monmouth. This Medieval scribe distinctly states that Ambrosius erected Stonehenge in memory of the three hundred British nobles who were treacherously slain by Hengist when partaking of his banquet at Amesbury. If, deploring Mr. Fergusson, he had been content with this unvarnished statement, no one would ever have doubted it; but, unfortunately, he embellished it, by adding that the great magician Merlin brought the stones from Ireland. This flight of fancy cast a doubt upon the whole narrative; but it need not have done so, for we have only to read that some of the stones were transported from Ireland, without the aid of magic, instead of by that agency, and all is clear. As is well known, some of the stones belong to rocks that are not found in Great Britain, but are common in Ireland, and the transport of these rarer blocks from that country may have been the foundation of Geoffrey's report. Mr. Fergusson thinks that though the native style fell into abeyance during the Roman occupation, it still flourished in Ireland, and was selected by Ambrosius, or recommended to him by Merlin, as most suitable for the national memorial of the three hundred nobles. Following Geoffrey still further,



CELL IN CAIRN, AT LOUGH CREW.

* Rude Stone Monuments in all Countries; their Age and Uses. By James Fergusson, D.C.L., F.R.S., &c. London: John Murray. 1872.

he suggests that the pairs of blue stones within the choir were placed there to the memory of Aurelius and Constantine, who are said by that historian to have been buried within "the structure of stones which was set up with wonderful art, not far from Salisbury, and called in the English tongue Stonehenge." In effect, he bids adieu to the temple and tribunal theories, and to the Druidical serpent idea, and proclaims the erection of this Giants' Dance, as it has been figuratively called in old times, to have commenced in the year 466, and concluded in 470 A.D. It is, he declares, the most effective example of megalithic art ever executed by man. "The Egyptians and Romans raised larger stones, but they destroyed their grandeur by ornament, or by their accompaniments; but these simple square masses on Salisbury Plain are still unrivalled for magnificence in their own peculiar style."

We have said that Mr. Fergusson arranges the various kinds of rude stone monuments into a sequence. He begins with the kist, or kistvaen, found in sepulchral tumuli, as his first "period." The buried chamber for several interments is the first step forward. As such a structure could not be externally completed till all the intended burials were made in it, considerable delay must have occurred in some instances, and the next step would suggest itself as a remedy for this inconvenience. This is the external entrance piercing one side of a tumulus to communicate with the central chamber. So far so good, doubtless.

We next find him setting out as a fact that the buried chamber, when composed of large unhewn stones, was the predecessor of the open or free dolmen, or cromlech. The next step to leaving them uncovered was to elevate them on the summits of tumuli. Some writers have supposed that all the dolmens we now see uncovered were once buried, and are only now exposed to view because the mounds of earth have been removed. This supposition Mr. Fergusson holds as improbable, and even impossible; for, he urges, the supports of the capstones are not sufficiently close to have prevented the earth falling into the central chamber, in the course of the formation of the mound over it. The capstone of the dolmen at Pentre Ifan, in Pembrokeshire, is large enough, and sufficiently high from the ground, to admit of four or five persons on horseback taking shelter under it. It is not likely, he argues, that any man would take the trouble to hoist this stone on to its supports merely to hide it again directly under a tumulus; for a stone one-third or one-fourth its weight would have answered the purpose of a roofing-stone equally well. But, he continues, "the mode of architectural expression which these stone-men best understood was the power of mass. At Stonehenge, at Avebury, and everywhere, as here, they sought to give dignity and expression by using the largest blocks they could transport or raise; and they were right; for, in spite of their rudeness, they impress us now; but had they buried them in mounds, they neither would have impressed as now their contemporaries." It will be seen that the term "stone-men" here used is not to be taken in connexion with the archaeological divisions of stone, bronze, and iron, for which, indeed, he shows but cold appreciation. After the rude stone-monument builders had raised their dolmens to the top of their tumuli, their progress is not so easy to trace. But that the circle is one of the latest forms of rude stone architecture seems to him certain. The demi-dolmen also appears to be a late and economical invention.

In comparing Eastern with Western dolmens, Mr. Fergusson finds what he considers to be unmistakable proofs of the same successive forms of burial are indicated—the kist, the chambered tumulus, the elevation of the kist on to the top of the tumulus in the open air, and, finally, the formation of the circular hole in one of the slabs of it. In the most ornate of Indian tombs, this parentage is pointed out. The rails round it represent the circle of stones round the rude monument; the domed tomb is the tumulus; and the toe on the top of it is the elevated external kist-vaen. In the case of the Lanka Ramayana Dagoba, of which a view is given, there is, moreover, unnoticed by him, another mysterious association of ideas indicated in the presence of a series of concentric circles on the side of the tee shown. "That a people might both bury in barrows and erect domical cairns to contain relics, would not necessarily involve a

proof of the one form being copied from the other; but that both should be surmounted by a simulated sarcophagus or shrine, and both surrounded by one, two, or three rows of useless stones, points to a direct imitation of the one from the other which can hardly be accidental," presses the author. Many would suppose that the ornamental tomb is the development of the rude monument formed of unhewn stones; but he has arrived at exactly the opposite conclusion, as we remarked at the outset. Wood being the earliest building vehicle in India; and having regard to the curiously attenuated pillars of this particular monument, he considers that the Lanka Ramayana Dagoba is an adaptation in stone of forms previously wrought in wood, and that the unhewn-stone monuments are but rude and late attempts to copy these early efforts in polished stone; and as it is allowed that no hewn stone buildings were erected in India before the year 250 B.C., the date of the rude stone monuments must be placed a long time after this period,—probably as much as five or ten centuries. There has been no break, he believes, in this manner of building from the time it was commenced till the present day.

An interesting feature in the work is a map, illustrating the distribution of dolmens, and showing the probable lines of migration by the dolmen builders. India, and Syria, and the Circassian coast of the Black Sea, are the chief seats of these relics in Asia, as far as our present information goes. But as the thousands now observed in North Africa were unknown to us twelve years ago, we are justified in assuming that there may yet be discoveries of more in other localities. Italy and Greece are still unexplored, for we may take the solitary dot in each country as evidence of this fact either west of the absence of dolmens. The south, west, and northern coasts of Spain, show an almost uninterrupted chain of them, the Andalusian coast being the only gap. One of the lines of migration stretches from the African coast to Granada, across the Mediterranean; and another line shows a communication between Africa and France, the chief dolmen country. From Spain, Mr. Fergusson gives two more lines of migration northwards, the one landing upon the south coast of Ireland, to account for the mysterious connexion of the Irish Milesians with Spain, and the other sailing along the west coast, touching at two points, all it was met by a line coming from the Orkney Islands and Norway. From France he shows two short lines crossing the English Channel to land in Cornwall and Devonshire. Kent and York were reached by emigrants from Holland and Hanover; and Northumberland was gained by an independent migration from Sweden and Jutland. Central Europe has yielded only occasional traces of dolmen builders up to the present date.

Every one really under the influence of the attraction of these enigmatical remains of an unrecognised people will look through Mr. Fergusson's labours with pleasure, although, as he is the first to admit, and we fully believe, he may not have found the right clue to the mystery of the subject. His impression is that the dolmens, like the circles, all belong to a period subsequent to the commencement of the Christian era, and he shows what he thinks some very good reasons for assigning them this late date. Mr. Baker's account of a cromlech-building Indian tribe, which still continues to bury in cromlechs, is one of the strongest arguments that could be urged, though by no means conclusive. The presence of a dolmen in the centre of the courtyard of a ruined Sinite temple, at Iwolee, in Dharwar, of which a view is given, again speaks for their modern erection, for it is difficult to believe that the Sinite priests would have sanctioned the erection of a temple close to a tomb belonging to a dispersed tribe; and as their building is a thirteenth or fourteenth century edifice, it follows that this particular dolmen must be late indeed if erected there after the temple had been ruined.

A still more striking reason for a belief in the recent date of some of them is presented in the case of the dolmens at St. Germain-sur-Vienne, near Confolens, in Poitou. Here we have a huge unhewn capstone, measuring 12 ft. by 15 ft., and of proportional thickness, raised upon five columns, of Gothic design, whereof one has now fallen; which columns, as if to preclude the supposition that they were hewn out of solid blocks similar to those that support the generality of dolmens, are each composed of three separate pieces,—a base, a shaft, and a capital. "Doubt seems impossible with regard

to this," says Mr. Fergusson, triumphantly: "it is a dolmen pure and simple, and it was erected in the twelfth century. In itself the fact may not be of any very great importance, but it cuts away the ground from any *à priori* argument as to the age of these monuments. It does not, of course, prove that they are all modern, but it does show that some of them at least were erected after the time of the Romans, and at an era extending far into the Middle Ages." Spain furnishes another remarkable case in point. Within the walls of a church, at a place called Arrichinaga, about 25 miles from Bilbao, in the province of Biscay, are preserved huge, cumbrous, unhewn stones, which appear to be parts of a dolmen. That these great blocks should have been enclosed in a Christian edifice, is at the least exceedingly singular, if the fact does not warrant the author's assumption that veneration for them must have been felt when it was built. At Kerland, in Brittany, there is a demi-dolmen, from which arises a cross, as though some early convert was buried below, whose relatives still adhered to the traditional form of sepulchre.

We are enabled to reproduce some of the illustrations of these important evidences given in support of the author's position.*

We have a large amount of new matter on the score of Irish rude stone monumental antiquities. The great battle-fields of Southern Moytura and Northern Moytura he explored, with the assistance of Sir William Wilde's knowledge of the locality, and made out their wonderful story by the aid of their dolmens with single, and double, and treble circles, and circles without central dolmens, cairns, and other relics; more than this, he examines into the question of the date of these battles, and shifts it down the scale of events from the high place the old writers gave them to the first century before or after the birth of Christ, which, of course, enables him to fit this vast field of antiquities neatly into his theory. About eight years ago a range of twenty-five or thirty cairns was first noticed, on Slieve na Calliagh, the lags' or witches' hill, near Bragh na Boine, the whole of which have since been opened by Mr. Conwell. One of the most perfect of these tumuli, 116 ft. in diameter, is surrounded by thirty-seven stones as a retaining wall, and, on its north side, has a large stone set back from this circle, which is fashioned into a rude seat, and covered with the identical cup markings and concentric circles that have been recently found inscribed on rocks in so many parts of England and Scotland. There is a central chamber on this tumulus whereof twenty-eight of the stones are ornamented with similar and additional sculptures. Another tumulus contains a chamber, 29 ft. deep and 13 ft. across, with similar ornamentation on its walls and pillars, in the centre of which lay one of the largest of the low flat basins, whose use is still a matter of wonderment, that has yet been found. Below the basin were charred bones and forty-eight human teeth, a few jet objects, and a syenite ball. Pieces of pottery, bone implements, and more charred bones were found in various parts of the chamber; but though the sculptures appear to Mr. Fergusson to have been engraved with a sharp metal tool, there were no metal objects to be seen. One of Mr. Conwell's drawings representing this chamber we give. Our author supposes this range to be the cemetery of Taltin, celebrated in Irish legend.

As might be expected, the early monuments of Scandinavia and North Germany occupy some prominence, likewise, in the volume. It is, doubtless, the Scandinavian battle-fields that have given Mr. Fergusson the courage to assume that our own circles are memorials of battles. One of them, at Kongsbacka, has similar alignments, he perceives, to those at Dartmoor, Ashdown, and Karna, and this is assigned to the fifth century. No right in history, he affirms, is better known than the fight on the Brunnala Heath, in Östergötland, where the blind old King Harold Hildstend was vanquished by his nephew, Sigurd Ring, and it does not seem to admit of doubt but that the circles and cairns on the heath commemorate the event and contain the ashes of the slain; and yet this field is nearly identical in its appearance with the Irish battle-fields at Moytura mentioned above. This similarity causes him, in fact, to falter in his opinion as to the builders of the Irish circles, and to ask whether they may not have been erected by Scandinavian Vikings on the occasion of a descent upon the west coast of Ireland.

* See p. 68.

In spite of the haze that has settled over this branch of archaeology, Mr. Ferguson believes that it will yet be possible to unravel the history of its great pillars and grave circles and lines of grey stones. Continuous researches have done much for the monuments of Egypt, Babylon, and Nineveh; and are likely to do as much for the remains under consideration. Meanwhile, he places great stress upon the fact of the classic writings containing no allusions to them. He asks whether such an artist as Caesar is likely to have passed them over; especially, as when he watched the fight between his galleys and the fleet of the Veneti in the Morbihan, he probably stood on Mont St. Michel and among the stone avenues of Carnac. The Romans, too, occupied Old Sarum during their stay in England, and one of their roads passed close to Silbury Hill; yet there is no allusion to Stonehenge or Avebury in anything that is written. The same silence is observed with reference to the dolmens in France. It is true Diodorus mentions a circular temple on an island belonging to the Hyperboreans; but his statement is so vague that it is impossible to identify the island. Under these circumstances, the author thinks himself approaching the truth in assuming that the bulk of our rude stone monuments belong to the period succeeding the Roman evacuation. Of those who have investigated the subject for themselves, some will receive and some will resent Mr. Ferguson's interpretations; but all who look into his book and examine his two hundred and thirty-four illustrations will be gratified. We should give but a limited idea of the scope of the work, the principal object of the present notice, if we omitted to add that the monuments of the Mediterranean islands, Western Asia, North America, Central America, and Peru, are also described as fully as those of the parts of the globe already mentioned. On another occasion we shall discuss Mr. Ferguson's theory, and show what reasons there are for believing he may be wrong.

THE ANTIQUE: ITS STUDY OR ITS RESTORATION.

We are glad to learn that advantage is being taken of the reproductions of antique sculpture from South Kensington, as well as of the resources of the Art Library and Museum, to bring into definite and accessible form the rules of symmetry observed by the great artists of antiquity. It is extraordinary that it should have been left to the present time to accomplish so much needed a work. One valuable result, however, is evident, from the collection, in one spot, of accurate copies of the most famous statues, as well as of the manuscripts, drawings, and rare books which are so accessible in the Art Library. A few years ago, months or even years would have been needed in order to carry out that accurate investigation which may now be accomplished in weeks. To visit Rome, Florence, Naples, Paris, and the British Museum, in order to take measurements of the Apollo Belvidere, the Venus de' Medici, the Toro Farnese, the Venus of Milo, the Torso of Cupid, the Theseus, and other noble works of ancient art, is, in itself, an undertaking. Permission and aid for the purpose of artistic investigation would have been more readily asked than obtained. And, in inquiries of this nature, there are constantly fresh references to former observations, rendered desirable by the continuance of research, that are all but impossible when the objects of examination are scattered through the museums of Europe.

The indescribable and magic charm of antique Grecian sculpture is felt by all those who have ever crossed the threshold of the temple of art. The cause of this charm, or rather the causes, yet baffle the investigator. Not that we are unaware of the nature of some of these causes. We know that, in ancient Greece, the symmetry of the body was a matter of deep study, and of almost religious culture. A divine gift of beauty was inherent in the blood. The climate, the topographic influence of broken hill country, of cool sea breezes tempering the heat of summer, of rocky islets tempting to a timid navigation,—the great national games, the development of strength and grace for the express purpose of victory in the *palæstra*,—all tended to enhance this gift. Female beauty was impersonated as a goddess. Various forms of manly symmetry engaged the care of the sculptor. The ponderous muscular form of Hercules; the lithe, fleet, angry majesty of Apollo; the saucy grace of Cupid; were all regarded with the same reverent love with which

Raffaello or Murillo dwelt on the incidents of the Divine Life. The greatest of Greek philosophers mentioned magnitude of size as the first virtue of women; and that with as much simplicity, as if no educated man could doubt that a stature which gave promise of being productive of fine-grown children was the first quality that any one ought to seek in a wife. Little indications occur in Greek literature that show that such was indeed the habit of Greek thought; as when Xenophon mentions, with unfeigned admiration, the large and beautiful women who were to be found in the countries traversed during the expedition of the Ten Thousand.

Exact measurements of famous statues have, indeed, been taken at various times. In the library of the British Museum is a folio volume, containing thirty plates, on the proportions of the human body, published at Paris, in 1683, by Gérard Audran, an assistant of the sculptor, Lebrun. A German edition of this work was published at Nürnberg in 1686. Among the seventy volumes, original or translated, that bear the name of Albrecht Dürer on the title-page, is to be found the small folio bearing the quaint title, "*Vier Bücher von Menschlicher Proportion, durch Albrechten Dürer von Nuremberg erfunden und beschrieben*," which is full of wood-cuts of male and female forms, and of interminable geometric investigations of the solid contents of various figures, applied to the equipercentuation of the human form. The "*Trattato della Pittura di Leonardo da Vinci*" has been translated into German, Dutch, Spanish, and French, as well as into English by J. E. Rignaud; and contains hints of the utmost value, although they were never brought into definite form by the accomplished author. All these, and other yet more detailed works of an anatomical nature, are, however, far beyond either the reach or the requirements of the ordinary student.

Another mode of treatment is to be found in almost any treatise on drawing, in which complicated arrangements of squares, circles, and triangles are described around the delineations of lay figures. The whole web of diagrams may generally be traced to unacquaintance on the part of the delineator with the use of mathematical instruments, or with the simple relations of the sides of triangles. Thus, where one dimension of the person is normally or approximately equal to another, the relation is expressed by describing a circle, instead of by a simple indication of the fact. In one little work, now out of print, the ratio that exists between the base and the hypotenuse of a right-angled triangle seems to have been regarded by the author as a discovery of such novelty and importance, that he has impressed the diagram which illustrates it on the cover, as well as on the title-page, of his book.

All this learned, or unlearned, trifling, however, serves only to divert the mind of the student from an inquiry that may really have fruitful results. Can there be detected any such rules of exact proportionate symmetry either in the writings or in the works of the ancients, as to shed any light on the wonderful harmony of the forms of antique art?

We are convinced that one result of a thorough investigation of this subject will be the conviction that conventional rules were much more rigidly adhered to in the purest period of Grecian art than in the subsequent ages. How far the hands of Phidias and of Scopas were fettered by exact rules, and how far the grace and apparent mobility which later sculptors gave to their famous works arose from the neglect of the ancient canons, it will be most instructive to learn. It is clear, from some of the earliest relics of Greek art, such as the statue of Apollo found at Tegea, that Egyptian practice and example predominated over the early period of Grecian sculpture. In Egypt, what we now call the Conventional system was reduced to the most perfect and durable system that can be conceived. We not only deduce this from the long series of Egyptian monuments, in which, for the ages that elapsed from the dynasty that reared the Pyramids to the Ptolemies, so little change was made in the sculptured representation of the human form; but we are in possession of the actual canon of the Egyptian draughtsmen. We find apartments, in monuments of very different date, in which the unfinished state of the walls leaves exposed to view the constructive lines by means of which these ancient artists invariably set out their work. The entire surface to be covered with sculpture, painting, or the curious combination of the two, which is known by the name of

koinanaglyph, was marked off into squares. In the earlier period, nineteen of these squares were allotted to the height of a standing figure; in the later there were twenty-two. Every part of the frame was thus drawn according to exact and unvarying rule; and the identity of portraiture that prevails over every territorial division of the valley of the Nile, and during the reigns of at least twenty-five successive dynasties, is thus at once explained. Sculpture, in Egypt, crystallised at a date so far back as to be at present indeterminate; and the crystals kept their characteristic angles till Egyptian art itself perished under the attrition of Roman sway.

It is not to be supposed that, by exact investigation of the canon of the Greek sculptors, we shall be enabled to imitate the excellence of their work, any more than that by a careful study of the laws of prosody we shall be able to reproduce the poetry of Æschylus or of Euripides; but it is none the less true that such exact knowledge is necessary to anything like a critical appreciation of the merits of ancient art. How far this is absent from those spots where it is presumed to exist, is shown by the fact that the curators of the great national museums of London and of Paris, the British Museum and the Louvre, have each dealt with one of the most precious relics of antiquity in their possession in a manner that would have been rendered impossible by a very small amount of acquaintance with the laws of ancient sculpture.

The first of these misrenderings of the message uttered by the marbles of Greece is to be found in the case of the headless and mutilated statue of a Cupid, which is stamped by the impress of the purest times of art. To this beautiful fragment a portion of a left foot has been attached, which actually must have belonged to a figure of altogether different proportions. The height of the Cupid, when perfect, was close upon 56 in. The foot with which the statue has been accommodated measures 9½ in. or nearly 10 in., and cannot have belonged to a figure of less than from 64 in. to 70 in. in height; besides being of a long narrow form, that indicates the female sex. The important lessons to be drawn from the study of this exquisite fragment are rendered all but valueless by this inappropriate restoration.

The case of the beautiful female figure which was discovered, in 1820, in a cave in the Island of Melos, in several different portions, and which, after a curious series of adventures, was secured by the French Government, and now forms, perhaps, the most famous treasure of the Louvre, is still more remarkable. The curators of that museum, with a devotion to their duty which forms a bright exception to much of the history of the last two years in France, secured this statue from shell and from petroleum by an internet as careful as that by which domestic affection honours the relics of the departed. In the cracking of the plaster by means of which the original fragments had been united, it became evident that wedges had been inserted at the waist, which gave the upper part of the body that inclination to the left which is one of the most puzzling characteristics of the statue. As we are familiar with the figure, a plumb-line dropped from the fontanel, or hollow at the bottom of the throat, falls altogether without the left foot. The most authoritative rules on the subject of the equipose of figures are to be found in the works of Leonardo da Vinci, a profound master of the subject, and are accepted as artistic canons. "The pit of the neck, between the two clavicles," are his words, "falls perpendicularly with the foot which bears the weight of the body." "If the figure rests upon one foot," is another precept of Leonardo, "the shoulder on that side will always be lower than the other, and the pit of the neck will fall perpendicularly over the middle of that leg which supports the body." If the arms be extended, or if any artificial weight be carried by the figure, the position of the fontanel will be changed. But nothing but the strain of a severe effort could throw it so far from the perpendicular as is the case with the statue in question. And the idea of such exertion is entirely inconsistent with the serene majesty both of face and form.

No attempt to decide on the original position of the arms has yet been attended with success. Among the fragments of Termes and of other statues which were found on the same spot with this noble figure, was a hand holding an apple. From this hand, which has never been satisfactorily co-ordinated with the figure, the name of Venus was applied, by M. Quatremère de Quincy. There was an ancient group, of which the idea

is preserved in gems, of Venus standing by Mars, with her left arm resting on the shoulders of the god. But the figure in question can have formed no part of such a group, as the right arm of Mars would in that case have rested on her back. Neither is the countenance in any way appropriate to such a composition.

The girths of this statue, the proportion between the height and the width of the face, and the peculiar physiognomical outline of the upper lip, are not those of the antique Venus. The latter, especially, is characteristic of Juno, and the draping of the lower part of the figure, while the entire upper part is undraped, was a feature of the grand statue of Juno, by Polycletus; the idea suggested being that the Queen of Olympus was hidden from men, but visible to the Immortals. It is true that in the group of Mars and Venus there is a drapery about the lower limbs of the latter, but it falls lower, and has nothing of the composed dignity of the drapery of the Juno of Melos.

Monsieur Félix Ravaisson, *Conservateur des Antiques et de la Sculpture moderne au Musée du Louvre, Membre de l'Institut*, has written a little work of sixty-eight pages on this subject, illustrated by photographs of the statue in its different conditions, which has been published by Messrs. Hachette. The work is one of great interest and value; and the extreme beauty of the first photograph, representing the noble figure in the coffin in which it was enclosed to be transported from the Louvre, is such, that we trust Monsieur Ravaisson will take the precaution to have a gelatine plate taken from the negative, for the sake of obtaining permanent unmounted prints, before the latter is injured or destroyed.

M. Ravaisson's little work is divided into two parts. With the first we are disposed altogether to agree, from observations as to the plumbing of the figure, made before this brochure reached us. There is a plate representing three restorations of the statue, using that word, not to denote modern conjectural additions, but the presentation of the antique relic in its most correct position. No competent judge can doubt either the correctness of M. Ravaisson's views on this score, or the service that he has rendered to art by their publication. It appears from a letter from Monsieur de Clarac to Count de Forbin, when director of the Museum of the Louvre, now for the first time published, that some intrigue or jealousy between the architects of the Louvre and the conservator of antiquities led to the hasty erection of this statue, without the supervision of the latter. M. Ravaisson shows, in full detail, the modifications that successively became natural from the first cardinal error of not regulating the vertical line of the figure by keeping the horizontal joint which passes through the haunches truly level. Hence wooden wedges were introduced, stopping of plaster was added, and even a sacrilegious chisel was applied to the ancient marble. Independent reasons, founded on the inclination of the figure from left to right, on that from the back to the face, on the falling of the fold of the peplos that crosses the left thigh, and on the angle at which the right foot is placed to the leg, enforce the opinion that a level bed was formed at the period of the ancient restoration of a yet more ancient statue.

With the second portion of the work, for reasons previously indicated, we do not agree. M. Ravaisson adopts the idea of M. Quatremère de Quincy that this noble figure formed part of a group of Mars and Venus. We have seen no argument that appears to us conclusive, or even plausible, for giving the name of Venus to a statue of a character so different both in proportions and in expression from that proper to that goddess. Admitting that a proud and severe dignity is the chief characteristic of the figure, M. Ravaisson thinks that he traces in it the influence of the school of Lysippus. We are sure that the process of minute measurement would lead this distinguished *savant* to reconsider this idea. Lysippus is known to have diminished the heads of his statues, and given greater proportionate length to the limbs, in order, he said, to give more mobility and appearance of life. In the Venus de Medici this reduction of the size of the head is but too apparent—to the great disadvantage of a statue of which the figure below the throat is perfect. But in the Juno of Melos the head is proportionately larger than in any figure we can at the moment cite, except than in the Antinous or in the Apollo Belvidere. Not only is this the case with reference to the height of

the head, from the apex of the chin to the scalp, but the proportion between the width and length of face is fuller, as indeed is the case with all the horizontal proportions, than in the other instances we have mentioned.

We are happy to give an English echo to the expressions of M. Ravaisson as to Restoration. It seems, he says, that the habit of restoring ancient works is a fatal habit which henceforth should be entirely renounced. Formerly it was thought correct not only to repair antiques, but to turn them out "as good as new." Portions which were wanting were supplied from the fragments of other statues. A large number of statues have at present antique heads which do not belong to them, often those of a totally different epoch, and which, in other respects, in no way harmonise with the figure. In the Louvre itself we may see more than one Greek statue surmounted by the head of a Roman personage; more than one statue of a certain god or goddess surmounted by the head of a god or goddess altogether different.

In the absence of antique fragments, recourse has been had, to supply deficiencies, to the chisels of living artists, such as Montorsoli, Guglielmo della Porta, or even Michelangelo. It is none the less true that often these restorations have caused the antique relics to lose much of their value. In the first place, they have often damaged the general physiognomy and the significance of the statue. Thus in the Louvre we see an Apollo, of Archaic Greek style, transformed, by the attributes given to him, into a *Bonnie Eventus*, a Roman deity of a late age; and a Wounded Amazon, whose tunic originally kilted above the knee, according to the costume which the ancients invariably attributed to the Amazons, has become a floating robe. Above all, we see monuments of the finest workmanship disfigured by additions of extreme mediocrity. But even if such restorations were effected with science and with talent, it is almost impossible that the work succeeding should be in perfect accord with the ancient workmanship; and thus the entire work loses the capital merit of unity of style and of execution. Finally, we must add that, sensible of the extreme difficulty of bringing the restorations into perfect harmony with the antique, the artist has almost always finished by endeavouring to bring the antique into harmony with the restorations. This has been done by giving to the surface of the Greek or Roman work, sometimes with the chisel, more often with the file, the new appearance which the restored parts present. The beauty of a great number of excellent works has thus been irremediably injured. The statue of Diana the Huntress was repaired after this fashion by Barthélémy Prieur, an able sculptor, but one who did not fear, after having restored the parts which were deficient, to retouch almost the entire surface! This fact is sufficient to explain the hesitation with which we have always regarded this statue. M. Ravaisson justly says that the execution no longer seems to arrive at the height of the conception. The same is the case with the Pallas of Velettri: the same is the case with many of the fine statues that adorn other museums of Europe, especially that of the Vatican. For this reason, some of these statues, when compared with others more recently discovered, have been referred to an epoch much too modern. If the few untouched portions of the Diana and the Pallas be carefully examined, the hair, part of the tunic, and the right foot of the former, and certain portions of the drapery of the latter, the traces of Greek workmanship are, in the opinion of M. Ravaisson, certainly to be discovered. The sublime effect of the untouched fragments from the Parthenon, preserved in the British Museum, is happily contrasted with that of the above-described restorations.

A note is added to this essay, from the pen of M. Des Cloiseaux, member of the Academy of Science, as to the chemical character of the marble employed for the statue in question. This is stated to be calcareous Parian marble; the unusual designation being due to the fact that Paros produces two descriptions of statuary marble. The first is a pure carbonate of lime, which effervesces with acids, and has a specific gravity of 2.71. The other is a magnesian marble, a carbonate of lime and magnesia, which does not effervesce with acid, and which has a specific gravity of 2.835. It further appears to M. Des Cloiseaux that the upper part of the statue is not cut from marble of the same quality as the lower part, the grain of the former being somewhat finer, and the colour a little

more yellow, than is the case with the latter. We should like to see a similar test applied to the Cupid which we previously mentioned.*

LAND†

THE commercial uses of land are mainly of two kinds;—the one as the foundation for buildings for residence, and for trade and manufacturing and commercial purposes; the other as the basis for the production of food; and there is, in addition, its use for social enjoyment.

It is admitted that any one possessing, as the produce of his own exertions or of those of his predecessors, money in any form, save in that of land, may use it in any way he sees fit; but it is maintained that if the money be invested in land, the owner is to be regarded rather as a trustee for the good of society, which has a kind of primary charge upon all land. I have never seen this suggestion practically applied, except to owners of agricultural land.

Adam Smith, in his "Wealth of Nations," written in 1790, deemed it necessary to devote a chapter in refutation of the theory that land was the only source of wealth; the tendency to regard agricultural land as the source of all wealth still influences many minds.

Our earliest impressions convey to us the notions that the blessings of Providence are those of corn and wine and oil, and cattle on a thousand hills, and they are extended to those of the market, the counting-house, the iron-works, or the manufactory, only by an effort of the mind. A town operative never hears of any blessings of townspeople, beyond those shared in common with the agricultural and the pastoral labourer. Our classical reading strengthens these impressions; for the Greeks and Romans, having little trade, and that in the hands of slaves, regarded commercial occupation as servile. The leading idea of our poetry is that "God made the country, and man made the town;" and the feudal tenure of land is the basis of our legal system, in which the customs of merchants have been with some difficulty intruded. However small the parcel, land requires a solemn deed for its conveyance; while a cargo of iron worth 10,000*l.* may change hands by a pencil memorandum.

Yet the utmost that the most energetic agriculturist can do by increasing the produce of his land sinks into insignificance when compared with the additional value conferred upon it by its appropriation to commercial purposes. The cost of building is much the same in the City of London and in the agricultural districts, and the interest required on such expenditure is also much the same; but the site upon which a business has been built up by several generations (operating, perhaps, over the whole world) derives a value from the very magnitude of the revenue obtained upon it; and, as a fact, realises a value unattainable for land in any other form.

For commercial purposes, the value of land ranges from the rate of 1,000,000*l.* to the rate of 200*l.* for an acre; for agricultural purposes, it ranges from 200*l.* to 2*l.* for an acre; and for social enjoyment, seldom exceeds 200*l.* an acre. For many years the first division has been always increasing in this country, the second division constantly becoming more productive by the increased amount of capital available for its amelioration; both rising in value with the increasing wealth of the country. The rate of 1,000,000*l.* for an uncovered acre of land is obtained in the best parts of the City of London, 400,000*l.* at Liverpool, 100,000*l.* in Westminster, and prices, decreasing from those amounts down to 200*l.* an acre in the vicinity of small towns, and for sites of manufacturing works and for residential purposes, are obtained from land previously devoted to agricultural cultivation.

The rate for an acre of the most valuable uncovered land in the City of London, after the Great Fire in 1666, was 30,000*l.*, and it is stated that the value of the land was then one-third of the value of the property after it had buildings upon it. At the present time the highest rate for uncovered land may be taken at 1,000,000*l.* an acre, and such value constitutes fully three-fourths of the value of the property after it has buildings upon it. The increase is thirty-fold.

* Since writing the above we observe an announcement that the intended work on Symmetry to which we referred is from the pen of Mr. Conder.

† By Mr. Edmund James Smith, member. Read at the Ordinary General Meeting of the Institution of Surveyors, January 29th; Mr. Thomas Huskinson (vice-president) in the chair.

Bentham lays down the principle that all improvement in the value of land should be confiscated to the State. If this theory had been adopted, it would have applied to land available for commercial purposes much more hardly than to agricultural land; and the revival of this suggestion by Mr. Mill would also operate most on land used for commercial purposes.

Mr. P. Anson, in his excellent paper of last session, showed how the special values of portions of land in the City of London have been maintained by trades carried on in the same spaces for centuries, and makes self-evident the dependence of the values of the sites of buildings upon the trades there carried on. In view of this interdependence, it is difficult to say why this Benthamite theory should not extend to the profits of trade as well as of land.

In Egypt, this theory of confiscation is carried out. The State appropriates what it deems to be the excess of each Fellah's produce,* leaving to him his maize, cucumbers, and onions to make his existence possible; but taking away his wheat and his beans. By Englishmen, this practice is not thought to be wise even in the interest of the State itself: there is not much between it and the Benthamite theory.

The commencement of the great increase of buildings on account of increasing trade and population may be dated from about the year 1770, when the recovery of coal had become easy through the effect of steam power, and steam power had become generally available in consequence of the abundance of coal.

We now glance at the improvements in agriculture during the last hundred years.

In 1770, great part of the corn-growing counties were parcelled out into parishes, which much resembled each other in their agricultural features. The village stood in the best part of the parish surrounded by a small portion of inclosed land. Next to these inclosures there were large open fields, farmed in narrow strips by separate occupiers, and there were open meadows along the village brook, and large space of grass land on the outside of some, or of all, of the open fields. These fields were generally three in number, because three years were required for the fulfilment of their invariable course of husbandry, and they were divided into narrow strips because the tenants had originally each ploughed in each field as much as he could in a day. It was rare to find three acres in one tenancy lying together. There are still a few such open field parishes; one, Castor, near Peterborough, of which I show you a map.

The first step taken to effect improved cultivation was the inclosure (generally by Act of Parliament) of these fields and pastures which were called common, not because they were not private lands, but, because, after the corn and hay were carried, they were depastured in common by all the tenants of the parish. The effect of an inclosure was to substitute for perhaps a hundred of such strips of arable occupied by one tenant (like the strips coloured pink on the Castor map), an integral block of land, fenced in, and capable of cultivation in any way the tenant saw fit, and also integral fenced shares of the meadows and common pasturage.

This was an immense stride. The fields had previously been capable of cultivation according only to the rule of the parish, say—fallow, wheat, and beans, in the three fields, in turn; but the tenant could now cultivate according to his own judgment, and grow green crops for the maintenance of his live stock in addition to his shares of the meadow lands and of the grass pasturage. Baro fallow is now one-twentieth, then it was one-fourth, of all the arable land.

The high prices of corn from 1790 to 1818 operated as an inducement for the breaking-up of the grass land previously intercommoned on the clay soils (which had constituted nearly the whole of the wheat-growing land) and also for the inclosure and division into blocks of the heaths, and the chalk hills, and the light lands of the country on which wheat had before been scarcely grown.

Olive Cromwell gave 100*l.* a year to a farmer named Howe, for introducing the cultivation of turnips; but their cultivation had made little progress in the face of the practical impossibility of growing them in the open fields. As soon, however, as the land was divided into inclosures, turnips became the foundation of the alternate system of husbandry, and the basis upon which the rearing and maintenance of cattle and sheep are founded.

Under these Inclosure Acts the lands were also generally freed from tithes in kind; and no small portion of the farming superiority of the north-eastern counties is owing to the fact of the tithes having been there extinguished fifty years before the general commutation of tithes throughout the country under the Act of 1836. We have almost forgotten that no one, so long as tithes was taken in kind, could carry corn or hay, or store turnips, or move live stock, until the tithe-owner had taken his tenth stook, or tenth turnip, or his tenth calf, pig, or goose.

The great fall in rents after the year 1818 must not be left unnoticed. Rents then fell fully one-third. In many cases, lands are now held at the same rentals as they were let at in 1810-14. Those rents depended on the high price of corn; these rents depend on the increased produce of the land from improved cultivation. Those rested on an insecure basis; these may be regarded as permanent.

Except this change from cultivation in open fields and pasturage in common to cultivation in inclosures is duly borne in mind, the increase of agricultural produce in corn and in live stock in the last hundred years is wholly inexplicable.

It is stated by Mr. Caird in 1851, and it is repeated by Mr. Fowler in 1871, that the produce of wheat has only increased since 1770 from 23 to 26½ bushels to the acre. The comparison is fallacious. The present wheat lands are not only those which grew wheat prior to 1770, but large tracts which never could have grown wheat at all except under the alternate system of husbandry. The present average produce of wheat does not indicate the improvement on the area formerly cultivated for that grain, but is the average of a very different and of a much more extensive area. The wheat crop about 1770 was probably 2,500,000 quarters,—the wheat crop is now 10,000,000 quarters,—and this is the true comparison on this single point. The statement that the average per acre has risen only from 23 bushels to 26½ bushels is not a sound basis of comparison, because the lands cultivated for wheat are not the same.

The general principle of the provision of the food of the kingdom by the land of the kingdom was given up when the Corn Laws were repealed; for this country lies at a disadvantage in comparison with countries in a latitude more congenial to the production of a grain which can be carried at a cheaper rate, bulk for bulk, than most articles of commerce. It may be desirable that as large a portion of the consumption of wheat as is practicable should be grown in England, but that the whole consumption should be so grown at present is compatible only with the complete possession of the market. That object was not deemed worth the cost; nor could the duties on the importation of corn have been maintained.

We will now turn to another set of facts or statistics. The population of the towns with 10,000 inhabitants at the first census in the year 1801, was 3,500,000, and of the rest of the country 5,250,000. In the next twenty years the towns with 10,000 inhabitants rose to a population of 5,250,000, and the rest of the country to a population of 6,750,000; and in the fifty years which have since passed those towns have reached nearly 13,000,000, instead of 5,250,000, and the rest of the country somewhat less than 10,000,000, instead of 6,750,000. The increase in the country districts in the last five centuries was at rates decreasing from 10 to 3 per cent. (although there is no reason to think that the fecundity of the agricultural population is not equal to that of the town population), while the number of residents in towns of 10,000 inhabitants increased at about an equal rate of 20 per cent. on each decennial return of population.

That this increase in the towns took place so rapidly that the governing powers, whether in Church or State, failed to provide a corresponding extension of spiritual instruction, or of sanitary control, or of municipal government, is our main existing difficulty. It was not until about thirty years since that practical infidelity, an enormous death-rate, and a general want of government of the towns, forced these subjects into attention; and that provision began to be made for the instruction, and the health, and the welfare of the town population. Thirty years have elapsed, and great progress has been made. Money, and intelligence, and self-devotion abound, and the rate of the progress of improvement shows no indication of diminution.

But, whatever the result might be as regards the towns, the increasing population of the agricultural districts found residence and means of

employment within and around them, and the rate of wages has throughout this period been highest in the great centres of industry in the north, and lowest in the purely agricultural districts in the south of England. The difference, before the law of settlement was practically abrogated in 1865, was 60 per cent.—wages ranging at 13*s.* in the north and 8*s.* in the south of England.

The use of land for social enjoyment requires no dry statistics. The thirtieth Stanley and the twenty-first Acland resident on their ancestral estates testify to the continuity of landed possessions, as the fact of the sexton of the parish of St. George, Hanover-square, being served as the nearest male heir of Thomas Plantagenet, brother of the Black Prince, testifies to the mutability of fortune. It is remarkable that our capital, accumulating at the rate of 150,000,000*l.* a year, rarely establishes an entirely new social country centre, but finds an ancient place which the impoverished possessor vacates for the new man. There is no grade of our peerage in which there is not at least one whose honours were founded on success in trade.

The principle that all property is robbery is, at least, intelligible; but the moment that the acquisition of any property by the individual is admitted, it is impossible to say that the acquisition, by legal means, of one kind of property is robbery, and that of another kind of property is allowable. Property must stand or fall as a whole. It is, therefore, quite illogical to maintain that ancient inclosures are distinguishable from land cultivated as arable pastured in common during part of the year, or from pasturage pastured in common during the whole year. And yet it is maintained that obstacles should be interposed to prevent land-owners and their tenants from dividing into blocks for cultivation lands heretofore depastured in common, while it is generally admitted that ancient inclosures cannot be meddled with.

The rent of agricultural land varies from one-half the value of the produce in certain cases of grass land to one-ninth of the value of the produce in arable clay lands where the costs of cultivation are very large. Such rent increases positively with the improvement of land, but decreases relatively to the increased amount and value of the produce. Taking the "Witfield Example Farm" as an instance, the rent is stated to have been 44 per cent. of the value of the gross produce prior to the improvement in 1840, and to have been 20 per cent. of the value of the gross produce after the farm had been improved by the owner at an expenditure of 3,500*l.* This example accurately illustrates the fact that the additional labour and capital requisite for the production of large quantities of food and stock involve the acceptance by the land-owner of a less proportion of the actual produce of the farm, the expenses of labour, and the amount of capital employed being increased. The produce, valued at 463*l.* before improvement, was divided into 200*l.* to the owners, 65*l.* tithes and taxes; labour, 170*l.*; tenant, 28*l.* The produce, valued at 1,912*l.* after improvement, was divided into rent, 375*l.*; tithes and taxes, 90*l.*; labour and maintenance of stock, 1,000*l.*; tenant, 447*l.* The chief gain was to the country, for the value of the produce was increased fourfold; the next greatest gain was the substitution of a substantial tenant for a poor one; and the landlord had 5 per cent. interest for his outlay. The tithes remained unaltered, or the outlay would not have been made. If the tithe had continued to be taken in kind, 120*l.* would have been paid to the tithe-owner in addition to his previous receipt.

If the surrender of land to the State could be required, the owner and the occupier must be paid at least for everything, except for the value of the bare land, wild and uncultivated. I have known where lands have reverted to pasturage common to all the occupiers of a township, after having been inclosed by Act of Parliament, and allotted to individuals, subject to the provision that if the allottees did not fence in the lands they should revert to their previous condition. This is some measure of the amount which the owner and occupier would have to allow to the State as a deduction from the payment of the value of the land in fee simple and of tenant right if all lands were resumed by the State.

We have seen that the definition of land extends from that long used for commercial purposes, and worth at the rate of a million of money for the acre to land of so little value as that the allottees will not fence it and take possession. The circle will be completed by

* Egypt, by Rev. F. Darham Zincke. 1871.

observing that such least valuable land is frequently that where minerals are found, and that the striking vein of ore within it raises the value of the surface at one bound, so as to bring it within the character of commercial land. There is no middle course between declaring all property to be robbery and admitting that no land, however used, can be taken compulsorily without purchase.*

FROM ST. PETERSBURG.

CONTINUING his notes, Colonel Richardson Gardiner writes—Let me say something about the famous carriages of the country, the "troicka" and the "chetverka." The first is a large car on a sleigh, drawn by three horses abreast, and holds four people inside besides the driver, who stands in a sort of receptacle for his legs just inside the splash-board. The centre horse has a grand and gorgeous yoke, which attaches him to the shafts, and the outside horses run along in traces. The harness is brilliant with silver plating, but, best of all, the pace they go at is most exhilarating; when you get into the open country, where the snow is in good condition for sledging, or, still better, on the ice on the river or on the Gulf of Finland, and the driver exhorts his horses to increased action simply by his voice and the language he uses to them, which they seem perfectly to understand. Off they go at full gallop, which gives you the nearest idea to what must be the delightful sensation of flying, of which you can possibly conceive, and for miles and miles they will continue stretching away at a glorious pace, although, from the appearance of the animals, you would hardly consider them capable of it, but they are "very little fellows, and as hard as nails."

A "chetverka" is a four-horse carriage, but not used so much on a sleigh as on wheels in the summer. The four horses are harnessed abreast, but their position and action while in motion is most curious. The pair in the centre do most of the work and the outsiders represent effect, and in order to give you an idea of the appearance they present, first of all, imagine them to be all looking and standing straight to the front. Well, we will leave the centre horses in this position, and give our word of command to the rear and off horses one after the other. Now for the horses on the near side. Attention! Left face! Left wheel! March! And just as he has complied with your instructions, and put out his left or near leg, to commence the march and wheel, halt him. And then you have him as he commences his gallop when started off. For the horse on the off side you reverse your word of command as regards his wheel, which must be right wheel, and you get both your horses facing outwards, and causing the four to present from the point the shape of an extended fan.

We had a delightful drive in our troicka one evening last week to the "Ice Hills," which afford much amusement here in winter. We had a few friends to dine with us, and after dinner our troickas were ordered round, and away we went up the Nevski, over the river Neva, with temporary lamp-posts erected on the ice to direct the way, and arrived at full gallop at our destination. When we had mounted an immense flight of steps to get to the top of the ice-hill, we reached a platform, from which you perceived a very precipitate descent of glittering ice, extending for some considerable distance. There you find the Russian guides, with their long flat pieces of board, covered with cloth, and fixed on to irons underneath, exactly resembling skates. This is long enough for two people to sit upon, but very narrow, the guide behind to direct it in its flight over the ice, and you in front with nothing to hold on by. When thus arranged at the edge of the platform, your skating-board is pushed forward, and in a moment you are off at the rate of at least sixty miles an hour, as hard as you can tear, down the ice-hill. We hesitated some time before trusting ourselves to this amusement, but, summoning courage, I took the lead, and enjoyed it so much that I induced L. and all the rest of the party to follow suite; and away we went, one after another, helter-skelter down the ice, almost taking our breath away before we were eventually stopped at the bottom, by a judiciously-placed layer of snow. Then up again, continually renewing the pleasurable excitement.

This day is the Russian 6th of January (the Epiphany), kept very sacredly by the Russian Church, as the day on which our Saviour was

baptised by St. John. Accordingly, every year the metropolitan, or archbishop of St. Petersburg, accompanied by the emperor, his sons, and all the male members of the royal family, forms a grand religious procession, headed by representatives from all the Russian regiments, with their colours, and proceeds in state to a beautiful temple, erected for the occasion, immediately opposite the Palace, on the banks of the river Neva, to celebrate the baptismal ceremony. Such a sight of regal magnificence, combining all the splendour of the grandest court in Europe, with a full display by a most paganistic church, and realising to your mind a spirit of soul-felt devotion, I have never before witnessed. The long line of galleries, gorgeously decorated rooms, guards of soldiers from every regiment in St. Petersburg, hundreds of officers in full-dress uniforms, with orders glittering with jewels, ambassadors from every court in Europe, and then the emperor, with military music striking up by band after band, as he passed along, created a sensation more easily felt than described. From the windows of the Palace we watched the ceremony. The emperor, with all his court, the high priests of the Russian religion, countless thousands of his subjects, all bare-headed, with eight degrees of frost, while the archbishop offered up his prayer, and afterwards blessed the banners of the regiments of all Russia, by which he was surrounded. The religious ceremony terminated, the procession returned to the Palace, passing through the rooms, the emperor bowing to us all as we lined the way. To give you an idea of the liberality of the court, as well as of its magnificence, there were upwards of 2,000 covers laid for a champagne *déjeuner à la fourchette* for those who were invited.

THE BRIGHTON AQUARIUM.

FOREMOST among public buildings in Brighton is the Aquarium, which is nearly completed. Mr. E. Birch is the engineer, or, as we should prefer to say, the architect.

The ground occupied by the building and offices is a space of 700 ft. east and west by 100 ft. north and south. The principal entrance is opposite the Albion Hotel. The entrance-court (58 ft. by 35 ft.) leads into the entrance-hall (100 ft. by 50 ft.), and the restaurant (60 ft. by 30 ft.). From the entrance-hall we come to the aquarium proper, which consists of a continuous corridor, 460 ft. in length, and from 23 ft. to 46 ft. in width, having forty-two specimen tanks on either side, from 100 ft. to 11 ft. in length, in which the fish are viewed through plate-glass, forming the fronts of the tanks. A space for table aquaria, 100 ft. by 23 ft.; a conservatory, &c., 160 ft. by 40 ft., communicate with this corridor.

The engine-house, naturalists' rooms, &c., are at the east end of the building. The kitchens and other necessary offices are in appropriate positions, near the restaurant. The upper part of the building is arranged to form a promenade the entire length of the building, and will have verandas with seats under, facing the sea, band-house, and saloon. Ornamental balustrades and bases will be introduced on this promenade. Part of the aquarium stands on the road that led to the Chain Pier, and a new road, 60 ft. wide, to a sea-wall has been constructed between the Aquarium and the sea, from the Albion Hotel to the Chain Pier.

The building, externally, is of red bricks, with Portland-stone dressings. The principal front is of terra-cotta (red and cream-coloured), crests, tritons, sea-plants, and other appropriate enrichments being introduced; the arms of the company and the town of Brighton, and the monograms of the chief promoters of the undertaking. In panel, on frieze, in mosaic, is the text, "And God said, Let the waters bring forth abundantly the moving creature that hath life."

The corridor of the Aquarium has granite and marble erections, and carved caps, from which, and corbels at the sides, spring stone ribs of groining, with carved bosses at intersection of diagonal ribs, and filling in of red and black and white and red bricks in alternate bars. The paving to the corridors is of encaustic tiles. The tanks for specimens have plate-glass 1 in. thick, and will be lined with rockwork. There are steps leading from this corridor to terraces over.

The conservatory, &c., are similar in character to the corridor. The conservatory has a glazed roof, with ornamental cast-iron bosses. The works have been carried out under the superintendence of Mr. J. S. Nightingale.

Ransome's patent concrete stone has been used in some portions of the work, and has attracted attention, this being its first introduction in Brighton. Concrete of shingle and Portland cement has been extensively used in walls where out of sight.

WHY THE METRIC SYSTEM?

SIR,—The subject of the metric system and the question of its introduction into England having been recently revived, I have thought it worth while to trouble you with a few lines to show that it is quite unnecessary to introduce that most inconvenient standard, the metre, even to obtain the advantages which it offers in lieu of the great embarrassment which it would produce.

I have had some little experience of the metre in actual practice, and have often used our own standard decimal, and can thus confidently affirm the superiority of the English standard under parallel conditions.

The defects of the metre are, firstly, that it is too long to be a good integer of numeration; and, secondly, that for the same reason its subdivisions are inconvenient. Owing to its great length, a vast majority of things measured must be expressed fractionally, and, as respects its subdivisions, the centimètre is too coarse, and the millimètre too fine, for ordinary use.

It is obvious, however, that the support which has been accorded to the proposal to introduce the metre rests upon some plausible basis, namely, the facility which it is supposed it would give to mercantile transactions with the countries which have adopted it and its decimal notation, aided, it must be admitted, by some confusion in our own weights and our measures of capacity.

We may practically obtain both these ends without any serious disturbance of our own system.

Firstly, speaking of lineal measures, to obtain the advantage of decimal notation we have no occasion to resort to the metre. It would suffice to divide the inch into ten parts habitually instead of only on the best rules, as at present; and in our measurements,—at any rate, in those of moderate extent,—to make more use of inches and less feet than we generally do. Mechanical engineers and glaziers, to a great extent, already reckon their measurements in inches, and tailors drop the mention of feet altogether. Measurements thus reckoned would be commensurable to a remarkable extent with the metre, which is equal to 39.3708 in.

To demonstrate this, it will be convenient to give some suitable designation to the length of 10 in. From the Italian *palm*, of analogous length, let 10 in. be called the *palm*. Then for ordinary comparison, 40 in., or four palms, would reckon as one metre, and for business transactions, one four-palm measure lineal as one metre and $\frac{1}{4}$ per cent. added to it (that is, four palms = one metre, one centimètre, and five millimètres), the correction to be added to square and cubic metres being 3 per cent. and 5 per cent. respectively. These corrections, reversed, would reduce metres to the four-palm measure of the same denominations. The errors by which these approximate reductions are affected would be less than the probable errors of measurement; I mean as measurements are in practice taken, with due but not extraordinary care. If, instead of the per-centages above given, namely, 15, 30, and 50 per mil, the corrections on lineal square and cubic were respectively 16 per mil, 32 per mil, and 48 per mil, the agreements would be beyond the reach of ordinary measurement altogether; that is, without the aid of refinements which are never used except for scientific purposes. These percentages are easily applied on paper. They might be readily taught at our schools, and the results so obtained would be at once available for all persons who wanted to employ them. As respects larger measures, no advantage worth mentioning would attend the reckoning miles with kilometers or acres with hectares more nearly than at present. Perhaps, however, we might ultimately be led to a mile of 64,000 in. giving to each link of the Gunter's chain the measure of 8 in.; but this is looking further ahead than is at all requisite at present.

As respects our weights and measures of capacity,—to reduce quarts to litres, and pounds to kilograms, by an easy per centage applied to each, offers no difficulty. Our own sub-division by halving of these measures is more convenient in practice than the metrical system, and needs no revision. But if we should

* To be continued.

adapt decimal multiples of quarts and pounds for larger quantities, it would be found very simple, and improve our own system in its weakest point.
F. C. PENROSE.

THE LATE MR. THOMAS VERNON, LINE ENGRAVER.

On the 22nd ult. English art lost one of the ablest of its few remaining votaries in pure line-engraving. We allude to the death, at the age of forty-eight, of Mr. Thomas Vernon.

He was born in Staffordshire, educated in Paris, and was afterwards a pupil of Mr. Light-foot. Amongst the works which vindicated Mr. Vernon's position in the front rank of English line-engravers are,—The "Bacchus," after Hillon; the "Christ and Virgin," after Raffaello; the "First-born," after Cope; the "Virgin and Saviour," after Dyce; the "Princess Helena," after the "Lady Constance Grosvenor," after Winterhalter; the "Olivia Unwilling," after Leslie; the "Rubens's Wife," after Rubens; and his *chef d'œuvre*, the "Christ healing the Sick," after Marullo, from the picture in the possession of Mr. Tomline, M.P., a piece of engraving of the highest class, worthy of ranking with the works of Doo and Robinson. Mr. Tomline, our readers may remember, presented this plate to the Newspaper Press Fund, and it has not yet been published.

While English art is the poorer by Mr. Vernon's death, many personal friends deplore the loss on personal grounds.

IN MEMORIAM.

WILLIAM RANDALL AND REUBEN WARM, WORKMEN.

It is good for us to recognise merit everywhere, but especially merit in humble life, when it has to struggle with many unfavourable circumstances which the comfortable classes can so little realise.

The two men above named I happened to know personally, and, knowing, to respect most highly, for the good they did in the midst of their daily care and toil.

William Randall, journeyman carpenter, was remarkable for two things,—first, his constant efforts to call public attention to the necessity of providing extended means of culture and education for his fellow-workmen; and, secondly, his moral courage with which, on public occasions, he bravely opposed the popular view, when he thought it unjust or mistaken. In respect to the first of these matters, he was, as has been already stated in your columns, a constant contributor to the *Builder*, under the title of "Jack Plane," writing letters full of terse good sense and of practical suggestions. In respect to the second, one cannot too much admire, in these days, the honest outspokenness with which at meetings and discussions he often put forward views opposed to those around him, not from mere love of opposition, but from a simple desire that both sides should be fairly weighed. On a recent occasion he nearly suffered personal injury,—of course, unintentionally,—when hustled out of a crowded meeting, for his opposition to the resolutions proposed. He was in the habit of attending discussions and conferences on social questions, at the office of the Workmen's Club and Institute Union, and it was there that I made his acquaintance. His death was caused by the fall of a picture, and he lingered only a few hours. Notwithstanding his industry and inexpensive habits (he was a teetotaler), his widow and large family, including, besides a boy, six girls under thirteen years of age, are left without means, and it is on their behalf that I now write. The boy has been taken as an apprentice by his father's late employers; but, of course, he can as yet contribute but little to the support of the household. I shall be glad to receive any suggestions of aid for the education of the five younger children, and perhaps some of your readers may enable the eldest girl to find service. The mother has been enabled by a friend to purchase a sewing-machine, and is anxious to obtain mantle-work. Her address is 34, Swinton-street, Granby-inn-road.

Reuben Warm was a metal-plate-worker, in the employ of Messrs. Wilson, in Wardour-street. Some years ago, observing the serious disadvantages,—such as waste of time and material,—occasioned by ignorance as to the principles on which the required patterns should be struck, he set himself to learn practical geometry. With

much labour and perseverance, he then studied the application of these principles to the special work of his trade, and prepared a most useful hand-book,* illustrated by a large collection of designs. After his long day's work, he was always ready to devote his evenings to the instruction of young men in the trade; and latterly he conducted a class on this subject, at the St. James's and Soho Club. Such useful and unselfish services, given zealously and unostentatiously, deserve high praise. He has now died, after a very long illness, accompanied with great agony,—and, of course, deprived during that time of earning wages. Let me, therefore, say a word on behalf of his family. Mrs. Warm has three children. The eldest girl is being educated for the duties of an accountant, or a telegraph clerk, and is making excellent progress in her studies. I had hoped to obtain admission for the boy (nine years old) into the London Orphan Asylum; but the secretary states that the children of workmen are not eligible. The youngest girl is, from delicate health, at present unable to go to school or be otherwise employed. I shall be glad to aid or advise in obtaining a place for the eldest girl (fifteen), and education at some institution for the boy. I propose trying to obtain admission for him into the Orphan Working School, Maitland Park, and I hope this letter may bring some votes for his election. Mrs. Warm's address is 54, Marquis-road, Camden-square.

HODGSON PRATT.

8, Lancaster-terrace, Regent's Park.

CARVED OAK DECORATIONS.

MESSRS. HINDLEY & SON have exhibited at the Society of Arts a series of twenty-six carved oak panels, intended as a dining-room wall-decoration, for Mr. C. B. C. Wright, of Bolton Hall, Yorkshire. The exhibitors have thought them worthy to be made public for two reasons:—First, for the scheme and novelty of the design, which is the illustration of scenes of animal life in Britain, past and present, by panels introduced into a dado, or wainscoting, about 5 ft. 3 in. high; and, secondly, as evidence of the skill of the carvers in their establishment, who have executed the work from drawings, "without the aid of a single model," subject to the control and direction of the artist of the firm, Mr. George Lock.

It is claimed that the cost of producing the panels has been comparatively small in consequence, and we shall be glad to know what the cost to the purchaser really was. The fact that the workmen had no models is not to be boasted of; it is simply an extenuation of any faults apparent: the work would of course have been all the better if models had been resorted to. The panels are to be regarded as inexpensive sketches, rather than finished works; and we gladly say that some of them show much spirit, and that a few of them are very creditable specimens of wood-carving. As a whole, they will make a very interesting room, and are far superior to the senseless stuff which is supplied wholesale from Wardour-street for similar purposes.

Mr. Lock, under whose direction they have been produced, is now a veteran in the art. Many years have passed since we found him at work on the restoration of the carvings in St. James's Church, Piccadilly, and gave him hearty praise for the skill he showed there.

ASSESSMENTS.

AN interesting return, called for by Mr. Goschen, has been issued from the Poor-Law Board, showing the rateable value of—1. Lands; 2. Buildings; 3. Railways; 4. Mines; and 5. All other kinds of property, according to the valuation list, or other record of assessment, which was last in force during the year ending July-day in 1870, in each parish and union in England and Wales; also the number of separate assessments in such parishes and unions. It testifies to the greatness whereunto manufactures and commerce, and our cities, towns, and villages have grown, that buildings are assessed at a higher amount than all the other four denominations of property put together. The assessment on buildings excludes such buildings as are assessed with farms, and embraces houses,

* "The Sheet Metal-worker's Instructor." To be had of Mrs. Warm, of 54, Marquis-road, Camden-square, London.

shops, warehouses, mills, factories, docks, and wharfs. The amount at which they are rated is 55,078,528*l.*, or 52.7 per cent. of the whole. Lands, including farm-houses and farm-buildings, tithe rent-charge and uncommuted titles, are rated at 39,488,882*l.*, or 37.8 per cent. of the whole. Railways, including stations and depôts, are rated at 4,854,193*l.*, or 4.7 per cent. Mines stand for 1,829,946*l.*, or 1.8 per cent. All other kinds of property include quarries, ironworks, gasworks, canals, saleable underwoods, telegraph wires, and all property not considered to come properly under any of the other heads. These miscellaneous possessions are rated at 816,873*l.*, or 3.0 per cent. of the whole. The total assessment amounts to 104,420,283*l.*, over an area of 37,324,883 acres.

The amounts for which the metropolis is assessed are for lands, 118,836*l.*; buildings 17,108,736*l.*; railways, 617,780*l.*; all other kinds of property, 391,568*l.*; total, 18,236,920*l.* Separate assessments, 446,337*l.* In the metropolis, the City of London stands highest, as may be expected, for the value of its buildings, 2,171,292*l.*; the parish of St. George's, embracing the palatial residences of the West-end, comes next at 1,797,741*l.*; and St. Marylebone at 1,004,847*l.* St. Pancras, embracing the Great Northern, the Midland, and the Euston terminal stations, is rated for railways at 91,788*l.*; the City of London, for railways at 50,537*l.*; and Paddington at 33,300*l.* Wandsworth and Clapham are rated at 26,200*l.* for lands; Lewisham at 20,569*l.*; Fallow at 12,439*l.*; and, somewhat curiously, the City of London at 13,277*l.*, whereas Chelsea stands low for lands as 410*l.*, and Westminster is nil. Liverpool is assessed at nothing for land; 1,749,929*l.* for buildings, and 36,577*l.* for railways. Manchester also is exempted in the matter of assessment on lands, but pays 990,936*l.* on buildings, and 51,966*l.* on railways. Among the largest assessments for mining property are:—Merthyr Tydfil, 159,469*l.*; Auckland (Durham), 75,483*l.*; Wigan (Lancashire), 91,943*l.*; Chesterfield, 47,818*l.*; &c. The total number of separate assessments for England and Wales is 4,793,417.

A NEW LIGHTHOUSE FOR THE HEBRIDES.

MANY of our readers will feel interested in the following account of a new lighthouse which is just upon the point of completion on an obscure rock in the Hebrides. Our chief authority is the *Scottishman*.

The Northern Lighthouse Commissioners began the erection of this tower on the wild rock of Dhu Heartach five years ago. We are now able to state that the stonework has been successfully finished; and there is every likelihood that the light will be exhibited from the tower in less than a year hence. This work is one of national importance, and has involved much spirited enterprise.

Dhu Heartach, or St. John's Rock, is a singular oblong basaltic mass, lying fifteen miles and a half south-west of Iona. It is 240 ft. in length, by about 130 ft. in breadth, with a rounded top, 30 ft. above high water ordinary spring tides. The rock rises sheer out of four fathoms of water, and is clear of everything in the shape of outlying reefs, save on the west side, where, at a cable's length, three small patches show themselves at low water. In consequence of rising out of deep water, and being unprotected by outlying reefs, it receives the full shock of the Atlantic, and proves more inaccessible than even the Bell Rock or Skerryvore Lighthouses.

But the value of a light on Dhu Heartach, although erected at great expense, will be rendered apparent by the simplest statement. From the Rhinns of Islay to Skerryvore is fifty miles. The middle part of this line for eleven miles is dark,—that is, the manner is beyond the range of either light. Now, suppose a vessel caught in a south-west gale upon this dark line, and obliged to hear up for shelter, there is at present no light to leeward to guide it for many miles. Should it hear up to the northward, Dhu Heartach lies under its lee-beam only ten miles away, its presence marked by the seas that are breaking and roaring over it, and its terrors augmented perhaps by the darkness of a wild winter night,—while eight miles farther on, spread far and wide the West Reef and Torran Rocks, a perfect archipelago of sunken reefs, on which many a proud ship has gone to pieces and many a noble seaman found a watery grave! The only safe course at present is to steer

easterly, and try to get a hold of the bright light on Rhu Vaal, which shows over the Island of Colonsay, and keep a hold of it on for Mull, not approaching too nigh the Colonsay shore. But when once Dhu Heartach is lighted, matters will be entirely changed. Instead of being dreading and shunned, the mariner will boldly approach it; and when obliged to bear up for refuge in westerly gales, it will form a new point of departure, guiding him safely between the Torran shoals and the Colonsay land. Not only so, but it will also form an important link in the chain of western lights, on the British Islands, and illumine for the mariner nearly 500 square miles of water, at present dark and dangerous.

The tower of Dhu Heartach, like that of Skerryvore, is built of Mull granite, and a description of the works at Erraid, where the stones have all been quarried and prepared, will help to set forth the gigantic character of this lighthouse undertaking; but this, for want of space, we must defer to a subsequent occasion.

Communication is kept up between the quarries and the lighthouse road by means of a steamer belonging to the Lighthouse Board. There is an outlook, consisting of a small circular box, perched on the top of the island, 200 ft. above the level of the sea. It is provided with a powerful telescope, 5 ft. long, mounted on a stand, and capable of being pointed either in the direction of Dhu Heartach or Skerryvore. There the sentry sits all day long, when the steamer is not at sea, watching any signal that may be made on the rock, 15½ miles distant, ready to repeat it on the flagstaff at his door. Should the men on the lighthouse rock intimate, by the hoisting of a ball on the mast of the barracks, that communication is wanted, the sentry instantly hoists his black ball on the flagstaff; and the watch on board the steamer, seeing it, at once calls the master's attention to it, and, no matter how coarse the weather may be, the *Dhu Heartach* will be seen in less than an hour breasting the swell outside of Soay.

The principal facts regarding the history of the works on the rock may be soon told. In the summer of 1867, a landing was made, and operations commenced for erecting a barrack for the workmen similar to those used in the erection of Bell Rock and Skerryvore Lighthouses, with this exception, that this was all of malleable iron instead of wood. It consists of twelve malleable iron standards, each 35 ft. long, firmly braced into the rock, and bound together with strong iron stays. On the top of these rests a circular barrack, 18½ ft. high, and 16 ft. diameter, reached from the rock by a chain-ladder leading up to a hatch in the floor. It is divided into two apartments, lower and upper—the one containing cook's kitchen and two small rooms for the officers; the upper, a dining-table for the men, and thirty beds ranged round the walls, tier above tier. The lower room is lighted by twelve bull's-eyes, in the sides, the other by a glass ventilating lantern on the top. This was the home of twenty-five men at all hours during night, and the narrow space in which they were shut up in bad weather, with the waves rolling beneath them, and wild winds raging around them. Though a somewhat trying situation, we have never heard that the men's confidence has been shaken as to the stability of the structure.

Towards the close of the season of 1868, the excavation of the pit for the foundation was commenced, and early in 1869 the first course was laid. Five courses were laid in 1869, twenty-six in 1870, and forty-four during the present season—seventy-seven in all. The first entire course contained eighty-four stones, the last only nine. The last stone was landed on the 16th of August, amid great rejoicings; the balcony railing was fixed on the 11th of September; and the work on the rock thereafter suspended until the summer of 1872. It is confidently expected that the internal fittings, which are nearly all ready at Erraid, will be fixed during the next season, and that the light will be exhibited from the tower before the year is done. The rapid progress of the work has greatly surprised all who know anything of the savage character of Dhu Heartach. The sea is seldom at rest around it, and it is only during the summer months that anything like regular communication can be held with it. We learn that in 1867 there were only twenty-seven days on which landings could be made on it; in 1868, thirty-eight days; in 1869, fifty-nine days; in 1870, sixty-two days; and during the present season about the same number. Some of those landings were of very brief duration. It may

be interesting to know how so many stones were landed on such a wild spot during the short seasons that were available. It was attained as follows:—Whenever the men on the rock thought the wind and sea had sufficiently gone down for landing stones, the ball was hoisted on the barracks. The signal being observed by the outlook on Erraid, was repeated by him to the steamer. Instantly, all on shore was in motion; the fires on board were stirred, the loaded lighters were manned and warped alongside, the superintendent hurried down to the wharf, and in less than an hour the *Dhu Heartach* might be seen outside of Soay, with two lighters in tow, pushing on for the rock. Arrived there, the steamer is attached to her moorings, and the lighters are warped to buoys nearer the landing. Meanwhile, all is activity on the rock itself. Steam has been raised on the boiler of the small winch engine lying in a cavity near the base of the tower. On a signal given a lighter is run alongside of the east end, and in fifteen minutes eleven ordinary-sized stones are lifted off the barge by a landing crane, and set on the rock. Another crane lifts them on a wagon, travelling on an incline of rails up to the base of the tower. Here another lifts them off and sets them down. The second barge is unloaded as speedily in the same way. The stones are then considered safe, and more time taken to hoist them, by means of a projecting needle, to the top, and have them set in their respective places by means of a balance crane. All this process was chiefly effected by steam-power, under the special direction of Mr. Brebner, and carried on with great expedition on all practicable occasions. The success attending it has proved its efficiency.

The Dhu Heartach tower rises to the height of 138 ft. above high water. The shape is a hyperbolic curve—one which secures more than any other lowness of the centre of gravity and direct action of the weight of the mass on the base. It is to be remembered that the stability of these towers depends on weight, not on rigidity, and that the great object of the engineer is to secure the perpendicular pressure of the superincumbent mass on the base as far as consistent with other interests. Hence the engineer's idea is that of a monolith with cavities, and with this object in view, stone is joined to stone and course to course by various mechanical devices. In the lower courses the stones are joined by angles, curves, joggles, and bolts; in the upper courses, by bolts, clasps, twisives, and ribbon joints. Between each stone, throughout the whole structure, the most tenacious cement is employed; so that when finished, the whole column may be said to be one stone, with certain cavities of a definite form and for a definite use. The tower is solid for 31 ft., and the doorway at that elevation is reached by a gun-metal ladder battened into the wall. Above the doorway there are seven apartments, rising in succession the one above another. When the history of this great undertaking comes to be fully written, it will take its place honourably beside those noble treatises which narrate the history of the construction of the Bell Rock and Skerryvore towers.

Some commendation is also due to Mr. Alan Brebner, the resident clerk of works.

PATENT HYDRAULIC BRICKMAKING MACHINE.

A MACHINE, constructed by Mr. G. W. Hick, of Leeds, engineer, is described and illustrated in the *Engineer*. It consists of a revolving table, containing three monoliths, and also of as many pressing-cylinders, with their accompanying rams and plungers. This table is made to revolve intermittently. This intermittent motion of the table is effected by means of a loose ring fitted so as to work freely round the circumference of the table. The ring has a reciprocating motion imparted to it from a small water cylinder and ram. The working parts consist of direct-acting pistons and rams, carrying plungers or pressing-blocks, the pistons, rams, and cylinders being kept watertight by hydraulic leather packing.

On the feed-mould being charged with clay from the hopper or pug-mill placed over the table, it is carried forward by the ring one-third of a revolution, thus presenting the contents to the pressing action of two plungers actuated by separate pistons and rams—one plunger being forced downwards upon the upper surface of the brick, whilst the other is being forced upwards

or against the underside of the brick, both situated and working in a cylinder cast with the bed of the machine; thus the brick is effectually pressed. The mould containing the pressed and moulded brick is then brought over and opposite to another plunger placed in the lower bed of the machine, and called the delivery plunger, and also a fresh charge of clay is submitted to the pressing plungers. Simultaneously with the pressing of a brick the delivery of an already pressed brick is accomplished. The mould thus emptied by the delivery plunger is again filled with clay from the hopper, so that three bricks are moulded, pressed, and delivered during one complete revolution of the machine.

MEMORIAL OF THE DUCHESS OF SUTHERLAND, DUNROBIN.

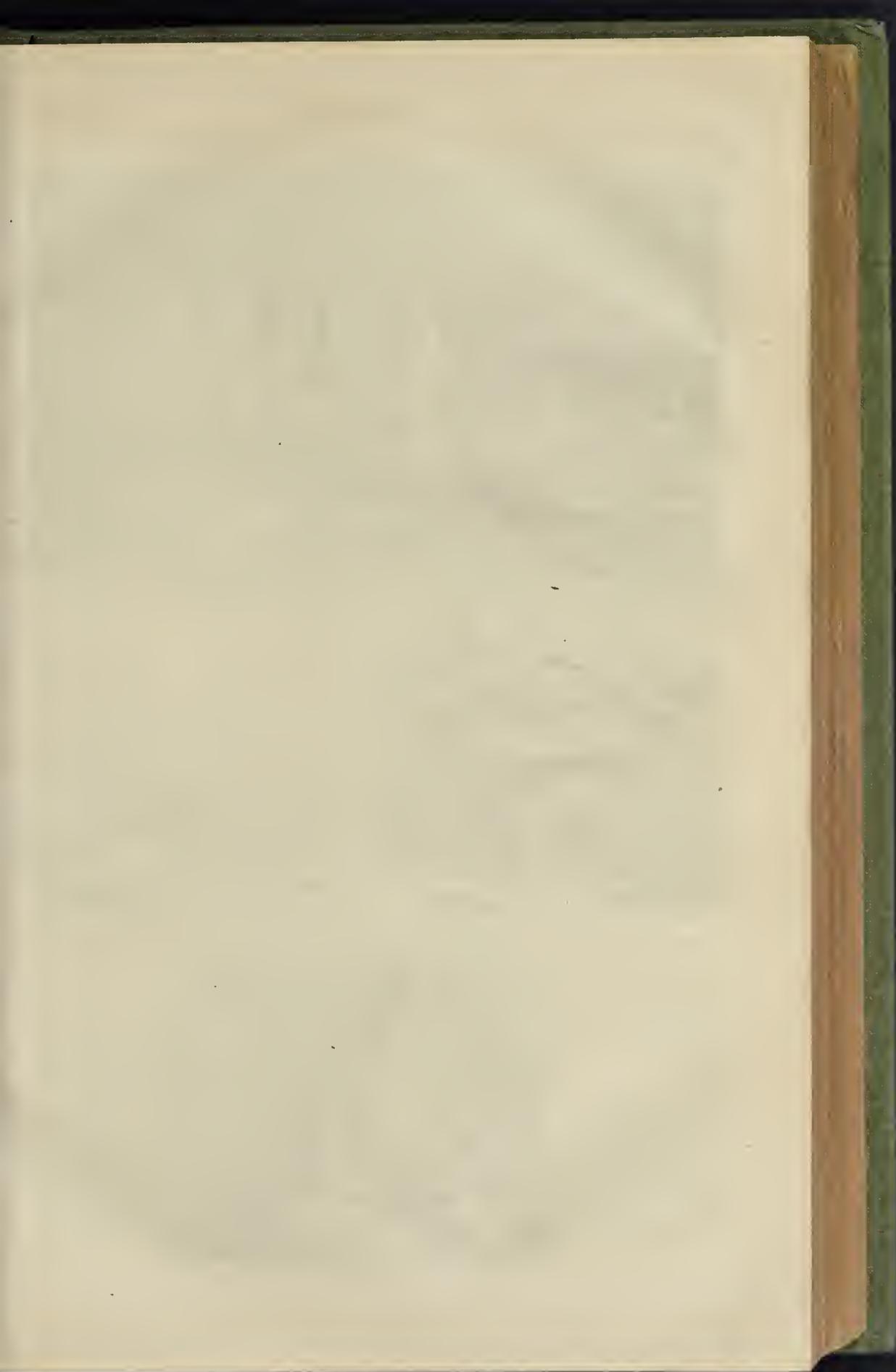
A COMMENCEMENT is about to be made with the erection of a monument to the late Duchess of Sutherland, which has been subscribed for by the tenantry on the Sutherland estates and others. The monument has been designed by Mr. John Robinson, and its execution has been intrusted to Mr. John Rhind. It is intended to be placed on a rising ground within the policies of Dunrobin Castle, and the white freestones for its construction will be supplied by the Duke from a quarry near Dornoch, and conveyed to the site by his grace's traction-engine. The monument will be a symmetrical structure, rising to the height of 40 ft., and in its outline bearing a sort of general resemblance to the monument erected at Dunkeld in memory of the late Duke of Athole. From a basement of three steps, covering a space 17 ft. square, the structure rises as a square mass of masonry, buttressed at each corner, relieved with horizontal mouldings, and finished at the top with a richly-carved cornice. Over this rise (one from each corner) four pillars, with grouped shafts and carved capitals. Externally the pillars support on each of the four sides a cusped arch, over which rises a crocketed gablet, terminating in an ornamental finial, and inclosing a triangular panel, intended for the display of monograms and armorial bearings. Internally the pillars are connected by groined arches, forming a sort of canopy, under which, and within the pillars, is to be placed a bust of the late duchess, executed by Noble. Above the gablets, between which pinnacles spring from each corner of the structure, the monument presents another stage of solid masonry, square in form, and having at each corner a round pillar with enriched capital, which, however, stands clear of the central block. Next comes a second open stage, consisting of eight pillars of various forms. On each side the pillars support a crocketed gablet, filled in with diaper-work, and between the gablets pinnacles rise from the corners as in one of the lower stages. From between these upper gablets springs a central spire, which, gradually tapering off, terminates the work with a crocketed finial and cross. In the execution of the monument a considerable practical difficulty has to be overcome. The four pillars forming the lower open stage must support the whole weight of the superincumbent stages, and, in the absence of buttresses, it is necessary so to adjust that weight upon the arches as to avoid lateral thrust.

MONUMENT OF THE DUCHESS OF SUTHERLAND, IN TREUTHAM CHURCH.

IN our volume for 1871* we gave a description of the marble effigy of Harriet Duchess of Sutherland, wife of George Granville, second Duke of Sutherland, executed in marble by Mr. Matthew Noble, sculptor, and which has recently been placed in Treutham Church. We publish in our present issue an illustration of the monument.

The tomb on which the effigy rests is executed in Sicilian marble, the cornice being supported by six columns, between which are square panels containing the inscriptions. The centre one, in Latin, was written by Mr. Gladstone, and fully quoted in our former account. In the foliage of the caps of the columns and in the cornice are introduced the hencherus and other flowers. The tomb was designed by Mr. John Robinson, architect, of Whitehall-yard, and executed by Mr. Earpe, of Leith.

* See p. 750.



RUDE STONE MONUMENTS.



THE STANDING STONES OF STENNIS.



DOLMEN AT CONFOLENS.

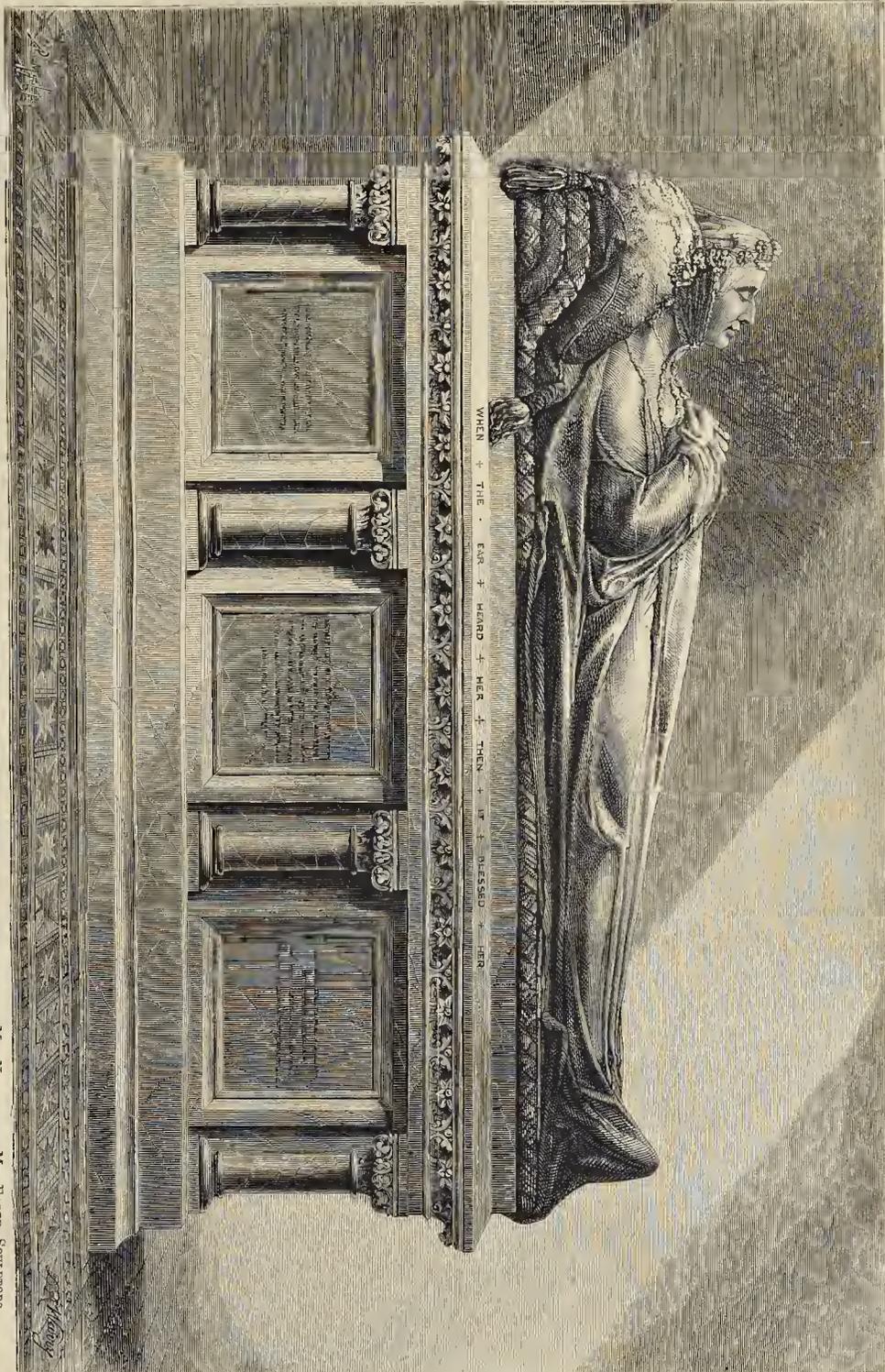


DEMI-DOLMEN AT KERLAND.



DOLMEN OF SAN MIGUEL, AT ARRICHINAGA.

[See p. 77, ante.]



WHEN + THE EAR + HEARD + HER + THEN + BY + BLESSED + HER

THE DUCHESS OF SUTHERLAND
 BORN 1797
 DIED 1857

HER HUSBAND
 THE EARL OF SUTHERLAND
 BORN 1797
 DIED 1857

HER SON
 THE EARL OF SUTHERLAND
 BORN 1827
 DIED 1872

MONUMENT OF HARRIET, DUCHESS OF SUTHERLAND, IN TRENTHAM CHURCH.—MR. JOHN ROBINSON, ARCHTCT; MR. NOBLE AND MR. DARRY, SCULPTORS.

John Robinson

THE PROGRESS OF THE PEOPLE.

MR. ALEXANDER REDGRAVE, principal inspector of factories, recently delivered a lecture in Bradford, wherein he gave some remarkable evidence as to the social progress of the people of this country. "Contrast," he said, "the prices of food and clothing of to-day with those which ruled thirty years ago. Contrast with them, at the same time, the relative power of increased remuneration to pay a higher price for necessities, I will not say luxuries, formerly not dreamt of. The following figures will enable us to imagine the position we would have been in with an increased population, having greater powers of consumption, but for free trade. This is the sum of the food imported into this country in 1870:—Animals, 4,155,463*l.*; corn, &c., 19,732,879*l.*; other provisions, 15,817,401*l.* Corn has ruled much lower than it did thirty years since, but meat has risen considerably, principally, I believe, from the enormous increase of meat-consumption in the country. The high rate of remuneration has enabled families to consume meat constantly who formerly only consumed it occasionally, and many who never consumed any can now afford to eat it frequently. But if meat has risen in price, tea and sugar have fallen greatly, and chiefly through the application of the true principles of taxation. Taking tea, in the first place, we find that in 1841 the duty was 2*s.* 1*d.* per lb., that the consumption per head was 1 lb. 6*oz.*, and the annual contribution of each person to the revenue was 2*s.* 11*d.* Coming now to 1870, we find the duty 6*d.* per lb., the consumption per head 4 lb. 10*oz.*, and the contribution to the revenue of each person was just 2*s.* 4*d.* per annum,—the revenue for the year being 2,910,000*l.* Then, again, with respect to sugar. In 1841, the duty upon sugar was 2*s.* per cwt., the average consumption per head was 17 lb. 8*oz.*, and the contribution to the revenue per head was 3*s.* 10*d.*, the revenue being 5,114,300*l.* In 1870, the duty would average, according to quality, rather more than 5*s.* per cwt., the consumption per head was nearly 54 lb., and the contribution per head to the revenue was about 2*s.* 6*d.*,—the revenue, notwithstanding the reduction of the duty one-half over the last nine months of the year, was just 4,000,000*l.*"

"We must look to all classes in considering the social condition of the people, and not only to those who live by labour. It is the aim of all classes to reach, at the least, the class immediately above them; and if we compare the taxes upon luxuries during the last thirty years, we shall see how far the middle-classes must have been augmented. For instance, it appears that in 1840, there were 318,251 horses charged with duty, exclusive of agricultural horses, which were exempt from duty. And notwithstanding the all but total extinction of stage-coaches and posting in 1870, there were in that year 744,906 horses charged with duty. In a similar manner, there is a comparison of the number of men servants and carriages kept, and of the consumption of wine—three elements of a well-to-do household. In 1841, there were assessed for duty 101,849 men-servants, and in 1870 the number was 267,671. In 1841, there were assessed for duty 28,334 four-wheeled carriages; in 1870 the number was 132,331. In 1841, the number of two-wheeled carriages was 41,663, and in 1870 the number was 249,991; and the persons charged with keeping such carriages were, respectively, in 1841, 34,694; and in 1868, 59,190. Again, taking the consumption of wine, an element of luxury and health, we find that the average consumption per head, in 1841, was a little more than one-fifth of a gallon, while in 1870 it had risen to half a gallon per head. Again, if we take the game licences, we find that they were, in 1847, 39,373, and 2,694 keepers; and in 1869, 54,203, and 4,921 keepers. But we may yet illustrate the increased wealth of the middle classes by an examination of amounts paid to legacy and property duty. In 1841 the capital subject to legacy duty was 41,476,521*l.*, and in 1869 this sum was more than doubled, for it amounted to 87,721,152*l.* The amount of property and income charged with duty in 1843 was 20,568,035*l.*; while in 1869 it was 386,519,366*l.* This is an enormous increase, even after allowing for the tax in Ireland, which did not come into operation until 1853. Another great advance has been the facilities for intercommunication by cheap postage, and for the diffusion of intelligence by cheap newspapers. In 1839 the number of letters delivered was 99,014,156. In thirty years the number had increased to

831,914,000. In the latter year also a sum of upwards of 19,000,000*l.* passed through the money-order office, and 2,727,763 letters of importance were registered. Since 1869 greater and very important facilities have been put into operation. The postage of letters, parcels, and newspapers has been re-arranged in favour of the public, and postal cards have been issued. That these arrangements have met a want will be credited by the fact that from the 1st October, 1870, to the 31st March, 1871, upwards of 58,000,000 post-cards have been issued, and upwards of 140,000,000 halfpenny labels and stamped wrappers. Cheap newspapers are of very recent introduction. For years the excise on paper, the stamp on newspapers, and the duty on advertisements, rendered a cheap newspaper impossible. But gradually each impost gave way before the more enlightened views of the statesman of modern days, and the press is unshackled; and what has been the result? In 1841 there were 134 newspapers in London, and in other parts of England and Wales there were 244, and in Scotland and Ireland, 167—total, 541. The number of stamps issued in the year was 59,936,897, which, as all newspapers were stamped, represents the number issued. At the present there are published in London 30 daily papers, upwards of 200 papers issued weekly, or at intervals within a week, and about 760 periodicals, partly of the nature of newspapers, partly of magazines, appearing at intervals from once a fortnight to once in three months. The number of provincial Scotch, and Irish papers is 1,158, and the number of papers and periodicals registered for transmission as newspapers is upwards of 1,000."

THE COVENT GARDEN WHOLESALE FLOWER-MARKET.

THIS mysterious establishment is undergoing extensive enlargement by Messrs. W. Cubitt & Co. When completed the area of the market, we are told, will be more than quadrupled. The new market will extend from the boundary of the old building in Covent Garden to Wellington-street, being about 200 ft. in depth, and its extreme width in the centre about 160 ft., altogether covering an area of about 3,000 square yards; and in order to effect this extension, it has been found necessary to demolish a considerable amount of property in Wellington-street and the immediate neighbourhood. One of the main entrances will be in the last-named street, in addition to that in Covent Garden. The basement has been excavated to a depth of from 12 ft. to 15 ft. below the ground-floor of the market, up to which eight square brick and stone pillars rise, and on these pillars are placed iron columns ascending to a considerable height, connected with semicircular arches at the summit between each column. The building will be carried up another story resting upon these columns and arches. The roof will to a great extent consist of glass, in the centre of which there will be a lantern. The entire basement will be arched over, and set apart for vaults and stores. We do not hear of any architect in connexion with the work.

DOMESTIC STAINED GLASS.

A PAPER was read on this subject by Mr. Lewis F. Day, at a meeting of the Architectural Association, held on Friday evening, the 26th of January. The small number of precedents in old domestic stained glass, as compared with those in church windows, was first noticed. From it was now resulting at first sight an increase of difficulty in this class of the glass producer's work,—perhaps compensated for by the necessity of attending to principles sought and obtained at first hand, stimulated in some degree by the stricter critical judgment shown towards novel works intended to be constantly seen in the ordinary daily course of life of their individual owners. The old glass may, however, be looked on as furnishing a large set of experimental processes,—specimens of methods partly or wholly successful pursued in the detail and execution of old glass; and brush painting in old times, which might be illustrated also by the Etruscan vase paintings executed in many respects under similar conditions. Viewing, then, the introduction of non-transparent glass in houses as a device primarily for hiding the view from without or within, Mr. Day treated in detail the characteristics of quarry glazing, and the opportunity

afforded by bands, borderings, tints, &c., of giving character, and that value resulting from the evidences of thought and design in fitting the work for a special position. To the introduction of tints in patterns there would be no objection on principle; but an intelligent haphazard arrangement was, he considered, in practice, more satisfactory, on account of its greater variety under happy accidents of lighting. Of plain glazing,—after an allusion to the success of the early Cistercian architects in this kind of work, so often mentioned with much appreciation by Mr. E. Sharpe,—the lecturer stated that here again the appearance of fresh design was indispensable, in order to obtain real beauty and interest. Diaper panels arranged in Paris only of a window, in a framing of emphatic lead lines, borders, &c., he considered preferable to the large single sheets of glass, rather too uniformly insisted upon now-a-days; smaller pieces, besides the great advantage of giving scale to a building, allow of decided definition of important forms, and the leading indicating the pitch of the design (as a note in singing), also of changes of tint; and (a not unimportant detail), the loss is often less radical in case of breakage. As to painted quarry-work, highly conventionalised work might be repeated in running patterns with propriety; but, in cases of a near approach to nature, such repetition seems to strike a wrong note; a bird or an animal (any piece of animated nature, in fact) may supply a most effective addition to the interest, which will be all but lost, or worse than lost, if any idea of mechanical mindless repetition is conveyed to the observer.

Mr. Day then suggested a scheme of decoration for the windows of a house with purely floral forms, bearing a relation to the uses of the different rooms: quarries of tobacco-plant conventionalised in smoking-room; coffee and tea in breakfast-room; noting, by the way, the suitability of the forms of these and other plants for similar decoration. Heraldry, also, though not particularly to be recommended for church windows, he considered might be often used with effect and some meaning in domestic work: suggesting that a plan adopted in old glass at St. Pierre's, Chartres, of countercharging the colours of the background with those of the coat, might be applied in new work: he did not know that it had been hitherto. Some of the heraldic windows at the Houses of Parliament he considered excellent. Treating of a still higher class of design for glass, with figure subjects in medallions, &c., he thought that strongly coloured and pronounced works, such as those in the windows at Chartres, might be compared to fresco painting; whereas suitable decoration for residences would be more properly compared to water-colours,—less forcible and more expressly elegant and refined. Backgrounds, landscape, and distances seemed quite out of place in very dignified monumental (church and similar) work, but not inadmissible and the nearer approach to ordinary nature in domestic work. The cost of glass, felt as a drawback sometimes to its introduction, he thought might be usefully reduced by the adaptation of replicas of medallions, if not carried too far. An entirely special design was often quite unnecessary; and the vulgarity of mere manufacture could be avoided by constantly fresh adaptations of existing materials. It perhaps might be advisable—though he hoped hardly necessary—to insist on complete lucidity,—a distinct glassiness being a most pleasing feature in a window, however it may have been turned into a thing of beauty, in the endeavour to modify, or to subdue or soften, the daylight passing through it.

In the discussion following the paper, Mr. R. P. Spiers called attention to the windows at St. Jacques, Liège, containing good figures, showing a grandeur of treatment, having, however, the later characteristics,—large pieces of glass, &c. He thought that in domestic work the safest counsel would be to use as much white, or nearly white glass as possible; not to distribute much colour of any strength.

Mr. G. H. West noticed that objections were sometimes made, not entirely without reason, to the stained glass in the upper portions of domestic windows, now apparently growing in use: introduced for purely decorative reasons, it, nevertheless, cut off most of the sky view. He observed also that in cases where patterned or obscured glass was required, all the effect, and an increase of safety, and the warmth of double windows, and perhaps in many cases a needful non-interference with symmetry, could be obtained by glazing with plate-glass outside the stained glass. He thought the attention, espe-

cially of students, might be usefully called to the chronological series of stained glass windows at the museum at Rouen; also to the early glass in the choir-aisles of the cathedral; later glass in other churches, and still later also (large fine pictures on glass), at St. Patrice's, for instance, in that city. Such quantity and quality of glass combined, he believed, did not exist anywhere else. Another member remarked on the substitution of stained glass in gilt leads, for the dwarf muslin curtains or wire blinds formerly in use, in windows adjoining streets, considering this an intelligent and pleasing use of the material probably destined to become very universal. After some other criticisms on points of detail, the meeting separated, having passed a vote of thanks to Mr. Day for his paper.

WORCESTER GUILDHALL RESTORATION.

At a recent meeting of the Survey, Buildings, and Property Committee, several letters suggesting arrangement of rooms, &c., were read, one proposing a large room for holding Oratorios in, in case the cathedral should ever be refused, and another that the hall should be carried further back. Ultimately the committee decided in reference to the reconstruction scheme of 9,000l. to submit to the architects sending in plans the following suggestions:—A large hall, about 4,000 superficial feet in area; Council-room, available also for conferences or small meetings, 1,000 ft. to 1,500 ft., five rooms for committees, &c., from 200 ft. to 400 ft. each; Recorder's Court, about 1,200 ft.; Police Court, about 1,000 ft.; four closets, lavatories, &c. For the larger or 18,000l. scheme the above, with instructions for a larger hall than before specified, and additional offices for Town Clerk (four rooms), Clerk to Magistrates, Treasurer, Nuisance Inspector, Street Inspector, Hall Keeper, &c. The general arrangement to be left to architects sending in plans. City Surveyor to furnish lithographed ground plans of Guildhall and adjoining buildings.

NEW RESERVOIR AT LAKENHAM FOR NORWICH WATERWORKS.

A second covered reservoir has been completed and opened at Lakenham. A stock of 3½ million gallons can now always be kept in readiness for the supply of the city. The first covered reservoir, erected about a year ago, is 128 ft. square, and 17 ft. from floor to roof, and was constructed on the principle of groined arches carried on independent piers, sixty-four in number, the outer walls for strength being made to form a series of bays, with half dome roofs. This system of bays is preserved in the new reservoir, so far as the outer wall is concerned; but a different principle is adopted inside, presenting a series of eight arched passages, the walls of which are pierced by corresponding side openings, and strengthened at intervals by buttresses. It is 128 ft. long, by 120 ft. wide, and has a depth of 18 ft. below the water line, and is thus capable of holding about one-third more water than the first, or "Saltzer" reservoir, which contains 1½ million gallons.

Both reservoirs are from the designs of Mr. Hawksley, the company's consulting engineer, and have been constructed by the company, under the superintendence of their manager, Mr. Ayrie, Mr. W. H. Bishop acting as clerk of the works.

EXTENSIVE NEW RAILWAY STATION IN LIVERPOOL.

ONE of the largest railway stations in the north of England is now in course of erection at Liverpool for the Midland, Great Northern, and Manchester and Sheffield Companies, who jointly have just constructed a new line of railway between Manchester and Liverpool, so as to give them a separate and independent through communication between London and Liverpool without using the London and North Western Company's line from Manchester to Liverpool. The new line is about to be opened for traffic, and the new station in connection with it, which is situated in Ranelagh-street, almost in the centre of the town, and called the Central Station, is rapidly approaching completion. The Ranelagh-street elevation is 310 ft. long, having a spacious area in front, somewhat resembling the Charing-cross Station, and has a commanding appearance. The station buildings are extensive, containing

the booking-office, waiting-rooms, managers' rooms, and the general offices of the several companies; also ornamental lodges, a carriage drive under a glass roof to the booking-offices, parcel-offices, and large dining and refreshment rooms. The interior of the station itself is very spacious, being 620 ft. long, whilst the entire area occupied by the several platforms and various lines of rails, is upwards of six acres in extent. The station is covered in by a massive roof, consisting of eleven elliptical spans, each 55 ft. wide, and extends the entire length of the station—620 ft., the area covered by the elliptical spans being 169,000 square feet. The extreme length of the station, station buildings, and approaches, is 838 ft., and occupies an area of upwards of seven acres. In order to secure the site for this large structure, a considerable quantity of very valuable property had to be purchased, including, amongst other premises, extensive new buildings and offices which had only quite recently been erected by the gas company, also several hotels, besides a large number of private houses and business premises, the amount which the companies have had to pay in compensation being very heavy. The station and buildings in connexion with it was designed by Messrs. Fowler & Brydone, of Victoria-street, Westminster, the engineers to the three-associated companies; and the works are being executed by Messrs. Kirk & Parry, of Queen-street, Westminster, and Sleaford, Lincolnshire; the contract being something more than 100,000l.

DAMP WALLS.

Sir,—It was with much interest that I read "Devonia's" letter upon this subject, knowing the importance of it to him and many others situated in that and other exposed parts. Having a knowledge of the climate of that wild district, Dartmoor, I am aware of the difficulties that he would have to contend against to build a damp-proof house. I have often wondered that, in a county like Devonshire, having such a fine store of beautiful building-stones as it has, some more effectual means have not been used or attempted to ensure weather-proof walls, than the unsatisfactory battening, or hiding and disguising, the fine appearance of the stone by stuccoing or slating.

The usual method of building in those parts, I believe, is to construct external walls 18 in. or 21 in. thick (generally of granite and other native stones), in random courses, and specified to be well flushed up. After such walls have been so constructed and well pointed externally with cement, I have seen the wet running down the interior of south and west walls in streams, and dripping from the window-heads on to the window boards, showing that the rain, accompanied as it generally is with high winds, drives through the granite, and gradually runs down the inside of the wall, making its appearance over the first opening, or out at the most convenient joints. If the floor-joints should have a bearing in those walls, or even if the flooring-boards run through to the stonework, it is surprising the quantity of wet they intercept, and this spreading over the floor, the consequences in course of time may be readily judged.

What I would propose and recommend (learnt from that large school, experience) is to build outer walls by either of the following methods—viz. to build an outer course of stone, 10 in. thick, and an inner course 8 in., leaving a space of 6 in. between, which is to be filled up with Portland cement concrete, well flushed into the interstices of each course of stones, and, when required, special perpend stones, selected for their non-absorbent nature. The other method that I have seen adopted is to build cavity-walls, bonded together by a special perforated non-absorbent bond of bricks. In some cases I have known the interior course to be carried up in brick.

In the latter method, cavity-walls, an additional expense is incurred by the necessity of laying lead over all openings; also great care is requisite to select non-absorbent bond.

Seeing, as I have, many proprietors and architects spending large sums of money in erecting buildings of this class, in the districts alluded to, many of them excellent pieces of workmanship to look at externally; but, through not being built upon a proper principle, dangerous and unfit to live in, I am impressed with the importance of the subject.

The different nature of the climate in those parts does not seem to have been provided

against in modern buildings so effectually as in existing ancient ones; and, as in most other cases, anything new, although commendable, is held in distrust. TAVISTOCK.

Sir.—Under the heading "Damp Walls" I observe a letter in your last issue. Being intimately acquainted with Dartmoor, also with the "fire-proof bricks" made in the locality, and, further, with the granite, from the disintegrated particles of which these bricks are made, I am not surprised that "Devonia" found his house like a "sieve," having adopted pretty sure means to that end.

It does not follow that a "fire-proof" brick is a "damp-proof" one, the very opposite being the fact; viz., that a good building brick, i.e., one that is "damp-proof," will be an indifferent fire-brick, and vice versa. The granite of Dartmoor is by no means damp-proof, and there is nothing in the manufacture of bricks from the disintegrated constituents of this granite to remedy the evil.

May I suggest two courses which your correspondent may now adopt, with, I will venture to say, success?

First, apply three coats of damp-proof paint, which contains neither white-lead, nor whitening. Such a paint is certainly to be obtained, and would stand for many years.

Or, second, let the house be encased with damp-proof bricks, which also are obtainable. This would, doubtless, be more expensive than the paint, in the first instance, but would prove a permanent cure if properly built and pointed with good cement. If the house—as it should be on Dartmoor—is built low, a slight casing with numerous bonds into the existing walls would be sufficient; an air space between the casing and the walls would also be advisable.

J. D. P.

NEW OFFICES FOR THE SHEFFIELD UNITED GAS COMPANY, AT SHEFFIELD.

The directors of this company held a meeting on Saturday last, for the purpose of selecting a design for the new offices to be erected near the new Post-office, on the approach-road to the Midland new station. The competition was strictly limited to the architects of Sheffield, and, we believe, nine sets of plans were sent in. These were, after deliberation, reduced to three, viz., those of Messrs. Hadfield & Son, Messrs. Flockton & Abbott, and Messrs. Hill & Swann. The choice of the directors fell upon the design of Messrs. Hadfield & Son, under whose care the work will at once be undertaken.

The building will have a frontage of 128 ft. to the station approach, and 108 ft. to the street, called Shude-hill. It will be of stone, in the early Renaissance style, of a Venetian type, the columns and door-cases.

The principal apartments will be on the level of the station-road, and will include entrance-hall, general office, manager's rooms, show-rooms, and staircase to the upper floor, which will be entirely occupied by apartments for the Board meetings, engineer, &c.

The estimate is 17,500l., and the time occupied in the building will be about eighteen months.

ACCIDENTS.

Fall of a Railway-bridge.—A railway-bridge, near Castle Ashby Station, on the London and North-Western line, gave way, owing to floods, just as a goods-train from Northampton was passing over it. No one was injured except the guard, and he was not seriously hurt.

Fall of a Boiler-house at Mossley.—A boiler-house in connexion with the mill of Mr. John Shaw, Micklehurst, has fallen, the destruction being such that scarcely a stone remained in its place, and the workpeople had not arrived. Fortunately, the workpeople had not arrived previously, and is supposed to have caused the mischief.

Fall of St. Paul's Churchyard Wall, Westminster.—A large portion of the wall bounding St. Paul's Churchyard, Coronation-road, Westminster, has fallen. On the Southville side of the church there is a deep, steep cutting leading to the ferry, known as Ferry-lane. At the top of the lane the churchyard is but a few feet above the level of the roadway, but the incline is so steep that near the bottom the wall rises to a height of more than 20 ft. It was here that the wall,

for about 20 yards, came down bodily, and without any warning; a great mass of earth falling along with it, exposing some fifteen coffins, large and small. Prompt measures were taken for covering the coffins, and protecting the churchyard. The accident is attributed partly to disturbance of the ground, but mainly to heavy rains.

STATE OF GLASTONBURY.

Sir,—I forward you an extract of a letter I have just received with reference to the state of Glastonbury and its drainage, wherein they say, "A party went to the Glastonbury ball, and the smell in the room from the bad drainage was so offensive that one of the ladies was taken ill the next day, and is now ill in bed with fever that they fear is typhoid." How much longer is this state of things to continue in towns, estates, and private houses, and how much longer are parties to inhale poison instead of pure air, especially in the country? They have had sufficient teaching in the *Bullein*, and now let them one and all take timely warning.

A SUBSCRIBER.

THE COURTS OF LAW.

Sir,—As the building for the Courts of Law will be one of the most important erections in this age and kingdom, and, if spared, of a permanent character, there cannot be too much thought and care bestowed by those who sanction the work, that it redound to the satisfaction of the public at large, and the credit of the national taste and appreciation.

I am not an architect, but have bestowed much attention upon the different styles of architecture; and, in the opinion of competent judges, have thrown some desired light in "The Basilica" (of which I sent you a copy), upon its origin, principles, and progress.

Admitting that each acknowledged style may have its merit, and, when well adapted to its object, may be raised to excellence, there seem to me certain conditions attached to every style in the construction of public buildings that should always be maintained to secure a proper effect upon the public eye, and by which the educated and uneducated are duly impressed, though the latter may not, like the former, be able to criticise the distribution of the parts.

The *tout ensemble* of each facade should have the first regard, and that should be broad, massive, and uniform, to secure, in the first instance, a fixed attention to the building as a unity, without any immediate distraction by the several parts. Without this there can be no sense of grandeur, with which every public building ought to impress the mind of the beholder, and overpower the pretensions of all the neighbouring private buildings.

The next requisite is, that the divisions should be well and boldly defined in subjection or harmony to the whole, diverging at equal distances from the centre, or principal entrance, and in perfect conformity with each other.

A diversity of parts which ought to correspond, is as if an artist should paint one eye of a different size and shape from the other—the one round and large, the other small and elliptical. The openings also should be level. When otherwise, it is like putting one eye an inch or more lower than the other. In many recent buildings symmetry appears to have been purposely dishonoured.

Let us one judge of the effects of architectural construction by the proportions, and harmony, and correspondences of the human frame, for the most famous writers on the subject have seized upon this analogy.

Next, and subordinate to the principal divisions, should be the ornamentation in high relief and deep incisions, decorative without being finikin; for the observation of the beholder should be calmly and leisurely withdrawn from the admiration of the contour to the appreciation of symmetry, grace, and proportion.

Stout of a firm texture and bright appearance is the best adapted to all public buildings. Brick requires ample stone dressings to be at all impressive, and even then is inferior to stone.

Any one who notices the banquetting-room at Whitehall, Spencer House from the Green Park, Somerset House, and Greenwich Hospital, will be struck with the impressive and superior aspect which they respectively present in comparison with all neighbouring buildings. What, then, was my amazement and disappointment

on seeing the representation of Mr. Street's ascensions for the New Courts of Law, to find that not one of the essentials described above was observed; but a jumbledom of a confused, incongruous multiplicity of diverse buildings, huddled together like "a happy family" of various animals, without head, subordination, or consistency!

Mr. Street is no doubt an able architect, capable of all that is required to construct a suitable and homogeneous building; but he seems to be a victim to the prevailing taste and purport of the last thirty or forty years, which is covet and consonant with the Oxford movement, the immediate object of which was to Mediaevalise everything, outwardly and inwardly, in accordance with the most corrupt period of the Romish Church. It is seen to a certain amount in the sister art of painting, and in all the grotesque revivals in wood and stone, brick and metals, and in all textile fabrics, to the delight and exercise of many imaginative ladies and feminine young gentlemen.

I hope there is too great a sense of propriety and of national feeling to suffer such a higgledy, piggledy style of building to be erected for the Law Courts of this kingdom,—to be unfavourably contrasted with all the public buildings of ancient nations, and those of all the capitals of Europe. The fables that are played with the roofs of this jumbledom combine all the worst features of a French capitulation. Turkish cupolas and minarets would be far more agreeable.

CHAS. FRED. WATKINS.

IMPORTANT LAW CASE.

O'GRADY v. THE RIGHT HON. E. CARDWELL.

It was sought in this case to recover damages laid at 500*l.* on foot of a contract to execute certain works at the barracks of Athlone, Ireland, which had been entered into by the plaintiff with the defendant as Her Majesty's principal Secretary of State for War. The motion was to set aside two defences which were alleged contained averments of a nature to make it uncertain whether the defendant intended to rely on the fact that the contract was an official contract, and that it was concluded under circumstances which rendered it not binding on the defendant personally. It was further alleged that the remedy of the plaintiff, supposing him to have any, was by a petition of rights. The court refused the motion with costs.

A word or two may be said in relation to this case. The employment of the plaintiff was certainly by Mr. Cardwell in his official capacity, but does this bar recovery of a claim, supposing it to be just? As this action is outside the region of politics, and the question at issue is a most important one to the building and architectural interests, we have a right to ask to what tribunal is the defendant responsible if not to the public ones? The plaintiff's counsel sought in vain to have the pleadings set aside, but the Court of Exchequer held that the defence was *prima facie* a good one.

The matter can scarcely rest here, for it will assuredly make many contractors hesitate in future before entering into a contract with officials if such decisions are to be anticipated in case of dispute. It is not a matter of Irish, but British interests. There is no plea of exorbitant charge or badly-executed work. There is only the plea of non-responsibility. Consequently the disputed claim, without any settlement, falls to the ground, because the action must not be against the Secretary for War in his official capacity.

The comfort to be obtained by a plaintiff on resorting to a remedy by a petition of rights, we fear, is very small, for he is only vouchsafed the hint by the counsel for the defendant that a remedy possibly may exist in that direction.

THE LONDON AND NORTH-WESTERN COMPANY'S NEW PASSENGER STATION AT BOLTON.

In connexion with a new line of railway between Bolton and Manchester, which the London and North-Western Company have just completed, and are about to open, in addition to the present line belonging to the Lancashire and Yorkshire Company, the former company are now erecting a large new station in Great Moor-street, Bolton. The building is an architectural structure, and of large dimensions. It contains a commodious block of offices, standing on high ground con-

siderably above the street level, which were ascended by a bold flight of steps, and at the south end of the station there is a spacious covered carriage-way. Four lines of rails are carried into the station, two on each side of the platforms; whilst, in addition to these, on the east side, there is a long coal siding for this department of merchandise traffic, the line of country through which the new railway passes opening out a large and important area of the Lancashire coal-field which has not hitherto had the advantage of railway communication. The cost of this new station is 45,000*l.*

THE NINE-HOURS MOVEMENT.

At a meeting held at Manchester, on Tuesday, 23rd of January, of the representatives of the General Builders' Association, and of the builders' associations of Hull, Liverpool, Halifax, and other towns, the following resolutions were passed:—

"That it is desirable that some uniform time should constitute a week's work in the building trade throughout the country. In the opinion of this meeting, 54 hours a week in summer is a proper and not excessive time, and this meeting agrees to assist in carrying out such an understanding wherever the question may arise."

"That this meeting thinks it a duty to advise architects, surveyors, and others interested in the erection and maintenance of buildings, of the enhanced cost of building materials and workmanship, in many cases consequent on the reduced hours of labour and the increased rate of wages."

"That this meeting desires to express its opinion of the great value of the Act of last session as a means of protecting labour from trade-union tyranny. And that in view of the attempts being made to obtain the repeal of that Act, a circular embodying the views of builders be prepared, signed by the chairman of each association in the trade, and sent to every Member of Parliament immediately upon action being taken in the House of Commons."

At a special meeting of the London Builders' Society, held on the 29th ult., to consider the circular addressed by the operative stonemasons to their several employers, it was resolved—

"That, having carefully considered the request of the 'Operative Stone Masons' Society in London and District, to 'continue the nine hours' system all the year round' and 'to increase the rate of wages from 8*d.* to 9*d.* per hour,' the employers present are of opinion that any diminution of the hours of mason's work during the summer months is unnecessary, and would cause great inconvenience and public dissatisfaction. The present working-hours, as proposed by the Operative Stone Masons last October, and agreed to by the employers, do not exceed an average of fifty-four hours per week, all the year round."

"That the wages of all artificers employed in the building trades, including stone masons, have been increased three times within the last ten years, and there is no cause shown why a further advance should now be made, nor does the state of trade warrant any such step."

THE WORCESTER SCHOOL BOARD AND THE PLANS FOR NEW SCHOOLS.

Sir,—Would you be surprised to hear that the authors of the three selected designs for the above carry on business within eight miles of the "faithful city"? Also, would it further astonish you to know that there is reason to believe that the estimates for the three said designs emanate from a firm of builders whose father was personally thanked by his colleagues (members of the Board) for "educating" the said members of the Board as to the respective merits of the designs submitted?

DIES NON.

A BUILDER'S COMMISSION AS AN ARCHITECT.

In the County Court at Tunbridge, in the case of Dove v. Smith, which was an adjournment from the November court, the plaintiff was a builder of Tunbridge, and the defendant a grocer of the same place. Since the summons was issued, defendant died, but the executors' names were substituted. Mr. Crapps, for the plaintiff, stated that the action was brought to recover 17*l.* remuneration for services rendered to the late Mr. Smith. The evidence on the part of the plaintiff was to the effect that Mr. Smith and Mr. Anison (Mr. Smith's father-in-law), called upon the plaintiff, and Mr. Smith told him he was desirous of building a house similar to the one built for Mr. Anison, only with the addition of a bedroom. He inquired the cost, and plaintiff said he could not say unless he first prepared the quantities. He then told plaintiff to do this so that he might state the cost, and if he found he could build it for 900*l.*, he should have the job. He made out the quantities, and informed Mr. Smith he could do it for 850*l.*, and submitted the plans to him and Mr. Anison. The plans were regarded as satisfactory, but shortly afterwards circumstances transpired which induced Mr. Smith to leave Tunbridge for Maidstone, and on his return in the spring he inserted an advertisement inviting tenders for the erection of two houses on the site of the one the plans, &c., of which had been prepared by plaintiff who, therefore, had no remuneration for his services. Plaintiff said there was no written agreement; but a verbal contract was entered into that he should build the house for 850*l.* He might have acted for the whole amount of the contract, but he did not choose to be harsh. He only charged 2*per cent.* for taking out the quantities, but he was entitled to charge for the plans separately. Mr. Smith's evidence was taken by the Registrar of the Hastings County Court. It was to the effect that he had some conversation with the plaintiff about building a house. Mr. Anison produced the plans, and the plaintiff

said he would draw out a rough sketch, or words to that effect, of the alterations required. Plaintiff took away Mr. Amison's plans, and afterwards brought a sketch stating that he could build the house for \$500. He heard nothing further from the plaintiff until he received a letter from him enclosing his charges for commission, but plaintiff was simply asked to give an estimate, and not produce plans. Mr. Smith denied that he ever had any plans in his possession belonging to the plaintiff. If he had wanted plans he should have gone to an architect for them.

The Judge said the real point was whether plaintiff was instructed. If he was he ought to be paid. Mr. Warner, for the defence, submitted that if it had been necessary to get out plans and quantities the plaintiff himself took the trouble of getting the job done to do; and that Mr. Smith merely asked for an estimate, not supposing that the plaintiff would be put to any expense.

Mr. Amison, called for the defence, stated that the plaintiff was merely asked for an estimate. After the advertisement inviting tenders was published the plaintiff told witness that he would have nothing to do with the work because the plans had been prepared by a man named Allen (whose misfortune was that of having been reduced from the position of a Government architect to a journeyman carpenter). He understood that the late Mr. Smith had offered plaintiff 50, or any just sum.

His Honour thought, in the face of that offer, the late defendant intended to have paid the plaintiff. He should therefore give a verdict for 100, and the costs.

THE THANKSGIVING DAY AND WORKMEN.

Sir,—As it is proposed that the Day of Thanksgiving for the recovery of the Prince of Wales shall be a public holiday, and if workshops are to be closed, workmen must, of course, lose their day's work, which is a great hardship, and a matter for the authorities to consider whether it will conduce much to loyalty; will you not use your influence that it may be deferred until Easter Monday, when workshops are generally closed? Thus, if workmen would not lose an extra day's pay, but rather would be able to contribute some small thank-offering towards the decoration of St. Paul's or the funds of an hospital, and then there would be no chance of dismissal from loss of money occasioned by compulsory loss of work.

The question affects some thousands of workpeople. Persons whose salaries go on all the same whether they work or play, may not know that in the case of mechanics, and labourers, and many others, no work means no money.

J. H. BARNICOLENSKY.

ASPHALTE PAVING.

Sir,—Your attention, for humanity's sake alone, is invited to the annexed letter taken from the *Telegraph* of January 30th.* The same experimental description of roadways in Holborn, opened for traffic on August 1st, 1870, is now in such a condition, notwithstanding the constant repairs that have been made in it, as to necessitate its removal or entire reconstruction. Over this piece of road innumerable poor animals have fallen, and no less than sixteen poor horses have been killed upon it, as witnessed by one of the drivers of an Islington omnibus.

A more recent application of the same asphalt in the Walworth-road seems to have suffered much by the continuous rain, and large broken-up spaces are undergoing repair.

There is also a length of the same asphalt running through Leicester-square and Cranbourne-street, upon which innumerable horses have been seriously injured, so much so, that recently a large printed circular was posted in most of the shops-windows, calling a meeting of the parishioners to petition for its removal through the falling off of the business of the shopkeepers, orders having been known to have been given to coachmen not to pass over it, and policemen to have been stationed to warn drivers to pass steadily over it.

Apart from the want of durability in the material, it is painful in the highest degree to witness the sufferings of horses endure when they fall, as they are constantly doing upon the asphalt, many of which fall for the last time, as instanced frequently in Cheapside and Holborn. The climate of London is altogether too moist for the adoption of asphalt for roadways unless some new method of application can be devised.

A. B. C.

THE REPORT UPON THE LIVERPOOL EXHIBITION OF PICTURES.

The Fine Arts Committee of the Liverpool Corporation have reported the results of the late Autumn Exhibition of Pictures at the Free Library and Museum, and the report has been adopted by the Library and Museum Committee. The Exhibition was opened to the public from 4th September to 18th November during the day at a charge of 1s., and from 16th October to 18th November during the evening at a charge of 6d. The number of admissions by payments at the door amounted to 22,725, besides 313 season tickets, and about 6,000 pupils of educational establishments admitted gratuitously. The number of works exhibited consisted of 430 oil colours, 450 water colours, 18 pieces of sculpture, 10 other works of art, forming a total of 908. Of these, 852 were for sale, and 235 were actually sold for sums amounting

* Walking through Cheapside this day (January 29th), between twelve and one o'clock, I saw no less than seven horses down. One of these poor creatures had its off hind leg completely broken, the skin ripped asunder, and the bone protruding,—a most painful sight to behold. A misty rain had just commenced to fall, which rendered the surface of the asphalt as slippery as a sheet of glass or ice.

to 6,355l. 2s. 6d., of which pictures to the extent of 1,377l. were purchased by members of the Town Council, exclusive of 500l. expended by the Corporation in pictures for the permanent Gallery of Art now in course of formation. The total receipts amounted to 1,481l. 9s. 8d., leaving a profit of 600l. 6s. 8d. It is contemplated to devote the surplus of these exhibitions to the purchase of pictures for a permanent Gallery of Art. If, as seems probable, says the report, the popular taste can be thoroughly roused and stimulated by such exhibitions, public bodies may then feel themselves justified in employing painting as an adjunct to architecture, and a revival of fresco paintings in our municipal buildings may take place.

ADVERTISING FOR TENDERS.

CHELSEA.

In the Chelsea Vestry the following tenders for the construction of a sewer in Gile-place and Cook's-ground, King's-road (768 ft. in length, and 3 ft. 9 in. by 2 ft. 6 in.), were considered. Mr. Steegles, Napier-road, Kennington, 22s. Mr. Kello, Stanhope-terrace, Regent's-park, 45s. Mr. Pizzev, of Battersea, 46s. 1s.; Mr. Bloomfield, Tottenham, 70s.; Mr. Wigmore, Wilham-green, 749l. 19s.; Messrs. Brass & Son, Manor-street, Chelsea, 800s.; Mr. Wittick, 224; Mr. Hubbard, 780s.; Mr. Neave, 766l. Mr. Davidge called attention to the fact that the lowest tender was 399l. 18s., and the highest 800l. Mr. Fisher proposed to accept the tender of Mr. Neave, and Mr. Symons seconded. Mr. Kingsbury thought the vestry should be consistent. When it was proposed to advertise in the local papers, it was suggested such a course would be found needless, as it would be sufficient to write to builders in the parish; but the vestry decided to advertise in other papers, and he would move to take the tender of Mr. K. Kello. This being put, ten voted for it, and ten against it. The chairman called for a division—for the amendment; 9, against it, 11. Mr. Neave's tender was accepted.

Books Received.

Sun Pictures. With Descriptive Letterpress. London: Sampson Low & Co. 1872.

UNDER this title we have twenty reproductions by the Heliotype process, of specimens of different branches of ancient and modern art,—oil painting, engravings, and sculpture. By this process mounting is superseded,—an important point in book illustration,—and permanence secured. Of the merit of some of these reproductions,—the Vandeyck portrait, for example,—we spoke when they originally appeared in *Art*. The collection makes a most charming volume, and is appropriately dedicated to H.R.H. the Princess Louise, whose elegant crayon "Portrait of a Canadian Lady" is the subject of one of the illustrations. "The Jeweller of St. Petersburg," by Mr. W. Cave Thomas, is one of the most striking prints in the book.

The City of London Directory for 1872.

Collingridge, "City Press" Office.

We gave our praise to the first issue of "The City of London Directory," and find it even more fully justified by the second, now before us. The work has been revised from information obtained by house-to-house call, and the corrections and business changes at Christmas are noted. It includes a good map of the City, on which the improvements during the year are marked. The lists show that there are within the City boundaries 270 architects and 366 surveyors. Prodigious! The list of surveyors, however, includes, of course, some of the names in the other list.

Examples of English Medieval Folio, taken from Buildings of the Twelfth to the Fifteenth Century. By JAMES K. COLLING, F.R.I.B.A. London: Published by the Author, 150, Hampstead-road.

THE previous work by Mr. Colling, "Art Folio," in which he gives an analysis of geometric forms, with a series of original designs for ornate enrichments, as well as studies from natural foliage, is well known and esteemed. In the present work he proposes to give a carefully-selected series of actual examples of art folio, drawn from English Medieval buildings, "to illustrate the most successful treatment of the various types of conventionalised natural forms in sculpture and painting," and he proposes to arrange them so as to show the progress of ornamentation and decoration. The first part, now before us, contains twenty plates, and gives promise that the author's programme will be well carried out.

Tables for Platelayers. By WILLIAM DONALDSON, M.A., A.I.C.E. London: Spion.

THESE tables are compiled from the formulae of the work on "Switches and Crossings," by the same author, and lately noticed in our columns. The tables, relating to various gauges, single and mixed, are preceded by an explanation. The volume must be a useful one to platelayers: it is cases in stout boards, and can be opened without breaking the back of the book, which is what cannot be said of every volume nowadays.

VARIORUM.

CASELLI'S "Illustrated Travels" for February thus sketches Salonica.—"As the bottom rowed us to the shore the charms of the panorama which we had been contemplating gradually disappeared; instead of the whitewashed walls, the towers, and the evergreens, we were struck with amazement at the desolate aspect of this once famous town, and the miserable appearance of its inhabitants. The two colossal towers which stand on the beach are queer specimens of military architecture; their bases are of cyclopean proportions, but their casemates are made of a strange composition of broken columns, stones, bricks, and mortar, all hashed up together. Their embrasures, and the guns inside them, were very shabby indeed; they looked as tame and harmless as the jaws of an old lion who has not a tooth left to bite with would be."—A new edition of Broc Hartley's "Luck of Nonring Camp, and other Tales," will shortly be issued by Messrs. Routledge & Sons, with two additional papers, not hitherto published in England, and with an Introduction and "Cossiping Glossary," by Tom Hood.—The current number of the *Leisure Hours* says to some relics of James Watt,—"We learn from James Gibson Watt, esq., the great-grandson of the immortal inventor, that some most interesting relics of Watt are still at Heathfield, in the very room next his bedroom, in which he worked till within a few weeks of his death, and which it would seem has never been entered since then, save on one or two very special occasions: there stands the lathe at which he was last at work, covered with chips; his tools, many of them his own inventions, just as he left them; his copying or diminishing machine, and some little works of art which he left unfinished. Watt's 'Parent Engine,' the improved 'Newcomen' or 'fire-engine' of the old pattern, and the 'Sun and Planet' engine, which contains the germ of all modern improvements except the crank, are in the South Kensington Museum, and are among the most precious things in the whole collection; other valuable relics of Watt are there also, and there Mr. James Watt tells us the relics now at Heathfield may eventually be deposited."—*Old Merry's Monthly*, illustrated (Warne & Co.), is a magazine quite after a boy's own heart.—*The Family Friend* (Partridge & Co.) and *The Children's Friend* are both remarkable for the goodness of the woodcuts with which they are illustrated, at an almost nominal price.—"The Perpetual Cross Calendar." By C. J. Recordon, B.A., of Pembroke College, Cambridge. Tribner & Co., London." The object of the author of this calendar has been to reduce the complete calendar of each year to its smallest possible compass. Each of the fourteen accompanying diagrams can be cut out, pasted on board, and hung up for ordinary use. It can also be engraved on a sufficiently small scale, in order to be placed in a watch-case. It could be applied to one of the faces of a church-tower. In this case the calendar should be made movable, so that every year the order might be changed to suit the case: thus a perpetual public or tower calendar would be secured.—"The Prince's Illness: its Lessons. A Lecture on the Prevention of Disease." By B. W. Foster, M.D., Birmingham. Churchill, London." This lecture was delivered to a popular audience in Birmingham last December. It is intended to show how greatly zymotic diseases may be diminished by simple sanitary precautions. There is nothing particularly new in it, but repetitions is desirable.—"The Drama in England" is treated of in the current *Quarterly*, and makes a very interesting article. The writer warmly advocates the scheme we have at heart for the establishment of a theatre in London not wholly dependent on the popular taste of the hour and where intellectual stimulus and refreshment may be looked for,—a theatre commensurate with the culture of the age. The writer takes the same view as to the *modus operandi* as was taken by Mr. Godwin in his initiatory observations on the subject, and thinks such

a theatre might be founded by means of a *guarantee* similar in principle to that under which our two Great Exhibitions were constructed.—Mr. J. W. Anson's little "Dramatic Almanack for 1872" includes some "Reminiscences of Asley's." The Graphotyping Company ought to be able by this time to do something better than the portrait of the editor given in the Almanack.—We have received a copy of Mr. E. M. Barry's pamphlet in reply to Mr. Street's statement, but too late for consideration this week.

Miscellaneous.

Mr. E. M. Ward's "Luther's First Study of the Bible."—We are glad to hear that an endeavour is being made to purchase, by subscription, this fine and interesting picture, exhibited at the Academy in 1869, for presentation to the British and Foreign Bible Society. A committee is now at work for promoting the object; it contains the names of numerous gentlemen whose influence, it may be hoped, will do much towards bringing the matter to a successful issue. Included in the list we find Sir Thomas Gabriel, Messrs. G. Moore, W. Leaf, W. Morley, F. Bennock, J. and F. Battam, A. Holtz, W. F. White, T. Walker, W. S. Silver, S. R. Ward, J. M. Stead, Major-General White, Colonel Worsley, Captain Bedford Pim, R.N., Rev. Josiah Pratt, Rev. F. C. Lloyd Jones, Rev. W. Windle, Rev. J. V. Povah, and others. The price of the picture is 1,000*l.*, of which one gentleman, by his own individual efforts, has succeeded in obtaining 200*l.*; and the artist himself presents a similar sum to the society. We sincerely hope the whole amount will soon be collected, and that the picture will thus find an appropriate home. Members of the society should interest themselves in it.

Wooden Pavement.—By the sanction of the Commissioners of Sewers a new principle has been lately introduced, and is now on its trial at the south end of Bartholomew-lane. The pavement is constructed of wood. It is laid on a bed of sand, of sufficient depth to form a good grade, say from 1 in. to 2 in.; on that a flooring is placed, which consists of two thicknesses, one laid horizontally, the other transversely, each thickness consisting of a $\frac{3}{4}$ in. board, prepared with tar. Upon these boards blocks of wood measuring 9 in. by 3 in. by 5 in. are placed, and between each row of blocks a strip of wood 1 in. by $\frac{3}{4}$ in., is nailed to the flooring, the object being to steady the blocks in their places during construction; after being thus laid, the spaces or joints are filled with hot gravel, upon which hot tar or pitch is poured. This is rammed tight home, and again repeated until the spaces are filled up. Subsequently another application of tar is made over the surface, on which a dressing of fine gravel is thrown: when dried the pavement is complete.

The Genius of Michelangelo.—Hawthorne, in his "Notes," says, speaking of the statues by Michelangelo on Giuliano de Medici's tomb in St. Lorenzo at Florence,—"The statue that sits above these two latter allegories, Morning and Evening, is like no other that ever came from a sculptor's hand. It is the one work worthy of Michelangelo's reputation, and grand enough to give him credit for; and yet it seems a simple thing enough to think of or to execute merely a sitting figure, the face partly overshadowed by a helmet, one hand supporting the chin, the other resting on the thigh. But after looking at it for a little time the spectator comes to think of it as a marble statue; it ceases to life, and you see that the princely figure is brooding over some great design, which, when he has arranged it in his own mind, the world will be fain to execute for him. No such grandeur and majesty have elsewhere been put into human shape. It is all a miracle,—the deep repose, and the deep life within it. It is as much a miracle to have achieved this as to make a statue that would rise up and walk."

Dyson's Diamond Stall Plates.—The "Diamond Stall Plates," for shop-fronts, registered by Messrs. Dyson & Co. have advantages of their own. The letters are silvered by a patent process on a bronze plate, and they require less cleaning than some other plates do.

Technical Education and the Nine Hours Movement.—On Monday evening a large public meeting of cabinet-makers, carvers, and chair-makers, was held in the Motley-street School-room, Shoreditch, for the purpose of establishing drawing-classes in connexion with the department at South Kensington. Mr. Benjamin Lucraft (of the London School Board), occupied the chair. He said that one of the largest employers of labour in the trade had voluntarily reduced the hours of labour to 52 hours a week, and he had not the least doubt but the nine hours movement would become general. He urged the importance of young men turning this leisure to their own educational advancement, so that men should not say a reduction in the hours of labour had only given them more time for drinking and idle amusements. Mr. Buckmaster then addressed the meeting on the advantages which a knowledge of drawing gives to working men. Several working men spoke in favour of the establishment of drawing-classes; a large number gave in their names; and classes will be commenced at once.

The Royal Historical and Archæological Association of Ireland.—The annual meeting of this association (originally the Kilkenny Archæological Society) was held Jan. 17, the Mayor in the chair. The Rev. J. Graves, hon. sec., read the report of the committee for the past year, after which it was unanimously resolved,—“That, in order to improve the museum and library of the society, and to render it more interesting to the public, subscriptions be requested from the gentry of the county and the citizens of Kilkenny, for the purpose, particularly as it is the intention of the committee to open the institution to the public; also that a sub-committee be appointed to carry out the necessary arrangements.” It was arranged that the sub-committee consist of the Rev. Mr. Graves, and Messrs. Prim, Robertson, and J. L. Ryan. The treasurer reported favourably on the financial condition of the association. Twelve new members were elected, and two members advanced to fellowships. Various presentations were made, and interesting objects exhibited.

Public Park for Ashton.—A few months ago Mr. H. T. Darton, solicitor, purchased the Highfield estate, on which is erected a large mansion. The house and grounds cost 16,000*l.* Wishing to promote the establishment of a public park for the inhabitants of Ashton, Stalybridge, Dukinfield, Mossley, and the neighbourhood, Mr. Darton offered the whole estate to the public for 2,000*l.* The late Mr. Samuel Oldham has already bequeathed a sum of 7,000*l.* to maintain a public park, and Lord Stamford came forward and offered to forego the chief rent on the Highfield estate, amounting to 131*l.* per annum, if it was converted into a place for the recreation of the working classes. A number of subscriptions were collected. Lord Stamford has now further offered also to give twenty-four acres of adjoining land absolutely, on the condition that a sum of 10,000*l.* be raised by public subscription during the present year for the purpose of buying Mr. Darton's interest and laying out the park and communitations.

Demolition of Radley's Hotel, New Bridge-street.—This well-known establishment in New Bridge-street, Blackfriars, is about to be taken down, and buildings of another character erected on the site. An announcement of the sale of the materials of the building has for some time been before the public, and the sale was to have taken place on Tuesday last, at one o'clock, at which hour there were not less than from 250 to 300 persons present connected with the building trade. When, however, the auctioneer, Mr. Glaisher, made his appearance, he somewhat surprised the company by the intimation that he had been desired at the last moment, by the Governors of the Bridewell Hospital, to postpone the sale for a month, in consequence of unforeseen arrangements in connexion with the Queen's visit to the City on the approaching Thanksgiving-day. After the display of some little opposition, the postponement was ultimately agreed to.

Clerk of Works for the Sheffield School-board.—Mr. W. H. Parsons has been appointed clerk of works to the Sheffield School-board, at a salary of 2*l.* 12*s.* 6*d.* per week, subject to one month's notice on either side, and that he be required to devote the whole of his time to his duties, under the direction of the surveyor to the Board.

Market Accommodation in the City.—At a recent meeting of the Court of Common Council the Markets Improvement Committee brought up a report as to the best mode of utilising the vacant land at the western end of the Metropolitan Meat and Poultry Market, in Southfield, and on the northern and southern sides of Charterhouse-street, and submitted designs and estimates for the erection of an additional market on that site at an estimated expense, exclusive of the value of the land, of 87,500*l.* The consideration of the report, was postponed, in order that it might be circulated among the members, but it will most likely be discussed at the next meeting.

The Lyons Exhibition.—On Monday a committee meeting was held at the Mansion-house, under the presidency of the Lord Mayor, for the purpose of considering the best means to be taken to insure the proper representation of the United Kingdom at the International Exhibition of Agricultural and Industrial Products and Works of Art, to be held at Lyons from May to October next. It was announced that the Minister of Agriculture and Commerce, under whose patronage the Exhibition was to be held, had promised that the French Government would furnish the medals to be awarded by the international juries, and that the committee of organisation at Lyons would defray the expenses of the London committee to the extent of 6,000 francs.

A Group of Sculpture for Ober Ammergau.—A letter from Munich says that the King of Bavaria, who was present last autumn at the representation of the Passion Play at Ober Ammergau, has determined to erect on the Pelberg, above Kefel, which commands the entire district, a colossal group in marble representing Christ at the moment when he said, "Behold thy mother," "Behold thy son." The execution of this group has been entrusted to Professor Falbig. The figures are to be 10 ft. or 11 ft. in height, and the height of the whole group will be from 36 ft. to 40 ft.

Extensions at the Blackfriars Metropolitan Railway Station.—During the present week alterations of an extensive character, which commenced a few days ago, have been going forward at the Blackfriars Station of the Metropolitan District Railway. We understand that the upper portion of the station, above the booking offices, is intended to be applied to the purposes of an extensive hotel or restaurant, and with this view three stories above the present ground floor of the station are now in course of erection extending to the entire length of the existing structure.

Coating with Zinc.—According to M. Böttger, copper or brass may be given a firmly adherent zinc coating, by the following method: Finely divided or powdered zinc, in a non-metallic vessel, is covered with a concentrated sal-ammoniac solution; this is heated to boiling, and the articles of copper or brass, properly cleaned, are introduced. A few minutes suffice to produce a firm and brilliant coating. The requisite fineness of the zinc is produced by pouring the molten metal into a mortar and triturating the same until it solidifies.

The Cathedral Restoration, Chichester.—This work still goes on. The Lady Chapel is completed, with the exception of the paving and carving of the bosses, &c., of the sedilia and piscina. It is understood that the paving, which is to be of a handsome pattern, is in the hands of the manufacturer. The chapel, when completed, will probably be used for the early morning service of the Theological College. The latest work undertaken is to pave the south transept with Portland stone and Purbeck marble.

Argyll-street Galleries.—A considerable suite of rooms in Argyll-street, Regent-street, has been opened as a "permanent exhibition of pictures," with a view to sale. The collection includes the large painting by Jacques Louis David,—“The Coronation of the Emperor Napoleon Bonaparte in the Cathedral of Notre Dame.” Mr. W. Harris is one of the secretaries.

The Joiners and Technical Education.—The Joiners' Company has placed at the disposal of the Birkbeck Literary and Scientific Institution, Southampton-buildings, three prizes for the encouragement of technical education.

The Invention of Steel Pens.—Mr. Henry Mitchell writes to a Birmingham contemporary:—The remarks which have appeared in the local papers upon the death of Mr. Joseph Gillett, that "the adaptation of machinery to the manufacture of metallic pens" was his invention, lead the public to wrong conclusions. It is due to the memory of my late father, John Mitchell, that I should state that he not only made steel pens, but used machinery in their production, for some time before Mr. Gillett commenced in that branch of business.

Material for Roofing.—According to the invention of Mr. J. Erichsen, of Copenhagen, best quality pasteboard is boiled in anhydrous coal-tar, limmer asphalt, powdered silicate of soda and potash, and liquid flint, or other silicious soluble earth. It is then passed through rollers, then sanded, and then rolled again. When fastened to the boards it is coated with Erichsen's India mastic, consisting of anhydrous coal-tar, limmer asphalt, Portland cement, Farnham rock, or other soluble silicious earth, all boiled together and well stirred.

Opening of an Oddfellows' Hall, Bristol.—The erection of the Oddfellows' Hall in Rupert-street is completed, and its opening has been celebrated by a banquet in the new building. The hall has cost, including the money paid for the site, about 2,000l. It has been erected from designs by Mr. Harford, of Lower Ashley-hill, the builder being Mr. James P. Stephens. The style is Italian, and the material used in the exterior work Pennant stone, with freestone dressings. The building is an ornamental one, and is to be used for lodge meetings and other purposes.

A Deep-water Dock for Hartlepool.—A deputation from the Hartlepool Port and Harbour Commissioners attended the last fortnightly meeting of the North-Eastern Railway directors, at York, for the purpose of pressing upon them the immediate necessity of affording increased dock, quay, and railway accommodation for the Hartlepoons, particularly the urgent necessity for a deep-water dock. The chairman of the Board informed the deputation that the directors are willing to carry out the entire scheme as proposed by their engineer.

The London Carpenters.—A preliminary meeting of the carpenters of London was held on Wednesday in last week, at which it was resolved to call an aggregate meeting of the trade to consider the propriety of memorialising for the nine hours system, to commence from the 1st of July; the notice thus to expire at the same time as that of the masons, so that if there is a strike or lockout they may not have to undergo the inconvenience of two agitations in the building trades at different times.

New Docks at Milford Haven.—A movement has been started for the purpose of constructing docks at Milford, of such a size as will provide accommodation at neap-tides for a class of vessels similar to the new steamers belonging to the National Steamship Company. It is stated that vessels of this class could make to New York two more voyages per annum from Milford than from Liverpool. The cost, as estimated by Mr. Hamilton Fulton, the engineer, is about 600,000l.

St. James's Park.—Rumours are again rife with respect to an intended encroachment by the Government on the grounds of the St. James's Park. It is said, that in order to construct the new Admiralty and War Offices, necessitated by the changes which the present Administration has effected, the Government propose to take a slice off the park, near where the wooden cannon stands, in the rear of the Horse Guards.

Brampton New Workhouse.—A considerable time has now elapsed since the guardians purchased a small field whereon to erect a new workhouse and the usual adjuncts. Plans were advertised for, and the most approved set for the inspection of the Poor Law Board in London. The central authority suggested a few alterations, and these having been completed tenders will soon be invited for building.

Thanksgiving-day in St. Paul's.—The tradesmen of Ludgate-hill have resolved upon joint action with a view to decorate that thoroughfare in a manner worthy of the occasion on the approaching visit of her Majesty to St. Paul's. They should obtain the best available artistic advice.

The Savoy Chapel, London.—A painted window, which has for the last few weeks been in course of construction at the Chapel Royal, Savoy, has been opened. The gift is an anonymous one, the donor, however, being a member of the congregation. The window is situated on the north side of the church, and is divided into six compartments, the upper three representing the birth, and the lower the baptism of Jesus. The window is the work of Messrs. Clayton & Bell, of Regent-street, and makes the fifth painted window presented to the chapel, that in the east being the gift of her Majesty; and it is expected that a sixth will shortly be erected.

Sale of the Grosvenor Mansions.—The large building known as the Grosvenor Mansions, situate in Victoria-street, Westminster, let out in suites of chambers, &c., producing a rental of 3,000l. per annum, was sold by auction, by Messrs. Chinnock, Galsworthy, & Chinnock, on the 25th January, and realised the sum of 19,500l.

Mr. Scott.—Mr. George Gilbert Scott, jun. M.A., has been elected a Fellow of Jesus College, Cambridge. Mr. Scott is a son of Mr. George Gilbert Scott, architect. He graduated in 1866 as senior in the Moral Science Tripos. In 1868 he obtained the Burney Prize. In 1870 and 1871 he acted as one of the examiners for the Moral Science Tripos.

The Vienna Exhibition, 1872.—The pilv-driving for the foundation is proceeding rapidly, sixteen rams being at work, and having fixed 224 piles in one day. Tenders will be received shortly for the carpenters' work, constituting the skeleton of the Palace, the Arts Exhibition, the Commissariat, the telegraph, post, &c.

Victoria Park.—The Government has consented to an agreement with the Metropolitan Board of Works, by which the thirty acres of Victoria Park which were in jeopardy will now be secured to the use of the public.

The Public Hall, Dorling.—The works are being pushed on by the contractor. The large hall is almost ready for the roof. The alterations to the existing building are also being rapidly executed.

Newspaper Press Fund.—The annual general meeting of this institution will be held on Saturday, the 24th inst. The Duke of Argyll will preside at the anniversary dinner, on the 11th of May.

Town Tramways for Sheffield.—The Sheffield Town Council have resolved to construct street tramways on their own account, the offer of a private company having been rejected.

Society of Female Artists.—The annual exhibition of works by female artists will be opened to the public on Monday, the 5th inst.

The Royal Academy.—Sir John Gilbert and Mr. Richard Norman Shaw have been elected associates of the Royal Academy of Arts.

The Leominster and Kington Line at Presteign.—The contract amount, we are told, is 30,000l., not 23,000l.

Erratum: the "Standard" Office New Buildings.—We are informed that Messrs. Jackson & Shaw were the contractors for the work, and not Mr. John Anley.

TENDERS

For alterations to Lower House, West Hill, Wandsworth, for Mr. W. M. Seaman. Mr. T. H. Vernon, architect. Quantities supplied by Messrs. Mann & Saunders:—

	Not deducting	Credit.
Mitchell	419	4,299
Sprake	227	4,822
Sutton	60	4,490
Parsons	103	4,392
Simpson	20	4,459
Admson	323	4,435
Scrivener & White	106	4,034
Fish	—	9,950

For additions to mansion at Cockayne, Hatley Park, Bedfordshire, Messrs. Wm. M. Tension & Cross, architects:—
Twelvetees (accepted) £1,950 0 0

For gate-lodge at Biggleswade, Bedfordshire, for Mr. E. H. Adcock. Mr. T. N. Kemp, architect:—
Ridd 234 0 0
Smith 332 0 0
Twelvetees (accepted) 322 0 0

For new infirmary and infectious wards to the Union, Great Dunmow, Essex. Mr. F. Chaucellor, architect:—

Glassecock	£1,500 0 0
Cornwell	3,971 0 0
Cozzett	3,870 0 0
Cole (accepted)	3,390 0 0
Parmenter	3,257 0 0
Saul	3,200 0 0
Hobson & Co.	3,150 0 0
Brown	3,061 0 0

For Wesleyan chapel, near Boston, Lincolnshire. Exclusive of old materials in present chapel. Messrs. Bellamy & Hardy, architects:—

Brown & Co.	£299 0 0
Hobson & Co.	873 0 0
Cook	824 5 3
Lee (accepted)	735 0 0

For the erection of a Wesleyan chapel, Prince of Wales-road, N.W. Mr. E. Hoole, architect. Quantities by Mr. S. J. Thacker:—

Dove, Brothers	£3,275 0 0
Booth	5,000 0 0
Myers & Son	4,859 0 0
Hobson & Co.	4,900 0 0
Jackson & Shaw	4,818 0 0
Hobson	4,828 0 0
Wright	4,650 0 0
Killy	4,577 0 0
Niblett & Son (accepted)	4,490 0 0

For the erection of new public baths, Burton-on-Trent. Messrs. Thompson & Young, architects:—

Upton	£9,000 0 0
Hadfield	5,950 0 0
Hadfield	5,891 10 0
Maddocks	5,751 0 0
Janet	5,747 0 0
De Ville	5,650 0 0
Chamberlain	5,629 0 0
W. H. Mason	5,595 0 0
Mason	5,550 0 0
Low & Sons (accepted)	5,533 0 0
Bowler & Beck	5,530 0 0

For altering and finishing a house in Windmill-street, Haverhill, in connection with the Royal Pavilion Music-hall, Mr. Frederick Sullivan, architect:—

Potter	£1,150 0 0
Badcock	1,034 0 0
Hawkes (accepted)	999 0 0

For the supply, delivery, and fixing of bridge ironwork for the Hedingham Highway Board. Mr. E. R. Boulter, architect:—

Tillot	£475 0 0
Hill & Smith	472 10 6
Smynton	459 0 0
Worcester Engine Works Co.	403 0 0
Horsley Co.	400 0 0
Head	311 15 6
Couthard (accepted)	350 0 0

For alterations, &c. to the "Coach and Horses" Lower Sloane-street, Chelsea, for Mr. J. G. Poole. Mr. John Bradbury, architect:—

Buckley	£250 0 0
Janet	190 0 0
Sawyer (accepted)	174 0 0

For the construction of sewers in Edith-grove, Chelsea. Mr. Pattison, surveyor:—

Whitlock	£335 0 0
Bees & Son	323 0 0
Hubbard	320 0 0
Neave	309 0 0
Clegg	291 0 0
Bloomfield	290 0 0
Keble	283 0 0
Wignore (accepted)	239 10 0
Warren	214 0 0
Puzey	223 5 0

For alterations and repairs at 55, Great Titchfield-street, for Mr. Stone. Mr. W. A. Baker, architect:—

Baugh	£190 0 0
Allen	170 0 0
Watson, Brothers	163 0 0

For alterations to one house, and for finishing four garages, at Merton, Surrey. Mr. R. B. Marsh, architect:—

	Detached House.	
Bedford (accepted)	£270 0 0	
	Corcuses Nos. 3 and 4.	
Groom	570 0 0	
	Corcuses Nos. 5 and 6.	
Dunkley & Sons	375 0 0	

TO CORRESPONDENTS.

H. G. P. (find us particulars of the mode adopted).—H. A. (thanks declined).—J. W. (our correspondent, who invites us to claim for compensation on the Lambeth Waterworks Company, should take proper notice).—Constant Reader (right would depend on the terms of the contract. Power to omit is usually reserved).—N. P.—T. H.—D. M.—E. B.—J. & S.—Mrs. J. T.—C. G. & C.—F. & Co.—K. & P.—J. R. C.—J. J.—M. P.—H. P.—F.—M. O.—W. S.—H. H.—J. C. R.—S. S. Co.—T. H. V.—C. G. H.—E. P.—T. B.—T. P.—W. S. W.—S.—M. H.—A. Subscriber.—W. S.—E. H.—E. P.—B. E. N.—S.—J. B.—E. W. H.—J. N.—G. C. (next week).—A. (next week).—F. H. (next week).

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TO ARCHITECTS.—The Aberystwyth School Board are prepared to receive APPLICATIONS for the APPOINTMENT of ARCHITECT to the Board.—Letters, stating terms, to be sent to the Clerk of the Board not later than FRIDAY, the 3rd day of FEBRUARY next.

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TO SEWAGE FARMERS and OTHERS. The Local Board of West Derby REQUIRE a competent person to SUPERINTEND the LAYING OUT of their SEWAGE FARM at Fazakerley, near Liverpool, in accordance with the plans of the Board's Engineer and Surveyor. Applicants must give particulars of their experience, previous engagements, and salary required. Written applications to be sent in before SATURDAY, the 10th prox.—By order, RADCLIFFE & LAYTON, Clerks to the Board. Public Office, Green-lane, The Brook, near Liverpool, 26th January 1872.

COUNTY of SOMERSET.—AXBRIDGE HIGHWAY BOARD.—26th and 30th Yc. 6*d.* DISTRICT SURVEYOR.—The Highway Board of the District of Axbridge are desirous of receiving APPLICATIONS from Persons fully competent to undertake the duties of SURVEYOR, as required by the said Act. The salary fixed at 200*l.* per annum, which is to include house-rent, travelling, and other personal expenses rendered necessary in the performance of the duties. No assistance will be allowed by the Board. The person appointed will be required to keep the accounts, as laid down by Act of Parliament; to devote his whole time to the duties of his office; and to hold the security of the Oathes Society to the amount of 500*l.* The district comprises thirty-eight parishes, the town of Axbridge being nearly in the centre, where the Surveyor will be required to reside. The farthest part of the district from the town is about 9 miles, and the public roads are estimated at 57 miles or thereabouts, exclusive of footways. Applications, accompanied by testimonials of character, capability, &c. must be sent to the Clerk, by post, on or before the morning of the 14th day of FEBRUARY, and one notice will be given to any candidate whose attendance may be required. None but experienced Surveyors need apply. For any further information apply to J. W. BENNETT, Clerk to the said Board. Dated, Axbridge, 25th January, 1872.

TO ARCHITECTURAL ASSISTANTS
WANTED, for a Permanency, in Yorksire, an ASSISTANT, well qualified in all classes of design, details, and specifications. Address, stating age, salary, references, &c. to B. G. Post-office, Huddersfield.

WANTED, a first-class FOREMAN, to take the MANAGEMENT of a DEPOSITARY and PAINTING Business. Apply to JAMES DIMENT, 19, St. James's-square, Bristol.

WANTED, by a Firm, in the Iron Trade, an ASSISTANT DRAUGHTSMAN, to make working drawings, take out quantities, and call upon London Architects, Engineers, &c. One accustomed to travelling preferred. Apply, by letter only, stating age, where last employed, and salary expected, to G. H. care of Messrs. WARREN HALL & CO. 88, Cannon-road, London, N.W.

WANTED, by a country Firm, a Draughtsman, who must be a good colorist and well up in construction and details. Age not to exceed 35. Salary not to exceed 25 a week. Address, stating age and references to No. 557, Office of "The Builder."

Also, a JUNIOR ASSISTANT, who must be a good penman, quick at accounts, and able to write shorthand.

WANTED, a thoroughly competent BUILDERS CLERK. First-class references required. Apply, by letter only, to GEO. BAKER & SONS, St. George, Lambeth.

WANTED, the SERVICES of a thoroughly efficient CLERK of the WORKS, well educated in all branches of the building trade, to Oversee Two or Three Works in the Midland Counties, with a chance of permanent employment. Apply to H. S. care of Mr. Derry, Stationer, Nottingham.

WANTED, a young Man, to CARRY OUT EXPERIMENTS, under direction, in TRYING MIXTURES, &c. for a patent. He must be accurate, and thoroughly trustworthy, and should have a general knowledge of mechanics. Apply, stating previous employment, wages expected, and other particulars, to J. P. & Co., Colvers-road, East Greenwich.

TO BUILDERS FOREMEN
WANTED, a GENERAL FOREMAN, for the Restoration of a Church, where there is considerable quantity of oak work. Address, by letter, stating age, terms, &c. and where last employed, to H. A. Post-office, Stourbridge, Bucks. Satisfactory references required.

WANTED, a PERSON of experience, to TAKE THE MANAGEMENT of STEAM BOILERS, and otherwise competent to render ordinary mechanical assistance. The salary will be 30s. per year, with board, lodging, washing, &c. Application to be made by letter, with references, and delivered, prepaid, not later than THURSDAY next, 8th FEBRUARY, addressed to W. WEBB, Westminster Union, Clerks' Office, 2, Great Marlborough-street, Poland-street, Oxford-street.

WANTED, a MAN and WIFE, without encumbrance, ages from 35 to 45, for the BAKERY at ALMS HOUSES, Lea Bridge-road. The man to keep the garden in front in order, the wife to keep the house and scullery rooms in order, and value of the inmates. Further particulars may be obtained of the Treasurer, Mr. DEATH, 28, Kingsland-road, Friday or Saturday Morning, between Nine and Ten o'clock.

BOROUGH of LEEDS.—WANTED, an ASSISTANT, in the Office of the Borough Surveyor. He must be thoroughly proficient as a land surveyor, accustomed to the use of the theodolite, and be a good mapper. Applications, stating amount of salary required, accompanied by testimonials from professional men with whom applicants have been employed, must be sent to my Office, not later than TUESDAY, the 6th day of FEBRUARY next. Note that practical surveyors who have been engaged in town surveying need apply.—By order, C. A. CURWOOD, Town Clerk, Leeds, January 15, 1872.

BUILDERS' FOREMAN.—WANTED, a thoroughly practical Man, as SHOP and GENERAL FOREMAN. First-class references required.—Apply, by letter only, to GEO. BAKER & SONS, St. George, Lambeth.

UPHOLSTERER'S FOREMAN
WANTED.—Age, experience, salary, and general particulars, to be stated by letter to C. H. S. 143, Oxford-street, W.

TIMBER TRADE.—WANTED, an active, energetic Man, as TRAVELLER. State last engagement and salary required.—Address, Messrs. WELLS & HARE, Timber and State Merchants, Chatham.

TIMBER TRADE.—WANTED, by a Young Man, with over seven years experience in the wholesale and retail timber trade, a RE-ENGAGEMENT as CLERK. First-class references and testimonials.—Address, J. W. & Co., Kempford-square, Richmond-road, West Norwood, S.W.

TO ARCHITECTS ASSISTANTS
REQUIRED (temporarily) a first-class DRAUGHTSMAN and expeditious practical ASSISTANT, especially skilled in the planning and design of country mansions in the Italian style. He will be needed for any gentleman to apply who cannot to the fullest extent meet all the above requirements.—Address, stating age, terms, experience, and full particulars, to 559, Office of "The Builder."

TO EMPLOYERS OF SKILLED LABOUR.—Several WORKING PROFESSIONAL MEN, refugees from Paris, seek EMPLOYMENT, as Architects, Draughtsmen, Civil Engineers, Painters, Decorators, Sculptors in bronze and marble, Electricians, Gasfitters, Plumbers, Plumbers, Tanners, Dyers, Brass, Bronze, and Copper Moulders and Moulders; Copiers, Sculptors, Profoundly of Languages, &c. and others. Full names and addresses of any of these, apply to H. F. JUNG, Watchmaker, 4, Charles-street, Clerkenwell, E.C.

TO GAS AND HOT-WATER ENGINEERS, BELLHANGERS, &c.
WANTED, by a practical Man, a SITUATION as above. Can take charge of a small or large job. First-class references.—Address, A. D. 15, Great Pultney-street, Regent-street, W.

WANTED, by a BUILDERS CLERK, aged 25, a RE-ENGAGEMENT. Well up in office work, book-keeping, and the different treatments of accounts, &c. Been used in the general management of building operations, which he would fill up time in shop if required. 30s. per week. Good references.—Address, H. 25, Ash Grove, Barking, E.

WANTED, by a CLERK of WORKS, a RE-ENGAGEMENT. Can be strongly recommended by the highest architectural references for ability and character, and has lately made important discoveries in Building Appliances, which have already been adopted by a large number of architects. Most accurate technical testimonials.—Address, 389, Office of "The Builder."

TO GASFITTERS, &c.
WANTED, by a Young Man, a SITUATION for Permanency, as GASFITTER and BELLHANGER, and all kinds of Jobbing. Moderate wages required.—Address, F. A. 355, King's-road, Chelsea.

TO PLUMBERS and BUILDERS
WANTED, by a Young Man, a Constant SITUATION as PLUMBER and GLAZIER. No objection to fill up his time in painting. Well up in closet work.—Address, T. G. Blenheim-street, Colchester, Essex.

TO CARPENTERS, BUILDERS, &c.
WANTED, by a Young Man, a Carpenter, of special character, a SITUATION, either in the Office, or at the Bench. He is a good penman, expeditious at accounts, and conversant with plans, specifications, &c. Can set out work with accuracy. Age 24.—Address, E. 39, Gray-street, Welber-street, Blackfriars-road, S.E.

TO ARCHITECTS AND SURVEYORS
WANTED, by the Advertiser, an ENGAGEMENT in an Architect's or Surveyor's Office in London. Has a knowledge of surveying and designing.—Address, M. H. Post-office, Dulwich, S.E.

TO BUILDERS AND FOREMEN
WANTED, by the Advertiser, aged 25, EMPLOYMENT in a good CARPENTER and JOINER'S SHOP. Town or country. Wages moderate.—Address, A. D. No. 7, Great Chesterfield-street, Marylebone.

TO ARCHITECTS AND SURVEYORS
WANTED, by the Advertiser, aged 19, an ENGAGEMENT in an office of the above. Four years' experience under articles.—Address, A. F. E. 10, Quaker, Architectural Association, 5, Conduit-street, Regent-street, W.

TO LANDLORDS AND OTHERS
WANTED, by the Advertiser, a PERMANENT SITUATION as COLLECTOR, and to SUPERINTENDENT HOUSE REPAIRS. Dependable references.—Address, A. R. 119, Old-road, Barnsbury.

TO BUILDERS AND ARCHITECTS
WANTED, by the Advertiser, who has just completed a large job, a SITUATION as GENERAL FOREMAN, or CLERK of WORKS. First-class testimonials. Joiner by trade. No objection to the country.—Address, S. M. 63, Camberwell-road, S.E.

TO PLUMBERS, GASFITTERS, and BUILDERS
WANTED, by the Advertiser, a SITUATION as IMPROVER to the above trades. Has also a knowledge of painting and glazing, having been three years on a large public building. Wages moderate.—Address, T. R. New Assizes, Hereford.

WANTED, by the Advertiser, aged 21, a SITUATION, as ASSISTANT CLERK in a large Builders' Office in London. Has had six years' experience in the office, and the last thirteen months in the office, where the highest references can be obtained. Can take out quantities, process drawing, &c. and show specimens.—Address, C. 27, George-street, Portman-square.

TO BUILDERS AND OTHERS
WANTED, by a thoroughly practical Man, a SITUATION as WORKING FOREMAN of PAINTERS. Can do graining if required. Unexceptionable testimonials. No objection to town or country.—Address, A. 2, Denmark-road, Kilburn.

WANTED, by a thoroughly practical Man, a Carpenter, Joiner, and Strainer, South Lambeth, a RE-ENGAGEMENT as a BUILDERS' FOREMAN, or CLERK of WORKS. Good references.—Address, H. A. 27, Thurloe-road, South Lambeth.

TO BUILDERS AND CONTRACTORS
WANTED, by a thoroughly practical Man, of twenty years' experience, a RE-ENGAGEMENT as AGENT or GENERAL FOREMAN. Five years with present employer. First-class references.—Address, C. P. care of Mr. Green, Architectural Carver, 74, Lancaster-street, Borough-road, S.E.

TO BUILDERS, CONTRACTORS, and OTHERS
WANTED, by a thoroughly practical Man, an energetic Man, BRICKWORK CUTTING or POINTING, by the Piece, or a SITUATION as Foreman of Bricklayers, or Clerk of Job. Thoroughly acquainted with drawings and setting out work. Good references.—Address, A. B. Boxer House, Southgate-road, Ilford, N.

WANTED, by a thoroughly practical Man, aged 26, Carpenter and Joiner by trade, a RE-ENGAGEMENT as GENERAL FOREMAN (out-door). Town or country. Twenty years' good London experience. Just now completed a five year job. First-class testimonials from last employer.—Address, W. H. 34, Borough-road, Southwark, S.E.

WANTED, by a thoroughly practical Man, a RE-ENGAGEMENT as GENERAL FOREMAN. Town or country. Carpenter and Joiner by trade. Twenty-five years' good London experience. Seven years' first-class testimonials from last employer.—Address, W. H. 34, Borough-road, Southwark, S.E.

WANTED, by a thoroughly practical Man, a RE-ENGAGEMENT as GENERAL FOREMAN. Town or country. Carpenter and Joiner by trade. Twenty-five years' good London experience. Seven years' first-class testimonials from last employer.—Address, W. H. 34, Borough-road, Southwark, S.E.

WANTED, by a thoroughly practical Man, a RE-ENGAGEMENT as GENERAL FOREMAN. Town or country. Carpenter and Joiner by trade. Twenty-five years' good London experience. Seven years' first-class testimonials from last employer.—Address, W. H. 34, Borough-road, Southwark, S.E.

WANTED, by a thoroughly practical Man, a RE-ENGAGEMENT as GENERAL FOREMAN. Town or country. Carpenter and Joiner by trade. Twenty-five years' good London experience. Seven years' first-class testimonials from last employer.—Address, W. H. 34, Borough-road, Southwark, S.E.

WANTED, by a respectable married Man, a GENERAL HAND in the GRAINING, PAINTING, and PAPERHANGING branches. EMPLOYMENT as WORKING FOREMAN, or others, or would take the work of a Builder piecework.—Address, H. E. Post-office, Basingstoke.

TO BUILDERS AND CONTRACTORS
WANTED, by a practical BRICKLAYER, a RE-ENGAGEMENT as WORKING FOREMAN. Thoroughly understands plans and setting out, or by the Rod, Gauge-work, or Painting, piecework. Two years and a half with last employer. No objection to a country job. Good references. Age 22.—Address, J. V. & Albert-gardens, Kilburn.

TO ARCHITECTS AND SURVEYORS
WANTED, by a good DRAUGHTSMAN, ASSISTANT. Can prepare designs from rough sketches; perspective drawings. Good colourist and penman. Four and a half years' experience. Unexceptionable references.—Address, W. G. E. No. 2, Lowndes terrace, Knightsbridge, S.W.

TO BUILDERS AND CONTRACTORS
WANTED, by a sober and energetic Man, a RE-ENGAGEMENT as GENERAL FOREMAN of WORKS (bricklayer by trade). Has had charge of several extensive public and private jobs. First-class references, and seven years' good testimonials from last employer.—Address, H. L. 2, Amber's-cottages, Cuscuton-road, Croydon.

TO ARCHITECTS
WANTED, by a good ARCHITECTURAL DRAUGHTSMAN, of seven years' experience, a RE-ENGAGEMENT. Well up in Office Drawings, &c. Good references. Terms moderate.—Address, 770, Office of "The Builder."

TO PLUMBERS and BUILDERS
WANTED, by a first-class PLUMBER, a SITUATION or JOB. Good references if required.—Address, E. CARTER, 96, Dayham-street, Camden-town, N.W.

TO BUILDERS AND CONTRACTORS
WANTED, an ENGAGEMENT, by a thoroughly qualified DAY CLERK. Neat and expeditious penman, quick at accounts, and accurate at cubing, squaring, and assisting generally. Good reference. Practically acquainted with the trade. Age 22.—Address, 271, Post-office, Red Hill, Surrey.

TO BUILDERS AND CONTRACTORS
WANTED, a RE-ENGAGEMENT, in a London ARCHITECTS OFFICE. Perspective, detail, working, contract, and specification drawings, and usual office duties. Fair colourist.—Address, N. Y. 4, Fitzland-place, N.W.

TO ARCHITECTS AND SURVEYORS
WANTED, a RE-ENGAGEMENT, by a Young Man, in a neat draughting office. Can prepare drawings from rough sketches, and assist in taking out quantities.—Address, S. R. 30, Arlington-street, Regent's Park, N.W.

WANTED, a RE-ENGAGEMENT, as SHOP FOREMAN, OUT-DOOR FOREMAN, or CLERK of WORKS, by a thoroughly practical London Builder's Foreman. Joiner and Strainer, well up in draughting, and well up in piecework and machinery of all kinds. No objection to fill up his time in the office. First-class testimonials from Architects and Builders.—Address, H. K. 41, Matilda-street, Cuckfield-road, N.

TO ENGINEERS or CONTRACTORS
WANTED, a RE-ENGAGEMENT, as CLERK, or INSPECTOR of WORKS, or GENERAL FOREMAN. Has been employed upon large works, having just completed a large contract in the City. With first-class references from last and previous employers.—Address, R. H. 8, Great New-street, Fetter-lane, Holborn, E.C.

TO PLUMBERS or GASFITTERS
WANTED, a SITUATION, in Town or Country, by a respectable Young Man, aged 20, as IMPROVER. In the above trade, to a good master. References of three years' standing.—Address, G. F. 25, Colledge-street, Chelsea, S.W.

TO BUILDERS, SURVEYORS, and OTHERS
WANTED, a SITUATION, by a practical CLERK, aged 25. Is well acquainted with estimating, quantities, measuring bills, and keeping accounts.—Address, A. R. 171, Blackfriars-road, S.E.

TO BUILDERS, CARPENTERS, and OTHERS
WANTED, a SITUATION, by a good CARPENTER and JOINER. Highest References. Wages moderate.—Address, G. R. 26, Joseph-street, Burdett-street, Bow, E.

TO BUILDERS AND CONTRACTORS
WANTED, a SITUATION, as CLERK, capable of managing a branch contractor. Has just completed an engagement with a first-class contractor as assisting agent.—Address, A. B. C. 5, Villie on the Heath, Hammersmith, N.W.

WANTED, a SITUATION, by an experienced Man in STAIRS, SHOP-FRONTS, Boxing Shutter, Slashes, and Frames, the Building Alterations, and the care of his own country job. Can make out working drawings and estimate up work. Wages 6d. per hour. Age 50.—Address, T. T. 19, New-street, Kensington-part-road.

TO BUILDERS AND CONTRACTORS
WANTED, a SITUATION, in Town or Country, by a good DRAUGHTSMAN. Well up in Builders' accounts, quantities, measuring, estimating, &c. Practically acquainted with the trade and setting out all kinds of work. Terms moderate. First-class references.—Address, N. Y. 7, Post-office, Woodstock, Oxon.

TO BUILDERS, CONTRACTORS, and OTHERS
WANTED, by a good practical MASON, a RE-ENGAGEMENT as FOREMAN, or Work by the Piece. Labour only. Town or country.—Address, R. N. 6, Newchurch-road, Dalston.

TO BREWERS and ADVERTISING WRITERS
WANTED, by an experienced Workman, a SITUATION, as SIGN WRITER. Good references, if required.—Address, R. H. Post-office, 40 Ford, E.

TO ARCHITECTS
WANTED, an experienced ASSISTANT, working, and detail drawings, perspective, plans and elevations. Town or country. Temporary or otherwise. Age 23.—Address, H. G. 42, Golding-road, St. Peter's Park, Harrow-road.

TO BUILDERS, SURVEYORS, and OTHERS
WANTED, by an experienced BUILDER'S SURVEYOR, well up in taking off and preparing quantities, measuring and estimating accounts, plans and elevations, &c. at present unemployed. First-class testimonials.—Address, X. Y. 24, Everett-street, Russell-square, W.C.

THE Advertiser, a good DRAUGHTSMAN, COLOURIST, and DESIGNER, wishes EMPLOYMENT. Had considerable practical experience in bridge building, surveying, &c. No objection to go abroad. Having a few hundred pounds capital would join an architect or builder already established in a good business.—Address, ALPHA, 251, Tottenham-cour-road.

THE Advertiser desires an ENGAGEMENT in a large Firm as ESTIMATOR, MEASURER, and BOOK-KEEPER. Is thoroughly practical, quick, accurate, and careful. Well recommended both as to character and ability.—Address, C. R. J. No. 10, Trinity-square, Borough, S.E.

TO BUILDERS AND CONTRACTORS
THE Advertiser, who has a thoroughly practical knowledge of the trade, requires an ENGAGEMENT as MANAGING CLERK. Can take off quantities, estimate, and measure and value all works connected with the business. First-class references.—Address, 9, "250," 24, Kingsland High-street.

The Builder.

VOL. XXX.—No. 1514.

Conventionalism in Art.

NOTWITHSTANDING the frequency with which the above-named term, and its opposite, "realism," have been bandied about by recent writers on art, it may be doubted whether a majority of readers connect any very certain or definite idea therewith; whether the importance of the principle which it represents, as bearing on the objects and forms of expression of Art, is adequately recognised. Perhaps a good many who not infrequently make use of the word "conventionalism" would find it difficult to explain the precise meaning in which they use it; and those compilations which profess to define the signification of words give us no help here. It is almost needless to say that the term was not in existence in Johnson's time. Webster recognises it; defining *convention* as "the act of coming together," hence *conventionism*, and *conventionalism* as "that which is received or established; convention or agreement." Richardson's later dictionary, again, ignores the word, giving only *conventional*, illustrated by a quotation from Reynolds,— "Poetry and elocution of every sort make use of signs, but these signs are arbitrary and conventional." The omission of the one word, and the illustration of the other, equally show that Richardson, as well as Webster, was quite unacquainted with the term "conventionalism" in its modern use in reference to Art; indeed, owing to the indifference to Art characteristic of English literary students in general, a dictionary of the English language is generally about the best place where one may look for new light in regard to terms of this class.

The fact is that just as "conventional" is a derived meaning from "convene" and "convention," so "conventionalism," again, is a derived meaning from the adjective, a degree further removed from the original signification of the verb. The quotation from Reynolds given by Richardson indicates plainly enough the meaning of "conventional," as applied originally to signs, such as letters and symbolic figures,—things which have no meaning in themselves, and no necessary relation to any fixed idea, but to which we have agreed to attach certain ideas. Reynolds, who was probably as innocent of artistic conventionalism, properly so called, as his friend Johnson could have been, was distinguished between the signs used in writing, which were purely arbitrary and selected, and those used in pictorial art, which were expressions of unalterable and universal forms of nature. And so long as pictorial art is regarded as merely this,—as purely imitative of Nature,—in her forms and details, there is no need for any intermediate shade of meaning other than this broad and general one to be attached to the word "conventional." But when modern art-criticism commences to weigh and to discriminate principles more accurately,—to look (may we not say) more deeply into the meaning and objects of art than the practical realistic school of Reynolds and his coeppers, for

the most part, cared to look,—it became apparent that between pure realistic imitation and purely arbitrary symbolism lay many degrees and grades of departure from nature; that possibly realistic imitation was not everything in art; that even in the imitative art of painting there could be a use of natural types without literal imitation,—not arbitrary, yet so far "conventional" that it permitted of a choice on the part of the artist as to how near to nature he would go, even of an "agreement" on the part of a school of artists to recommend departure from nature up to a certain point, more or less defined by canons of criticism. To this tendency (much more marked at some periods, and in some schools of art than in others) to depart more or less, in imitative art, from the real forms of nature, we have gradually concurred in giving the name of "conventionalism," as expressive of a principle of treatment which, while totally distinct from that arbitrary choice of symbols properly styled "conventional," is yet arbitrary as far as this, that it leaves us free to choose in what degree or in what special qualities we will endeavour to imitate nature.

But though it is in connexion with the art of painting that the existence of these two principles, conventionalism and realism, has been most clearly made manifest and recognised, and the strife most actively carried on between their respective adherents, yet that would be a very superficial view of art which should regard this opposition of the two principles as confined to the painter's art. In fact, the question as between conventionalism and realism is one which concerns more or less every form of artistic expression, and is intimately associated with the most essential considerations as to the objects and even the very existence of art in the widest sense. If the sole end of the various forms of art which more or less imitate nature, is to form a lesser world within the natural world, a mere mimicry of the beauty of the latter, then is realism the true goal of the artist, and power of technical execution becomes all-important as the sole means of attaining his end. In regard to painting in particular there have not been wanting able and acute critics to support this view; among recent adherents to this school we must count, apparently, one of the most brilliant contemporary French writers, M. Taine, who has criticised our art and literature with much originality and insight. Such a view, however, very much narrows the sphere and lowers the status and mission of art. It places art below even material nature; renders it, in fact, only a kind of dignified plaything, a means of reproducing in a fainter degree the same aspects or sounds or combinations which give us pleasure in nature. Such a view we take to be radically wrong; and to have been entirely suggested, probably, by the fact that one of the objects of painting and sculpture is to a certain extent imitative, from which a hasty generalisation has been made to the effect that art copies nature. There are other branches of art which afford little basis for such an idea; and the fact that painting comes nearer to literal imitation affords no real basis for it: either, the distinction in this respect between it and other arts being incidental rather than essential. All art stands on the same common ground, so far as general object and principles are concerned; and the enjoyment we derive from it is distinct from our enjoyment in nature, in kind as well as in degree.

Could we really reproduce in their completeness and intensity of effect those things which in nature cause us delight,—could we re-create nature for ourselves,—conventionalism would be then an impertinence or a mere imperfection. But we cannot do so, and therefore when working as artists we take our stand on a different ground. We endeavour, not to reproduce nature, but to produce that which will stir and

affect our own feelings in the same manner as natural beauty affects them. And so we select various classes of types or phenomena in nature as a language through which to speak or to render visible our thought. Since we cannot imitate and reproduce nature as a whole, we avoid the attempt, because it would always expose our work to disparaging comment, as falling so far short of the original. But we can select for ourselves such phenomena as we are able separately to deal with, and from which we can make a language or a form wherein to clothe our ideas. We can do this through colour, through light and shade, through form, through rhythm and harmonic proportion of sound. We use the human form, in various representations, as the means of expressing feelings and ideas; but we do not as a rule attempt that degree of *vraisemblance* which can be called deceptive or completely imitative. We eliminate that which we cannot fully imitate, and only seize those points which suffice to express our idea. We may approach nearer to nature, with success, in some artistic media than in others. We approach nearest in painting, because there we have the elements of form and colour, and can give the effect of relief, sufficiently to satisfy the judgment, without being accused of attempting any imposition on the senses of the spectator. The most careful execution will hardly cajole the eye into the belief that it is dwelling on reality instead of on a show. But the case is opposite in sculpture. Here we have the actual form, relief, and contour of nature repeated in solid and tangible reality. But for that very reason we shrink instinctively from applying imitative colouring, and thereby challenging direct comparison with the reality. Such an attempt would defeat its own end. For, in the first place, it cannot be supposed that the most subtle sleight of hand would avail to rival all the cunning of Nature in her infinite details, and we are again in danger of condemnation as bungling imitators. But suppose we could succeed in absolutely cheating the spectator, for the moment, into a belief in the life and reality of our work, what have we gained? Merely the praise of a cunning and painstaking sleight of hand; and what, on the other hand, have we lost? We have lost the object, the meaning, and end of our work, which was to express an idea, not to concentrate the spectator's attention on a feat of mechanical execution. It may be true, as Byron put it, that we—

"Have seen much finer women, ripe and real,
Than all the nonsense of their stone ideal;"

and the ripeness and reality we cannot remake and imitate; but that which is greater than these we can,—the poetry of form, of gesture, of expression, which will be all the more impressive in proportion as we refrain from weakening their effect by attempts at literal imitation of more material beauties. We may have seen landscapes, sunsets, moonlights in nature, more intense in their beauty and consequent effect upon us than any imitation of them on canvass could ever be; but the spirit of them we can reproduce, and from their elements create new scenes and new feelings which we have never actually met with in nature. We may be more deeply touched by the sounds of the sea, and the brook, and "the trees of the wood moved by the wind," than we could be by any attempted artificial imitation of them (which, indeed, in almost any conceivable case must be a mere piece of grotesque); but we can translate into measured tones the feelings which run through these unmetrical sounds of nature, and so we may have such things as the "Pastoral" symphony of Beethoven and the "Fingal's Cave" overture of Mendelssohn; not imitating either the brook or the tempest or the sea, but calling up in us feelings analogous to those excited by these natural phenomena and their associations. So

that, in whatever art-language we speak, it seems that we use forms or types which are parts of nature, as a language conventionalised to express feelings which are too subtle to be expressed in words. We will carry on the subject in our next.

THE CHAPTER-HOUSE OF WESTMINSTER.

It is now some years since we first called the attention of our readers to the neglected state of the beautiful Chapter-house of Westminster, as we did afterwards to the effort which was about to be made, under the auspices of the Very Reverend the Dean, to proceed with the restoration of that building. This has now been effected to a certain stage. Not only has the progress of decay been arrested, and the building placed in a thoroughly sound and weather-tight condition, but relics of ancient work have been discovered and preserved which throw light on the history of ecclesiastical architecture and decoration in England. A hall of great elegance has been added to the venerable series of the chapels and chambers of Westminster; the very cradle of English history since the date of the Norman Conquest. What yet remains to be done is to replace, to some extent, the dilapidations of time by the erection of appropriate woodwork; and, above all, to fill the large windows, the white light admitted by which is incongruous with the character of the vaulted apartment, with the jewellery of appropriate stained glass. We give a view of the restored building in our present number.*

The Chapter-house at Westminster is an octagonal building, to the south of that entrance to the Abbey known as "Poets' Corner." In the centre of this hall rises a lofty shaft of Purbeck marble, around which eight smaller shafts are clustered. From the bold and graceful capital of this central column, groined arches spring on either side to the walls. The roof is built of white chalk, groined with ribs of fire stone. The bosses which form the keys of the groins, although now, are executed from ancient designs. Four of them represent sacred subjects—Moses with the Law; David, the author of psalmody, the Angel of the Annunciation; and the Virgin receiving the mystic Ave;—the other four are boldly foliaged. A wall arcade surrounds the entire building, with the exception of the western side of the octagon. Here the only entrance to the Chapter-house is situated,—a doubly-arched portal, which leads through a vaulted passage to the great cloisters, from which entrance is now afforded by two iron open-work gates. There the prior and monks were able to assemble in a veritable cloacve, free from all possible interruption from the outer world. The entrance was decorated with extraordinary splendour. It was surmounted with a large pierced quatrefoil, in the centre of which was placed a large seated figure of Christ. An angel with a turban attended on either side; and in the four cycloets are the well-known emblems of the Evangelists. Around the main arch of the doorway, and harmonising with its rich mouldings, was sculptured a tree of Jesse—the royal and patriarchal figures lending the attention to the central occupant of the throne.

This portion of the Chapter-house was in a lamentable state of ruin. The central pillar, dividing the arch, was thrown down, as well as the greater part of the tracery. The windows of the passage were destroyed, and their apertures wholly blocked up. It has been only by taking the utmost care of every fragment of the original work that the task of restoration has been rendered possible. From a springer here, and a moulding there, a shaft here, and a capital or a fallen shaft, evidence has been gained of the features of the original work. To uncover from protecting whitewash the happily preserved diapers, and mural paintings, and delicate decorative features of the building, has been a labour of love, carried out with patience.

When the work of restoration was commenced, the central pillar of the Chapter-house was in a threatening condition, inclining towards the south-west. Many of the slender clastering shafts were broken and loose, being only bound together with coils of copper wire. The capital had been split into several portions, some of which had been replaced with plaster of Paris. The whole had been adorned with several thick coats of stone-coloured paint. On removing this, and taking down the loose shafts, the broken capital, and the annulets, the central pillar

proved to be perfectly sound. It is formed of a number of short cylinders, lying on their beds, the whole being held together by a bar of iron placed in a central perforation, and run in with lead. To this latter precaution the preservation of the shaft is due. Had the bar been run in with lime-mortar, the surrounding column would have been long since riven asunder by the slow but irresistible process of the oxidation of the metal. About a quarter of the metal required replacement, but to effect this was easily possible, from the sharpness of the mouldings in the sound portions. Copper plates have been inserted, which cover nearly the whole surface of the bed, and bind the portions of the restored capital together. The moulded annulets are new, with the exception of a portion of the central part around the main shaft. All the new portions are bonded together with copper.

The floor of the Chapter-house is covered with tiles, which have been well preserved by the wooden floor that was placed over them when the building was deserted. Only some 30 ft. of the entire superficies were missing, and even this deficiency appeared to be due rather to the decay of the tiles, from imperfect burning, than to violence or wear. The defective portions have been made good by new tiles, executed by Messrs. Minton & Hollins. There are nearly sixty different varieties of tiles used in this floor, of which forty have been made in imitation. The bearing of the kings of England since the time of Richard I., who added the third lion (that borne by the Dukes of Aquitaine) to the Norman two, is the prevalent ornament. But below the base of the shield, in a position, so far as we are aware, that is without precedent, are the centaurs of Stephen, which, though not grouped as either "tenants" or supporters, must have been placed there for heraldic reasons. On the southern side of the floor are six lines of lettering in bands running north and south. The letters are in separate *rosses*, capable of being arranged like type. They are much decayed. One word is traceable, which we read as, *ossians*. The folios of others of the tiles is bold and spirited. The interesting character of this floor needs no comment.

The arcades round the wall of the Chapter-house appear to have been all decorated with mural paintings, in oil, and by inscriptions, written on thick paper, and carefully attached to the walls. In those places where doorways have been broken through,—namely, in the south-east, the north-east, and the northern sides,—all vestiges of the paintings have, of course, been destroyed; but enough remains, not only to give a clear idea of the style of their ancient artists, but to enable us to understand the general plan of the chromatic decoration of the building. The gold, which has been freely used, remains in many places as fresh as if it had been applied last year. The tracery of the canopy-arches was painted in red and blue, relieved with gold. A series of sacred paintings ran round the arcade, the whole history of St. John the Divine, including his vision, being represented in separate groups. Below these celestial scenes were drawn a series of natural-history subjects, contrasting, so far as the remains allow an opinion to be formed, the wild and the domesticated state of various creatures, as the wild and the common ass. Below these, again, seem to have been a series of fish or aquatic animals.

Each bay, or side of the Chapter-house is adorned with an arcade, or row of five small arches, relieved from the wall. As the doorway occupies the western side, there were thus thirty-seven of these spaces; the large pointed window, which fills up the greater portion of the upper wall, rising at a higher level. Originally of a hundred distinct subjects were originally portrayed in these arcades, of more than half of which some traces are yet to be distinguished. Commencing on the left hand as we enter the Chapter-house, we find the legendary story of St. John. In the first picture, the arrest of the saint by the Proconsul of Ephesus, by the order of the Emperor Domitian, is represented. The proconsul wears a large golden crown and a formidable sword, and the apostle is distinguished throughout by a golden nimbus. In the second scene the saint is placed in a cauldron of oil. An attendant is pouring in the liquid with a ladle, and another blows the fire beneath it with a pair of bellows. In the third scene, St. John is shown as having escaped unscathed from the cauldron, and his banishment to Patmos is indicated by his figure in a boat, which is being pushed from the shore. There are five figures in this scene, and there were seven in each of

the preceding ones. In the fourth picture, the apostle is landed, and left desolate on the shore of the island, his companion returning in the vessel. In this scene the curious method of representing successive events in one composition, which Ghiberti has carried to such a remarkable pitch in his famous gates, has been adopted by the painter. The apostle and his companion being shown together in the stern of the boat, and the same figures being again separately represented, as parted from each other after the disembarkation.

In the next arch we enter upon the illustrations of the Book of Revelation, to which these scenes from the legendary life of St. John serve as a prelude or introduction. We are first shown the angel, making known to the apostle the object of his mission. Then St. John is portrayed writing to the seven churches of Asia, which are little stone buildings of a cruciform plan, each with a central tower, surmounted by a spire, and with leaded roofs. In the porch of the north transept of each of these quaint little buildings is displayed the Angel of the Church. In the third compartment is the figure of Christ, with a sword in his mouth, standing in the midst of the seven candlesticks, with the Apostle Galen at his feet. In the fourth, the same figure appears, seated on a throne, surrounded by a rainbow, with seven lamps of fire burning before it. The four Evangelists, and the four-and-twenty elders, with crowns and instruments of music, are represented in worship around. The opening of the seals succeeds, the weeping of the apostle at his inability to read the book being very literally represented. The riders on the white, the red, and the black horses follow,—Death on the pale horse having been unfortunately obliterated. From this part of the story the painting has been destroyed, until we reach the twenty-fourth bay of the arcade, in which the original form of the beast with seven heads and ten horns is faintly discernible. In the twenty-fifth bay there is only one compartment, which represents the Lamb standing on Mount Zion. In the twenty-sixth, also, but one compartment remains, representing the proclamation by the angel as to the fall of Babylon. In the next bay are two compartments, the first showing the two angels with the sickle and the fan; the second, the seven angels with the seven last plagues. In the twenty-eighth bay is shown the pouring out of the first two vials. Then comes the pouring out of the fourth vial, and the scorching of men with fire. In the thirtieth bay is represented the outpouring of the seventh vial, and the impersonation of the mystic Babylon seated on a scarlet beast. In the thirty-first bay four compartments are discernible, representing the declaration of the angel that Babylon is fallen, the calling forth of the people of God from her plagues, the angel casting a millstone into the sea, and the burning of the harlot with fire. Then follow the marriage of the Lamb; the worshipping of the angel by St. John, who is raised by the former figure; the triumph of Him whose name is called Faithful and True, on a white horse; and the angel calling to the birds of prey. In the thirty-third bay we have the war waged by the Beast, and the kings of the earth, with their armies, against the rider on the white horse; and in the thirty-fourth bay the loosing of Satan. The accurate following of the text, and the minute, realistic detail with which each incident is unmistakably represented, make this remarkable series of drawings rather a graphic rendering of the Apocalypse than a mere illustration. Nothing appears to have been omitted. Although the fidelity to the text is so close as at times to border on the ludicrous, the earnest, religious aim of the artist is visible throughout. There can be little doubt that when these paintings were fresh and the series uninterrupted a more distinct acquaintance with the account of the wonderful vision would have been gained by a visit to the Chapter-house of Westminster than would have been easily acquired in any other way,—at least, by the laity.

It is on record that one William of Northampton was employed on these paintings, about the middle of the fifteenth century. The style is vigorous and ingenious, and the artist follows his theme verse by verse. An artist of another order, however, has left his mark in the fine eastern arcade, in which were the seats of the Abbot, the Friar, and the Sub-friar, with, probably, those of the Chancellor and the Precentor. They are thought by Mr. G. G. Scott, under whom, as our readers know, the restoration has

* See p. 107.

been effected, to have been decorated by a pupil of Giotto, and two heads are yet to be seen there, not unworthy of the pencil of that famous master himself. We can recall nothing in mural painting finer than one of these heads, which bears a strong resemblance to the noble face of Achilles, where the heralds of Agamemnon are conducting Briseis from his tent, in a well-known fresco at Pompeii. The whole of these arcades appear to have been occupied by one grand composition, representing the reign of Christ in heaven. In the central compartment the Lord sits enthroned. His hands are held up, and his side is bared, to show the wounds received at the Crucifixion. Angels hold a veil, or dossel, behind the throne, and others bear the instruments of the passion. The remaining spaces were filled with clouds of cherubim and seraphim, the former represented on the larger scale, and occupying the most important positions. They have each six wings; two shadowing the face, two expanded for flight, and two veiling the feet. The prevailing colour of the wings is blue, which is that attributed to this exalted order of intelligences. The feathers are cooleted, like those of the peacock—the artist's version of "fall of eyes, within and without." One holds a crown in each hand, one a crown in one hand, and the "written stone" in the other. On the feathers of the wings of one of the cherubim are written the names of Christian virtues—not the cardinal, religious, and moral virtues, but certain qualities of religious excellence. Such are—*Officii sinceræ plenitudo; voluntatis discretio; simplex et pura intentio, munditia carnis; puritas mentis; confessio; satisfactio; caritas; elemosina; orationis devotio; simplicitas, humilitas, fidelitas.* In the outer niches are smaller cherubic figures, with faces expressive of sorrow, regarding the wounds of Christ. In the background above and foreground below, are a multitude of seraphim, distinguished by the colour red. All the figures have gilt nimbi.

It only remains to notice the three arcades in the south-eastern group, painted by another hand, and probably at a later date. The grouping of the figures here gives the idea of multitude, and is thought to illustrate the suffrages of the *Te Deum*—the goodly fellowship of the Prophets, the glorious company of the Apostles, and the noble army of Martyrs praising God. Some of the faces here are thought to be portraits.*

ON THE CONSTRUCTION AND ARRANGEMENT OF BREWERIES AND MALTINGS.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THIS was the title of the paper read on Monday night last, by Mr. George Scamell, jun., of whose work on the subject we gave an account some time ago. Its importance is shown by the estimates lately prepared by Professor Leoni Levi for Mr. Bass, that the capital invested in breweries and maltings, &c., in the United Kingdom, amounts to 12,400,000, and that the total number of persons employed in the trade is 246,000, or, including the retail trade, 846,000. The number of breweries being worked now being nearly 4,500, and the quantity of malt annually consumed now amounting to 6,250,000 quarters; the total annual income to the revenue of the country from licenses for brewing, malting, and the duty upon malt, being upwards of 6,850,000.

After giving a sketch of the method of brewing, the reader proceeded to speak of

General Arrangement.—As far as possible the various utensils should be so placed that the wort may flow from one vessel to another, through the whole process, without pumping, i.e., the mash-tun should command the copper, the copper the hop-back, the hop-back the coolers, and these again should command the fermenting-tuns, cleansing-vessels, &c. Where, however, on account of the great height required by the vessels in a large brewery, the buildings would require to be of great height, it is best to arrange for one pumping; that is, from the hop-back to the coolers. Occasionally the copper is placed at the top of the building; then the raw wort has to be pumped up from the under back. The majority of brewers, however, object to

pumping raw wort, as it is urged that the wort is injured by being subjected to the action of the pump before being boiled.

A perfectly level site is not as a rule to be selected, as by taking advantage of any natural fall of the ground, even in a large brewery, the vessels may be placed so as to command each other without carrying the buildings to any undue height.

After the selection of the site, the next point to be considered is the position of the well. The proper selection of this place is most important, as the well should be so placed and constructed that there is no possibility of any sewage or deleterious matter leaking in, as in such a case most serious injury would result to the beer brewed from such contaminated water. It should also be convenient for driving the pumps from the engine. The site generally should also be thoroughly well drained, all the drains being of rather larger capacity than would suffice for ordinary buildings, and laid to a sharp fall, as a good deal of stale yeast and brewing refuse will find its way into them when washing out the various utensils, and if there is not a good fall, the yeast, from its peculiar nature, is liable to adhere to the pipes, and cause a great amount of inconvenience: this is a point that should be well attended to.

These preliminaries being settled, we will now pass on to the consideration of the brewery. For a large establishment, as a general rule it is best to divide it into three grand divisions, the first containing the mash-tun, and the accompanying utensils, hop and malt stores, &c.; the second division, which we will call the copper-house, containing the wort-coppers, boilers, hop-back, and under-back; the third division, the fermenting-tuns, which we will call the tun-room: all these divisions should be so situated that either division can be enlarged without altering the general arrangement.

In the first division the following vessels will have to be situated,—the cold-water tanks,—and which the majority of brewers prefer to have under cover. These tanks are generally of iron, and it is a great advantage to have them lined with white glazed tiles; if this be decided upon, the tank-plates should be cast with chequers on to form a key for the cement: if the tanks are under cover, and not exposed to the extreme variations of temperature, the expansion or contraction is not found to loosen the tiles. The underside of all iron tanks should be boarded, as if not the moisture in the atmosphere condenses, and the continual dripping is a constant source of annoyance, besides causing damage if any malt or hops happen to be stored beneath.

A vessel will have to be provided for heating the water for mashing. It should contain sufficient water for the whole brewing, and is generally best made of wrought iron, the water being heated by a steam coil. In some instances, where expense is not a great object, these vessels are made of copper.

The malt-rolls for crushing the malt vary in size from 6 in. to 18 in. in diameter, and from a few inches to 3 ft. in length, according to the quantity of malt to be crushed per hour. Space will be required over them for a hopper for containing the malt to be crushed, and a screen for screening the same. They should be situated so as to be convenient for driving from the steam engine; but the opinion of the brewer must be taken as to their position with regard to the grist case, as some prefer to have the rolls fixed directly over the case, and grind into it, whilst others prefer to have the rolls some little distance, and allow the ground malt or "grist" to be conveyed into the case by means of an elevator or Archimedian screw, thus giving the grist an opportunity to cool, as the temperature is considerably raised by being ground. The same description of elevators or screws may be used with advantage for moving whole grain.

We next come to the grist cases, or receptacle for the ground malt. They are made of wood or wrought iron, in which case they should be flush riveted on the inside, as the least obstruction will hinder the flow of grist. But, on the whole, I prefer a case made of thoroughly well-seasoned deal, as grist runs so much more freely on that than on any other substance. The stuff from which the case is made should be particularly well seasoned, and should be ploughed and tongued, as it is a difficult matter to keep the joints tight, the malt-dust blowing through the slightest crack almost as readily as water would. The angle of the bottom should not be less than 45°, the capacity should be sufficient to admit of it containing the whole quantity of malt to be

mashed, allowing 12 cubic feet per quarter, with a sufficient margin so as not to necessitate any levelling or trimming by hand. The weight of a quarter may be reckoned at about 3 cwt. Occasionally they are preferred made to hold double the quantity of the mash-tun, fitted with a division so as to enable two days' supply to be ground. The outlet will have to be arranged according to the description of mashing machine which may be decided upon. If an external one, then there must only be one opening. If, however, the grist is to fall into the tun direct, then two or four are best, so as to admit of the grist being pretty equally distributed in the tun. In this instance the outlets should be fitted with slides so arranged that they are all opened at the same time by one wheel or handle. The mash-tuns are generally constructed of wood, though occasionally of iron; if so the girders should be as rigid as possible, and if an internal machine is to be used, the framing for supporting the tun must be so arranged as not to interfere with the gearing for driving such machine.

We will next consider the second grand division, viz., the copper-house. The utensils that should be grouped together in this division are those from which a large amount of steam is given off, comprising the under-back, coppers, hop-back, and steam boilers; by keeping these vessels in a distinct house, the brewery may be kept comparatively free of steam. The under-back is a small vessel, and does not often require to hold more than from seven to ten barrels, and is used for running the wort into both the coppers. It should be placed as near as possible to the mash-tun, and should be ready of access and in a good light, as the brewer in charge will require to get to it continually to watch the taps whilst the wort is running from the mash-tun; it should be so situated as to allow of the wort flowing into the boiling-copper. The boiling in some establishments is effected by fire, in others by steam; this point must be decided by the brewer, who also must decide as to the greatest quantity required to be boiled at one time, as it is very rarely the case that the whole of the brewing is boiled at once. The usual allowance as to the capacity of a copper is that the copper should hold one-third more than the quantity to be boiled, to allow for the ebullition. The coppers should under any circumstances be kept as far as possible from the tun-room wall, as if contiguous the heat given off when boiling will seriously affect the temperature of the tun-room; they should be high enough to command the hop-back, allowing a good fall for the main for connecting to the same; there should also be a ready way of conveying the hops from the hop-loft. The setting of the wort-coppers should also be closely attended to; if in London, some description of smoke-consuming furnace must be adopted; if so, the patentee or maker of the selected furnace will give the size of that particular furnace suitable for the size of copper. If an ordinary furnace is to be erected, then for a copper the bottom of which is 7 ft. diameter, a furnace the bars of which are 4 ft. long by 3 ft. 3 in. is sufficient; or for a copper 5 ft. 6 in. diameter, then if the bars are 3 ft. long by 2 ft. 6 in. wide, and so in proportion for other sized coppers. The flues must finish, or, as it is termed, be *safed* in, so that the top of the flue is just below the level of the least quantity of wort required to be boiled at one time. All flues must be lined with fire-brick, set in fire-clay; such linings should not be incorporated with the settings, but an air space of 2 in. or 3 in. left between, being merely connected with the body of the work by a few headers here and there.

The crown of all boilers should be covered with some non-conductor to prevent the heat radiating, but most certainly not with brickwork, as under such circumstances, if any leakage take place round the manhole or safety-valves it may not be detected until the boiler is seriously injured. Provision must be made for getting into the flues for cleaning out or for examining the boiler; a drain must also be provided in front of boiler for conveying the waste water when blowing off. For all practical purposes the chimney-shaft need never exceed 75 ft. in height from the furnace-bars; and in designing a shaft should always be borne in mind the possibility of an additional copper or boiler being erected; therefore the area of the shaft should be rather larger than absolutely necessary for the present requirement. Mr. Rawlinson recommends for a tall chimney-shaft, that the shaft be carried up square with an internal circular lining of fire-brick, thus leaving spaces at the corners for air spaces; these spaces will

* A view of the entrance to the Chapter-house from the cloisters, and various other illustrations and descriptions of this part of the Abbey buildings, will be found in our earlier volumes.

tend to keep the external work cool, and it will not be so liable to split. This is no doubt an excellent arrangement for massive chimneys, but for shafts of ordinary dimensions it is scarcely necessary to go to this additional expense; all that is necessary is to line the bottom of the shaft, and about 12 ft. or 15 ft. of the top, with fine brick. The area of the outlet at top of shaft may be found by multiplying the number of pounds of coal consumed per hour by 12, and dividing the product by the square root of the height of chimney in feet, the result being the area of the top of the chimney in square inches. For a circular shaft the diameter at base should not be less than one-tenth of the height; the thickness of the work should not be less than one brick for the first 25 ft., and increasing by one-half a brick for every additional 25 ft. At the base of the chimney should be an iron door, to allow for removing the soot, and it is a great advantage to cause the flues to enter the shaft a few feet from the bottom, so as to form a receptacle for the soot without interfering with the flues. Where sugar is used for brewing from, it is convenient to have a separate vessel fitted with a steam pipe, for dissolving the sugar in before it enters the copper; this vessel should be placed as close as possible to the coppers, and can be made of wood or wrought iron.

There should be abundance of ventilation in the copper-house, both in the side walls and also in the roof. The openings in the walls should be so arranged that a copper or boiler can be easily removed and replaced, it always being a great advantage, indeed, almost absolutely necessary, that such utensils should be taken in whole. The fermenting-tun rooms were then described, and the vats sometimes required for storing beer.

Mr. Scamell said he had found that the cost of building a brewery will range from 2d. to 6d. per cubic foot. A 63-quarter brewery and malting, costing about 12,000l., costs about 2d. A 24-quarter brewery, brick built, cost 3,600l., or 4d. per foot. The buildings for a 100-quarter brewery carried up in stone, not including the tun-room, cost about 5,000l., or 5½d. per foot. A 40-quarter brewery of brick, with a considerable amount of moulded brick dressings, &c., 3,700l., or 6d. per foot. The total cost, including the plant for the 63-quarter brewery, and a 70-quarter malting, cost about 20,000l., or the 24-quarter total cost 6,300l., or 262l. per quarter. The 40-quarter brewery complete cost about 8,900l., or 225l. per quarter. The 100-quarter without tun-rooms would cost about 9,600l., or say 100l. per quarter. The 21-quarter, 7,700l., or 320l. per quarter. These amounts do not include the coopers department. Now, as a rule, a brewery coopers is only required for repairing, not making, casks, and should therefore be of a greater width than a shop where casks are to be made; about 20 ft. in width will be a very convenient shop. Each man will require to have a wood block, and an iron plate let into the floor for placing the casks on, when driving the hoops, and one or two commodious firing-places for firing the casks in; these should be about 6 ft. or 8 ft. square, and covered with an iron hood, having an outlet of not less than 2 ft. square at the apex; the floors should either be of oak plank or wood blocks, as ordinary street pavement; the hearths of the firing-places may be paved with brick on edge, as they stand the heat better than any other description of pavement. Over the shops should be a good loft for the storage of flags and hoops.

After treating of the construction of maltings, the reader urged that architects engaged on such works should get the views of the proprietor very clearly expressed in writing, as to the system upon which the brewing is to be conducted; in general it is a difficult matter to get definite instructions as to the many points of detail, and it is always advisable to get the brewer's authority in writing, confirming any particular form of apparatus which may be proposed to be introduced, and it is as well to get the views of the gentleman who may have to work the plant, as thereby many a hint may be obtained as to small matters of detail, which would otherwise be overlooked until the deficiencies were found out when commencing to work the plant, thereby causing a long bill of extras to the dissatisfaction of all parties.

Market, Newton Abbot.—A commodious market has just been erected at Newton Abbot, Devonshire, at a cost of 17,000l.

LAND.*

HAVING referred to the theory of the confiscation of all improved value of land, and to the doctrine that the State may resume all land into its possession, I will now refer to a clever essay which has recently appeared as one of the Cobden Club Essays,—“The Present Aspect of the Land Question,” by William Fowler, M.P., 1872.

The essayist maintains that, although all property is sacred, the present tenure and mode of possession are so unfavourable to its productiveness, that Parliament should intervene; but the essayist altogether omits to notice the legislation and the improvements effected within the last twenty years. Concurring with the essayist to a considerable extent, I propose to, partially, supplement his essay by noticing such legislation and improvements.

The essayist writes,—“The largest landed estates in the kingdom, the Bedford, Northumberland, Westminster estates, and those of the Earl of Leicester,—though in great part settled on tenants for life, are thoroughly well handled. But the question is, are they not exceptional? And, in order to clench the argument, the essayist quotes Mr. Caird's “Agriculture in 1850.” If he had quoted Mr. Caird's statement in 1850, that “at our former period has the general progress of agricultural improvement been greater than at present,—on every side increased exertions are being made by both landlord and tenant,” Mr. Caird's observations would have been properly appreciated; and arguments founded upon the *then* state of agriculture would have been obviously inapplicable to its state after the lapse of twenty years.

Wages were, for instance, stated by Mr. Caird at an average of 9s. 7d. in 1850, against 7s. 3d. in 1870. The average wages of the same countries were, according to the last Parliamentary returns, 13s. in the year 1870. Their rate at the present moment is still higher, and there is a demand for labour which it seems impossible to satisfy. The practical abrogation of the law of settlement in 1865 emancipated labour, and enabled it to flow freely throughout the country. The essayist makes no reference to this fundamental change.

Good cottages follow good wages and difficulty in finding a supply of labour. The best-managed estates have the best cottages. The cottages will never be built unless they pay fair interest; and the source of that interest must come, and in many cases already does come, from the increased produce of the land. I have been entrusted with the building of many cottages yearly for many years, and they all pay interest; but, where the land has not been well farmed, their cost may be part of the expenditure necessary to secure a good tenant.

The essayist maintains that we want “men to buy land in order to make a living out of it, and not men who buy it as a luxury, and can be satisfied with 2 per cent. interest.” Admitting that great estates are now frequently sold in lots, the essayist says “that no one would bid against a rich man intending to buy the whole,” and “that such a purchaser would not be likely to spend money in improvements.”

My experience is that “a man wanting to make a living out of land,” sells whatever freehold land he possesses, and becomes tenant with the capital so acquired. This seems natural and wise. The sum of 4,000l. can provide 400l. a year for the tenant of 500 acres of land, while as landowner his income is but 120l. a year. The question to him is whether he will be landowner with his capital producing 3 per cent., or tenant with his capital producing 10 per cent.

An estate is not, it seems, to be sold in the dearest market,—possibly to a purchaser who is willing to give fifty years' purchase,—nor is the property to be sold, as it is frequently offered, in lots, so as to afford an opportunity to the speculator who desires to resell, or to the adjacent landowner desiring to buy it, but it is to be sold only to some one desiring to purchase “in order to make a living out of it.” This kind of purchaser must, surely, soon be at the limit of his capital. The man who will take 2 per cent. on his capital is, on the other hand, not likely to have invested the whole of it in his purchase; and if his tenant will pay him 5 or 6 per cent. on money spent in draining, or

buildings, or improvements, he may after all get 3 per cent. or more on the whole capital expended.

The existence of tenant farmers, with both capital and intelligence, seems to be altogether ignored; and the tenant is viewed as without either the one or the other if he does not “buy land in order to make a living out of it.” We have seen why a man of intelligence, with 4,000l. of capital, should be a tenant rather than a landowner, and, as a matter of fact, such is the course generally adopted. According to the last agricultural returns, the farms exceeding 100 acres occupy 20,000,000 acres, or 65 per cent. of the whole acreage of cultivated land included in the last year's official returns. No one acquainted with the occupation of land throughout England for forty years can fail to recognise the result of the more liberal education given by farmers to their children, which has prevailed during the latter part of the period. The only practicable mode of increasing materially the produce of the land is to apply to it both capital and intelligence in the forms of machinery and management.

The problem yet to be solved is mainly how to counteract the uncertainty of the seasons. We admit that it is right to guard against contagious diseases and against preventable sickness, and we drain our land to carry off the superfluous water. We want to be able to go on our farms for the autumn and spring ploughings just in those few days of fine weather which there are in the worst years; and we want to harvest our corn in the few fine days in which the worst harvest season always comprises; and we want that the land shall not be parched by the treading of horses; and that the cost of cultivating clay lands—the old wheat lands—shall be reduced.

And steam ploughs and agricultural machinery promise us all this; and, as far as they have gone, have fulfilled their promises. But small farms and small fields cannot co-exist with steam cultivation. In almost every other form of production we have availed ourselves of steam power, and in all steam power, once introduced, has effected the desired results, and occasioned in the long-run the employment of a larger amount of labour. In farming, where steam power is introduced, a greater amount of labour is employed, and it is of a more intelligent kind; the compensation to the employer is found in the greater amount of the produce and the greater certainty of its production.

The essayist states, as an actual fact, that the value of lands in mortmain is one-sixth of the real property of the kingdom, and worth 500,000,000l. of money. The real fact is, that there is now very little land truly in mortmain in the country. The Settled Estates Act, the Church Emancipation Acts, the Globe Sales Acts, the Universities Acts, the Charities Acts, have afforded means for the sale of almost every corporate property. No reference whatever to these enabling Acts is made throughout this essay, and a total want of knowledge of some of them has been frankly admitted. As regards nearly all the estates formerly in mortmain and all the settled estates, the question of their retention or of their sale is only a question of expediency. There is no legal impossibility.

The essayist states that he has recently discovered an instance where the poor of a parish in Lincolnshire hold land worth 700l. an acre, from which they receive an annual return of some 2l. or 2l. 10s. an acre. A little further research will enable him to discover the Charity Commission, where the facts relating to this land must be registered; and the invocation of its authority will enable the sale of the land, and the yearly return of 23l. an acre to be received, instead of 2l. or 2l. 10s. This kind of difficulty has been obtained for the last eighteen years.

According to the essayist's personal opinion,—and his opinion is very valuable on this point,—the annual savings of the kingdom amount to 150,000,000l. a year. Yet he is of opinion that all corporate estates should be sold and converted into money. The incomes of corporations having generally specific appropriations and special claims to discharge, it is of the utmost importance that the recipients should throughout the future obtain not nominal, but real income. We are all familiar with the difference between reserved rents, which were real rents 300 years since, and the present rental of estates. The colleges, on Cecil's advice, reserved one-third of their rents in corn; and they have, for this third, always continued to receive substantial revenue. The suggestion now made is that the fee-simple value

* By Mr. Edmund James Smith, member. Read at the Ordinary General Meeting of the Institution of Surveyors, January 29th. See p. 80, ante.

† The first edition contains observations on the Ecclesiastical Commission, which, being confessedly unfounded, are to be omitted in the next edition.

of corporate real property (which must rise as money falls in value) shall be placed in the Public Funds,—in other words, be lent out for the benefit of the Government,—and thus be limited to a definite revenue, which can never be exceeded but may be decreased by the discharge of the debt or the reduction of the rate of interest, and which must bear a constantly decreasing proportion to the whole revenue of the kingdom.

Mortmain has had one good use. It has enabled us to trace for 300 years the annual value of precisely the same estate. Properties in mortmain could not vary in extent prior to the passing of the comparatively recent enabling acts; and we have, therefore, a complete series of valuations of the same properties throughout the period. In purely agricultural districts the extent, where no outlay whatever has been made by the owner, but all improvements have been made by lessees holding long leasehold terms, doubled itself between 1670 and 1770, and increased about fourfold between 1770 and 1870,—about eightfold since 1670.

We have seen that land in the best parts of the City of London is, in 1870, of thirty times its value in 1670.

There would seem to be many reasons why corporations should be the best of all possible owners. A corporation can exercise no political influence (if political influence be not altogether fictitious), wants no shooting, no game, no interference with the tenant, no change of tenants, and has no financial crisis. A corporation desires a well-farmed estate, with the rents paid regularly, and with fair interest on money invested in improvements in substitution of lying in the Funds at 3 per cent. A corporation can have no objection to grant leases; and its tenants, subject to paying their rents, are practically owners. There are always good-natured friends near every corporation estate, who will transmit to its managers, or to their own Parliamentary acquaintance, any complaints which seem to require, and some which do not require, to be investigated. The corporations are non-resident, admit; but the tenants are almost necessarily the best kind, many quite equal to the squire of fifty years since.

When the Northumberland Estate, now so admirably managed, was in the worst possible condition (Duke Algernon spent 524,600*l.* on its renovation), the Greenwich Hospital Estate, under the management of John Grey, of Dilston, was the example estate of the kingdom. The Continental strangers who came to inspect our farming were sent, as a matter of course, to Dilston, to view the Greenwich Hospital Estate. This amount of 524,600*l.* expended in the improvement of a single estate, is a princely amount, and Duke Algernon was only tenant for life; but the Percys have ever been princely people. The expenditure on roads, bridges, &c., was 29,690*l.*; on buildings, cottages, &c., 308,330*l.*; and on draining, 176,580*l.*, making up the total of 524,600*l.*

It may also be suggested that, if new systems are to be adopted, it will be more easy for the State to give them effect on a corporate property than to have to buy land on which to try them.

When the leasehold term of a corporation lessee comes to an end, he may be dismissed, under Parliamentary authority, and the farm may be cut up into twenty (or more) tenancies, and twenty new homesteads created with 25 acres each, and the twenty tenants may be pitted against the one tenant of the adjacent 500 acres. These little occupiers will work under more favourable conditions than if the lands had remained uninclosed and cut up into strips in open fields. But the result is, nevertheless, certain. Intelligence and capital will beat hand labour, and steam cultivation and machinery will prevail.

The most favourable condition of hand labour is the occupation of plots of land in the vicinity of large towns, where vegetables can be grown for the consumption of the town population. The produce, in such a case, reaches 50*l.* an acre annually. The land-owner may receive one-tenth, or one-eighth at the utmost, for rent, and one man off an acre of ground may obtain a return for his skill and labour somewhat exceeding the wages given in the neighbourhood. But the skill and energy necessary to effect this might earn a much better income in the town. The remarkable fact is, not the profit derivable by the individual, but the amount of produce obtainable from one acre of land when manure is readily accessible, and several crops can be raised in the year. It also seems almost impossible to exhaust land long used as garden-ground,

the thorough commixture of the soil producing effects obvious for centuries after the land has fallen under ordinary cultivation. No possible amount of hand labour could ever effect such a thorough commixture throughout the whole of our agricultural land, but steam cultivation may effect it.

Our neighbour, France, gives us a warning as to land culture, as in other respects. The law of 1793, compelling the sub-division of land amongst all the children of the parent, has existed somewhat more than two generations. M. Leonce de Lavergne, writing, in 1865, in its favour, tells us that thirty-seven farms which, in 1793, divided between them the 3,500 acres of the commune of Venast, now belong to 600 owners, with an average estate of less than 6 acres each, and those not lying in one plot. In many departments of France, says M. Monny de Morney, the partition of property has reached less than the fiftieth part of an acre. Imagine the condition of an owner of 3 perches of common field land. In France, of 8,000,000 proprietors, says M. D'Esterno, there are 3,000,000 exempted from personal taxation on the plea of indigence. There are 60,000 possessing 130 acres each on an average, and there are 4,500,000 averaging 12 acres each.

The French law of 1793 places the children of the family as a whole in the position of our oldest sons. That which he would take for himself about they take amongst them; for the liberty allowed to the parent to dispose of a small portion is practically disused, because its use is generally followed by legal proceedings after his death. The land is thus practically entailed by law on all the children, without the probability, which exists in an entailed estate, of an heir from time to time having the fee simple vested in him; for no such child throughout all time can have more than a life interest. The alternative is to limit the family fecundity wholly to primogeniture.

The sum of the whole matter is this. Restrictions on the use of land are as unwise and injurious to the State as restrictions of trade, and owners and occupiers will find for themselves, under the pressure of public opinion, the best mode of employing their land and their capital without State direction. The abrogation of the laws of settlement leaves labour free. The removal of legal restrictions on sales by corporations or by the owners of settled estates has practically extinguished mortmain. The future of agriculture depends upon machinery, not upon laws. There is no distinction between agricultural and other land. The prime use of land in England is for commercial purposes. The quotation from Mr. Cobden, prefixed to Mr. Fowler's essay, "I believe we have no adequate conception of what the amount of produce might be from a limited surface of land, provided only that the amount of capital were sufficient," embodies the main truth in relation to agriculture.

It is our daily duty to advise on the sale or the purchase or the management of indestructible property, and our first necessity is to train ourselves to a judicial frame of mind, so as to ponder the circumstances of each particular case, and accurately weigh, with the aid of past observation and experience, the advantages, present and future, of a proposed sale or investment. We are, therefore, obliged to extend our views much further than is necessary in the ordinary transactions of trade, where the sale or purchase exhausts its effects in a very brief period. The purchaser who bought the farm at Crews at a very high agricultural price, because he foresaw that, from the conformation of the country, the property must be intersected by the future great line of railway through that district, did exactly that which each of us aims daily to effect.

I have, therefore, thought that the subject of this paper was fitting for this institution; and I have expressed my views the more boldly because our institution comprises the leading surveyors throughout the whole of England, and their experience will, in the ensuing discussion, point out further supplementary information, and lead to the correction of any erroneous conclusions.

After a few remarks by members, the discussion of the paper was postponed to the next meeting on Monday, February 12th.

The Public Health.—The Queen's Speech contains the following passage:—"There will likewise be laid before you legislative provisions founded on the report of the Sanitary Commission."

WORCESTER SCHOOLS COMPETITION.

MR. DAY writes as follows:—

"SIR,—Observing that you have published Mr. Witherington's protest against my plans for the Worcester schools, I think it necessary to state that my delivery of plans was a legal one, as I have duly explained to the Board; and with regard to your remark as to 'the possibility of a favoured competitor being able to see the designs of other competitors before completing his own,' I have to observe that no such possibility existed, the plans being all packed and kept in the custody of the Board."

Many other statements made by Mr. Witherington are erroneous; but I have neither the time nor inclination to enter into discussion on these points.

ERNEST A. DAY.

A meeting of the School Board was held on the 1st inst. to consider the protest we printed last week, and according to the published reports Mr. Day ("De Die") admitted that his drawings were not delivered until Monday instead of on or before the date prescribed by the advertisement. The School Board came to the resolution "that the Board having heard Mr. Witherington, see no reason to depart from their decision in favour of Mr. Day."

SIR,—I think it possible that some misapprehension may exist in the public mind as to the facts concerning the late decision of the School Board on the architects' plans submitted to its judgment. I shall be obliged if you will allow me the opportunity of stating what the facts are.

In October last the Board advertised, in the Worcester papers, and in the *Builder*, inviting architects to send in designs. The form of advertisement was as follows:—

"TO ARCHITECTS.—THE WORCESTER SCHOOL BOARD are desirous of receiving PLANS for a BLOCK of SCHOOL-ROOMS, giving accommodation for 230 boys, 200 girls, and 300 infants, with class-rooms, lavatories, and all suitable offices, with external boundary-walls, iron palisades, gates, &c. In preparing their plans, architects are requested to combine economy with efficiency. The architect whose plans are approved will superintend the works on the usual terms. The second-best plan will receive a premium of 30*l.* The ground being somewhat irregular, the site should be seen before plans are prepared. Plans are to be sent in on or before the 30th of November, to Mr. MARCUS, Clerk of the Board, of whom any information may be obtained."

Several architects having written to the clerk to state that the time allowed was insufficient, the Board resolved to extend it to the 31st of December, and a further advertisement was inserted in the same papers to this effect:—

"TO ARCHITECTS.—EXTENSION OF TIME.—THE TIME allowed to Architects to send in PLANS for the ERECTION of SCHOOL BUILDINGS, as advertised in 'The Builder' of October 28th, is EXTENDED; by order of the Board, from NOVEMBER 30th to DECEMBER 31st, 1871.—F. MARCUS, Clerk to the Worcester School Board."

At the time when this extension was granted, it was quite overlooked that the 31st of December, 1871, fell on a Sunday; nor was this remembered till it was too late to remedy the mistake.

Under such circumstances some diversity of opinion would naturally arise whether Saturday, the 30th of December, or Monday, January 1st, was the ultimate day on which plans could be received. There is no express law on the point, and I think a good deal might be urged for either side of the question. As a fact, the competitors in this case took different views. Some sent their drawings on the Saturday; several sent theirs on the Monday, accompanying them with a letter stating that, as the day fixed fell on a Sunday, it was conceived that they complied with the terms of the advertisement by sending on the Monday following.

On Wednesday, the 27th of December, Mr. Witherington, sen., sent a youth (who is, I believe, employed by him) to Mr. Marcus, the clerk of the Board, inquiring, on behalf of his son, what was the latest day for sending in plans, as the 31st fell on a Sunday, and there were conscientious scruples as to sending on that day. The answer of Mr. Marcus was that he could not go beyond the words of the advertisement, which Mr. Witherington must construe for himself, but that if (Mr. Marcus) would not urge the rejection of any plan if there were any conscientious scruples regarding the 31st. No other communication on this subject passed between Mr. Marcus and Mr. Witherington; nor did Mr. Marcus, either on that occasion or any other, say that "plans must be delivered before the 31st of December."

On Saturday, the 30th, a messenger from Mr. Witherington called at the Guildhall, told the hall-keeper that he had to bring something for the School-board, and asked at what hour it must be delivered. The hall-keeper replied that it had better be left by five o'clock, as he might be absent at a later hour. Nothing was said as to the "something" being plans for the Board schools, nor had the hall-keeper any authority to speak, nor any knowledge to enable him to speak, nor as a fact did he speak, on such a matter. The Guildhall was not named in the advertisement, which directed plans should "be sent to Mr. Marcus, clerk to the Board." There is consequently no foundation for the idea that Mr. W. S. Witherington told that he must send in his plans by five o'clock on Saturday, the 30th. The choice of the day was his own.

It is now complained that Mr. Day, on the contrary, called the Monday; but there is no more ground for complaint against him in this respect than there is against the other competitors who sent on that day; nor in my opinion is there ground for complaint against any of them. It was a point on which a difference of opinion might fairly exist, and none can doubt that those who sent on Monday did so *bona fide*, and in an open way.

All the plans were kept in the custody of Mr. Marcus, sealed as he received them, until the Wednesday morning, when they were opened in his presence and under his inspection in the north room of the Guildhall, in which room they were all seen by the Board before the admission of any other person.

I have confined myself strictly to a statement of facts, and those facts I have verified by a personal examination of the witnesses thereto.

G. W. HASTINGS.

HANLEY PUBLIC BATHS: COMPETITION.

Out of thirty-one designs submitted, twelve were in the first instance selected by the Committee, and were then reduced to four,—those of "Mark Well," "Bono Populi," "A Competitor," and "Well considered." In presenting these, the Committee recommended the plans of "Mark Well" for the first premium of 30*l.*, and those of "A Competitor" for the second premium of 20*l.*

Mr. Miller raised the point that neither of the plans could be carried out for the stipulated sum.

Mr. Cartledge said that the Committee had adopted "Mark Well's" plans as the cheapest and best exhibited.

The members having inspected the four sets of plans, and heard the remarks thereon of the surveyor (Mr. Lohley), Alderman Ridgway moved that the first premium be awarded to "Mark Well."

The motion having been seconded, Mr. Miller moved as an amendment that, before awarding the premiums, means should be taken to obtain tenders for the execution of the designs.

Mr. Hampton seconded the amendment. The amendment, being put, was negatived. The motion was then carried.

On the motion of Mr. Alderman Ridgway, the second premium of 20*l.* was awarded to "A Competitor."

The sealed envelopes accompanying the prize plans were then opened, and it was found that the first premium had been awarded to Mr. R. Dain, Hauley; and the second to Mr. Charles Lynam, Stoke, both local architects.

THE LEICESTER MUNICIPAL BUILDINGS COMPETITION.

If the information we receive from the spot be correct, we are not likely to hear anything satisfactory as to the proposed municipal buildings there for some time: the matter is quietly shelved for probably a year or two, until the old cattle-market is removed, when the question will be re-opened, and eventually the erection will be made on this site, and not the Friar-lane site.

Corporations, committees, Government, forget the obligations, moral and legal, they are under to the architects who respond to their offers in such cases.

EXAMINERS ON STANDING ORDERS.

Up to the eve of the opening of Parliament, Messrs. Frere and Robinson, the examiners, had got to No. 217 on the list of private Bills, which number 304 in all. Some of the Bills called, however, have been passed on to a future day for consideration.

Among the Bills that have been passed during the week affecting metropolitan communications is the South Kensington Railway Bill, in connexion with which Standing Orders are declared to have been complied with. This Bill is for a railway 4 furlongs 3 chains in length, commencing on the south side of the South Kensington station of the Metropolitan and Metropolitan District Railway, and terminating on the eastern side of the building which mites the Royal Albert Hall with the conservatory of the Royal Horticultural Society, in the parish of St. Margaret, Westminster. The land scheduled for this short line only amounts to two rods. The works will include 28,000 cubic yards of earthwork in soft soil, at 5*s.* per yard, 7,000*l.*; a viaduct or girder bridge, 2,000*l.*; culverts and drains, 500*l.*; covered way, 13,000*l.*; permanent way, 1,620*l.*, being at the rate of 3,000*l.* per mile; stations, 11,500*l.* These, with a few other items, and 10 per cent. for contingencies, make up a total of 45,000*l.* for the little more than half a mile of line. Plans were lodged on the 30th November for a competing scheme, under the designation of the Exhibition Subway. This project appears to have been abandoned, but the Temple Subway Bill, for a connection between the Victoria Embankment and Lambeth, under the Thames, has passed Standing Orders. It will probably be time enough to project additional subways when the capital has been raised and the works executed in connexion with the City and South-west Subway, already authorised, and with the Temple Subway, to make which, powers are now petitioned for. Powers are taken in the South Kensington Bill to underpin houses and buildings within 100 ft. of the proposed railway. Lord George Gordon Lennox, Mr. Richard

Baxter, and Mr. Alfred Rhodes Bristow are the first directors named in the Bill. Mr. Rammell is the engineer.

Of Bills relating to London some have been withdrawn, abandoned, dropped, have not paid the deposit, or from whatever cause have not had any one to answer for them when they have been called by the Examiner. Among these are the Metropolitan and Wimbledon Line from West Brompton to Barnes, which lodged its plans, copy of Bill, and complied with various other Standing Orders, but has passed for all (this into the limbo of dead infants. Another unexecuted call was that upon the promoters of the London and South-Western and London Chatham and Dover Railways Junction Railway Bill, for a working junction between Waterloo and Blackfriars stations. It was supposed that the Holborn Viaduct Station, the works at which have been commenced, would give an impetus to this project, but the junction will not be made for yet awhile. It has been stated by a contemporary, usually well informed, that "the plans have now been fully agreed upon" for the Holborn Viaduct Station. It is curious that the engineers for the erection of the station know of no "fully agreed upon" plans, although it is true that the works are in active progress.

Among the Bills that have passed Standing Orders unaltered is the London Street Tramways (Extensions, &c.), for the construction of tramways in Oxford-street, Holborn, and other principal thoroughfares. The opposition to this scheme is doubtless reserved for the committee or probably for the House, which threw out the same Bill last session.

The International Communication Scheme (Mr. Fowler's ferry) has passed Standing Orders, but the Continental Communication Bill (Newhaven and Dieppe) has been postponed to the 21st February.

SOCIETY OF FEMALE ARTISTS.

The exhibition, in Conduit-street, of works by members of this society, now open, includes 316 pictures in water-colours and 105 oil paintings. Amongst them are works by artists who have gained a position, backing up their less experienced sisters, who find here, by the exhibition of their works, incentive to further effort. Thus Mrs. E. M. Ward sends a picture of mark entitled "The Tower, ay, the Tower," No. 321 (two of her daughters, by the way, Miss Flora Ward and Miss Eva Ward, are following promisingly in their parents' footsteps); Mrs. Benham Hay, "The Prodigal Son" (350), a very meritorious work; Miss Louisa Starr, a powerfully-painted "Portrait of Mr. Frederick Murrable" (354); Miss Louisa Burgess Swift, a very elegant "portrait" of a lady (337), with other pictures; and Madame Jerichan "Penserosa" (357), and "Danish Fishermen."

Amongst the water-colour drawings, Mrs. Murrable's contributions make a considerable show; "The Old Yew-tree Walk, Clifden, Maidenhead" (81), is especially noticeable. Miss Marian Croft's landscapes have considerable beauty, but exhibit the too free use of body-colour. "Eaton College" (63) and "Bridge-street, Chester" (71), both by Louise Rayner, would "hold their own" in any exhibition. Miss Julia Pocock is in strength, and we have marked "Evening" (28), by Miss S. S. Warren; "Calculations" (74), by Miss Partridge; Miss Gastineau's "Near Ventnor" (100); Lady Duckett's "Sparrows and Barberties" (108); "Joan of Arc" (109), by Miss H. Thornycroft; "Mignon" (126), by A. L.; and, with an extra tick, "Early Frost" (211), by Madame C. Bisschop,—a charming work.

THE PEABODY FUND.

The annual statement of the trustees for 1871 has been published. First Trust.—Under this trust, five groups of buildings—at Spital-fields, Islington, Shadwell, Westminster, and Chelsea,—have been erected, affording accommodation, collectively, to nearly 600 families; and the trustees also possess a site at Brompton, on which they contemplate building. The accrued rents and investments of this trust, after deducting its administrative expenses, amounted, at the close of the past year, to 32,922*l.* 1*s.* 3*d.* This sum, added to the original fund of 150,000*l.*, makes the property of this trust now amount to 182,922*l.* 1*s.* 3*d.* Second Trust.—The second donation of Mr. Peabody, to the amount of

200,000*l.*, became available for building purposes in 1869, and to this sum will be added, in 1873, in accordance with Mr. Peabody's bequest, a further sum of 150,000*l.* Out of this fund were purchased the site at Chelsea, and the Magdalen Hospital estate at Blackfriars-road. On the last-named property, the buildings were completed in August last, affording tenement to 300 families, for which applications were and continue to be largely in excess of the accommodation available. Profiting by experience, the trustees have introduced into these dwellings a new style and system of construction, affording, at less outlay and without increased rents, greater comforts and conveniences to the tenants than in the buildings previously erected. The following is the financial statement of the second trust to the 31st of December, 1871: Debit.—Amount as per last report, 213,918*l.* 1*s.* 7*d.*; interest and rents since received, 7,305*l.* 12*s.* 2*d.*; less expenses of management, 238*l.* 3*s.* 2*d.*, leaving 7,067*l.* 9*s.*, total, 220,985*l.* 10*s.* 7*d.* Credit.—Land and buildings, 73,707*l.* 9*s.* 7*d.*; investments, 141,198*l.* 1*s.* 11*d.*; cash at Bank of England, 6,010*l.* 15*s.* 11*d.*; ditto in hand, 6*l.* 3*s.* 2*d.*; total, 220,985*l.* 10*s.* 7*d.*

STATUE OF THE LATE EARL OF DERBY.

The members of the Junior Carlton Club may congratulate themselves on possession of the statue of the late Lord Derby, which has been executed for them by Mr. Theed for the amount of their comparatively small subscription,—about 700*l.* It is a replica of the statue lately placed in St. George's Hall, Liverpool, of "heroic size," an excellent likeness, dignified and vigorous. The costume, the robes belonging to the Order of the Garter, is very elaborate, and is worked with extreme care and skill. By great good luck, too, the marble, so far as the front view is concerned, and which is alone of any consequence in the position the statue is to occupy in the inner hall of the club, is nearly spotless. In short, it is a very successful and admirable work.

A WORD OF A SORT WITH OXFORD.

OXFORD is celebrated for her University. She has been celebrated for that several centuries; but why has her "matter in the wrong place" never been mentioned? She can say without contradiction, "I not only have the finest and the greatest number of schools, but I have the largest quantity of mind, of any town or city in Europe." The tourist who visits this seat of learning is as much impressed with one characteristic as with the other; and if he desires to bear away a memento of his visit, there is nothing like Oxford clay. There is another memento he will be certain to take, against his will,—catarrh and every other complaint that marsh, bog, fen, mud, slush, puddle, stagnant water, and cesspool can give him, to say nothing of fever and small-pox. On the cast, south, and west sides of Oxford there are thousands of acres of water waiting to moisten the throat of Phobus, and a great deal of this water is above the level of the city; consequently it is, with the present system of doing it, impossible to drain the streets. The most surprising thing is, that these pestiferous floods are encouraged. What for? "Tell it not in Gath!" That there may be safe skating for the collegians. Hundreds of (perhaps valuable) lives are thereby sacrificed. Compare the toleration and encouragement of these floods and all their attendant evils with one of the coolest acts of Vandalism ever perpetrated. The most attractive feature in High-street was the noble row of elm-trees in front of Magdalen College. To the everlasting disgrace of Oxford, the delightfully unbragous and picturesque productions of ages have been shorn, lopped, and decapitated, till nothing but the trunks remain, and all this has been done lest one of the branches should blow off, and make some nervous old lady scream. Death may steal in and carry off its hundreds of victims; but it must not bodily snatch off a victim indiscreet enough to walk on the shady side of the street in windy weather. Aquarius may have its victims, but not Boreas. If there are any who read this so unsophisticated as to ask, "If Oxford is situated in a marsh, how is she to avoid superfluous water?" let such see what has been done at the sister University and in the fens of Lincolnshire, Cambridgeshire, and Norfolk, ages since.

On that side of the city where the denizens do not be amphibious, a new and well-built one is springing up,—a, and with giant strides; and, to judge by the style and build, both architects and builders have scoured the globe to lay the golden eggs. New premises, works, and houses testify that the scores of London contractors to whom quantities have long been pingers might look in upon the University at the advantage to themselves. They will only have to pay their workmen the same wages the owners of the latter received; and the houses they build will let well before they are completed, so anxious are people to find a dry spot. The authorities have been dreaming about no kind of sewerage for two or three decades. Our forefathers who founded and built the city were not “of such stuff,” and unaccountably fixed upon the worst site they could be found in England; still, as it cannot be changed of the site, it behoves the present generation to do what they can to make it fit for purposes superior to water-rats, newts, and snappers.

GARGOYLE.

SOME NOTES FROM DUBLIN.

A NUMEROUSLY signed memorial was brought before the Public Health Committee, praying for the suppression of the scavenging department set up by the corporation at Blackpits, a poor and overcrowded locality of the city. A resolution was passed, requesting No. 1 Committee to take immediate steps in abating the nuisance. The suppression of a similar nuisance was urged, existing on the north side of the city, the banks of the Royal Canal. Scavenging filth is likewise here deposited for the purpose of shipment. The Under-Secretary has replied that the Government cannot sanction the appropriation of the old prison at Cranebogman for the purpose of a convalescent house for small-pox patients, on their discharge from hospital. Other findings can be procured quite as suitable in Dublin.

The Club-house Green—a pleasant green near Kingston Harbour—will not now be appropriated for the purpose intended, that of laying a storehouse. The Lord-Lieutenant is understood to have personally interested himself in the matter. So the Royal Irish Yacht Club, and the visitors and residents of the fine watering-place, will have their little oasis grass preserved.

The Dublin Bridges and Quay Walls Bill is meeting a very strong opposition, and it is very doubtful if it will ever become law. The duty gentry and ratepayers held a meeting, convened by the High Sheriff at the Court-house, Kilminkham, for the purpose of protesting against the Bill. By the provisions of the Bill, the county would be included in the area of taxation for the maintenance, rebuilding, and repair of the Dublin bridges and quay walls. All the speakers severely criticised the Bill, and the conduct of the corporation, thinking that it would be a great misfortune for the county if the control of its finance were handed over to the corporation of the city. Lord Talbot Malahide said, in the course of his remarks,—

“I admit that I have a considerable amount of corporation for the ratepayers of the city of Dublin. I view they are heavily taxed, and that they do not get the worth of their money; but if they are badly used it is their own fault. If they were to organise a corporation which would be worthy of the name, and instead of wrangling among themselves, and turning the council chamber into a debating club for discussing sensational political questions, would consider the interests of those whom they represented, we should have the city of Dublin in a different state from what it now is. It has been authoritatively stated that it is the dirtiest in Europe, and, from a considerable acquaintance with the city, I think I may confirm the statement.”

Often has the *Builder* said in substance what Lord Talbot de Malahide has at last openly given expression to.

Nearly five years ago the city engineer brought up a report on the question of erecting open abattoirs in the city for the slaughtering of cattle. He stigmatised the then existing slaughter-houses as the most filthy that could be imagined. They are the same still, and are situated in over-crowded neighbourhoods. The corporation have almost rested on their oars since 1867 in the matter of abattoirs. They are now about affording a licence to a butcher for the maintenance of one in Marlborough-place, a most crowded neighbourhood; and though it is protested against by some of their own members, and by some of the merchants and gentry, they are determined to have their own way. It is within the province of the Lord-Lieutenant to

interfere when any of the Sanitary Acts are infringed by the neglect of the corporation, or when it refuses to carry their provisions properly out.

The corporation are about appointing their present borough engineer in future as consulting engineer, and supplying his place by an assistant engineer. They allege that the time of the former will altogether be absorbed in future for several years with the work of the main drainage. What is the use of putting the city of Dublin to the expense of a main drainage, by intercepting sewers, if the sewage is to be cast into the Bay, after intercepting it in the first instance from passing into the river.

The Limmer and the Val de Travers Asphaltic Companies are pushing hard for precedence in laying their pavement in Dublin. The corporation are not disposed to indulge in the luxury of the Cheapside material to any great extent, or of any other asphaltic material, unless they can get the inhabitants of the streets desiring this new roadway to pay two-thirds of the first cost of laying.

Building operations are not at present very brisk in the city, but with the opening of the spring an increase of new works is anticipated, in addition to those already in hand or projected.

THE MOOR-STREET STATION, BOLTON.

Sir,—I recently saw an extract from your valuable paper in which it was stated the London & North-Western Railway Company were building a new station in Great Moor-street, Bolton, &c. I beg to say, as a person passing the ground in question, they are doing nothing of the sort; they only ought to be, and the reason why I think I can guess. They have begun the station (new), and have, after getting the street and all around into the most filthy and disgraceful state, suddenly stopped, owing, I suppose, to the amalgamation which they intend with the Lancashire and Yorkshire Railway Company; but I think they ought not, for some three or four months now, to leave the public in such a mess as they are doing, whether they can get their Act or not, and I for one should be glad if you would just give them a quiet little paragraph in your truly valuable paper to that effect. J. H. HOWARD, A Shareholder in both Companies.

THE TEMPLE OF DIANA OF THE EPHESIANS.

THERE appears to be every probability, or to speak forth bluntly the truth that is within, there is no longer room for reasonable doubt that the site of the great temple of Diana of the Ephesians has at last been determined by the judicious perseverance of Mr. J. T. Wood; the production of unequivocal remains of the building, and associated, moreover, with inscriptions as decisive, settles many a controversy. It may naturally be expected to open many more,—some, perhaps, that the outside world need not care to take part in till they have run their course, been argued out on all sides, and the issues cleared upon which general opinion may at last be fairly appealed to to declare itself. Then they who did best service will have been clad in cordial recognition. But even now there is little risk in expressing an opinion that the precise site ought not to have remained quite so long the secret that it certainly was up to the time that it was studied by the architect now on the spot. It seems only too clear, indeed, for the self-complacency, not to say composure, of some of us that the enigma in the terms it was stated did really include its own solution, and that comparison and analysis of the notices of ancient geographers and antiquaries only required to be somewhat more sagaciously conducted for all to be agreed at what spot the spade might be put in with all but certain hope of success. Put in it has at last been, with success the more creditable that the explorer did not come right by mere process of exhaustion, leaving no other opportunity for error or opening for research, but in virtue of reading off for himself with better skill the meaning of conjoint topographical and literary evidence. A conviction that was held to justify was duly vindicated by the resolute removal of 18 ft. of solid earth; and then back again after buried centuries the long-hoped-for testimony of the lower frustum of a column in position was brought to view of men, and to the light of now photographic day. Beyond the voracious and verifying photograph few details have at present reached this country, but the difficult excavation proceeds, in the meantime, it may not be without interest to pass in review the notices that have come down to us respecting the architecture of the temple of the great goddess Diana,—Artemis of the Ephesians: the pains will not be thrown away even should excavation

when it has done its best be rewarded with better success than, all difficulties considered, can be hoped for by the most sanguine. The precedent of the Mausoleum instructs us how vexatiously fortune will sometimes give much, indeed, to well-directed endeavours, and yet keep back the one or two evidential relics that would settle the last difficulty, and how ruins of the original monument may owe as much illustration to literary fragments as they confer. Let us weigh then the literary evidence that we have independently, and so be prepared to appreciate at once the full significance of whatever is brought up from below the ground; no doubt it would be agreeable to find that we are still in time to vindicate criticism from the opprobrium of only discovering after the monument is produced that it had been in possession of some main conclusions all along had it only had the dexterity to elude them. It is likely we may have to be satisfied with much less than this; with evolving, for instance, a distinct inconsistency between the several notices, and thus between the plans of restoration that are severally compatible with the conflicting authorities; with gaining a firm conviction of no more than the probabilities from general consideration of the seat of error,—of the possibilities of errors on all sides,—of the vitiation by inaccuracy of every notice more or less; and so we may find ourselves left at last fain to work out a result avowedly conjectural as based upon one most isolated avowal of an ancient writer, of whom it is only conjectured at last, not proved, that he knew anything about the matter, or that his words—if he had knowledge—have come down to us accurately.

And, then, it is quite possible that the restoration which evinces itself in the course of such an inquiry as beyond comparison the most probable by the evidence, may, after all, be proved wrong by the result of excavation. The highest probability remains still but a probability, and does not amount to warranty of absolute truth,—let this be ever a check to the positiveness of speculation,—but, still, much is done if the matter of highest probability can be established legitimately by the evidence. A true conclusion from false premises,—a correct restoration that is inconsistent with the grounds assigned for it,—we may value as Socrates avowed he valued the guidance of the man who only thought he knew the way to Larissa, though he did, ignorance notwithstanding, happen to take the right road and get there.

One other motive for this review of the evidence may be mentioned: although the result may only be a hypothesis, a hypothesis,—the best to be had,—is always of use to an explorer,—and this exploration, if supported as it should be, will not be brought to an end in a day;—it, at least, suggests what questions may be most reasonably put first,—gives a reason for striking in one direction in preference to any one of a multitude of others that are open: it is scaffolding that is not the less useful because constantly changed and altered and very unlike indeed to the structure to which it gives up its place at last. Neglecting, then, the notices that bear exclusively on the position of the temple,—a matter settled,—let us gather up the scattered hints as to construction, dimensions, and style,—and, as very materially affecting style, the date of the temple.

The temple that we are concerned about was in process of completion when Alexander passed into Asia, B.C. 334, in succession to one that had been set on fire on the very night of his birth, B.C. 356. He offered, we are told, but in vain, to defray all past expenses, and undertake all that were to ensue, on condition of being allowed to inscribe it as his dedication. This coveted honour was conceded for the Temple of Athens at Priene; and the stone that bears what is almost equivalent to the autograph of the great Macedonian is now to be seen in the British Museum, presented by the Society of Dilettanti, among other produce of their recent excavations. Strabo states that the temple of his day was an improved reconstruction,—was, in fact, this same reconstruction of that burnt by Herostatus. He adds, what is most important, that, besides private contributions, including personal ornaments of the women, some funds were realised by sale of the former columns, as proved by decrees, that, perhaps, may still reappear among inscriptions from the ruins. The conflagration of St. Paul's without the walls, in our own time, well illustrates what mischief fire might work on such a structure. It therefore appears that the improvement intimated

extended to the entire order; and we may safely assume the order of the temple that existed long after the time of St. Paul to be a work of the same fine character and in the same general taste as the contemporary Ionic structures, the temple at Prieno and the Mausoleum at Halicarnassus; and any scheme of restoration must be subject to certain control in unison with this fact, and may hope for furtherance from its due consideration.

Strabo distinguishes three forms of the temple; the original of which he names Chersiphron as the architect; the enlargement of this by an architect unnamed by him; the reconstruction after ruin or damage by the incendiarism of Herostatus, and with enhanced beauty by an architect whom he reports hesitatingly as the Chalcroetes (q.v., read Democrites), who laid out Alexandria.

From the hesitation with which he speaks as to the latest architect, we must not count too strongly on his knowledge who was the first; otherwise, when accuracy is in question, he is not an author to be lightly set aside out of regard for Pliny, who implies (xxvi. 14) that it was Chersiphron who was the architect of the last reconstruction.

But Pliny is supported here by Vitruvius, who speaks of the existing Ephesian temple as commenced by Chersiphron of Gnossus and his son Metagenes, and only completed by a Demetrius and Pæonius of Ephesus. It is thus clear that we must correct Pliny's text in another place (ii. 37), and read Chersiphron of Gnossus, instead of Chersiphron, to whom he ascribes the "admirable fabric of Ephesian Diana." The limiting date of this school of architects is further approved by the notice of Vitruvius that the same Pæonius, in conjunction with a Daphnis of Miletus, built—so far as it was ever built—the temple of Apollo at Miletus, a rival in magnitude to the Ephesian. The Gnossians, father and son, left a treatise on the symmetries of their Ephesian design. There is deeper significance than can be dilated on here in the observation that Greece at this date could be under obligations for artistic help to Crete,—to Gnossus, home of, at least, semi-mystical Dædalus and his artist clan,—of Dædalus, architect, even according to Homer, of the broad dancing-place of Ariadne. The literary works have perished; the architectural illustrations to a certain extent remain, and may yet give us back whatever was of chief importance in the written text.

Pliny states that the temple—which evidently to him is one and the same through all its transformations—was in course of building for 220 years, which, reckoned back, carry us from the date of Alexander's visit, and its final embellishments, to the time of Croesus, king of Lydia, and a distinctly marked epoch in its history, inasmuch as we learn from Herodotus that he contributed some columns. When Herodotus wrote, the Heraeum of Samos was the largest Greek temple that he knew (i. 60), although he pairs with it the temple as then existing at Ephesus (ii. 148) as a marvel of magnitude; the enlargement, that gave unquestioned supremacy to the Ephesian, was, therefore, later than his time. The only hint that I know for dating this extension more exactly, and not too much to be relied on, is, that it may have taken place after that conflagration of the temple that occurred as late as some sixty years before Alexander,—in the same year as the death of Socrates (B.C. 399).—(Euseb. Pamp. Chron. Cam., i. 134.)

Whatever temples may have preceded that which Herodotus knew, there cannot be a doubt that his occupied the site—and the site newly cleared—of the structure that we are interested in.

The vast Heraeum of Samos known to Herodotus must be carried up to the time of Samian prosperity and power (500—580 B.C.), the age of Polycrates and Croesus. He gives the architect's name, Rhœceus; he was also a distinguished sculptor. Diogenes Laertius states that Theodoros, son of Rhœceus, supplied the counsel to lay the foundations of the Ephesian temple on charcoal, as suited to resist the moisture of the ground. Theodoros, according to Vitruvius (Pref. vii.), left a work upon the proportions of the Heraeum, which was in the Doric style; and it seems most probable that the Ephesian temple at which he assisted was in the same,—that the columns therefore that Croesus contributed and that were sold at the rebuilding were Doric columns. There seems to be no reason for disallowing a prose treatise at this date, and resorting to some supposed second Theodoros.

The date assigned corresponds with Livy's

notice, which is, at least, evidence as to his belief, that about A.U.C. 157 (= B.C. 557) there was a temple of Ephesus built by contributions of the various states of Asia, and forming a centre of concord and alliance. Contributions of this nature—it may be said in passing,—the dedication of columns by the King of Lydia,—the custom for Asiarchs to be selected for honour on account of wealth, and to contribute—to have to contribute—liberally to public funds,—these may be the matters of fact represented, and no more by Pliny's strange notice that the 127 columns of the temple were presented by as many kings.

Pliny also has a notice of the expedients employed in providing a foundation for the enormous structure in a soft and marshy situation. The situation, he says, was deliberately chosen as a security against shocks of earthquakes and openings of the earth; otherwise, it may easily have been that the sanctity of a precinct of the goddess, who ever affected freely-watered groves and meadows (see E. Falkener, "Ephesus," p. 199), may have left the engineers no choice. The account given by Herodotus of the great works of engineering at Samos,—tunnelling through a mountain and vast mole of the harbour,—explains the resort to Samos for advice in a difficulty even greater than Stephenson had to cope with at Chat Moss. "To preclude sliding and instability," says the naturalist, "they laid down first a bed (beaten or trodden charcoal, and upon it fleeces of wool)." It seems just possible that this notice may cover an original fact of the use of charred plies; otherwise the fleeces of wool might have been laid down to more manifest purpose at first.

Of what solidity was the preparation made for the superincumbent weight we have a notice in the fragment that alone remains of the description of this wonder of the world by Philo ("De Sept. Orb. Mir.") "When the soil had been dug out to a great depth, and an immense excavation effected, the architect laid the foundations with stone from the quarries above; so that in these subterranean works he exhausted the quarries of entire mountains. The ground being thus rendered firm by a solid foundation, and strengthened to support, like an Atlas, the superincumbent building, he commenced the work by forming a basement of ten steps." Any exaggeration there may be in these expressions we shall find to have been invited when,—the basement thus prepared,—we proceed to the verified dimensions of the superstructure.

The dimensions of the entire temple (*universo templo*) are given by Pliny as 220 ft. by 425 ft. These measurements of front and flank present themselves, in the first instance, as probably those of the top step or stylobate, which in itself is the most natural and seems to have been the most usual standard of relative magnitude; but they may be those of the lowest step, which there was a motive for quoting in preference, in order to give the wonder of the world the advantage of the highest numbers obtainable, and the comprehensive phrase of Pliny would be justified by this interpretation. We have therefore to work out the consequences of each assumption in turn in connexion with whatever other information we possess that affects the question. There the numbers stand, and we must take them as authentic to begin with; it will be time enough when we find that the plan and proportions of the temple are not to be consistently brought out by them,—to consider which dimension is most likely to be erroneous on general grounds,—and what modification will bring out the most plausible result either as requiring least change or from satisfactoriness in itself, considerable change notwithstanding. We may, however, be more fortunate than to be driven to such straits. The further notices to be had regard to are these:—Pliny (xxvi. 14) states that the height of the columns was 60 ft., and the weight of the epistylia,—the architrave stones,—enormous; the number of columns he gives as 127, "made by as many kings," of which thirty-six were *celatoe* (sculptured in relief); one by Scopas. Pausanias confirms the extravagant magnitude of the temple, which, he says, surpasses in this respect all other constructions of mankind (iv. 31, 8. Cf. vii. 5). I must be driven to sore straits indeed before I can consent so to read Pliny's Latin as to gain a reduction of the columns to 100 with Fergusson or to 120 with Falkener by a supposititious comma before *viginti* or before *septem*.

Vitruvius states that the temple was of the

Ionic order, and octastyle and dipteral on either end, and having double rows of columns on the fronts. Philo, *de Septem. Orb. Mirac.*, states, as we have seen, that the temple was raised upon a basement of ten steps; but there is a possibility,—not, I think, a probability,—that he refers to a detail of an earlier temple that may have been changed in course of enlargement and restorations. It is possible also,—again, I think, not probable,—that the ten steps are to be reckoned exclusively of the top step or proper stylobate.

The full breadth of front of an octastyle temple is made up of seven columniations, plus the distance from centre of angle column to margin of steps, and the breadth of the steps of either end; understanding by the term columniation an extent from centre to centre of adjacent columns. Fergusson allows 11 ft. for the sum of the two half bases and margin, and 30 ft. for the spread of ten steps, 15 ft. on either side, which is a liberal allowance at least, as there may probably have been only nine treads to be accounted for, in consequence of the stylobate reckoning as a step. This leaves 178 ft. divisible by 7 ft., and brings out 25 ft. 7 in. for the columniations. It is by an oversight that he notes this interval relatively to his estimate of diameter of the column, as corresponding to the eustyle spacing, which prescribes an intercolumn, not of 3½ but only of 3¼ diameters.

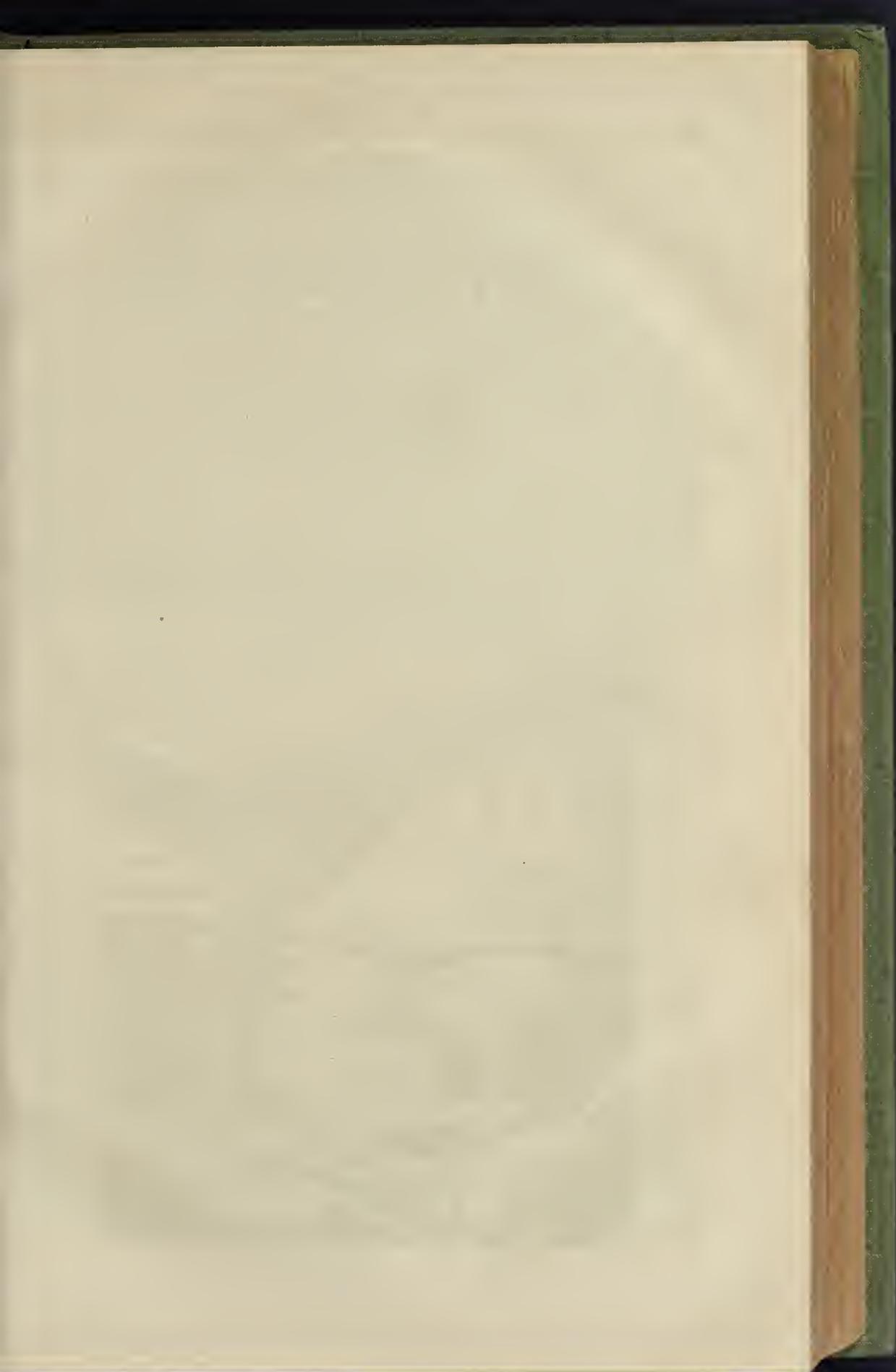
What is of more importance is, that we cannot possibly admit such an extravagant scantling for intervals by the score, as 25½ ft. With every consideration for the value to be assigned to consenting ancient testimony as to the magnitude of the structure, especially to the explicit account of Pliny, as to the difficulty of setting the enormous architrave stones upon the columns, we must demur positively to such dimensions in such multitudes. The architrave stones of the Parthenon are but 14 ft.; the single triglyphal span of the Propylæa, 18 ft.; that of the colossal temple at Miletus, 17½ ft. This temple, unlike the Ephesian, was never finished, but from its scale may well have been designed to be a rival; its proportions deserve more consideration here, not only because Iro is a notice that one of its architects, Pæonius, had been concerned in building or restoring the Ephesian temple, but from the height of its columns, as measured, being 63 ft. to compare with the 60 ft. of Pliny. The columniation of the Temple of Jupiter Olympius, of Athens, is 18-176 (the columns, 55-225). Only the angle architrave stone, which is exceptional, as entirely covering one capital, is 21-68 (3-438 by 4-1); it is the largest now found in construction at Athens, and weighs about 23 tons (Penrose). Only four such would be required for the structure. It is manifest, therefore, that we must give up a scheme of restoration that would apply the undiminished 220 ft. of Pliny's full breadth to the upper step of an octastyle front.

Edward Falkener, in his elegant and comprehensive volume on Ephesus, has taken the alternative of interpreting the Vitruvian passage, with a rather rash variation, and worked out a decastyle plan with surprising ingenuity and plausibility also; but here again the fatal difficulty is overlooked and passed over of assuming such a span for the architrave stone as 23-63 ft. It can scarcely be admitted that we have a legitimate option to exceed the spacing of the cited examples at Miletus or Athens; even if we strain probabilities so far as to adopt 19 ft., and allow 9 ft. for plinth and margins, we have still 20 ft. on either side, divisible among ten or more, probably only nine treads (19 × 9 + 9 = 180 + 40 = 220 ft.).

No doubt when we renounce the reference of the given dimensions of plan to the stylobate immediately and accurately, weary by no means bound to assume that they were taken upon lines of equal projection beyond it on front and flank. The steps may easily have had a further extension in one direction than the other; there is a precedent in the Ionic portfolios of the Society of Dilettanti. The ascent of as many as ten steps may, indeed, possibly,—in my own opinion probably in the highest degree,—have been interrupted by some wider step or platform. Such a probability at once affords a means of extrication from difficulties of extravagant spacing to advocates of either arrangement; but we are bound by the record to give the benefit of relief to the octastyle arrangement in the first instance before entertaining the decastyle that is in the position of an uncertificated pretender.*

W. WATKISS LLOYD.

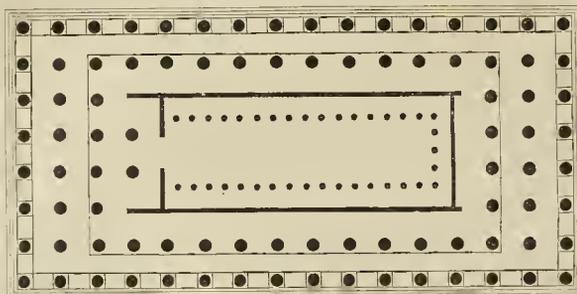
* To be continued.



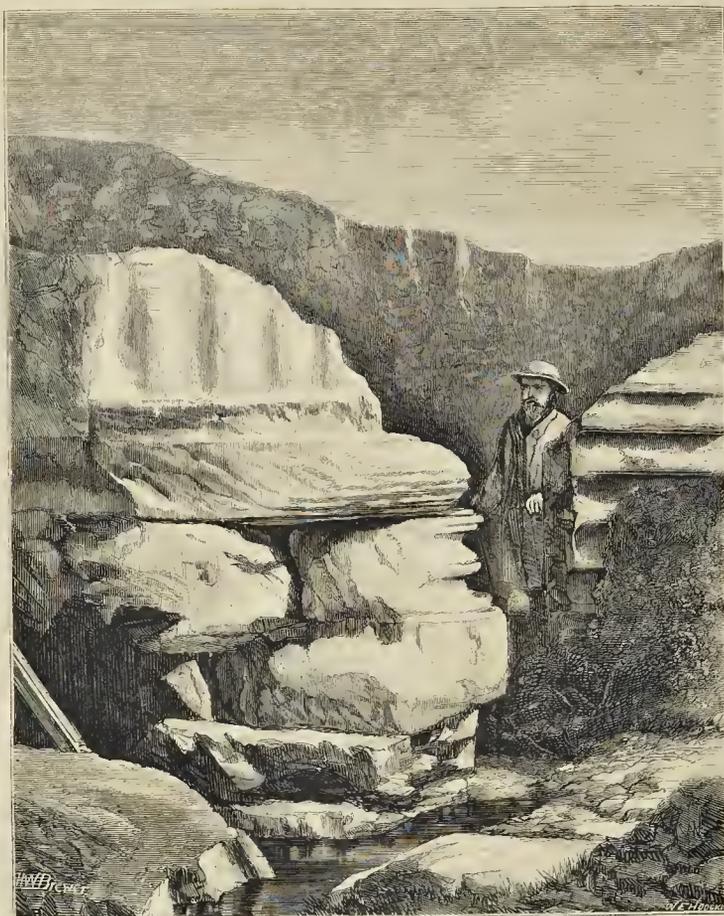
THE TEMPLE OF DIANA, EPHEBUS.

— 125 3' PLINY —

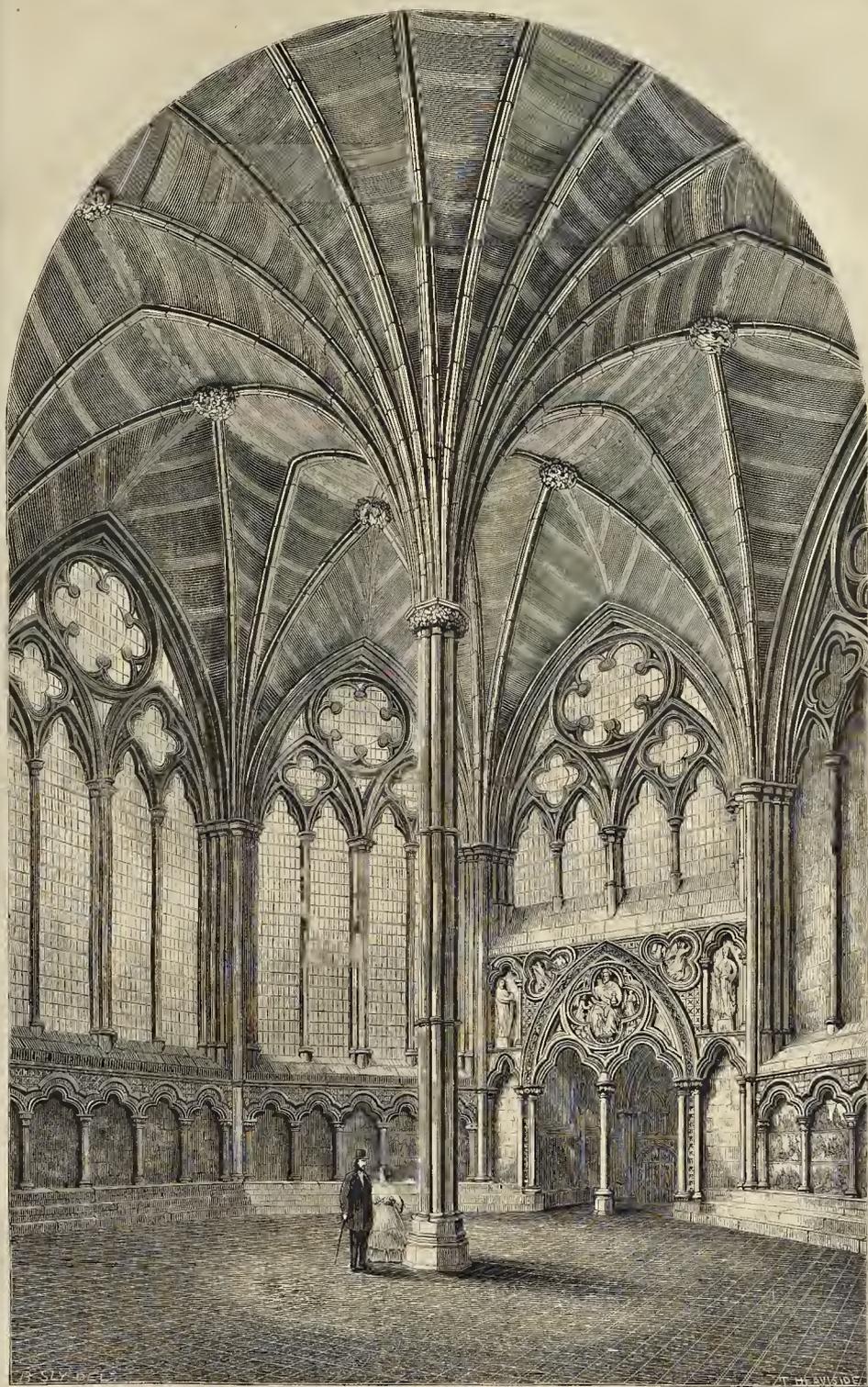
— 210 8' PLINY —



Sketch Plan.



Remains of Column, 6 ft. 1 in. diameter, discovered by Mr. J. T. Wood, 1871.



THE CHAPTER-HOUSE OF WESTMINSTER. — As Restored by Mr. G. G. Scott, R.A., Architect

[See p. 98, ante.

MR. STREET AND THE NEW LAW COURTS.

SIR,—Mr. Street's recent pamphlet is neither so accurate nor so complete as it ought to be. Smarting under Mr. Fergusson's caustic account of his appointment, he seeks consolation in an endeavour to damage Mr. Barry; and as he could get no help in this attempt from any one of the facts of the case from the beginning to the end, if fairly stated, he—well, he does what no one ought to do, least of all one who assumes so lofty a tone of rebuke when dealing with his critics. It appears that the report of the sub-committee of lawyers upon the competing plans happened to be less favourable to Mr. Barry than to other competitors, but it also appears, though Mr. Street does not tell us so, that the Judges of Designs for whose use the report in question was made, did not indorse the view of the committee, but, on the contrary, gave Mr. Barry's plan the first place. Fairly stated, therefore, the fact of this committee's disapproval could afford Mr. Street no help in his attack on Mr. Barry. He consequently proceeds to manipulate the matter, and produces the astounding statement that the inquiry conducted by this committee was "the most important of all, as the final plan had to be founded on this very report to the exclusion of all others." "With sorrow for the writer," I have simply to say that this is not true. If it were true, surely the competitors would have been made aware of it. They would have been told that everything depended upon their satisfying this committee; but I doubt if the competitors knew until after the designs were sent in that any such inquiry was to be made. I believe that the first hint they had of the existence of the committee was in your pages, where a correspondent called attention to certain curious proceedings of the said committee, wherein an entirely new set of tests was proposed to be applied to the competing plans. It is well known that the committee did apply their new tests, and having first of all, and after seeing the designs, resolved definitely on certain all-important questions which had been left open in the instructions to the competitors, they proceeded to award the first place to the only plan which completely met these all-important questions—Mr. Waterhouse's. I am not in the least concerned to dispute the wisdom of their award. I simply state the fact as to the result of their inquiry. But, as already remarked, it was quite a subordinate inquiry after all. Their report, in company with others, was submitted to the judges of designs, who, whatever they did, certainly did not endorse the opinion of the lawyers. What, then, becomes of Mr. Street's statement? Moreover, if that statement were true, it would imply that the authorities had arrived at a foregone conclusion to accept no decision from the judges of designs which did not coincide with the opinion of this committee; and it may be that this is so. Certainly the final result is that the lawyers have to a great extent gained the day. They have got the plan, if not the man, they approved; though reading Mr. Street's pamphlet, one is left to suppose they have got both. Indeed, I think we have a right to complain of the disingenuousness of all Mr. Street's remarks about the plans. He quotes the clauses of the instructions to the competitors, which point out the paramount importance of arrangement and convenience of plan, and then so introduces his present plans, and the hearty approval given to them by the late lamented Mr. E. W. Field, as to create the impression that his plan has gained him his appointment. One is compelled to view the matter in this light because he is replying to Mr. Fergusson, who says he was appointed because his plan was "the worst." Now, every one knows that Mr. Street's plan was nowhere in the competition, and that his present plan is Mr. Waterhouse's. I have no doubt that this latter fact is the key to the hearty approval by the late Mr. Field, of which Mr. Street tells us. Why will he not make his statements complete?

I will say nothing on the question of style; but I will say this. Let not Mr. Fergusson nor any enemy of "higgledy-piggledy" lose heart. Mr. Street is, to compare small men with great, somewhat like Mr. Gladstone in one respect—he shows a great facility for being converted. Some people do not think so. I do; and, as the Attorney-General says, "I will tell you why." When the decision of the judges of designs was impugned by the unsuccessful competitors or some of them, Mr. Street was quite clear that

the decision was good, and that it would be rank dishonesty to upset it. When he was appointed sole architect, he did not think it rank dishonesty to accept and leave Mr. Barry out in the cold. *Voilà* conversion No. 1. When appointed, he threw over his own competing plan, and appropriated Mr. Waterhouse's,—conversion No. 2. Then came the famous battle of the sites, when he began by advocating Carey-street; but when Mr. Lowe, the purse-bearer, took the field at the head of the enemy, Mr. Street showed his gratitude to his friends the lawyers, who like his plans so much, by deserting them bag and baggage, and going over to the Embankment,—conversion No. 3. The lawyers gained the day, and the purse-bearer, vanquished, had to return to Carey-street, with the recalcitrant Mr. Street in his train. As that, however, may have been an unwilling journey on Mr. Street's part, we will not count it as conversion No. 4.

The conclusion I draw from this little truthful history is of a nature which ought to be consolatory to Mr. Fergusson. To get a satisfactory building for the Law Courts it may not be necessary to change the architect, but only to change his views, and the purse-bearer will do that for us in a trice. Report says that he is not at all unlikely to give us a proof of his power.

PLAIN-SPEAKING.

ASPHALTE AND ITS PROGRESS.

A CORRESPONDENT acquainted with this subject writes as follows:—

Mineral-rock asphalt was first introduced in England about thirty years ago; and from that time until lately materials were imported, and works executed, to any large extent, by the Pyremont Seyssel Company, and by Messrs. Armani & Co., only. The merit of this impervious and plastic material was comparatively little known and appreciated by architects and contractors, though as well adapted for flooring, flats, roofs, stables, granaries, warehouses, &c., for the prevention of dampness and vermin. The advisability of using asphalt, mineral or factices, for roadways, with the great traffic of London, is a question still to be decided, and only time and trial of the various sorts will resolve the question.

The asphalt of Val de Travers, for roadways, as in the Poultry, Cheapside, and Holborn, in its natural state, warmed, spread, and compressed, was first introduced in England in 1853; and the list of prices at that time shows for 1½ in. thick, only 1s. 5d. per foot super., or 12s. 9d. per yard. The City paid 18s., and afterwards 16s. per square yard, for the Poultry, &c. The experiments and samples made in that year left doubts as to its efficiency in all respects.

The asphalt powder of the Val de Travers Mine, being rich in bitumen, is well suited for roadways made with it; but it still remains to be seen how it can be well applied and utilised, in its warm and compressed state, so as to obtain a uniform, levelled surface. Wear and tear are also a difficulty. The specimen in Holborn was laid down at 2½ in. thickness; and now we have remarked on pieces taken up for repairs that it is reduced to nearly 1 in., by the continual heavy pressure.

Reserving for the future opinion as to what has yet been done, we feel strongly the sanitary and economical advantages of smooth and impervious street surfaces.

The old firm of Armani & Stodart, having transferred their business to the General Asphalt Company, Limited, and that company having entered into large contracts with the London Tramway Company, for asphalt paving of roads, have nearly finished five miles in Camberwell and Peckham parishes. Over 6 in. of strong concrete, they spread some fine broken granite, and fill and mix it up with asphalt, which they call "McAdam Asphalt," and on the top they lay a coat, 1 in. thick, of Seyssel asphalt, from the mines of Gardie Bois, Lovagny, and other natural mineral asphaltes, mixed with mineral tar. They employ a new machine, drawn by a horse, which they call "Locomobiles," which brings the materials hot and ready to the works, and thus prevents the smoke and smell arising.

However the question of using asphalt for roadways may be decided, we are convinced that good, natural, mineral asphalt may be properly and efficiently used for footways, and the attention of parish authorities may very properly be called to the subject.

Very few specimens, until now, were laid down for footpaths, but the General Asphalt

Company having obtained permission of the Board of Works to lay down their asphaltes on the footpaths on the south side of the Victoria Embankment, leading to Blackfriars Bridge, we shall have opportunity for judging.

We shall not enter on the merits of the various quarries of asphalt, but in all continental Europe there are not less than fifty-two mines or quarries, with more or less rock stone, mixed with bitumen, varying from 3 to 12 per cent. These quarries are situated—fourteen in France and Savoy, four in Switzerland, eleven in Prussia, Hamburg, Alsace, and Lorraine; eight in Austria, with Hungary and Dalmatia; nine in the kingdom of Italy, three in Spain, one in Portugal, two in the empire of Russia and Poland, and some are placed at too great a distance to be conveniently worked and imported. There are already formed twenty-four companies, limited, with capitals amounting to the large sum of 3,570,000l. sterling, but as yet only three or four of those companies have commenced operations.

COMBUSTIBLE BUILDINGS IN THE CITY.

SIR,—Can you give me and the public at large any information as to what the powers are that enable the City folks to permit wooden and inflammable structures to be put up close to the highway, while in the rest of the metropolis no one is allowed to erect a wooden outbuilding, even at the bottom of his own back-garden? Some time ago a large wooden and canvas structure was put up at the corner of Ludgate-hill and Bridge-street, Blackfriars, and now another wooden shop for the sale of tea sports its ugliness to thousands on their way to and from the railway-station, close by the last-named. Perhaps it is intended to fill up the plot of ground with a row of these unsightly and dangerous booths, close to the footway, and only waiting to receive a spark from one of the engines continually passing just over them to convert the lot into a glorious blaze of triumph. With your aid probably such a calamity may be prevented. Who is responsible for these irregularities?

Y.

ALL SAINTS' CHURCH, MAIDSTONE: MEDDLING.

SIR,—An offer has been lately made and accepted to supply stained glass to the east window of this church. The window is large, and the offer liberal. But the donor, or his professional adviser, or glass-painter, is not content with supplying glass: he proposes to demolish the present window, and rebuild it, or build another with similar tracery, 5 ft. higher.

In the history of the church, by Mr. Whicford, that architect observes,—"Perhaps few single buildings possess more completeness and uniformity than this church: one general idea is prevalent throughout, with a correspondence of parts, proportions, and details very uncommon in Middle-Age structures."

Now, the person who has the present job in hand seems to be of opinion that he knows better than the architect of All Saints', Maidstone, and that the completeness, uniformity, and general congruity of the building are not to be considered in comparison with the improvement his patch will make.

The present east window is in excellent preservation, and therefore presents no excuse for destruction on that account.

Surely such a tampering with an old church is a pitiful vanity, a wanton barbarism, and an impertinence to architecture. A. LEHASE.

THE SEWAGE QUESTION.

A REPRINT has appeared of the "Report of the Committee on the Treatment and Utilisation of Sewage re-appointed at Liverpool, 1870" (Taylor & Francis, Printers, Red Lion-court, Fleet-street), read at the meeting last year of the British Association in Edinburgh. It contains an account of several of the chief sewage experiments, such as those at Breton's Farm, near Romford; of Beddington Farm, Croydon; Norwood Farm; the Sewage Farm at Tumbidge Wells; the Redhill and Reigate Sewage Farm, &c.; also of the Dry Earth System, and its impracticability for cities and towns. It also gives an account of how the wind was taken out of the sails of the sensational Dr. Cobbold, who horri-

fied the public with his parasites in oxen fed on sewage farm produce. The Liverpool Committee took this bull by the horns, presenting the doctor with an ox for slaughter and examination after being fed for twenty-two months on the Breton Farm produce. This examination was made with the aid of Professors Marshall and Corfield, and in the presence of several members of the committee (which includes Professor Anstod, F.R.S., Mr. Bailcy Denton, Dr. Odling, Sir John Lubbock, F.R.S., and other scientific men). Dr. Cobbold had to confess "the perfect freedom of that animal from parasites of any kind." In his explanations he says, "The sewage had a strong smell of beer, suggesting the presence of sufficient alcohol to destroy the vitality of all ordinary parasitic germs." We should think this must have excited some sensation amongst the distillers.

INDIVIDUAL PROVIDENCE FOR OLD AGE AS A NATIONAL QUESTION.

A PAPER on this subject was read at the Society of Arts on the 31st ult. by Mr. George C. T. Bartley. The Earl of Derby was in the chair.

Mr. Bartley drew attention to the means which now are in active operation, and are understood more or less by the industrial classes, for encouraging habits of providence, and how they are made use of; showed how they fail to provide for old age; pointed out the means which do exist for enabling a man to put by, in small weekly sums, for old age; and treated of the means which it seemed to him should be taken to encourage providence for old age, and to make known among all classes the facilities which exist for this purpose.

He suggested the formation of an association whose work should be to promulgate information as to the best means by which the wage-classes, domestic servants, &c., can put by weekly sums to provide for old age; to make known more generally the advantages offered by the Post-office by purchasing deferred annuities and life assurances by weekly and other payments; to facilitate the means of collecting such small weekly sums by inducing manufacturers and employers of labour to open, on their premises, offices for the receipt of such sums as arranged for by the Post-office; and generally to endeavour to create habits of providing against old age and possible premature death among those earning small wages. It should not, said Mr. Bartley, give relief in any form, or be in any way of an alms-giving character, but should more fully make known among all, by means of lectures, addresses, personal intercourse, and other means, in all parts of the kingdom, the facilities which exist for enabling a man to provide for himself in proportion to his earnings, in the best manner, as in allowing a regular weekly deduction from the wages, and at the smallest possible sacrifice compatible with sound commercial security, such as in the Government Post-office deferred annuities, &c. The society, he added, should also endeavour to effect alterations or extensions in the Government systems at present in existence, if this should be required, and to frame others if experience from time to time proved them to be necessary. In conclusion, said the speaker, I assert that a far nobler field for charity than almsgiving is the prevention of distress, which can be best done by inducing and stimulating every one, as far as in him lies, to provide for himself and for those of his own household.

The paper was followed by a discussion, in which Lord Derby took part.

PROPERTY IN LONDON.

In the case "Gladstone v. The Duke of Newcastle" (Rolls Chambers), which was a proceeding by Mr. Gladstone and Lord de Tabley, as trustees of the late Duke of Newcastle, in respect to the mansion in Carlton House-terrace, in which the present duke had resided, an application was made on the part of the plaintiffs that a second valuation of the mansion should be obtained.

The solicitor for the plaintiffs said the valuation was 50,000*l.*, which was considered very much under its actual value. The interior of the house was very costly, and another valuer would give an estimate for a fee of 20 guineas.

The Chief Clerk (Mr. Hawkins) asked the rental of the house.

The solicitor said between 2,000*l.* and 3,000*l.* a year.

The Chief Clerk said it could have been ascertained, as an assessment must have been made.

The solicitor on the other side made no objection, as the fee for a fresh valuation would only be 20 guineas.

The Chief Clerk made the order, and, in answer to a question, could not learn whether the house was to be sold by auction or contract.

Order accordingly.

A DEPUTATION OF CIVIL ENGINEERS.

On the 30th ult., his Imperial Majesty the Emperor of Brazil received, in Paris, a deputation from the Institution of Civil Engineers, to present to his Majesty the diploma as an honorary member of the society, and to receive his signature in the register of members. The deputation, which was composed of Mr. Gregory, past-president; Mr. Homans, vice-president; Messrs. Brunlees and Woods, members of council; Mr. C. Henry Vignoles, representing his father, Mr. C. Vignoles, past-president; and Mr. Charles Manby, honorary secretary,—was graciously received by his Majesty, who, in a few well-chosen sentences, expressed the pleasure he had felt at joining a society in whose labours he fully sympathised, and always had taken so much interest. A considerable number of persons were present.

NEW TRADE SOCIETIES' HALL AND CLUB ROOMS AT CHELSEA.

THERE are at present in Chelsea and the neighbourhood upwards of seventy friendly societies, and a building is about to be erected in Chelsea specially for their use, which is to combine all the features of a public hall with those of a club and reading-rooms. The estimated cost of the building is 5,000*l.*, which are being raised in shares of 1*l.* each, amongst the members of the various societies, the amount being payable by monthly instalments of 1*s.* each, and already the greater portion of the shares have been taken, and a considerable part of the required capital raised. The undertaking is of a somewhat novel character, and when built, the hall will be the first of its kind in the metropolis erected on this plan of co-operation. We understand that a site has been obtained in the neighbourhood of King's-road, Chelsea, in the direction of Kensington, and that the erection of the building will shortly be commenced. In the meantime, temporary premises have been secured for the purposes of the club.

VAGARIES OF COMPETITION COMMITTEES.

SIR,—I can furnish you with another instance of what may be mildly termed the "vagaries of committees," but somewhat more eccentric than the Worcester case. The directors of the Leeds Exchange Company invited six architects, myself among the number, to furnish designs for their proposed building. The time was limited, and I applied for one day's extension of time, to enable me to finish the perspectives. I applied in vain, but one competitor, not having sent in perspectives, was allowed to prepare and send *in vivo*, some weeks after the competition was closed to the other architects.

The directors selected the design thus contemplated, placing my own second, and that of another Leeds architect third.

GEORGE COXON.

RESPONSIBILITIES OF ARCHITECTS AND BUILDERS.

WARDLE v. THE REV. JOHN BETHUNE.

This case (before the Judicial Committee of the Privy Council) has been decided. There had been litigation between the parties for more than ten years, and the present case was an appeal from the Court of Queen's Bench, Lower Canada. The appellant had built the cathedral church at Montreal, which had been destroyed by fire, and sued the respondent, the rector, for an alleged balance of 5,000*l.* The answer was that the tower had sunk, and the liability was denied. There had been three appeals in the matter besides the present one.

Mr. Horace Lloyd, Q.C., and Mr. Morgan

Howard were for the appellant; Sir Roundell Palmer, Q.C., and Mr. Bompas for the respondent.

Sir Joseph Napier read a long judgment, in which he reviewed the litigation and the law applicable to the case. Their lordships held that the architect and builder were to be considered as one, and bound to provide for the stability of the building. Their lordships would recommend to her Majesty that the appeal be dismissed with costs.

This seems a very important case, though there may be special conditions of contract that will prevent it leading in other instances. The dispute now pending with respect to the Covered Market at Preston seems to have features in common with the above case. Part of the market fell, and the builder denies the responsibility, claiming that he constructed the market in accordance with the architect's design, and that the design was faulty.

THE IMPROVED INDUSTRIAL DWELLINGS COMPANY, LIMITED.

THE report and statement of accounts to be presented at the seventeenth half-yearly meeting of shareholders of Sir Sydney H. Waterlow's Company to be held at the Mansion House, London, on the 10th instant, has been published. According to this report, the dwellings at Bethnal-green have been completed, and handed over by the builders; and about 160 are now occupied. The buildings in George-street, Grosvenor-square, will be opened in the course of two or three weeks. The directors hope that those in Compton-street will be opened shortly after, and that the others in King-street and Crab-tree-row will be partly occupied by Midsummer. The great demand for improved dwellings in the neighbourhood of Oxford-street has been shown in the case of the George-street buildings, there being already upwards of 180 applications for the thirty-eight dwellings. The directors hope soon to obtain additional sites near this locality, and have opened negotiations for that purpose. The directors have obtained from the Marquis of Westminster the lease of an additional site in Ebury-square, Pimlico, and sixty-four dwellings are now in course of erection there.

The report contains a table showing the progress of the Company since its formation in the year 1863. From this table we extract the following particulars:—

At 31st December.	No. of Dwellings erected and occupied.	No. in course of erection.	Total.	Expenditure exclusive of Cost of Land & Buildings.	Surplus Profit after payment of Dividend of 5 per cent.
1864	50	208	258	£ 15,078	£ s. d. 407 10 1
1868	50	19,432	19,482	170,425	407 10 1
1871	1,001	262	1,263	170,425	1,698 12 10

The directors say that they "venture to think that this statement is highly gratifying, as evincing the appreciation in which the efforts of the Company are held by the working classes; while the fact of the Company having from the commencement paid a dividend of 5 per cent., and carried forward considerable balances, is a strong proof that, while the tenants continue to pay the commercial value of their occupations, their independence is in no way interfered with; and the care generally taken of the property by the tenants, is an evidence of their desire to aid in the extension of the work, from which they derive so many moral and physical advantages."

THE CHANNEL TUNNEL COMPANY.

SIR.—Allow me to offer some statements in reference to the article in the *Builder* of the 27th ult.

The projects of M. Thomé de Gamond referred to in the article, are "studies" in which he was engaged up to 1867, and, however generally valuable, have no direct relation to the proposal of the Channel Tunnel Company.

The present proposal does not embrace any openings or shafts other than those on the shores. The engineers are Messrs. Hawkshaw, Brunlees, Thomé de Gamond, and Low, and their plans are approved by Messrs. Talbot and Michel Chevalier, and generally by a French Imperial Commission of Civil and Mining Engineers specially appointed to consider them.

The railway is to be made in the lower chalk, not in the upper chalk, as stated in the article,—an essential difference.

The investigations of the engineers, extending over

lengthened period and including deep borings on such...

The public are not asked to subscribe as stated. Subscribers are expressly asked only from a comparatively few wealthy individuals...

The article advises the sinking of a deep well on the coast to test the strata. There is more than one well already existing...

As to the time of execution the originators of the proposed tunnel have been very particular in their working size and in the material to be tunnelled through...

It will be seen, therefore, that "investigation" has been carried out in the most minute detail, and the work proposed by this company, which, if it meet the success expected, will form part of the complete tunnel...

THE SECRETARY OF THE COMPANY.

NON-CONDUCTORS OF SOUND.

Sir,—Will any of your readers let me know whether sand or sawdust is the best non-conductor of sound...

FLOORS AND DRY-ROT.

Sir,—Can any of your readers tell me whether a 3-in. close-jointed deal floor, laid on joists 5 ft. apart...

AS TO A NEW STYLE.

Sir,—If your numerous correspondents and contributors who write upon this subject with ideas no more advanced than those which prevailed twenty-five years ago...

"LES ARCHITECTES ONT TOUJOURS TORT."

"The union workhouse, we are told, is the proper hospital of the sick poor. Where else can he have such attendance, such medicine and proper food...

This is from the Times, 31st January, 1872: on the new "Broad roads" recommended by the Local Government Board.

A pleasing new version, as my architect-readers will notice, of "the safest thing you can do is to do nothing"; a now-slightly-discountenanced moral maxim (commonly attributed to Lord Melbourne)...

DECIES REPETITA PLACEBIT.

METROPOLITAN IMPROVEMENTS.

THE improvements projected by the Metropolitan Board of Works have been reported on to the City Sewers Commission by their Finance and Improvement Committee...

The Finance Committee, in their brief report, say:—

"As a summary of our opinion after careful consideration of these various projected improvements, we consider that the streets proposed by the Metropolitan Board of Works will relieve the present enormous traffic of the City to a very limited extent...

In respect of the important question, which the engineer has introduced, suggesting the construction of a new bridge to cross the Thames, east of London Bridge...

The series of proposed improvements reported on are summarised by Mr. Haywood as "Improvements in Wapping; Shoreditch improvements; Old-street, towards New Oxford-street; Harrow-road improvement; Newington Butts improvement."

In respect to the chief of these improvements, that of Old-street towards New Oxford-street, Mr. Haywood says:—

"Much of the traffic between the east and west of the City goes to districts south of the lines of the thoroughfare proposed by the Metropolitan Board, much of it to not short distances north of the City; thus any new thoroughfare intended to relieve London-street, Finchchurch-street, Cornhill, Chancery, and Newgate-street, will utterly fail in its object if it be for north-bound traffic...

The new line of street to which the Finance Committee refer is one proposed by Mr. Haywood in 1866, he says, after a careful survey and due consideration. It is thus described in Mr. Haywood's report:—

"It would start from the eastern end of the Holborn Viaduct, and be carried eastwards across King Edward-street and St. Martin's-le-Grand (north of the General Post-office), across Noble-street, Cook-street, Allernancy, Basinghall-street (north of Guildhall), and Coleman-street to Moorgate-street, at a spot about 230 yards north of the Bank."

Then passing little Bell-alley and Sadlers'-place to the end of Blomfield-street; and then by way of London Wall and Woramwood-street (which streets, being widened, would form part of the line of thoroughfare) to Bishopsgate-street; thence across Houndsditch and Middlessex-street to a junction with Whitechapel High-street, opposite the Commercial-road, which would be a continuation of it; and the whole would form a road leading in nearly a straight line from Holborn Viaduct to the Docks.

The width of the street should be 70 ft. or still better, 80 ft. Its length would be 295 yards, and the present distance from the western end of Newgate-street to Whitechapel, and thence to the north end of the Commercial-road, is 2,383 yards, and the new route would therefore be shorter than the existing one by 117 yards."

The report of the Finance Committee has been adopted by the City Sewers Commission, who will take a locus standi in the matter, reserving power to oppose the scheme of the Metropolitan Board.

SOCIETY FOR THE ENCOURAGEMENT OF THE FINE ARTS.

LAST week a lecture was delivered before the members of the Society for the Encouragement of the Fine Arts, at the Lecture-hall, 9, Conduit-street, on the subject of "Light and Colour," by Mr. William Spottiswoode, M.A., F.R.S. The chair was occupied by the Chancellor of the Exchequer. The lecture was illustrated throughout by experiments, conducted with the electric light, showing the combinations of colour proper, the different rays of light to be found in the spectrum. At the close of the paper the Chancellor of the Exchequer said,—One remark strikes me as resulting from the lecture, and that is, how very difficult it is to know in this world what is simple and what is complex. This sheet of white paper which I hold in my hand looks

Report from the Finance and Improvement Committee to the Hon. Commissioners of Sewers of the City of London upon the proposed Metropolitan Improvements of the Metropolitan Board of Works. And Appendix, containing the Engineer's Report upon the same, with Plan, January, 1872. Judd, Printers, Doctors'-commons.

the most simple thing in the world, and yet it is a very complex result of a great many things of which we have little conception or idea. Instead of being the beginning of the simple, it is the end of a large number of combined and complex elements which go to make up what you see here. Well, that is just like science. It begins by being difficult, but as you rise higher and higher in knowledge you will find that the difficulties with which you were at first met resolve themselves into very simple laws. That which appears to be simple in nature frequently, when examined, turns out to be exceedingly complicated; while that which appears to be complicated and perplexing often, when followed up, ends in absolute simplicity.

THE WATER SUPPLY OF SOUTH LONDON.

THE medical officer for Lambeth, Dr. McCormack, having examined the Lambeth water drawn from the main at Kennington-cross, and that of the Southwark and Vauxhall Companies, says:—

"Having examined the waters by the two most modern and delicate processes, and having got results by both which confirm each other in a most striking manner, I have no hesitation in reporting that both waters are totally unfit for human consumption, and are little better than merely extensively diluted sewage. Of the two the Lambeth water was a trifle worse than the Vauxhall, but both were much worse than many waters which have been already consumed and the wells closed. The analysis clearly showed that the company's filters have been completely overmatched by the late floods, and have been totally unable to remove even the suspended impurities, and we have simply been drinking the sewage matters and living organisms produced and poured into the river by all the town and farm drains along its banks; it is a little wonder that we are sickly, but it is a great wonder that so many of us have escaped disease."

THAMES SEWERAGE COMMISSION.

At Kingston-on-Thames, an influential meeting has been held for the purpose of receiving information from Mr. Bazalgette, as to his plan for purifying the river between London and Windsor from sewage. Mr. Peck, M.P., was voted to the chair. Since the passing of the many Thames Navigation Acts, the inhabitants of the towns and villages in the valley of the Thames have experienced difficulty in disposing of their sewage; and, in order to carry away its united bulk to lands where it will not generate disease. The area to be dealt with embraces about 100 square miles, containing a population of about 300,000 persons. Mr. Bazalgette proposes, in the first place, to purchase and adapt about 3,000 acres of inexpensive and almost unutilized land between Woking and Bagshot, to which sewage might be applied on the principle adopted at Croydon and other places. The sewage would be conveyed by natural gravity from Acton, Chiswick, Ealing, Hanwell, Brentford, Isleworth, Barnes, Mortlake, Kew, Richmond, Twickenham, Mitcham, Merton, Malden, Morden, Wimbledon, Teddington, Kingston, Hampton, Esher, Thames Ditton, Moulsey, Walton, and Weybridge, to Hampton, where it would be conveyed by pumping engines, and again flow by gravity till it arrived at Chertsey, receiving on its route the drainage from Sothall, Norwood, Heston, Hounslow, Hanworth, Sunbury, Laleham, and Shepperton. Other main sewers, commencing at Eton and Windsor, would bring the drainage from Windsor, Datchet, Old Windsor, Horton, Colnbrook, Egham, and Staines, also by gravity, to Chertsey, where a regulating reservoir would be formed, and where a second pumping station would raise the united volume to a reservoir at the head of the proposed farm, on, to, and over which the sewage would ultimately flow. The total cost is estimated at 650,000*l.* The rainfall from the local sewers would, in general, be excluded. To carry out this plan, a Board of Commissioners, elected by the parishes interested, would be proposed. The promoters allege that the scheme would give relief from the penalties under the Thames Navigation Acts, and a cheap and effectual method of disposing of the sewage at a distance. Preliminary steps have been taken to submit the scheme to Parliament in the present session. In the end of the meeting, it was unanimously resolved,—

"That this meeting is not sufficiently informed on the many questions and conflicting interests involved in the plan as briefly laid before it, and is not prepared to express an opinion thereon without further consideration."

Mr. Slagg, a resident engineer, objects to the scheme of the Thames Sewerage Commission, that—

"It is wrong in principle to combine many town

together for the purpose of disposing of the sewage. The true principle is, in my opinion, *dispersion*, and not *concentration*, of sewage. The principle of this proposed measure is that of the combination of many towns for the purpose of conveying all the sewage to one place. That seems to me a needless work. That it would be a very expensive work may be seen when it is considered that to enable this scheme to be carried out for the estimated amount of 880,000 gal. the volume of the rainfall must be excluded from the sewers, and for that purpose a set of drains must be laid in every town, both in the streets and through to the backs of the houses."

Mr. Slagg states that when it was proposed to adopt this "separate system" in London, Mr. Bazalgette himself, in reading a paper at the Institution of Civil Engineers in the year 1865 on the "Main Drainage of the Metropolis," objected to it; but Mr. Bazalgette says he was misunderstood, and disowns the objection.

DWELLING HOUSES.

DR. HIME recently read a paper before the members of the Sheffield Architectural and Archaeological Society on "Dwelling Houses." After some introductory remarks, the doctor said:—

The great object of sanitary legislation is to secure for each individual the greatest amount of fresh air, pure water, sunshine, and dryness of soil. Public sanitation in towns should provide for the people width of streets and their paving, the removal of fluid and solid nuisances from them, and (a most important matter) the establishment of unoccupied places to facilitate the circulation of air, and serve for breathing and recreation resorts for the inhabitants. The width of the streets is of great importance in relation to the height of the houses. The width should never be less than the height of the houses. The healthiest sites for dwelling-houses are known to be those on trap, granite, and other metamorphic rocks, where water readily escapes, and the soil, and consequently the air, are dry. Cholera is rare in houses on such sites. Permeable sandstone, gravel, and chalk, if unmixed with clay, are also healthy. Sands which contain organic matter, clay, and alluvial soils are always to be suspected. Thorough draining, both subsoil and surface, is a necessary preliminary to building. Dampness of ground necessitates dampness of air and of the walls. This causes chemical alteration in the organic materials in the houses, with absorption of oxygen and discharge of other gases; it favours, too, the growth of low animal and vegetable organisms, which poison the air of the dwellings, and produce disease. The decomposition of the organic contents of the soil is hastened by its dampness, and especially by rapid alterations of its hygrometric state, which is, perhaps, the chief condition of outbreak of cholera. Building materials should have great solidity, be bad conductors of heat, and be in a good hygrometric state. Calcareous stone is best,—some sandstone is so porous that, though dry to day, it may be soaked with damp to-morrow. Houses should never be built on ground filled up with ashes and other *debris*. The large amount of organic matter contained in it, which is freely exposed to the action of the air and moisture, becoming decomposed, must cause poisonous emanations, destructive to those who, living above, must breathe it. The drainage and other pipes laid in this soil is extremely liable to be entered by these poisons, and thus they are conducted into houses directly. Frequent sweeping and washing are necessary in every house. Dust is not alone unpleasant, but it is a fruitful source of disease,—perhaps the most so. The dust of curtains, carpets, papers, and other coloured substances, consisting of organic and colouring matter, being swallowed with the food and inhaled, causes many a doctor's visit. Every house should have a kitchen and wash-room distinct from the dwelling-rooms. The latter should be large enough to allow of each inhabitant obtaining 10 cubic feet of fresh air per hour when doors and windows are shut. Each house should have abundance of good water for drinking, cooking, and washing, including bathing: five to six pints per day should be allowed for drinking, at least eighteen gallons for washing, and eight to ten should be used daily to flush the sewers. Sick people require more,—from forty to fifty gallons daily. Water-closets consume various quantities, according to their construction. The nature of the closet and the method of removing the contents have become one of the most important questions which advancing civilisation has created. The dry earth system is quite inapplicable to large towns; it suits private houses of the rich or jails

well. The Goux system is equally unsuitable. The water system, where there is a plentiful supply of water, is infinitely the best and the cheapest. A sufficient fall of ground can nearly always be obtained. The improvement of the dwelling-house and the establishment of comfortable homes worthy of human beings is a necessary duty of the State and a noble work of the philanthropist. These necessary conditions may be advantageously supplemented by a little comfort and elegance. A little garden is a civiliser of great power.

LONDON ROOKERIES.

My attention has been directed to your article bearing the above title, in your issue of the 20th ult., and I beg to bear witness to the important suggestions contained therein. These rookeries should be,—I might say must be,—swept out of London. My experience is mostly confined to the "fifty acres of courts and alleys all in a mass between Aldersgate-street and Bunhill-fields, opening out of Upper Whitecross-street, Gendelane, &c." If I were to pen what I have seen in this neighbourhood you would refuse to publish it. Imagine the worst of dirt, squalor, misery, and vice, and you cannot approach the facts. They are much worse than the human mind, not accustomed to seeing these things, can imagine.

All this property lies in the parish of St. Luke, Middlesex. The vestry and parishioners now possess the power to remedy such a condition, but they refuse to do so. The medical officer has reported that much of this property should be registered and kept healthy by means of the 35th section of the Sanitary Act, 1866. The Vestry have refused to adopt it. An effort was made a little time since to carry out the suggestions made in your article, namely, to pull down, open out new streets, and to build model lodging-houses on the ground. The promoters were immediately put into disgrace, the prime mover thrown off the committee, and the public were assailed with falsehoods, and deceived. Why is all this? The facts are plain. In the parish many members of the vestry are holders of this squalid property, and their friends, publicans, brokers, and the like. They meet at a public-house, where the important work of the vestry is often settled. Surely, when the health of over three millions of people is jeopardised in this way, some action should be taken by the central authority.

While such places exist the School Board is almost a farce: they can do nearly nothing: physiological laws are all against them.

Your article mentions that it would be necessary to obtain an Act of Parliament. I think it is not at all necessary. The vestries now can, in conjunction with the Metropolitan Board of Works, open out new streets, while the following Acts of Parliament,—14th & 15th Victoria, cap. 34, "An Act to encourage the Establishment of Lodging-houses for the Labouring Classes"; 30th Victoria, cap. 32; and 31 & 32 Victoria, cap. 130, "An Act to provide better Dwellings for Artizans and Labourers,"—are sufficient for the purpose.

The Act 29th Vict., cap. 28, gives the parishioners the power to raise funds on most favourable terms, for carrying out such improvements.

All, therefore, which is required is a will. This with the powers which are dominant does not exist. No doubt, the action of these vestries is calculated to bring local self-government into disrepute, and will ultimately break up the present system of vestries; but these men do not seem to have the capacity to perceive this. In the interest, however, of the parishioners and of the metropolis, it is necessary that such a state of things should be speedily put a stop to, and with that view I am glad to see your valuable paper lending its aid.

FREDERICK HOVENDEN.

CHURCH-BUILDING NEWS.

Kirby Underdale, near York.—The chancel of the church here has just received an additional ornament by the erection of two stained-glass windows, and the decoration of the organ-pipes, by Mr. J. W. Knowles, of York. The windows are of two lights, with quatrefoil tracery, and in each light under a canopy of early character, is represented a figure of one of the Evangelists standing upon an arched base, in which is its

respective emblem. The organ-pipes have been dispersed with ornament of a conventional character, in green, red, and gold, upon a buff ground, the ornament being divided occasionally by horizontal bands of blue and gold.

Petersfield.—A meeting to consider the question of the restoration of the parish church has been held at the townhall. The Bishop of Winchester presided, and strongly urged the importance of the undertaking. Lord Hylton moved, and the Rev. J. M. Sumner seconded, a resolution, which was passed, that the meeting regretting the present unseemly state of Petersfield church, undertakes its restoration at the earliest possible period. Mr. Blomfield (who designed the newly-erected church of St. Mary, at Sheet) has been appointed as architect, and that gentleman will at once be requested to furnish a detailed report of the present state of the church, and a scheme for its restoration.

London.—The parish church here has been restored. The chancel has been restored at the cost of the Ecclesiastical Commissioners, and under the direction of their architect, Mr. Ewan Christian. The floor has been laid by Mr. Nursey, of Bungay, with tiles, in chocolate lozenges on a red ground, with figured yellow centres and borders; the pavement of the sanctuary being of smaller tiles, with a dark green border on the stone steps. The Communion-table has been raised on a foot pace, and new seats of oak (executed by Mr. H. Ward, of London) have been placed on either side of the chancel. Boarding has been inserted between the rafters and the lead of the roof, and the windows have been repaired. The cost has been about 370l. The remaining work already done (partly by money collected by the vicar, partly by money derived from a farm left for the use of the church), at a cost of about 600l., comprises the repair of the roof of the north and south aisle, and the lighting by means of gas burners, arranged on the capitals of the pillars, the repair of the east window, the restoration of the woodwork of the panels at the base of the screen—once painted and gilded—and the laying of the passage in front of the screen with a copy of the original tiles. The pews have been lowered, as a temporary arrangement. This has been done under the direction of Mr. Thomas Jeekyll, by Mr. B. W. Spaul, of Norwich, and Mr. H. Ward, who repaired the roof. The work immediately to be done is the opening of the tower-arch, the restoration of the tower window and roof, the removal of the organ to the end of the south aisle, where a vestry will be constructed; and the repair of the organ. Other work necessary and in contemplation is the restoring of the old benches, repairing and re-glazing the old windows, relaying the passages with tiles, restoring the south porch, and scraping the colour-wash off the columns and walls—which will involve an outlay of nearly 1,000l.

Cambridge.—It has been resolved to continue the restoration and enlargement of St. Beudief's Church. Plans by Mr. Brandon, architect, have been exhibited to the vestry.

Castle Hellingham.—The parish church, after partial restoration, has been re-opened. The chancel was restored in 1870, and it was resolved by the parishioners that the nave should be suitably restored, so as to accord with the chancel, and this was rendered the more necessary as part of the building was actually unsafe. The efforts to raise subscriptions have been attended with fair success, nearly 400l. having been collected from residents and landowners in the parish itself, and about 350l. from friends outside. Although this is far short of the original estimate, which amounts to 1,200l., yet much has been done. The work of restoration, which has been going on during the past five months, has embraced the entire rebuilding of the wall between the porch and south-east angle of nave, with all the windows, &c.; the repair and renewal of all the windows; the repair of all the stonework of pillars, round the doors, &c.; plastering throughout; the paving of the whole nave with Peake's tiles; and the warming with hot air. For the present the seats are chairs, as the funds will not yet admit of the expense of wooden benches. The doors have been, on the inside, re-caused with oak. The gallery at the west end has been removed, and several objects of interest discovered in the walls have been restored. Besides the question of benches, there is the more imperative necessity for the repair of the battlements and tower, the repointing of the north wall, the restoration and improvement of the west window (the only one that remains to be done), and the purchase of a new pulpit. The

architect employed has been Mr. H. Woolyer, of Bedford; and the builder, Mr. Rogers, of Earslboro.

SCHOOL-BUILDING NEWS.

Birmingham.—The proposed schools at Bloomsbury are to be built on a site which has one frontage to Lingard-street and one to Goodrick-street. The area of the site is about 4,000 yards. The buildings will be placed at the northern end of the ground, so that both the school-rooms and the playground will get as much sunlight as possible.

The schools are intended to accommodate 1,000 children, viz., 400 infants, 350 boys, and 250 girls. The infants' school will front to Lingard-street, and will form a distinct and separate building. The boys' school will front to Goodrick-street, and will be on the ground-floor. This building will be of two stories, the girls' school-room being over that of the boys. The boys will enter their school from Goodrick-street, and the girls and infants from Lingard-street.

The arrangement of the boys' school is as follows:—A porch or lobby is placed at the north end of the school-room, and on the right hand of the porch is a large cloak-room and lavatory, and a staircase, which leads to the master's private room or board-room, which is placed in an upper story over the cloak-room and lavatory.

To the left of the lobby is the door leading into the school-room. The school-room is formed of three blocks or parallelograms, arranged like the letter E, the middle arm of the E being omitted. The end blocks are each 20 ft. wide and 45 ft. 9 in. long, the middle one being of the same width, but 50 ft. long. The space between the two end blocks is filled up by three class-rooms, each room being 16 ft. 3 in. wide and 19 ft. 6 in. long.

The general shape of the school-rooms and class-rooms, taken together, may be roughly described as a parallelogram, whose outside dimensions are 3 ft. in length and 49 ft. in breadth. The clear height of the schoolroom is 15 ft. 9 in., and that of the class-rooms 14 ft. 9 in. The whole of the rooms are arranged so that the head-master can see every part of them without moving from his desk, and thus not only the school-rooms but also the class-rooms will be under constant supervision.

The plan, while fitted to the present system of teaching, can at any time be modified without expense, so as to increase the number of class-rooms, should the plan of dividing the children into distinct classes and instructing them separately be adopted. The girls' schoolroom is placed over the boys', but consists of two blocks only, the third block being occupied by the cloak-room and lavatory, and the mistress's private room.

There are also three class-rooms, as before. The whole of these rooms are built about half-way up the roofs, the total height in the clear of the schoolrooms being 40 ft., and that of the class-rooms 17 ft.

The superficial area for each child will be about 11 ft. of the school-rooms, and nearly 9 ft. in the class-rooms. It is proposed to warm the whole of the buildings either by hot air or hot water; but, except in the private rooms, there will be no fireplaces. The whole of the rooms will be carefully ventilated. The buildings are to be of brick, with tiled roofs; the floors of the school-rooms and class-rooms of wood. The windows will probably be of iron, and will be glazed with thick glass. There will be no skylights in any part of the buildings. The staircase to the girls' school will be of stone.

The infants' school is a one-story building, with entrance porch, large cloak-room and lavatory; a nursery, 22 ft. long and 23 ft. wide; a principal school-room, 60 ft. long by 32 ft. wide; and a cloak-room, 22 ft. long by 25 ft. in width. All these rooms will be well lighted and lofty.

The playgrounds are separated from each other by a wall, and the out-offices are arranged in a convenient manner. The architects are Messrs. Martin & Chamberlain, of Birmingham.

Dorchester.—The new girls' and infants' schools have been opened by the Bishop of the diocese. The schools, built by Mr. G. Wheeler, from plans by Mr. G. G. Scott, architect, have been erected as a joint memorial, at a cost of about 800*l.*, of which sum the vicar, the Rev. W. C. Macfarlane, has given 450*l.*, and Miss Macfarlane 100*l.*, to the memory of their late aunt; and Mrs. Cook (wife of Mr. W. Cook, churchwarden), 100*l.*, to the memory of her sister, the late Miss Wallis, and 100*l.* as her own donation. Several other sums have been given, which are almost sufficient for the purpose.

Bromyard.—The Church of England schools, recently erected in the parish of Thornbury,

have been opened. They are built near Thornbury Mill, about half a mile from the Wall Hills, on the summit of which are vestiges of a British encampment, supposed to have been constructed by Caractacus. The schools are intended to meet the educational requirements of the following parishes:—Thornbury, Edwin Ralph, and a portion of Collington.

Monkton, Kent.—For new schools for the parish of St. Mary Magdalene, Monkton, Mr. William E. Smith, of Upper Bedford-place, London, architect, Mr. Cephas Fead's tender (665*l.*) has been accepted.

Books Received.

"The Civil Engineer's Pocket-Book," by John C. Trautwine, C.E. 1872. (Trautner & Co.), treats of Mensuration, Strength of Materials, Bridges, Cost of Earthworks, Foundations, &c., and elucidates some important principles in construction. It is a very valuable little book—a cyclopædia in miniature.—"The Charity Organisation Reporter" is the title of a publication, issued weekly by the Society for Organising Charitable Relief and Repressing Mendicity. It does not profess to be a newspaper, but proposes to report so much of the proceedings of the Charity Organisation Society as is likely to be of interest to members of its district committees and of similar agencies in the country, and to its supporters generally. It will also bring together information relating to the removal of causes of pauperism and bearing on the elevation of the poorer classes.—A paper "On Customary or Local Measures of Land in the British Isles," read by Mr. Joseph Boulton, at the Liverpool Architectural Society, in November last, has been published in the Transactions of the Society.—Under the title, "Spiritualism answered by Science" (Longman & Co.), Mr. Sergeant Cox replies vigorously to the disingenuous attack made on him by the writer on this subject in the *Quarterly*. The learned Sergeant had clearly stated that he found "no evidence tending to prove that the force [whatever it may be] is other than a force proceeding from or directly dependent upon the human organisation," and he declines, therefore, to be termed a convert to "Spiritualism." It is quite time that the matter was investigated scientifically, and the ground on which charlatans stand knocked away from under them. Sergeant Cox deserves credit for the steps he has taken in this direction.

Miscellanea.

The Abolition of Tolls on Waterloo Bridge.—A crowded meeting has been held at the Lambeth Baths for the purpose of considering the abolition of the tolls on Waterloo Bridge and other metropolitan bridges. Mr. W. M'Arthur, M.P. (in the chair), stated that during the last six years 5,000,000 persons annually passed over Waterloo Bridge, the income from which amounted to 21,000*l.* per annum, and that since the opening of the bridge the sum of 851,760*l.* had been received by the company. Mr. M'Arthur suggested that the House of Commons be petitioned for an extension of the time to which the coal and wine dues were already mortgaged, and that the money so obtained be applied to the purchase of Waterloo Bridge. Sir J. C. Lawrence, M.P., thought that the best way would be to first free Hungerford Bridge. Half the traffic of Waterloo Bridge would thus be transferred to Hungerford; and, on a valuation of two years' traffic over Waterloo Bridge being taken, it would be found much reduced, and the bridge would consequently be sought for a much lower sum than it would otherwise be. It was unanimously resolved,—"That the tolls on Waterloo and other metropolitan bridges were a heavy tax on the community, highly injurious to the value of property, and detrimental to commercial intercourse, presenting an anomaly not to be found in any other city of Europe or America;" and "That this meeting urges upon the Metropolitan Board of Works and the Corporation of the City of London to confer and communicate with the Government and the Waterloo and other bridge companies with a view to the introduction of a Bill into Parliament for carrying out the foregoing resolution, and that the various metropolitan vestries be called upon to co-operate."

A Big Building for Boston (U.S.).—The *Boston Commercial Bulletin* states that it has been determined to erect there a building of "proper size" for great meetings. "The ground plan is to be a parallelogram, 822 ft. in length by 422 ft. in width, measuring 347,506 square feet in area, or a trifle less than 8 acres. Throughout the space not a single post, pillar, or support of any kind will obstruct the view from end to end. The roof, consisting of a double system of self-supporting trusses, will spring in a gentle curve directly from the foundations, constructed on piles, driven 35 ft. into the ground, the two segments meeting at the ridge and forming a graceful arch, at an elevation above the floor, of 172 ft. Similar segments will spring from the ground at either end, uniting with the side segments, forming an immense Mansard pavilion, with the graceful lines peculiar to that style of architecture. The trusses supporting these end segments of the roof will run the entire length of the building, having a clear span of over 800 ft., and knitting the whole roof into a substantial self-supporting structure. From the foot of the arches on either side end will rise perpendicular buttresses, 53 ft. high, at which elevation the curve of the trusses will leave a space of 18 ft. between the outer line and the line of the buttresses. This space will be floored, forming an outside promenade, with an elevation of 50 ft., a width of 18 ft., and a total length equal to double the combined length and width of the building, or half a mile."

Dedication of the New Freemasons' Hall, Bristol.—The building in Park-street formerly used as the Philosophical Institution and Museum was recently purchased by the Freemasons of Bristol, and it has been solemnly dedicated to the purposes of the craft. The premises have been decorated throughout. The upper floor, formerly used as a museum, has been set apart for the grand hall, and suitably arranged and embellished. Above the gallery at the end of the hall hangs a portrait of the Duke of Sussex, late Grand Master of the Order in England. At the western end is an organ, standing on a platform. Adjoining the grand hall is a chapter-room, and "the preparing room," in which neophytes are prepared for initiation. A reception-room is also provided. On the ceiling of the staircase are paintings of Justice, Fortitude, Temperance, and Prudence, executed by Mr. Bird, R.A., and which formerly adorned the ceiling of the old hall in Bridge-street. Mr. Diment, builder, Mr. Eastbrook, carpenter, and Mr. Hunter, gasfitter, have been employed in fitting the premises for occupation by the Masons; and Mr. Vowles has renovated the organ.

The "Scotsman" and the Walter Press. The Walter Press, invented by Mr. J. Macdonald, the manager of the *Times* printing establishment, is now used in printing the *Scotsman* newspaper. A reel of tightly-rolled paper, in the form in which it leaves the paper-mill, fully four miles in length, and weighing nearly six cwt., is placed at one end of the machine, and in the process of un-reeling is damped, printed first on one side then on the reverse with unflinching precision, is cut into sheets, and delivered at the rate of fully 12,000 copies per hour at the other end of the machine. The sole attendants necessary are two lads at the delivery hounds, and a third, the striker, who starts the machine and looks after the rolls as they are unrolled. While printing, the paper travels through the machine at the rate of nearly 1,000 feet per minute, and a reel four miles long is thus printed in less than twenty-five minutes. The delay in changing from one reel to another scarcely exceeds a minute, so that the production is thus almost continuous. With the two Walter presses in the *Scotsman* office, thirty-six miles of paper are printed each morning in two hours, and on Friday, when the *Weekly Scotsman* is also printed, the length of paper used is about eighty miles.

London and County Bank.—At the meeting of the London and County Bank, the report showed an available total of 102,548*l.*, including a previous balance of 4,494*l.*, and a dividend was declared of 6 per cent, with a bonus of 3½ per cent. (together, 11.18s. per share), making, with the June distribution, 18½ per cent. for the year. For the previous year the distribution was 17½ per cent. The deposits held are 16,116,730*l.*, an increase of 2,720,479*l.*; and the acceptances are 2,778,016*l.*, a decrease of 332,105*l.* The paid-up capital is 1,000,000*l.*, and the reserve 500,000*l.*

National Music Meetings at the Crystal Palace.—The arrangements for the first series of national music meetings, to be held at the Crystal Palace during the ensuing summer, are progressing satisfactorily. At these meetings, native and foreign choral societies, glee, madrigal, and part-song vocalists, cathedral and church choirs, military and volunteer bands, and amateur solo singers will be invited to compete for prizes, some of them considerable in amount. The project seems to us to deserve the hearty support of the public. It is intended that the meetings shall be held on five days during a fortnight at or about Midsummer in each year; and a council will be formed, consisting of eminent authorities in music, from which body the competitors for the different prizes will elect a jury by ballot. The greatest care must be taken in forming the tribunal; any failure in justice would greatly interfere with the success of the scheme. The total amount of the prizes will be 1,500*l*.

Accidents.—The engine of a Millard goods-train had just passed over the bridge east of Castle Ashby Station, when the main buttress gave way, and the bridge fell. The tender and more than twenty wagons were thrown over on to the line, but none of them fell into the river. The bridge was afterwards inspected by Mr. Woodhouse, the company's chief engineer. The accident was owing to the great rush of water against the buttress, the brickwork of which appeared to have been twisted completely round. A minute or two before the accident occurred an up Millard goods-train passed over the bridge; and if the two trains had met, as they sometimes do, on the bridge, the whole of it must have fallen in. —A large piece of masonry from the Castle of Vert Port Nice, was blown down on Friday week, and fell on a house, killing one person, and injuring seven others.

Testimonial to a Sanitary Inspector.—At a special meeting of the sanitary committee, St. Luke's, City-road, a handsome testimonial, inscribed on vellum, and mounted in a carved and gilded frame, was presented to Mr. James Neighbour, the sanitary inspector. The testimonial recorded that at a meeting of the vestry, held at the Vestry-hall, City-road, on Tuesday, the 3rd of October, 1871, Mr. Churchwarden Patten in the chair, it was resolved unanimously that the sum of 20 guineas be awarded to Mr. James Neighbour, the sanitary inspector, as an acknowledgment of the extra services performed by him during the late epidemic of small-pox, and that he be also presented with a copy of this resolution on vellum, in testimony of the appreciation by this vestry of the mode in which he has discharged his duties.

The Proposed New Market and Buildings, Leicester-square.—The company which has been formed for the erection of a new market close to Leicester-square, near Coventry-street, include in their plans a proposal to build on a portion of the square, dividing it into wide and spacious streets, leaving about half the area of the square open and still unbuild upon. It is suggested that the site and the property in the locality will be enhanced in value by the opening of a fruit and vegetable market on the side of Coventry-street, with two entrances from the last-named street, and platforms underneath, connected with the new railway which is about to be constructed, so as to unite the Euston with the Charing-cross and Waterloo Stations. All the requisite plans in connexion with the company's proposed works have been duly deposited with Parliament.

A Statue of George Kinloch.—Lord Kinaird has unveiled at Dundee a statue which has just been erected to commemorate the political life of George Kinloch, of Kinloch, who, in consequence of his intrepid advocacy of political rights, was compelled to flee the country nearly forty years ago. Great difficulties were at first thrown in the way of erecting the statue, but ultimately the town council gave a site. The work was executed by Mr. Steel, of Edinburgh, who is a native of Dundee.

Fall of an Archway.—On Tuesday last, an archway in course of construction in Messrs. Parker & Sons' spinning-mill, Dundee, gave way, and six men who were working on the top were precipitated to the ground. They were all more or less injured, two of them having received wounds which are likely to prove fatal. The accident was caused by the breakage of one of the tie-rods.

Vehar Waterworks Extension, Bombay. A "Report on the Toolsee Valley as an Auxiliary to Vehar, by Rieni G. Walton, C.E., Acting Executive Municipal Engineer; and Remarks thereon by Thomas Ormiston, M. Inst. C.E. (Bombay: printed at the Educational Society's Press, Byculla: 1872)" has been issued. The acting municipal commissioner, Mr. T. C. Hope, basing on the report and remarks of these engineers, says, in a letter to the clerk of the peace:—

"My own opinion after visiting the locality is that Toolsee should be utilised as an increase to the gathering ground of Vehar to the utmost extent of which it is capable, namely, to that of the third or largest of the three projects, but that it would be a mistake to attempt to make it anything more; that is, an independent supply either for annual use, or in the event of the Vehar dams bursting. For the latter purpose it is too small, and the money which would be necessary to connect it with Bombay direct, would be far better reserved for a totally separate reservoir of far larger dimensions elsewhere."

About 4-lacs of rupees appear to be the anticipated cost. Mr. Walton estimates it at less, and Mr. Ormiston at more.

The Trees on the Thames Embankment.—The Metropolitan Board of Works, at their last meeting, decided to offer a reward of 20*l*. to any person who could give information as to the offenders who have lately busied themselves in cutting—maliciously as was shown—the trees on the Victoria Embankment. A like sum will be given for information likely to lead to the conviction of future offenders. As Mr. Luntz stated, a vigilant and proper police attention should render the committal of these wanton acts impossible. If the scoundrel who has been guilty of this crime (damaging to all attempts to obtain ornamental places of public resort), were detected and pitched into the Thames, we would not cross the road to throw him a rope.

Government Acquisition of the Atlantic Cables.—In a printed statement of the present position of the movement for making the telegraphic communication with America international property, and thus securing a reduction in the rates for messages to one-fourth of the existing tariff, without loss to any one, Mr. G. T. Shead, of Mincing-lane, who is promoting the object in view, states that a Bill will be introduced in the approaching Parliament to enable the British Government to carry out the scheme, either alone or in conjunction with other Governments. This Bill will not include the purchase of any competing line brought forward since the proposition for Government acquisition was made public.

A New Military Prison at Denmark-hill.—Within the last few days the inhabitants of Denmark-hill and Coldharbour-lane, Camberwell, have been thrown into a state of considerable trepidation by the announcement that the Government have determined to erect a huge military prison in the neighbourhood, and that for this purpose 17 acres of land have just been purchased by the Government authorities on the brow of Denmark-hill, in the immediate vicinity of palatial residences and ornamental grounds. A public meeting is about to be held to protest against the erection of the proposed structure on the site which the Government have selected.

Peter the Great.—On Monday last a board bearing the foreign inscription was put up in the new Foreign Cattle Market at Deptford, by order of the City officials:—"Here worked as a ship-carpenter Peter, Czar of All the Russias, afterwards Peter the Great, 1698." That Peter the Great visited this country is apparently clear enough, but it has not been satisfactorily proved that he worked as a shipwright in Deptford Dockyard. The traditional belief is, however, very strong, and the great Czar's title has been given to a street in Deptford, a very wretched and woe-begone one, and quite unworthy of the name.

The Leicestershire Architectural and Archaeological Society.—The annual meeting of this society was recently held in the Town Library, Guildhall, Leicester, the Rev. Assheton Pownall, F.S.A., Rector of South Kilworth, in the chair. After the transaction of business in committee a general meeting of the members was opened, when Mr. North, the hon. secretary, read a report of the committee for the year 1871, and a statement of accounts for the past year; after which the report and accounts were adopted, received, and passed, to be printed in the usual manner. The committee and officers for the year 1872 were then appointed.

A Pleasant Prospect.—The gradual sinking of Nantwich, to which we lately adverted, is attributed by the *Mechanics' Magazine* to "the withdrawal of the lime from the subterranean salt lakes which underlie the town." The slip this winter occurred about the same spot where similar landings happened one or two years ago. The pit is about 300 yards in circumference about 100 ft. deep, and its sides are almost perpendicular. The inhabitants much fear that the town itself may ultimately suffer, not by gradual decadence,—that they are used to (it is not uncommon to enter a house from the street into what had formerly been the first floor),—but by one of these sudden collapses.

Royal Gallery of Illustration.—"A Peculiar Family" having been withdrawn, a new musical proverb, "Clarity begins at Home," written by B. Rowe, with music by Alfred Cellier, has taken its place, excellently sustained by Mrs. German Reed, Miss Holland, Mr. Corney Grain, Mr. Alfred Reed, and Mr. Arthur Cecil. A novelty by Mr. F. C. Burnard is in preparation, and also a work by Mr. W. S. Gilbert. Mr. Planche's charmingly-written "King Christmas" has proved a great success, and is running glibly and gaily.

Proposed New Theatre and Opera-House, Aberdeen.—A limited liability company has been formed for the purpose of building a new theatre and opera-house for Aberdeen, with a capital of 8,000*l*. The site is in Guild-street. The designs are being prepared by Mr. C. J. Phipps, of London, and will be executed under his direction, jointly with Mr. Matthews, of Aberdeen. The new theatre will seat about 1,000 persons, with standing-room for 200 more, and will probably be completed by next Christmas.

A Hard Cement.—The Abbé Moigno relates a circumstance which may contain a valuable hint in relation to the use of cement. A workman employed to repair the steps leading to a garden made use of Portland cement mixed with finely divided cast and wrought iron filings, or fragments, in place of sand. The result is stated to be that the mass has become so hard as to resist fracture, either with the hammer or pickaxe.

National Railway Association.—Mr. R. Brandon, honorary secretary of the National Railway Association, has just returned from a week's journey in Scotland, whither he had been invited by the provosts of Leith, Dundee, Jedburgh, Hawick, and Dumfries, to explain his scheme for the management of the railways by the State. Mr. Brandon lectured in each of the above-named towns, and resolutions approving of his plan were passed, and branch associations were formed in each town.

Reading Town-hall and Public Offices.—The local committee in committee have resolved that "this committee do deem it desirable to complete in such buildings any provisions for a new town-hall, or for magistrates' offices, or for a cow exchange or markets," and that the Public Offices Committee be requested, with the aid of Mr. Waterhouse, to prepare plans and specifications for new buildings, at a cost not exceeding 7,000*l*."

Intercommunication.—The desirability of forming a tunnel under the river at Gravesend has been suggested, with the view of connecting the present Tilbury and Southend line with the North Kent, and London, Chatham, and Dover lines. By this there would be a continued uninterrupted way between these lines and the Great Western, London and North-Western, Midland, Great Northern, Great Eastern, and Eastern Counties Railways.

Leeds New Bridge.—Mr. Richard Gouthwaite, of Lumbly, the arbitrator, has given his decision in the arbitration which was heard at the Town-hall, Leeds, on the 20th and 21st of December, as to the amount of compensation the corporation should pay Mr. William Emsley in respect of his shops and warehouses on the south-east side of Leeds Bridge. Mr. Gouthwaite has awarded the sum of 7,700*l*.

Royal Architectural Museum.—A conference is to be held at the Museum, on Thursday, February 15th, at 4 o'clock p.m., for the purpose of considering the best means of rendering the collection of greater advantage to workmen engaged in trades requiring a knowledge of art. Such a step is much needed.

Museum and Library for Devises.—The Vitulive Archeological and Natural History Society have determined to purchase some premises in Long-street, Devises, for a museum and library, at a cost of 620*l.*, provided that the purchase-money, with an additional sum of 300*l.* or alterations, can be raised by the 24th of February.

TENDERS

For the erection of house and schools at Ewell, Surrey, by Mr. Jas. Hammond. Messrs. Walker & Eism, architects.

Table with 2 columns: Name and Amount. Includes Mason (1,034 0 0), Nightingale (1,023 0 0), Thomas (429 0 0), Sheppard (994 0 0), Ifard (920 0 0), Wagner (850 0 0).

For additions and alterations at Walton Lodge, St. John's Wood, for Mr. J. C. Pavie. Mr. W. Todd, architect.

Table with 2 columns: Name and Amount. Includes Bonstead & Sons (645 0 0), Higgs (629 0 0), Langmeir & Budge (569 10 0), Blyth (568 0 0), Nightingale (555 0 0), Pitcher (539 0 0), Richardson (accepted) (464 10 0).

For alterations and repairs to Harford House, Stoke Newington-road, Kingsland, for Mr. S. N. Stowe. Mr. Edwin Shales, architect.

Table with 2 columns: Name and Amount. Includes Anon. (430 0 0), Richardson (359 0 0), Morley & Son (accepted) (330 0 0).

For billiard-room, new offices, coach-house, and man's room, to a mansion at Hampton-on-Thames. Mr. Herbert Pearl, architect. Quantities supplied by Messrs. Ardley & Mortimer.

Table with 2 columns: Name and Amount. Includes Kirby, Brothers (2,715 0 0), Pelly (2,294 0 0), Hallowell (2,211 0 0), Perry & Co. (2,105 0 0), Brown & Robinson (2,049 0 0), Brass (1,907 0 0), Hallowell (1,907 0 0), Higgs (1,987 0 0), Jarrett (1,983 0 0), Gammon & Son (1,983 0 0), Streptom (1,983 0 0), Williams & Son (1,983 0 0), Gammell & Way (1,947 0 0), Scrivener & White (1,895 0 0).

For the erection of a warehouse, and repairs and alterations to old premises in Purville-street, Bethnal-green, for Mr. R. J. Chillingworth. Mr. William Mundy, architect.

Table with 2 columns: Name and Amount. Includes Beale (2,038 9 0), King & Sons (1,076 0 0), Ross (955 0 0), Eaton & Chapman (971 0 0), Marr (1,020 0 0), Christoffer, Brothers (953 0 0), Forrest (837 0 0), Longwood (829 0 0), Blackmore & Morley (873 0 0), Dyer (905 10 0).

Royal Pavilion Music Hall.—Messrs. Lacy & Forkington state that they also accept a tender—1,031*l.*

TO CORRESPONDENTS.

G. L. S.—J. R. T.—F. M. C.—D. P.—M. J. C.—O. R.—F. A. K. G. S.—Mr. D.—F. P.—A. M.—I.—T.—G. G.—H. F.—C. B.—J. P.—T. W.—R.—J. F.—W. H. P.—R. G.—J. R.—A.—J. W. C.—U.—O.—W.—H.—B.—E. N.—T.—F.—M.—P.—A.—R.—F.—C. B.—W. C.—E. H.—I.—B.—T. S. (the character is the contractor to obtain payment, rights as it would be, would fall; but this would depend on the exact terms of advertisement and letter. Take legal advice.)—F. W. (new and plans will appear shortly.)—T. W. (what appear)—T. H. V. (note reached us quite late, when other bid was in type.)—Walls (next week)—A. L. (next week)—T. C. S. (next week)—Hastfield (next week)—A. W. M. (next week). Everett.—In letter "About a New Style," in 69, 474, "amazingly" in first column, should be "immaculate," and "Roman, highly English, or Decorated," at end, should be "Norman, Early English, &c." We are compelled to decline printing on books and giving addresses. All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication. Note.—The responsibility of signed articles, and papers read at public meetings, rests of course with the authors.

PUBLISHER'S NOTICES.

The TWENTY-NINTH VOLUME of "THE BUILDER" (bound), for the year 1871, is now ready, price One Guinea. Also, CLOTH CASES for binding the Numbers, price Two Shillings and Ninepence each. SUBSCRIBERS' VOLUMES, on being sent to the Office, will be bound at a cost of Three Shillings and Sixpence each. A COLOURED TITLE-PAGE can be had, gratis, on personal application.

Bath and other Building Stones of Best Quality.—RANDELL, SAUNDERS, & CO. Limited, Quarriers and Stone Merchants. List of Prices at the Quarries and Depôts, also Cost of Transit to any part of the United Kingdom furnished on application to Bath Stone Office, Corsham, Wilts.—[ADVT.]

Ashton & Green, Slate and Slab Merchants and Quarry Agents.—Shippers, Merchants, and Contractors furnished with Price-lists of every description of ROOFING and MANUFACTURED SLATE, Railway-rates, &c. Agents for London and Country for the Sale of the celebrated WHITLAND ABBEY GREEN SLATES. Drawings and Prices of A. & G.'s RED RIDGE TILES, specially prepared for use with these Slates, on application.—Offices and Show-rooms, 14 & 15, Bury-street, St. Mary Axe, London, E.C.—[ADVT.]

Turret Clocks.—Mr. Streeter, 37, Conduit-street, London, W., Manufacturer of Turret Clocks (with gravity or dead-beat escapement) for Churches and Public Buildings. Estimates and plans on application. Price.—Village clocks, from 15*l.*; church clocks, from 40*l.* The wheel-work throughout these clocks is of best hard brass or gun-metal. No iron wheels used. Timekeeping and durability guaranteed. Wholesale Entrance—Burlington Steam Works, [ADVT.]

NO PAINT—NO RUST. GREAT DISCOVERY. BRONZED IRON. BY ROYAL LETTERS PATENT. TURNER & ALLEN. (Sole Patentees). ART-FOUNDERS, ENGINEERS, MERCHANTS, AND CONTRACTORS, 201, UPPER THAMES STREET, LONDON, E.C.

Extract from Paper read at the Royal Institute of British Architects, December 4, 1871, by Henry Carr, esq., C.E.— "The great desideratum of the day, no doubt, is some means of permanently protecting iron from rust: this is now said to be done by Messrs. Turner & Allen, of 201, Upper Thames-street. If the process of coating iron with copper can be successfully carried out on a large scale, it will be one of the greatest boons of our time."

J. L. BACON & CO. MANUFACTURERS OF IMPROVED HOT-WATER APPARATUS, FOR WARMING AND VENTILATING Private Houses, Churches, Schools, Hospitals, Manufactories, Greenhouses, &c. OFFICES AND SHOW-ROOMS:—476, NEW OXFORD STREET, LONDON, W.C. WORKS:—FARRINGTON ROAD. Publishers of a Pamphlet on "Hot-Water Heating."

CONTRACT for DANZIC TIMBER, &c. Contract Department, Admiralty, Whitehall, January 31, 1872. TENDERS will be received on TUESDAY, the 5th of MARCH next, at TWO O'CLOCK, for 2,460 LOADS of DANZIC FIR TIMBER, 150 LOADS of DANZIC OAK TRUCKSTUFF, 200 LOADS of DANZIC OAK PLANK, 11,289 DRUM DEALS, and 2,292 STAGE DEALS, to be delivered at Her Majesty's Dockyard, and their Landing-places to themselves, on unlimited power of selection, and do not bind themselves to accept the lowest or any Tender. A form of Tender, containing all particulars, may be obtained at this Office. FRANKS W. BOWFIELD, Superintendent of Contracts.

YEOVIL WATER-WORKS.—To CONTRACTORS.—The Corporation of the Borough of Yeovil are prepared to receive TENDERS for the CONSTRUCTION of a COVERED SERVICE RESERVOIR, a TANK, and other Works connected therewith. Drawings and specifications may be inspected, and forms of Tender may be obtained at the office of the Town Clerk, in Yeovil, and of Messrs. THOMAS & CHARLES HANSMLEY, Civil Engineers, 30, Great George-street, Westminster, S.W.; and Tenders must be delivered at the Town Clerk's Office on or before FRIDAY, the 1st day of MARCH, 1872. The Corporation do not pledge themselves to accept the lowest or any Tender. Yeovil, 5th February, 1872.

LONDON AND NORTH-WESTERN RAILWAY.—To CONTRACTORS and BUILDERS.—ERECTOR of the PASSENGER STATION, FORMATION of a ROAD, at Halesden, on the Hampstead Junction Branch Line. The Directors are prepared to receive TENDERS for the ERECTION of the PASSENGER STATION and CONSTRUCTION of a ROAD at Halesden, on the Hampstead Junction Line. Plans and specifications may be seen at the Office of Mr. H. WOODGATE, Station Station, on and after the 17th inst. Tenders addressed to the undersigned, and must be accompanied by a deposit of 10*l.* on or before FRIDAY, the 2nd day of MARCH, 1872. The Directors do not bind themselves to accept the lowest or any Tender. S. REAY, Secretary. Euston Station, London, N.W. February, 1872.

PERSONS desirous of TENDERING for the ERECTION of a BAPTIST CHAPEL, at CROYDON, will please send their names and addresses, on or before the 15th instant, to JOHN THOS. BAILEY, Architect, West Croydon.

BOROUGH of LIVERPOOL.—To BUILDERS, CONTRACTORS, &c.—The Water and Rada Committee of the Council of the Borough of Liverpool, desire TENDERS for the ERECTION of BATHS and WASH-HOUSES in Seeb's-Parish. Plans may be inspected, and specifications may be obtained by application to the Tender, obtained at the office of the Borough and Water Engineer, Municipal Office, on payment of 2*l.* 2*s.* Scale of Tenders, which must be in the presence of the Tender, addressed to the Chairman of the Bath Committee, and endorsed "Tender for Baths and Wash-houses, Seeb's-parish," must be delivered at my Office, Municipal Offices, Dale-street, before TWELVE O'CLOCK on the 24th instant. The Committee do not bind themselves to accept the lowest or any Tender. JOSEPH RAYNER, Town Clerk. Municipal Offices, Liverpool, February 4, 1872.

BOROUGH of BRADFORD.—CORPORATION WATERWORKS.—To CONTRACTORS.—CONSTRUCTION of TWO RESERVOIRS at OSENTHORPE.—The Corporation of Bradford are prepared to receive TENDERS for the CONSTRUCTION of TWO COMPENSATION RESERVOIRS, and the Works thereon, connected, at Osenbothorpe and Leasnavy, at Osenbothorpe, in the Township of Harworth, and parish of Bradford, in the West Riding of the county of York. Drawings and specifications may be inspected, and forms of Tender may be obtained, at the Office of Mr. CHARLES GOTT, Civil Engineer, Corporation Offices, Bradford, on and after TUESDAY, the 6th of FEBRUARY instant, between the hours of TEN in the forenoon and FIVE in the afternoon. Tenders must be delivered at the Town Clerk's Office, Bradford, sealed, and addressed, to the Chairman of the Water Committee, "Tender for Reservoirs," before TEN O'CLOCK a.m. on FRIDAY, the 1st of MARCH next. The Corporation do not bind themselves to accept the lowest or any Tender.—By order, W. T. MCGAVIN, Town Clerk. Corporation Offices, Bradford, 2nd February, 1872.

TO BUILDERS.—Notice is hereby given that PLANS and SPECIFICATIONS for BUILDING a NEW MANSION, with Stables, &c., at Brandisfield, in the parish of Goulthorpe, and county of Kent, about six miles from the Marine Station of the South-coast Railway, may be seen at Brandisfield, on FRIDAY, the 15th, to SATURDAY, the 24th inst., on application to the Architect, Mr. HENRY COLEMAN, and all persons desirous of contracting for the works must send in sealed Tenders, directed to T. RIDGWAY, Esq., B. Chestnut-street, Belgrave-square, London, on or before SATURDAY, MARCH 2nd, 1872. Neither the lowest nor any Tender will necessarily be accepted. The Contractor must be prepared to enter into the usual legal bond for the fulfilment of his contract. Quantities will be supplied. Dated February 7th, 1872.

TO BUILDERS AND CONTRACTORS.—Notice is hereby given, that the Woolwich Local Board of Health will meet at the Town-hall, Woolwich, on TUESDAY, the 20th FEBRUARY, 1872, at SEVEN O'CLOCK precisely, to receive TENDERS for the CONSTRUCTION of about 400 feet of CIRCULEAK, 18 IN. dia., 2 feet 8 inches in diameter, and other Works, at the North-west, Plans and specifications may be seen at the Office of the Local Board of Health, on and after WEDNESDAY, the 15th inst. The person whose Tender may be accepted will be required to indemnify for the due performance of the Contract. Tenders to be in duplicate for the whole of the works, to be endorsed "Tender for Drains," North-west," addressed to the Clerk of the Woolwich Local Board of Health, and delivered at the Town-hall, Woolwich, before SEVEN O'CLOCK p.m. on the day above mentioned. The Board do not bind themselves to accept either the lowest or any other Tender, by order of the Board. ANDREW C. REED, Clerk. Town-hall, Woolwich, February 7th, 1872.

TO BUILDERS.—The Guardians of the Poor of the Bridge Union will, at their Board meeting, to be held on the 25th instant, be prepared to receive TENDERS for the ERECTION of NEW WAREHOUSE, WAREHOUSE STABLE and COACH-HOUSE, together with New Wash-house, Hot-water Supply, and other Buildings to the Union Workhouse, at Bridge, near the tertiary, according to plans and specifications prepared for that purpose, by Mr. BENJAMIN ADKINS, Architect, Faversham.—The plans and specifications of the several works, to be seen at the Board-room, Union Workhouse, Bridge; and bills of quantities prepared on application to the architect, to whom application is also to be made for any further information respecting the works. The Tenders (prepared upon the form supplied, are to be sent in to the Clerk of the Board of Guardians, Bridge-street, Canterbury, on WEDNESDAY, the 28th day of FEBRUARY, before FOUR O'CLOCK in the afternoon. The Guardians do not bind themselves to accept the lowest or either of the Tenders, and the person whose Tender may be accepted, must be prepared with satisfactory securities for the due performance of the works if required by the Guardians.—By order of the Board. ALLEN FIELDING, Clerk. Canterbury, February 6, 1872.

EDMONTON UNION.—To BUILDERS AND OTHERS.—ALTERATIONS and ADDITIONS to the EDMONTON WORKHOUSE.—The Board of Guardians will be prepared, at a meeting to be held at the Board-room of the Union Workhouse at Edmonton, on the 29th day of FEBRUARY inst., to receive TENDERS for carrying out certain PROPOSED ALTERATIONS and ADDITIONS to their WORKHOUSE, at Edmonton. Sealed Tenders, addressed to "New Buildings, Edmonton Union," must be delivered to me, at my Office, at Edmonton, on or before the 24th day of FEBRUARY inst. The plans and specifications may be seen at the Office of the Clerk to the Guardians, Edmonton, and all information obtained at the Office of the Architect, Mr. T. L. KNIGHTLEY, 104, Cannon-street, City. Persons Tendering are to take out their own quantities, the Board not undertaking to be responsible for the same. The Board do not bind themselves to accept the lowest or any Tender. Security in the penal sum of 500*l.* will be required to be given by the builder whose Tender shall be accepted for the due performance of the contract, and the names and addresses of two responsible persons as securities must be given with the Tenders. No Tender delivered after the time stated will be opened.—By order of the Board. WILLIAM PELLEY, Clerk to the Guardians. Edmonton, February 1st, 1872.

TO DUST CONTRACTORS.—The Sewer TENDERS for the REMOVAL of DUST, ASHES, VETTERABLE, and HOUSE REFUSE in this Parish for the coming year, to be made by Tender No. 1 to consist of that part of the parish north of the North London Railway, and No. 2 of that part of the parish which lies south of that line. The Contractor to find a shoot, horse, carts, labour, tools, &c. Bonds will be required, with two sureties of 100*l.* each, for the performance of the contract. The Sewer authorities do not bind themselves to accept the lowest or any Tender. Tenders to be sent to me on or before the 16th instant. W. A. TOOTELL, Edgware, February 3, 1872.

WATER—CARTS.—Notice is hereby given, that the Board of Works for the St. Barnard's District are prepared to receive TENDERS for the SUPPLY and USE of a sufficient number of WATER-CARTS, with all necessary gear, together with horses and competent drivers, to well and efficiently water the roads and streets within the district, comprising the two parishes of St. Barnard and Christchurch, from the 1st day of March to the 31st day of October next, a period of eight months. The carts, horses, drivers, and men are to be available and in working order at all times, and the water is to be done to the satisfaction of the Board, and as directed by their respective officers. Tenders must be left at the Office of the Board not later than FOUR O'CLOCK p.m. on WEDNESDAY, the 14th of FEBRUARY instant, and persons Tendering should be in attendance at that time. The contractor will have to execute a contract, and to be bound in the penal sum of 250*l.* and he will have to bear the expense of the loss of his carts, horses, and drivers, if any of the Tenders obtained on application. Board-room, Emmanon-street, Edgware, S.E. Feb. 1st, 1872.

The Builder.

VOL. XXX.—No. 1515.

Conventionalism in Art.



PURSUING this subject,* we repeat the observation that the importance of the use of conventional treatment,—in imitative art especially,—has been much more recognised at some periods of art than at others. In regard to all the arts which may specially be classed as imitative,—painting and sculpture in all their branches,—conventionalism seems to have been generally most attended to in the earlier and middle portion of their history. A superficial view might incline us to assign this to accidental circumstances—to a want of technic perfection in the artist; but that this is not the sole explanation we may infer from the fact that the same sequence is to be traced in the history of arts not so directly imitative, or dependent on the skill of the delineator. The music of the earlier schools, for instance, of Palestrina, or Bach, even of Mozart, is for the most part highly conventional, suggesting not the remotest reference to nature in any way. It is only in the modern period that we have music written (unconnected with words) to illustrate special ideas. So with the drama, which is conventional in its early history among nearly all nations; what we now call the “domestic,” or realistic drama being a late production of modern civilisation. So with painting: it was certainly the case that Giotto was an inferior draughtsman to Raffaele and Titian, but there is evidence in the manner and treatment of his subjects, nevertheless, that, though he would, no doubt, have drawn more perfectly if he could, yet he was not contemplating realism as the end of his art; and that the idea, as distinguished from the execution, was usually uppermost in his mind. And a review of the history of any branch of art will, we believe, show (what it is perfectly natural to expect), that it is in the decadence of the art, when the great ideas which it had to express have had their day, or have lost their hold on men’s minds, that attention becomes directed (as a last resource) to mere bravura of execution, and careful realistic imitation of incidents quite subsidiary to the subject, such as dresses and furniture, becomes a serious object in painting, just as the same kind of realism of details comes to be regarded as the chief thing in the drama; just as piquancy and novelty of effect, and brilliancy of execution in music, take the place of the higher and more serious qualities which belonged to the art in an earlier period of its career.

Still we must not for a moment be supposed to be advocates for that kind of dilettantism in art which consists in supposing that the idea is everything and the execution nothing. A more

dangerous mistake can hardly be made either by artists or the public. But it is important to discriminate between what is essential in imitation and execution, and what is superfluous or absolutely hurtful to the effect of a work of art. Now, it is just on this point that the modern school of artists who were at first called (or called themselves) pre-Raffaelites fell into singular and very odd inconsistencies. They saw, and managed to make others see, that there was in many of the painters of the earlier Italian school an earnestness and depth of feeling wanting in the works of the later and more highly accomplished technical exccutants of the cinque-cento period. But they, or some of them at least, could not separate this from the shortcomings and deficiencies of the early painters, which they proceeded to reproduce, in some cases in a very absurd manner. Equally singular, in an opposite direction, has been their way of dealing with landscapes. Starting on the ground that “study of nature” was to be everything, they directed their efforts to a hard literal reproduction of minute detail (which, in fact, never could be reproduced in all its minuteness on canvases), scorning the previous school of landscape-painters as people who were content to represent “conventional foliage,” &c. Yet were some of these very scorers themselves admiring and painting at the same time conventional figures, conventional often in the bad sense of being unlike nature and impossible in their attitudes and construction. And to crown their inconsistency, this very school of realistic landscape-painters have chosen for their special object of worship—Turner; the painter who, of all others (of all men of genius, at least), played the most extraordinary transformations with nature, and, in fact, made nature merely a suggestor for his own peculiar creations in effect. Now, just see what a curious confusion of principle, or no principle, there is here. And all this results from ignoring the relation which exists between the materials we use in art—language and the object we have in view in using them. We may make landscape-painting merely an affair of topography and natural history, no doubt; but it was not so that Turner used it. He, as well as every imaginative painter who ever lived, used it as a form of poetry—as the means of creating and imparting an original feeling; his studies were merely the collection of materials to this end. What we want in landscape-painting as an art is ideal beauty of scene and effect; it is not the sticks in the hedge that interest us. In this respect it is curious to notice the interest and artistic beauty of some of the French contemporary landscape painters (Corot and Duprez in particular), whose trees are absolutely unrecognisable as of definite growth or species in many cases; yet are their landscapes full of poetry, of suggestiveness. On the other hand, if we turn to *figuro* pictures, the case is different in one sense. We use the human figure, here, as the medium of expression and feeling; and it is an object so far more mechanical and exact in its physical structure than a tree, that it is essential for the attainment of our purpose that it should be drawn in its main points of proportion and construction, precisely as the best examples are in nature, or the result is merely an expression of grotesqueness or malformation; and it is equally essential that the artist should be able to represent what he intends to represent; that he should be a sufficiently accomplished draughtsman to foreshorten a limb without danger of his intention being misunderstood or standing as a manifest failure. In these respects conventionalism cannot be allowed in this branch of the art: a fact of which some of those who were at first among the leaders of the modern school before referred to have indicated their conviction, by gradually adopting a more realistic style of figures and of delineation than that which, fifteen years ago,

startled the frequenters of our exhibition-rooms.* But it would be wrong to suppose that there can be no conventionalism in figure-painting, or none which can add to the force and interest of pictures of this class. We may conventionalise here, either by the method of treating the figure itself, or by the accessories and surroundings with which it is connected. How far this should be done will depend both on the method of execution employed, and on the subject of the work and its degree of relation to real life. The more our method of execution is capable of, in the way of exact imitation, the more may be safely attempted: we may come nearer to nature in an oil painting than could be attempted in fresco; for the failure of any such attempt by the latter process would be certain, from its want of *chiaroscuro* and of delicate gradation of colour. On the same principle mosaic would seem to demand a yet more conventional treatment than fresco, to avoid conveying the impression of an unsuccessful attempt at what the nature of the material will not allow of. But the subject and object of the work also go far in deciding the matter. If it is to be a painting of everyday life, especially life on its comic or humorous side, realism, to the greatest extent to which the material will carry him, must be the artist’s aim. But if we are painting what is far removed by its association and history from the commonplace of everyday life, or what we wish so to remove, our work will actually gain in effect and in power by being removed more or less from the semblance and actuality of life by the use of a conventional tone of colour, a conventional flatness of treatment, or whatever removes it from all attempt at realistic imitation, and thereby concentrates our thought and attention solely on the higher aim and feeling of the artist. To exemplify: we recently saw a portrait of a lady by a well-known French artist of remarkable technical skill, which was an absolute marvel of imitation, producing on the eye an illusion which even a very near inspection scarcely dissipated. There is a value, in its way, in this kind of technical skill; but compare this class of work with such a portrait as that of Herr Joachim, by Mr. Watts, and who can doubt which is the finer and more artistic achievement. The latter, in one sense, is purely a picture: it could not for a moment be considered illusory: the tone and the whole effect, the total abeyance in which all accessories are kept, are all conventional; but this very removal of the details which would contribute to *vraisemblance* eliminates also all the element of vulgarity which attaches to mere trickery of imitation, and raises it to the height almost of an imaginative work. Very charming instances, too, of true conventionalism in figure-painting have been given in some of the small pictures of Mr. Mason (whom we regret to have missed from the Academy walls), whose subtle low tones of colour, and thin, flat execution, contrived to throw an air of poetry and idealism over what, in coarser hands, would have been mere paintings of rustics. An additional interest attaching to this allowable conventionalism in painting is that thereby we see not merely nature (which we might see for ourselves without the artist’s intervention), but nature as seen by the artist’s own mind, which (in cases, at least, where the said artist has a “mind”) makes a picture a very different thing from a mere transcript of external facts. It is this putting forth of the artist’s individuality

* The works of that very remarkable artist, Mr. D. G. Rossetti, will present, whenever they shall be publicly exhibited, some striking instances of the adoption of this kind of false conventionalism (as we believe it to be), this ignoring of the true and natural conformation of the figure, in the search after new and intense forms of expression and idealism. They will furnish also instances of the degree in which works evincing real genius, and almost an inspiration in colour, may fail to satisfy the judgment through mere (if it would almost seem ostentatious) neglect of technical truth in drawing and construction. This may be a prosaic part of the artist’s work, but it is not one to be rashly slighted.

which gives much of the interest attaching to the works of the French landscape-painters, before alluded to. It is true that a list of really successful fresh transcripts from nature may be a delightful possession, but it is almost an open question whether that less-realistic landscape-painting which gives us the artist's own feeling and idiosyncrasy be not the source of higher pleasure. In figure pictures of a high class, there can, we think, be little question in the matter: if there be, we shall "question" away the title to honours of some of the greatest artists the world has ever seen.

Before quitting the subject of painting, it is to be observed also that there is an additional interest for the critic, in all works which are conventionalised on right principles, in the perception of the relation of the means to the end, of the manner in which the material employed by the artist is adapted, in its treatment, to its true capabilities. This is more especially apparent in what may be called the subsidiary branches of the art. In water-colour we feel more interest in the broadly washed-in foliage of Cox and De Wint, than in the minute stippling and touching of some popular artists of the present day; not only from the very strong individuality of taste and feeling evinced therein, but because we feel that in such works the peculiar capabilities of the material are regarded, and we feel an additional interest in seeing how much can be done without overstepping these bounds. So in the use of crayon, for instance: a crayon portrait attempting verisimilitude of colour and detail is almost always a vulgarity, coarse and unrefined in effect; a study in monochrome in the same material may be a fine and effective thing, all the more so because removed by the conventional tone of colour from realistic effect, and from all attempt at competition with nature. In etching, again, the peculiar treatment by which the points of line and shadow in a landscape are caught, and the lights left broad and untouched (so well exemplified in Whistler's admirable etchings on the Thames, where in some cases the water is represented by nothing but an untouched blank), has its own interest as illustrating the capability of the art. In water-colour or pencil, such a treatment would be called weak and bald, because those processes are capable of more, even in slight sketches; in etching the very restraint under which the sketched labours, the conventional manner in which he is forced to represent ordinary incidents of nature, become in themselves sources of interest.

Some remarks on the relation of our subject to sculpture and architecture, and the arts accessory thereto, we must defer to another number.

CHESTERFIELD AND ITS BLACK SPOTS.

The casual visitor to this town of the twisted spire, after satisfying a natural curiosity in viewing the steeple phenomenon from various points of advantage, will probably take a note of the cleanly appearance of the streets and roads. This favourable state is due in some degree to the elevated position of the town, resulting in suitable gradients to the streets, thus offering rapid passage to the rainfall, leaving the surface in a dry state soon after every shower; but most of the good result is due to the excellent material employed in the formation and surface work, the greater portion of which is macadamised in the usual mode. Some parts, however, are coated with an artificial asphalt of excellent material, equally economical and substantial.

Many of the causeways and paths are constructed of similar asphalt of somewhat finer texture, and although much of this work has been laid down fifteen and twenty years, it presents a firm foothold of thoroughly indurated and even surface. Altogether, it is very superior to the usual kind of slippery, uneven granite causeway pavements met with in mid-land towns, with the advantage of much greater economy.

The system of paths adopted by the local surveyor is one that may be studied with profit by many towns of larger pretensions than Chesterfield. The material is of the cheapest description: simply boiled gas-tar, mixed with furnace slag, broken and sifted to different sizes, laid down, and rolled in the usual manner.

Unhappily for this northern Derbyshire town, in the eyes of the sanitary reformer the sense of tidiness vanishes rapidly when he ventures to dissect beneath the outer surface, and probes the

inward parts. Hence it is our duty—unpleasant though it be, for much commendable work has been done,—to speak in sharp tones of condemnation upon certain of the sanitary arrangements, slovenly propensities, and dirty habits exhibited in sundry parts,—less, however, the fault of the inhabitants, who seem anxious and willing enough for better things, than the neglect of the responsible authority.

The ancient market and borough town of Chesterfield, now without Parliamentary representation, is very extensive: the parish comprises an area of upwards of 13,000 acres, divided into eight townships. The town proper, however, with which we have now to deal, is more constricted, the population approaches 12,000, and the area is rather more than 200 acres.

The present system of sewers, laid down a few years ago, appears to be good and uniform, whilst the ventilation of sewers is commendable. The gases of decomposition are diffused evenly throughout the system, without concentration at certain points, as is common in most towns wherever ventilation exists. The town is for the greater part of its periphery bordered by two streams, the Hyper and Rother, and into these waters the sewage flows from numerous outfalls.

The larger sewers terminate in a duplicate arrangement of tanks, the sewage passing through three partitions of filtering media, two being charged with broken stones and gravel, and the last one with charcoal, after the manner suggested in one of the Parliamentary Blue Books. The result of this scheme is to keep back the grosser and heavier parts of solid sewage, and 250 tumbler-loads of such refuse have been removed from the series of tanks in six months. Nevertheless, the sewage practically passes unaltered, and even unclarified, into the Rother, from which river a small town some two or three miles below stream has the misfortune to draw its water for domestic and manufacturing purposes, a proceeding which, we are pleased to learn, is about to be discontinued. Let us hope that the act will be in time; for, with an epidemic in Chesterfield,—not an unlikely event,—the consequences must speedily prove most serious to the partakers of water charged with effluvia of an infected town. At the time of our visit no nuisance appeared to arise from the face of the waters, for it was flood-time; yet we can well understand those deep mutterings proceeding from residents near to the stream-sides of foul odours and miasmatic vapours arising in the warm, moist evenings of summer, when the flow of water and its volume are reduced to a minimum.

The responsible authority will do well to be thinking of a more effectual method of dealing with their sewage, and then speedily act upon it, for the present system of passing it through a few feet of inert gravel is merely a delusion. The facilities of the neighbouring lands appear suitable, whilst a sewer constructed to skirt the two brooks will properly intercept all sewage from passing into them and connect the present scattered outfalls into one.

A perambulation through the old town reveals a sanitary state truly deplorable. Leading out from the Market-place,—the central part of the town,—are a number of courts, lanes, and yards, entirely upon the declivity of the hill, for the most part terminating with their lower ends at the break side.

We entered Brown's Yard. An open gutter runs upon one side just facing the houses, the bottom end is in a filthy condition, and the gully at its extremity and the adjacent space around contained much ordure and garbage. Fortunately the people of the cottage whose door is opposite this mess have the good sense to clean it away weekly, which is done by the barrow-load. Near the bottom of the yard is the joint-stock privy for accommodation of the residents at this end; its proximity is denoted by the usual effluvium, which was strong even upon a cold day. By the exercise of a little agility and skill we contrived to obtain a momentary view of its interior, which showed accumulated abominations on seat, walls, floor, and approaches; hence the practice of passing excremental matter into the open sewer. The rooms of those houses we entered are small, with low ceilings, a trifle over 6 ft. high, which must prove very uncomfortable at all times and dangerous during periods of pestilence, now looming in the front and not far distant. Half-way up the yard are two more privies doing duty to six houses: they were foul, loathsome places, but not so filthy as the first one, although quite unfit to enter, and have been so, the neighbours

say, for more than two years. The seats are broken, and covered with ordure.

A mother told us her child had fallen through into the seething mass beneath, "and was like to be smothered." So we should think! Towards the centre of the yard, and within a few feet of and mostly surrounded by poor dwellings, is a nest of privies with ashpits, numbering more than a dozen. All we could get at were filthy and abominable, and a disgrace to a country boasting of civilisation. The brute creation never tolerates such sights as we witnessed in this locality. The whole place about this nest was reeking with sewage that flowed over the sodden ground. The upper portion of this lane presents a more favourable aspect than the centre and the lower. Nevertheless, these central privies just referred to appear to be the only conveniences for the inhabitants at this end.

Wagon-yard, in Willen-lane, is another of the sights of Chesterfield. Here are twenty tenements or more in a commodious open court, but everywhere presenting a disgusting appearance, with ashes here, garbage there, and ordure everywhere, even to the very doors. The yard possesses a cluster of eight privies, of a type such as is not often met with. The entrance of the passage leading to these places is guarded by a cart-load or so of ashes and house refuse; over which it is essential to climb to obtain a view of this Augean stable. The whole interior presents one mass of excreta, whilst upon the seats and floors the mess measured from two to three inches thick, so we judged. The vile smells of the locality were indescribable,—in summer and warm weather they must be simply unbearable; and no one could tell us how long the place had been in this state, nor when cleaned, but it appears to be the normal condition of the neighbourhood, and as such is tolerated.

By way of comparison and encouragement, Nicholson's-square is a model of cleanliness, although cramped for breathing-space.

Again, Castle-yard is a contrast, filthy, foul, and abominable, refuse and garbage here and there, the open gutter much in want of the hose and jet, and ordure is visible in most directions.

In Bradshaw's-yard are six houses, and two privies, one of the latter quite unapproachable for human filth. The ashpit is full to the top, and the accumulation of ashes and garbage stretches yards away from it,—a rough measurement showed about half a dozen cartloads collected outside the pit. We tried to discover when this specimen was last cleaned, but no one could remember! Heaps of household refuse are scattered over the surface of the yard. One small grate is supposed to receive the fluids and slugs; but in practice most of these are thrown down in front of the doors. Complaints are rife of the abominations; but, whilst some people are willing to take a turn at a little grooming, others will not; and so things go from bad to worse, until stinking disease makes a sweep; and then the authorities may possibly step in with a hose and broom.

Daniel's-yard contains few houses, but much garbage and debris everywhere, whilst the slugs and sewage flow over the lower end of the district, which is saturated with it.

Ward's-yard contains a number of courts, for the most part furnished with filthy privies. Some of them cannot be approached with decency. The road leading to the lower parts of the yard, where most of the houses lie, is almost impassable for mire and sludge.

Commercial-yard is another example. Here is a foul, wet, and reeking, undrained large ashpit, with privies emptying into it. The whole has an area of about 50 square yards. The privies are inaccessible from the quantity of ordure lying about. A pound expended in draining this disgusting place would make things much pleasanter for both passing pedestrians and residents. Numerous other places, of much the same character as those described, were visited; others, again, were models of good arrangements. Some foul spots lie very close upon the municipal buildings, and we wondered the council never feel discomforted by the stealthy, steady smells that must at times find their way into the midst of its deliberations.

On the outskirts of the old town lies the long, straggling village of Brampton,—a somewhat extensive place; its population, including Calthorpe and other hamlets, is about 5,000 inhabitants. Here the roads are of a very different character to those in Chesterfield, distinguished from the very boundary line by mud and mire! Time did not permit much research hereabouts,

and we did not see more than a very small portion of the village: however, sufficient for the day, for we saw enough.

In clearance-place the house-cells were cess-pits, and, of course, abominable: such spots are the very foci of disease. In the Old Road the house-cells contained twelve inches of water, and the people complained of the smell proceeding from them.

Just about the boundary line between Chesterfield and Brampton, but rather, we believe, in the former, is West-row. Here the privies are foul and stinking (those attached to the houses in Brampton were very favourable examples of this kind of convenience), whilst the sewage flows to the rear of the premises, and lies in an elongated stagnant pool, bordered by the house-walls, soaking the foundation,—the whole a green seething mass, awaiting in anticipation of a harvest of epidemic; afterwards it may possibly be removed.

It would be well for the old and justly respected magistrato interested in property round about to remember that there is as much honour and renown obtainable in preventing offences against health and decency, in providing houses comfortable for the occupants, where the manly vigour of the thews and muscles of the country can be maintained in their prime, rather than be allowed the chance, nay, certainty, of incurring subtle complaints that break up the frame, ending in the workhouse and hospital, as in convicting of petty offences against the common law.

Chesterfield possesses natural advantages that ought not in the interest of the community to be any longer discarded by the local authority. With an excellent water supply, good sewers, plenty of ventilation, and generally ample space, with roads and causeways of the best, and, not least, every power in their capital bye-laws, it is a sad blot upon her escutcheon that such places as these we have described should be tolerated for an instant. Why not place the regulation of all such matters in the hands of the surveyor,—the proper person, and not continue a divided authority? The chief constable may be an able man in his way, but he has not the special training of a town surveyor.

With a threatened epidemic at her doors, let Chesterfield wako up; and with broom and hose in hand thoroughly cleanse her inmost parts. If members of the Local Board are owners of property of the kind we have endeavoured to depict, let them set an example such as will be followed by the whole town, and thus become what they should be, teachers and leaders of the people.

Let not the public any longer await the coming of the sanitary inspector, nor the sanitary inspector await the coming of the public, but let each seek out the other; for in this waiting, we suspect, lies part of the secret of the present disgraceful aspect. If this be done, our warning will not have been in vain; and our next visit to Chesterfield may be pleasanter and our duty more agreeable.

THE TEMPLE OF DIANA OF THE EPHESIANS.*

LET us now turn back to the dimensions of Pliny's plan, 220 : 425. This length is within such a difference of double the breadth as to present on first view a probability that it falls short of exactness in consequence of representing the side of a double square that has been extended by a margin not proportionately to unequal sides, but equally all round. The single dimension that can be in question is easily calculated (425 - π = 220 - π × 2). The deduction of 15 ft. from both length and breadth would give us a plan of a double square 205 : 410, with a margin of 7.5 ft. all round. The first question that has now a claim to be considered is, does this double square mark the centre lines of a colonnade having a double number of columniations on flank,—that is, with one less column than twice the number on the front, as cols. 8 : 15, giving intercolumns 7 : 14.

On this assumption, the deduced margin 7.5 would stand as the measurement from centre of column to edge of top step, including that is semi-base,—or semi-plinth if such existed, and any margin between plinth and edge of step; this may have been scarcely any, as at Priene, or considerable, as at Teos,—viz., 1.280.

The semi-plinth of the temple at Miletus, as

given by Texier, is 4.45, to compare with (7.5 + 2 - π) 3.75, say 8 in. or 9 in. less. This difference would be easily disposed of if the Ephesian columns were without plinths, and their bases also somewhat smaller.

Pursuing the hypothesis, we have 205 ft. divisible among the columniations of the front :
 1. As Octastyle, 205 ÷ 7 = 29.3 for columniation.
 2. Decastyle „ +9 = 22.8 „
 3. Dodecastyle „ +11 = 18.7 „

It thus appears that a decastyle front would imply epistylia of 22.80, which we can hardly regard as more possible than the 29.20 of the octastyle; and it is only by adopting the hold, not to say wild, assumption that the temple had twelve columns on the front and twenty-three on flank that we obtain a dimension that is more moderately near, but still in excess of the limits that seem to be laid down by the exemplar temples of Athens and Miletus.

A dodecastyle temple, with 23 columns on flank, and a double colonnade all round, gives 124 columns, as against the 127 of Pliny; a triple row of columns on one front only would add 8 more, making 132; the same at the other end would raise the number to 140.

No regular arrangement of external columns will account for the odd number of Pliny's total; a central odd one is easily accommodated in the naos, and this consideration is sufficient to authorise,—to oblige us,—to include the sum of the interior columns in the 127. The enormous span of the naos, take what theory of restoration we please, would require a number of columns too great to come into the total as quoted; so that in this case, at any rate, there is no opportunity to apply, or no temptation to strain, Pliny's words, if to strain it be, as intended, to comprise all the columns in the temple. But a dodecastyle temple is so exceptional that it seems,—let it be plainly said,—it is impossible that it should have escaped record, among the numerous notices, had the Ephesian temple been really an example; the peculiarity must have been specified as its most wonderful characteristic. In this manner we are turned back on all hands from regarding our reduced oblong as that of the line of column centres, and must seek for some other interior proportion. The utmost probability up to this point is, therefore, that the equal margin of 7.5 represents the breadth of a certain number of steps ascending to an intermediate platform, which had the proportion 1 : 2. Five steps of 1.5 each in tread would make up the dimension; the platform itself would make a sixth step, leaving four more to be accounted for in the proper steps of the temple; that is, three steps and the stylobate, which is consistent enough.

If we pause to consider for a moment what an enormous mass of materials is implied in foundations upon marshy ground of a platform of the dimension given by Pliny, we may excuse the exaggerated phrases of Philo, and understand the reasonableness with which Herodotus took the work as at least a term of comparison with Egyptian magnitudes. Even in the case of the temple of Apollo Smintheus,—the archives of the Dilettanti Society must be again referred to,—where there was no lack of firmness in the foundation, the substructions are of extraordinary mass and solidity. The cubic contents of a basement of ten steps in ascent is of course an enormous addition of load.

The hypothesis, therefore, as it now presents itself, and demands to be worked out to its conviction or justification is this, that the Plinian oblong of 220 : 425, reduced by equal margins of five treads of steps (1.5 each) on all sides to a platform of a double square (1 : 2) 205 : 410 ft., supported the temple proper, which was again set upon a podium of four steps, including stylobate.

Deduct, then, the joint breadth of eight treads (= 12 ft.) on either side, = 24 ft., from the full Plinian breadth, and we have the remainder, 196 ft., divisible between breadth of top step of temple and joint breadths of the free platform on either side.

For the breadth of the step, we are in possession of certain probable limits; we are bound in the first instance to the Vitruvian averment that the front was octastyle; confirmed also by some medals, though the architectural testimony of medals is little to be relied on. The Plinian height of the column, 60 ft., limits the diameter of the column to between 6 ft. and 7 ft., and so furnishes at least a minimum for the diameter of a plinth. We should then have further to consider that it is unsafe to assume a length of architrave stone, that is a columniation,

at all in excess of, or even equal to, that at Miletus, 17.400, in a temple where the architect seems indeed from the greater height of his column to have aimed at surpassing—at trumping—the Ephesian marvel. But I am, in fact, enabled to avail myself here of one direct measurement, and of one only, that has been received from Mr. Wood, a columniation of 17 ft. 0½ in. fully verified by measurement of single and average of nine continuous columniations.

To employ this dimension in conjunction with the ancient, we must reduce it to terms of the same foot that Pliny quotes, and that no doubt was the Greek foot. Taking Mr. Penrose's equivalent 1.0134, we obtain 17.270 as equal to 17 ft. 0½ in. English. We have now,—

Columniations of octastyle portico, 17.270	
× 7 =	120.890
Breadth of two semi-plinths of Miletus order	9.110
Breadth of top step	130.000
Joint breadth of treads of steps on either side (1.5 × 8)	9.000
Breadth of lowest step	139.000
Joint breadth of platform steps (1.5 × 10)	15.000
Remainder for free platform = 33 ft. on either side	66.000
Full Plinian breadth	220.000

For a hypothetical length of the temple, the first claims are in favour of either sixteen or fifteen columns; that is, of a double number either of columns in the first case, or else of columniations in the second, as compared with the front.

On the assumption of sixteen columns, we have fifteen columniations:—

17.270 × 15 =	259.05
(Miletus) semi-plinth × 2 =	9.11
Length of temple on top step...	268.16
Steps	9.00
Length of temple on lowest step	277.16
Platform steps	15.00
	292.16
Remainder for platform, 66.42 ft. at either end (66.42 × 2)	132.84
	425.00

By this scheme of distribution, the oblong of centre lines of columns is proportioned as 7.15. The numbers of columns on front and flank being (8 : 16), 1 : 2, and the proportion of length to breadth on lowest step,—breadth, 139 : 277.160 length,—comes out so nearly 1 : 2 (139 + 2 = 278. Cf. 277.160), as to be virtually exact, and scarcely to need the correction for which there is full opportunity in estimate of plinth and steps. Thus, if the steps are taken as 8/16, or 1/36 for each tread of temple steps instead of 1/50, the result is absolutely precise. This change would give an enhanced dimension of 0.84 to platform remainder, both on length and breadth, making the exact proportion of 1 : 2,—

132.84	66.00
84	84
133.68	66.84

: 2 : 1

or probably it may be better to make the alteration in the plinth as 8.27.

The preciseness of these results, bewildering even to the propounder, may well seem suspicious to others. Too often, in such cases, we find that the seeming verification is merely fictitious,—result of every troublesome difference brought out by a backward calculation, being thrown into a dimension of which the arbitrariness escapes, perhaps, even the calculator's attention. But here quoted dimensions and stringent proportion allow no play except in a trifling difference of a semi-plinth.

With this result we may, perhaps, be so far satisfied; we have now to consider how to dispose the large number of 127 columns assigned by Pliny to the building. A dipteral scheme, as authorised by Vitruvius,—double row all round,—provides only for 80. If we treble the row at either end, as in the Olympium, and at the pronaos place 2 *in antis*, we raise the number to 90, and leave 37 for the interior. Here we are left to conjecture, unless so far as controlled and to that extent guided by certain limiting necessities, that do not help us very far. Thus, as the naos walls would range with the third columns of fronts, the interior width could scarcely equal the sum of the three intermediate columniations,—17 × 3 = 51,—say, at the very utmost, 50 ft. Following our only applicable precedent, the Parthenon, we will assume that the naos had a transverse row of columns at the

* See p. 103, ante.

extreme end, and two lateral rows, and of much smaller diameters than the exterior columns. It is in the transverse row that we have an obvious opportunity of disposing Pliny's odd column as central in a row of three, of five, or of seven. A row of five, as in the Parthenon, comes out as the most probable: three are manifestly insufficient, and seven would be unendurably crowded. The given width is then divisible between four columns, two diameter of column, and an ambulatory on either side, that would require to be wider than an inter-column: were it assumed to be of the same width, the divisor would be six columns, less one diameter. Let the dimension for this diameter be considered as thrown into the ambulatories; then $50 \div 6 = 8.33$ for columnation, which is consistent enough. That of the Parthenon naos is 8.67 or 7.50 . But to allow due width for ambulatories, take columnations at one-seventh, which leaves eleven for semidiameter and interval to walls. We have then thirty-two columns left to be disposed in opposite rows of sixteen, in a position that may be thought suitable for the enrichment of *calata*, along with the five at the end. As Pliny only mentions thirty-six so ornamented, we should have to assume that the central one was otherwise treated, or play tricks with the text ourselves, and read, "*et una a Scopis*,"—and a thirty-seventh by Scopas. At Bassa, however, a column in this position had certainly a peculiar treatment. Reckoning intervals to walls, the colonnades would extend to eighteen columnations, which are somewhat less ($18 \times 7 \text{ ft.} = 126$) than the eight external columnations with which they range ($17 \times 8 = 136 \text{ ft.}$);—to say nothing, however, of the improbability of but a single apartment, the proportion of naos so brought out,—2 : 5,—as an unusually long proportion, and the central avenue still more so; but it is enough, and only intended to show that the thirty-seven columns might, one way or another, easily find place.

There is another position assignable for the thirty-two columns *calata*, that in itself is a far more plausible alternative, and would leave free the distribution of the interior into more apartments than one. The inner row of columns immediately surrounding the cella will be found to number thirty-two exactly,—viz., six at either end and ten intermediate at the sides,— $16 \times 2 = 32$. I should conjecture that this range was elevated on at least one step, as in the Temple of Jupiter Olympius, where the inner range had a continuous plinth forming a step,—bases varied, of greater relative projection,—and diameter reduced. Whether in this temple the inner step was retained along the second or the third line in front is not stated, and does not appear, but I rather suspect, in variance with my conjecture here, along the second.

The height of the column is given by Pliny as 60 ft. Vitruvius says that the original Ionic columns of the Temple of Diana were eight diameters high,—a proportion which was changed afterwards,—whether in reconstruction of that temple or elsewhere does not appear,—to nine diameters.

There is some uncertainty of course whether the 60 ft. is an exact dimension or nearest round number, and also whether it includes plinth. Our only means at present of verifying this height is by comparing it for symmetry with spacing of the columns. It appears to coincide with the extent on plan of three columnations and a diameter; that is to say, with the space that includes the lower diameters of four columns and the three inter-columns, $17.270 \times 3 = 51.810 + 8.190$. This estimate gives 8.190 as remainder to answer either lower diameter of column, breadth of plinth, or perhaps breadth of abacus or spread of volutes. By previous calculations it will be recollected the plinth came out as 8.270. Sixty Greek feet divided by nine gives a diameter 6.670, equal to 6 ft. 9 in. English, for diameter of column, and leaving 1 ft. 6 in. for difference of plinth or projection on either side of about 94 in.

We shall do well to compare these results as to the Ephesian temple with the proportionate distribution of the temple nearest to it in scale of which we are in possession of any considerable particulars.

The decastyle temple of Jupiter Olympius at Athens had twenty columns on flank, giving an oblong of centre lines of columns proportioned as 9 : 19; the dimensions on the top step are 171.16 : 354.20, which do not compare in any definite proportion of low numbers; the additional margin equal on all sides that would be required

to bring this oblong to a double square ($354.20 - x = 171.16 - x \times 2$) (1 : 2) is 5.94, which would easily be appropriated in trends of steps; the corresponding dimensions come out in the Ephesian calculation as 4.50; the two trends of the Parthenon measure 4.974, or 1 ft. less. The dimensions of the plan on the lowest step would then be 183.01 : 366.08.

The plan of the peribolus, thickness of wall included, is given as 463.49 : 680.875, which manifestly points to a proportion of 2 : 3. The equation $(680.875 - x \times 2 = 463.49 - x \times 3)$ brings out 28.62 as the required reduction of each dimension, or 14.31 on either side. Deduct wall thickness, as given, 4.85, and we have an inner margin of 9.46, nearly 10 ft., between the inner face of the wall and the lines of the oblong, proportioned as 2 : 3. The absolute dimensions of this come out as 652.255 : 434.870.

That this inner line was in some way marked architecturally I do not doubt; but how marked I do not, in the absence of any remains, care to conjecture. If we deduct the length and breadth of the plan of the temple extended to the lowest step from this reduced dimension of the peribolus, we obtain 143.087 : 125.91 for breadth of platform on front and flank of temple. If we make the same calculated deductions (5.94×14.31 on either side) from Revett's measurements of the platform (164.30 : 146.16), we obtain 144.04 : 125.90 proportioned within a remote fraction as 7 : 8.

All these proportional regulations, it will be seen, correspond with others that have been conjecturally deduced,—but under stringent rule,—at Ephesus. The position, therefore, that has been assumed for the Ephesian temple upon its vast and solid platform has much analogy to that of the Athenian within its peribolus; in either case the definitely-proportioned plan of the proper temple is placed symmetrically within an outer quadrangle, also definitely proportioned, and of which the equal end margins have definite proportion of low numbers to the equal side margins.

The double-square plan of the Athenian temple as lying centrally within a peribolus proportioned as 2 : 3, has lateral breadth of platform proportioned to front as 7 : 8.

The Ephesian plan, also a double-square, lies symmetrically within a still larger double square, and its lateral and end margins of the platform are proportioned as 1 : 2.

To this broad and solid sub-basement I now recognise a direct allusion in the bymn of Callimachus where ascribing the original dedication of Ephesian Diana to the Amazons, he says that "at a later time a broad basement was built about the image."

Κτίσι δὲ τοῦ περιπέριτα ἑστῆσι πύργῳ
 Σιμῶθου
 Δωρῶν.—Callim. in Dian., 218.

On reviewing the results of our consecutive analysis with full consciousness of loyalty to data and accepted premises and processes, it is not easy to suppress the apprehension that they are even too complete and too plausibly coherent for it to be likely that they can be quite correct. Here they stand, however, in good time, and challenge examination with fullest confidence of approval of at least good faith. Having advanced so far, it is vexatious not to be able to proceed to study the symmetries of the elevation as completed by entablature and pediment: we might do so on admitted responsibility to the theory of Greek architecture alone,—alone, for beyond the recorded height and measured spacing of the columns, we have not another dimension to assist us. But the best evidence of all may be now forthcoming any day from the ruins themselves, and theory has already committed itself with sufficient temerity to have to await such demonstration of where it has gone wrong and how, with quite as much of anxiety as of archaeological curiosity and scientific interest.

W. WATKISS LLOYD.

THE FORTHCOMING BILL FOR REGULATING MINES.

THERE is reason to believe that the Act for the regulation of coal mines will be one of the first administrative measures of the present session. Considering the great importance of the subject, not only on account of what legislation may effect, but even more on the ground of the anxious attention directed to the proposed provisions by a large body of industrial persons; and the sentiments that

were pretty freely expressed, when the Bill was abandoned, with reference to the postponement of practical administrative measures to the discussion of vast organic revolutions, we think that we shall be doing good service to our readers in bringing under their notice the chief provisions of the proposed measure, in so far as we may be justified in anticipating them from the state in which the Bill of last year stood over as amended in Committee.

The preamble simply states that it is expedient to consolidate and amend the law relating to the regulation and inspection of coal-mines. This is an under-statement of the case, as it is not so much the regulation and inspection as the practical working which it is sought to amend; but the chief use of a preamble seems to be to commence by saying as little as possible.

The new Act, to be cited as the "Coal Mines Regulation Act," will come into operation on January 1st, 1873. The terms used are interpreted with comprehensive strictness, the term mine including every shaft in the course of being sunk, and every level and inclined plane in the course of being driven, for commencing or opening any mine, or for searching for or proving minerals; as well as all works below and above ground (who spare our readers the legal phraseology) adjacent to a mine. Owner, agent, Secretary of State, and summary jurisdiction Acts are severally defined. The Act is to apply to mines of coal, and of iron stone of the coal measures worked in connexion with coal, or with any disused or exhausted mine. The addition moved to clause 3, to the effect that it should not include clay-pits, seems to point out that it is not stated with sufficient distinctness that coal-mines alone come within the purview of the measure.

The first series or group of enactments in the Bill are those which refer to the employment of women, young persons, or children, in mines. From the commencement of the operation of the Act, female labour underground is entirely prohibited. No child under ten years of age is to be employed underground. Boys between ten and thirteen years old may be employed for not more than three days in one week, no day to exceed twelve hours. From thirteen to sixteen years of age the maximum time that may be spent underground is fifty-six hours in any one week. Mr. Elliot wishes to fix twelve, instead of thirteen years as the age at which this second rate of time should commence, and to extend the hours of employment to 120 per fortnight. Mr. A. Brown, on the other hand, wishes to reduce the hours of labour to fifty-eight per week. The time is to be calculated from the moment of leaving the bank-head to returning to the same. Twelve hours are to elapse between each period of employment; and intervals of one hour in five, or one hour and a half in ten, are to be allowed for meals.

Every boy between the ages of ten and thirteen is to attend school for ten hours per week, exclusive of Sunday attendance, or of attendance before eight in the morning or after six in the evening, unless prevented by sickness, by customary holidays, or by the fact of there being no school within a mile from his home. The owner or agent of the mine, the parent of the boy, and the immediate employer of the boy are each made responsible for his attendance or schooling. It is not stated whether all may be visited with penalties for one offence. Power is given to the paymaster of the boy to withhold 2s. per week, on the request of the schoolmaster, from the boy's wages, and to pay that sum to the former for schooling.

For the regulation of the employment of women and young persons above-ground, the provisions of the Workshop Regulation Act of 1867 are to be applicable. Registers of the boys employed are to be kept, and certificates of the school attendance are to be obtained.

The care of engines and winding apparatus is in no case to be entrusted to a female, or to a person under eighteen years of age, if steam power is employed, or under fifteen if animal power is used.

With regard to the payment of wages, three clauses are introduced by way of barrier against the evils of the truck system. An additional clause has been suggested by Mr. Pratt. With regard to this very important subject it is extremely desirable that there should be no patchwork. It appears, in our judgment to be absolutely necessary that the object which legislation has in view should, in the first instance, be defined, and then that such language should be applied as the framers of the Bill, properly

by Counsel, maturely approve, in order to express his intention. To have a clause from the author, and another from another, or to have the language of the original Bill patched and altered to include something more or something less, is sure to lead to confusion, and probably to litigation. The first clause, translated into English, provides that wages shall not be paid at a beer-shop or public-house; a provision as to the propriety of which all true friends of the miner will heartily concur. The second clause provides that all wages shall be paid in money at a proper pay-office. The third is to the effect that no deductions shall be made from wages for the cost of timber, or any other expense, in cropping the roof. All that we have to say as to these clauses is, that they should be plainly and intelligibly expressed, in language as to the meaning of which neither men nor masters can make any mistake. As they stand, the attempt to give exhaustive legal precision causes ambiguity in one place and surplusage in another. Mr. Pratt's addition is to the effect that no deduction shall be made from wages for any purpose whatever, except for certain specified items, if only set forth in the printed rules of the mine.

These items are to be confined to fines levied under the rules of hiring in use, cost of lamps, oil, candles, powder, tools, and stores, supplied, at the mine, to the miners, rent or fuel payable to the owners of the mines, and payments to sick clubs, schools, or similar purposes. Duly digested, this clause will prove a most important addition to the preceding protective enactments.

There should, we suggest, be added a fourth clause, to the effect that the payment of wages should be made weekly, and on the Friday. The advantage to the workmen of their wages being so enabled to attend the Saturday morning's market, is very great. Less to the masters there is none; and personal experience leads us to the belief that the loss of time incurred by drinking on the Monday is thus reduced to a remarkable degree.

Clauses follow to provide for the measurement of piece-work in mines. Mr. Pease, in each case where they occur, tries to strike out the words, "measuring or gauging," so as to leave the scales as the only criterion of price. This we think is an error, especially as the cost of weighing is put upon the men. The weight should not be paid by the men, but by a percentage on the coal. Inspection of weights and measures is provided for; and the manner in which right intentions, when they take the form of moving amendments in committees, tend to introduce anomalies or absurdities into Acts of Parliament, is exemplified by the amendment of Mr. Lancaster, to the effect that "the weight to be used shall be the pound avoirdupois, according to the imperial standard, without any reference to the contract per ton between the owner and the person employed." Fancy weighing the 800 or 900 tons that a mine "gets" in the year in pounds avoirdupois! What Mr. Lancaster means, no doubt, is, that a ton should be a ton, consisting of 2,240 standard pounds, and not of any other number, as in the case of a ton of gunpowder, which contains only a thousand pounds. This is a proper object, but it might be explained in proper terms.

We now come to a different subject. Clause 18 provides that it shall be unlawful to work any coal-mine that has not at least two shafts or outlets. It specifies that those shafts should be at least 10 ft. asunder. Sir D. Weddellburn proposes yards instead of feet. In the case of such terrific accidents as those which are evidently contemplated by this clause, we must ask of what avail such a frail and narrow barrier of what the Bill calls natural strata would be? 50 ft. would seem to be the least distance that should be specified, and in deep mines the space should be proportionably increased. The idea is to give the means of saving human life in certain cases, at a heavy precautionary cost imposed on the owners of the mine. We are far from contravening the propriety of the regulation. But, if this cost is to be enforced, let it be incurred so as certainly to effect its purpose. What would be the security of a pair of shafts, 3,000 ft. deep and 10 ft. apart? All agreements that go to prevent the provision of a second shaft are made illegal by the Act. In case of mining by way of searching for or proving minerals, or when the proved quantity of minerals is insufficient to defray the cost of a second shaft, the Secretary of State may grant an exemption, on the condition that not more than twenty persons are to be employed below ground at the same time.

General regulations follow. First, adequate ventilation is to be provided. Unused parts of the mine are to be fenced off. Why not say walled off? In approaching apprehended accumulations of water the working is not to exceed 8 ft. in width, and borholes are to be kept 5 ft. in advance. All underground inclined planes are to be furnished with proper lay-bies or manholes. The top of every shaft and all entrances to a shaft from the side or bottom are to be securely fenced. All shafts where the natural strata are not safe are to be securely lined or cased. Every working pit exceeding 50 yards in depth is to be provided with some means of signalling to the surface. A cover overhead is to be used when raising or lowering persons in a working shaft. This clause does not state what we conceive it to mean. A cover "overhead" is no protection to persons descending. What they require is a cover to the skip in which they are swung, which ought to be adequately strong, to throw off a stone falling down the shaft. No single linked chain is to be used in shafts, except for the short coupling chains attaching the cage or skip. Horns or flanges are to be attached to the drum of the winding engines; and an adequate break, and an indicator to show the position of the skip in the shaft, are made requisite. Fly-wheels and exposed portions of machinery are to be fenced, and every steam-boiler is to be supplied with steam-gauge, water-gauge, and safety-valve. Obvious as these precautions are, and important for the interest of the owners, we have no doubt that it is necessary to make them imperative by law. Lord Elcho suggests an inspection and report on all machinery and works once in twenty-four hours. This military notion,—admirable in its proper place,—would, we apprehend, produce nothing but a formalisation of negligence, and probably a false sense of security, among miners. Had Lord Elcho, said every six weeks, instead of every twenty-four hours, there would have been something practised in the suggestion.

The next group of clauses refers to the provisions against the fire-damp. Where an accumulation of explosive gas "is likely," no light is to be used but a safety-lamp. When these implements are used, they are to be previously examined and securely locked. In every mine where explosive gas is known to be produced, no powder is to be used for blasting or getting coal or other materials, except where it is taken into the mine in cartridges, and the place where the shot is to be fired is first examined and found to be safe. This clause should, we think, be more stringent, but it is one that demands very careful consideration. In fiery mines it should be made penal to introduce gunpowder on any pretext whatever, or to introduce candles, lucifers, tobacco, or any light but a locked safety-lamp. It is difficult to see what security is supposed to be attained by the use of cartridges. As preventing scattering powder by careless use is all very well. But the danger attending the use of powder in a fiery mine is from the explosion, not from the powder itself; and that is as violent from a cartridge as from a tamped hole. Lastly, no iron tamping-rods or iron pricklers are to be used. Penalties are annexed to the neglect or contravention of these regulations on the part of the workmen. This is a very necessary clause; but there is no provision for inspection to discover whether such offences occur, without which, stringently enforced, the prohibition will be a mere dead letter.

Clauses follow to provide for arbitration between the owners or agents of mines and the inspectors. The powers and qualification of the latter are defined. Maps or plans are to be accurately kept, showing the workings up to within six months of their date; and are to be produced to the inspectors. A map, on a scale of 6 in. to the mile, is to be sent to the Secretary of State by the owner of any mine that is abandoned or discontinued, within six months of such stoppage. These are valuable provisions. Classified returns of the persons employed are to be annually made to the Secretary of State by the owners of mines, the details of which are, however, to be kept private. Inspectors are to make annual reports, as at present. Provision is then made as to coroners' inquests. Penalties are annexed to offences against the Act of sums not exceeding 20l., for each offence on the part of an owner or agent, and 2l. for any other person; with an addition of 1l. per diem as long as the offence continues to be committed. Imprisonment with or without hard labour, for a period of three months, is incurred for wilful neglect,

endangering life or limb; two justices of the peace, or any stipendiary magistrate, or officer authorised by law forming a court of summary jurisdiction. Some technical clauses follow, and the Acts 5 & 6 Victoria, c. 99; 23 & 24 Victoria, c. 151; and 25 & 26 Victoria, c. 79, are repealed by the present Bill.

Such is the main outline, and such are the principal features of the Bill brought in by Mr. Secretary Bruce and Mr. Shaw Lefevre as amended in committee. It has very much to recommend it. It shows, with all our recent legislation, the evil of tinkering. That when a Bill has been settled in Committee it should be put into good intelligible English by one competent man, is a matter so obviously proper that our neglect of such a proceeding is sheer barbarism. That remark, however, is not special to this Bill. Some of the clauses are inspired by a spirit of fairness that no other Government than that of this country would dream of admitting for a moment. In the matters left for arbitration, for example, the Secretary of State is put on all fours with the mine owners. Whoever may complain of this, it is certainly not the latter. The annexation of penalties to those acts by which a man may injure not only himself but his neighbours, is a matter the obvious propriety of which will admit of no serious question. It is unfortunate that it should be necessary thus to treat grown men as children, but that that necessity there is no doubt. We know that what has already been done in the way of regulation and inspection has materially diminished the death-rate on coal; the numbers of fatal accidents bearing no proportion to their increase to the constantly augmenting yield of our collieries. From year to year the comparison may at times be misleading, but over a series of years it is reassuring.

In 1870 the fatal accidents were fewer by twenty-four, and the deaths in them fewer by 125 than in 1869; the yield of coal having risen in 1870 to 112,875,725 tons, and the number of male persons employed to 350,894, of whom 282,473 are returned as miners. We have recently had occasion to refer to the position of the spring of our manufacturing industry. To stop the enormous waste of coal which, especially in domestic use, is constantly going on in this country, appears to be a matter beyond the reach of legislative wisdom. But to insure human life from the effects of negligence; to protect the miner not only from any who might seek to oppress him from covetousness, but still more from his own carelessness and improvidence; to drive from our mines the shame of female employment; to save the precious hours given to childhood for the training of the future man, moral, physical, and mental, from being entirely devoted to the earning of a few miserable pence,—these are objects in which all good men must agree, and as to the best mode of attaining which there ought to be no very serious dispute.

We lay claim to no knowledge of the intentions of the Government further than such as may be derived from a survey of the actual state of the question. In a matter which is, or ought to be, neither of a political nor of a party character, we should have conceived that the best results would have been obtained by printing and circulating the heads of the proposed Bill before the opening of the session. To this condition of common sense we have not yet attained. But we invite all those of our readers who are interested in the matter, and more especially those of them who have seats in the House of Commons, to master the sketch we have endeavoured to trace,—to keep a sharp eye on such main provisions as those which provide for the proper method of payment,—for the sexes and ages of the persons employed,—for the tuition of the young,—for the ventilation and non-explosion of the mines, especially such as are known to be fiery,—and for the provision of a proper permanent survey of our proved mineral property, accessible to the administration of the country. Returns of the coal raised may, with great advantage, be required from the owners of mines. Clause 42 requires to be made more definite in requiring this. We hope that little private crochets such as those about not measuring or gauging work, or weighing by the pound avoirdupois, will not be allowed to interfere with the passing of a practical Bill. We trust that some of the earliest hours of the session of 1872 may be spared from that kind of fight which is called Parliamentary, for the more worthy struggle to avert some of the most pressing evils that affect the lot of the mines.

We understand that it is the intention of

Government to bring forward a measure dealing with the whole question of master and workman, a question with which the Coal Regulation Bill to some extent grapples. We think that legislation on the subject, if considered in the spirit of fairness and liberality to both sides, which characterises the sketch we have given, will discuss, and will obtain general and impartial support. Let us once more raise our voice in favour of the rendering normal the Friday night's pay. This simple regulation would be tantamount, in itself, to the addition of a considerable per centage to the money value of the wages actually received. And so far as our own experience goes, it would have a yet more sensible effect in the elimination of the Monday drinking, which is a natural and customary outcome of the Saturday night's pay-tale.

Since the above remarks were in the hands of the printer, Mr. Secretary Bruce has brought in the Government Bill. The chief modifications of the scheme which we have analysed are the following:—The enactments as to payment of wages are removed from the Bill, with a view to being dealt with in a more general measure. The new Act is to extend to stratified iron mines, slate mines, and mines of fire-clay. The day's work of children under thirteen years old is reduced from twelve hours to ten, and six half days may be worked instead of three whole days in a week. The representations of the workmen as to the evil of making weighing, instead of measuring, imperative, have been so far attended to that it is proposed to refer the matter, in any disputed case, to the decision of the Secretary of State, upon whom the provisions of the measure throw a responsibility, and confer a power, new to our legislation, foreign to our institutions, and calculated to lead to great confusion and discontent. The Bill makes a giant step towards the centralisation of executive power in the hands of the administration of the day, to which the attention of members of Parliament should be seriously given. As to double shafts, the point now urged is that there should be a sufficient communication between them. Safety is aimed at by the appointment of registered managers, subject to examination, and required to hold a certificate, who may be suspended or deprived, after due inquiry, in case of misconduct. An arrangement is proposed to allow of periodical inspection of mines at the instance, and under the direction, of the miners themselves. It is proposed to throw the responsibility of the propping and care of the roof of the mine on the owners and managers, and distinct intention is expressed to make the persons most deeply interested take efficient measures for the protection of their own life and property, instead of relying upon an activity on the part of the Government inspectors, which is altogether beyond the province of their office. While it is felt that due attention must be given to the discussion of these two details, favourable acceptance of the Bill was expressed by the professional members of the House.

CATHEDRAL RESTORATIONS.

Exeter.—A large and influential meeting of the inhabitants of the diocese has been held at Exeter, in furtherance of the restoration of the cathedral in that city. The work has been in progress in the interior for some considerable time, and the restoration of the choir will cost 24,000*l.* (about 18,000*l.* of which have already been obtained), whilst the nave will cost 10,000*l.* more; and the removal of some buildings which at present obstruct the view of the south side will cost 10,000*l.* or 15,000*l.* additional. The Bishop of Exeter earnestly commended the work to the meeting, and moved that it was most desirable to complete what was already begun. The motion was carried amid loud applause. On the motion of the High Sheriff, it was resolved that as the exterior of the cathedral was much concealed from public view by several incongruous buildings, application should be made to the dean and chapter and the Ecclesiastical Commissioners to consent to the removal, and to the laying out of the surrounding grounds in an appropriate manner. Chancellor Harrington, who has subscribed 5,000*l.* towards the restoration and re-seated the nave, as well as carried out a deal of similar work at his own private cost, expressed his willingness to give up his house.

Worcester.—The work of restoration on Worcester Cathedral is progressing satisfactorily, and an important portion of it has just been

completed. Sufficient money has been raised in the diocese for fully carrying out the designs, and it is expected that the restoration will be completed in a little more than a year from the present time. It is stated that the first artists of this country, and some "talented French refugees," have been engaged of late on the restoration of the choir, from designs by Mr. Gilbert Scott.

Bristol.—Bishop Ellicott, in his annual address to the clergy of his diocese, which has just been issued, observes:—"I regret deeply to say that I cannot report favourably of the advance of the work in the cathedral at Bristol. One of the best friends of the work writes to me that he has nothing satisfactory to mention, except that there has been no actual pause in the works of the new nave. Half-time work is now going on mainly on the south wall. What has been done up to the present time is as follows:—Two bays (the first and second) have been completed and roofed in. The third and fourth have been raised to the height of the crown of the windows, while the remaining bays have been raised about 30 ft. on the north side, so as to receive the south porch (nobly contributed by Mr. Wain, and now completed) and Mrs. Maza's lower window. On the west and south side the walls of these bays are only 10 ft. high. A portion of the cloisters has been restored, and stained glass contributed by the dean and other friends. What remains to be done, then, is much, and I regret to say there is little wherewith to do it. The appeal for the needed sum to roof in the whole nave (15,000*l.*) has been very inadequately responded to. Though a liberal Bristol citizen offered 2,000*l.* if the needed sum were raised before the next anniversary, I regret to say that as yet 1,600*l.* have been the total response to the munificent offer."

Gloucester.—Mr. J. D. Birchall, of Bowden Hall, has added to his previous contribution another 100*l.* to the restoration fund of this cathedral. The treasurer of the fund received in 1871, 2,592*l.* 13*s.* 3*d.*, and paid in that year 3,541*l.* 15*s.* 8*d.* The sum total of the receipts to December, 1871, is 12,465*l.* 13*s.* 2*d.*, and the sum total of the expenditure 12,178*l.* 6*s.* 2*d.* The need, therefore, of additional supplies without delay is very apparent. As the Bishop observes in his pastoral letter,—"The first portion of the great work may be considered as completed. Much, however, remains to be done. The state of the Lady Chapel is very deplorable; the stonework of the cloisters, and the windows on three sides, need extensive repairs; and in many other parts of the great building restoration is urgently needed."

Chester.—The restoration of Chester Cathedral has been steadily advancing at various points, and the results may be enumerated as follows:—The central tower, which was in so bad a condition that fragments of decayed stone used to fall on windy nights, has been for some time completely restored; so also has the south side of the choir, where tracery of the ancient form has taken the place of the windows which used to be seen there. At the eastern extremity of the south aisle of the choir a roof, which is supposed to have existed in the fourteenth century, but has afterwards destroyed, has been replaced. Some disappointment has been felt in consequence of the heavy appearance of the new roof, but the defect will be remedied by scaling. Here some new windows have been placed by Mr. T. Brassey, M.P., in memory of his father. In connection with this part of the fabric must be mentioned the restoration of the south side and eastern end of the Lady Chapel, to the appearance which they originally presented in the thirteenth century. Turning now to the nave, we find the south side, with its flying buttresses, along with the porch and the lower stage of the south-western tower nearly completed. Great progress has been made in the cloister on the north side of the nave, the completion of which is essential to give mechanical support to the groining of the north aisle. But the most conspicuous changes have been in the interior of the nave, from which the yellow wash has been removed and the injured masonry made good, where the south aisle has received stone groining, and where especially the great central space has been vaulted in oak. We notice here, in the centre the Royal arms of the Prince of Wales, "Earl of Chester," who before his illness gave encouragement to the work of restoration by a generous contribution. The various parts of this work of complete restoration remain to be done; for instance, the finishing of the west end of the nave and the north side of the choir;

but in order to deal effectively with the great south transept, which calls for extensive works both internally and externally, large accessions of money will be required. The original estimate for the whole undertaking was 65,500*l.* Of this sum, 40,000*l.*, including 10,000*l.* from the Ecclesiastical Commissioners, have been collected and nearly expended. There remains to be subscribed the sum of 30,000*l.*, and the hope of the Dean and Chapter is that of this sum 10,000*l.* may be obtained in the course of this year and next.

Fells.—The restorations on the west front of the cathedral are steadily progressing. The central part is very nearly completed, and much of the scaffolding has been removed, so that now the work that has been done can plainly be seen. So much of the more prominent parts of the stonework has been removed by the insertion of new stone that at first sight the restored portions have almost the appearance of a new structure. The Kilkeny polished marblo columns and mouldings contrast with the Donling stone. The workmen are now at work upon the south-west buttresses, and the southern and eastern portions of the south-west tower. The works are being carried on by Mr. White, the contractor, under the personal superintendence (with an occasional visit from Mr. Perrey) of Mr. J. T. Irvine, as clerk of the works.

ST. ALBAN'S ABBEY CHURCH.

The north side of the south aisle of the choir appears to have had originally a lancet arcade below the window. The arcade in a similar position in the north aisle is well known by the illustration in Brandon's "Analysis of Gothic Architecture." Only one bay remains, however, of the arcade in the south aisle. It was cut away under the windows—that were formed when it existed; and openings were made between the floor and their cills. In the course of recent examination of the walls in various portions of the buildings for the purpose of detecting the original form of the structure, and clearing away modern and ungainly accretions, a mass of roughly-constructed walling has been removed from the two bays westward of the door, now used for entrance to the building, at the east end of the south aisle. This has laid bare an unglazed stone screen in the eastern, and a pleasing doorway in the western, of the two bays, all in Tottenhoo stone. These stand, therefore (further back in the thickness of the wall), where the lancet arcade named above was aforesaid. The coincidence of position with that assigned to the Chantry Chapel recorded to have been built by Abbot Wallingford (who began to rule A.D. 1476) may probably lead to some interesting conclusions when excavations in the little graveyard have enlarged the amount of accurate information. The debris which was removed consisted of the fragments of a delicately designed and wrought shrine,—too fragmentary, however, for the design to be perceived. The visible surfaces are covered with strong colour and gilding,—forcible enough to cause acute pain to the advocates of unpainted masonry. Several fragments of Parbeck marble, evidently parts of an erection designed on a small module, have also come to light.

We hope that researches into the unexplored recesses of these most interesting buildings will enable us to report in the future some well-ascertained groups of facts that will throw light on our architectural history and antiquities, deduced from the materials extracted from the odd hiding-places in which they have been so strangely stored.

LAMPS ON THE EMBANKMENT.

LONDON, among other undesirable distinctions, possesses one that attaches to it from the variety and ineffable ugliness of its street-lamps. The patterns of the lamp-pillars are in many instances abominable, and a pillar that is not palpably off the plumb is quite a rarity. It is satisfactory to notice signs of improvement in this matter, and foremost among such signs are the handsome, substantial, spherical lamps that are being fitted on the artistic standards that surround the river-wall of the Victoria Embankment. These lamps are from the designs, if we mistake not, of Mr. Vulliamy, of the Metropolitan Board of Works. The lamps are spheres, of 24 in. diameter, or 26 in. over all. The glass is in four equal divisions above and below the central bar; one of the bottom quarters being fitted in a metal

...and adjusted to open, sliding within the cap for rather more than half its size, to each, for cleaning. The glass bars are of copper, rolled in such form as to give the greatest strength possible while exposing as little surface as may be for shadow. The apparent slightness of the glass bars might induce a fear that the lamps are fragile; but this is not found to be the case. Apart from ornamentation, and their being rather larger, the Embankment lamps are similar in structure to those at the Metropolitan and Metropolitan District Railway Stations, which have been found, on trial, to bear a crushing-weight of between four and five hundred pounds before sinking under it. Light and airy though they seem, each lamp, with the frame-rod in which it rests, weighs 1½ cwt. The whole of the metal in the lamp and frame that is above the capital of the cast-iron lamp-pillar is cast brass, or copper, rolled or stamped. Each lamp is furnished with three small brass rollers, upon which it revolves, as may be required, upon a ledge cast upon the inside of the central hand at the top of the standard. The metal-work, after being dressed, brazed, filed, and again dressed, where necessary, is cleaned and finished by bronzing. Mr. Parkes, who provided the lamps, was selected from among about a dozen competitors.

THE ROYAL ARCHITECTURAL MUSEUM.

The Council of this Institution are appealing to architects and employers of art-workmen to send students to the Museum, and they state that, beyond the collection, they are now in a position to provide for visitors many things in which they have hitherto been deficient; e.g., desks, chairs, facilities for taking down casts, &c.; while they contemplate, if the number of attendances should require it, the re-opening of the Museum at night. The catalogue, too, is now in hand, and will be issued without delay. To architects the Council represent the value of encouraging the study by their pupils of such a collection, and ask that a certain number of hours each week should be set apart as a rule for this purpose; employers of art-workmen are urged to give their men time to enable them to learn that which is the grammar of their art, by permitting them to visit the Museum, not after the day's work is done, but during working hours.

A conference was held in the Museum on Thursday, the 15th inst., at which the attendance was considerable, and included Mr. Beresford Pope, M.P. (in the chair), Lord Alwyne Compton, Messrs. G. G. Scott, Hayter Lewis, C. C. Nelson, W. Slater, E. Hall, George Phinckett, Elkington, Cox & Birnie Philip; Richardson, Slade, & Co.; Jock & Son, Lias & Son, Belfern, Hart & Co., Paice, Rudbeck, and others. The Chairman, Lord A. Compton, and Mr. Scott, placed before the meeting the views with which the Council had invited the Conference, and a number of suggestions were then made to which we may return on another occasion.

ERECTION OF DWELLING-HOUSES IN TOWNS IN IRELAND.

The smallness of the number of Building Societies amongst the labouring classes in Ireland has led to inquiries as to the cause of this state of things, within the power of the Legislature to remove. Dr. Hancock, of the Statistics Office, Dublin, points out the following as the causes which have come under his notice:—

1. Want of extending union rating to Ireland.
2. Want of extending to tenants improvements in human habitations in towns, the protection afforded to buildings on agricultural and pastoral holdings by the Irish Land Act of 1870.
3. Want of extending to expenditure in improvements of artisans and labourers' dwellings, when made by tenant or landlord, the priority "over all other estates, incumbrances, and interests whatsoever," which is granted to a local authority making such expenditure, by section 19 of Artisans and Labourers' Dwellings Act, 1868.
4. Want of extending to building leasing powers the definition of a "fair rent" contained in Irish Land Act, 1870, as a substitute for "best rent," required by statute and other leasing powers.
5. Want of extending to building leasing powers the facilities for hindering remainder-men, created by the Irish Land Act, 1870, as to charges for sums agreed to be paid by limited owner for tenants' improvements.
6. Want of extension to Irish County Courts of the equitable jurisdiction exercised by English County Courts.
7. Want of extension of Irish Record of Title to marketable as well as absolute titles, as proposed by the Lord Chancellor's (Lord Hatherley's) Bill for England and Wales.

8. Want of power in Irish Record of Title Office to establish a duplicate local register, for all dealings with artisans and labourers' dwellings, at the nearest post-office money-order office.

9. Want of power in local town authority to convert all waste unoccupied land, and land covered with ruinous houses (from defect of title), into useful building ground, by selling land after due notice, and investing money, until difficulties of title, which render the land waste, be removed.

Remark on these suggestions, Dr. Hancock says truly:—"The rule of requiring the 'best,' that is, the highest possible rent, to be reserved in a lease, as in the 25th section of Landed Property Improvement Act, 1860, has the effect of making a lease invalid if a landlord makes any allowance to a tenant in fixing the rent for previous improvements of the tenant or his predecessors. This is entirely inconsistent with justice and usage in Ireland, and accordingly, in the Irish Land Act, 1870, it was remedied as to agricultural leases granted under that Act; and instead of 'best rent' being required, the lease is to reserve a fair yearly rent without taking anything 'in the nature of a fine, premium, or forfeit,' with a proviso 'that in estimating such yearly rent, it shall not be necessary to take into account against the tenant the increase, if any, in the value of the holding, arising from any improvements executed by the tenant or his predecessors.' Many building leasing powers in Ireland, statutory and others, are rendered of very little value for want of 'fair rent,' as thus defined, being substituted for 'best rent.' As this has been done in the case of agricultural leases, it ought to be extended to building leases.

The subject is one well deserving further inquiry.

PATERNOSTER BUILDINGS, ST. PAUL'S.

A SUBSTANTIAL and comely block of buildings bearing this title has been erected in the central area of Newgate Market, from the designs of the City architect; Messrs. Sandon, Brothers, being the builders.

There is a passage-way on the ground-story through the block, north and south, and one east and west, the passage-way north and south facing Rose-street, in Newgate-street, and Paved Passage in Paternoster-row. The ground-floor all round is appropriated to shops, and there are two floors of rooms above. The elevations are in brickwork, with cement dressings, and all the ceilings within are boarded. To what extent ventilation is obtained for the inner portion of the parallelogram, we were not able to see, the gates which close the footways being fast at the time of our visit. The Messrs. Blackie have already moved into one of the shops, and other publishing firms will speedily be located there. We have still a belief, with all proper respect for the opinion of those who have thought otherwise, that a good direct thoroughfare north and south would have been a better arrangement for the public and the future than that which has been adopted. We conclude that the old houses around the area on which the new block has been erected will shortly come down; their present aspect is deplorable.

COMPETITIONS.

Sunderland Workmen's Dwellings.—The first premium has been awarded by the corporation of Sunderland to Mr. Thomas Oliver, of Newcastle-on-Tyne.

Saltash School-Board Competition.—We have received complaint that the clerk sent out one of the sets of plans before they were examined by the committee to a gentleman who was not a competitor. The statement, however, is not clear.

WORCESTER SCHOOL BOARD COMPETITION.

We have received at the last moment from Mr. Witherington a reply to Mr. Hastings, and copy of Counsel's opinion on the matter. We are able to make space only for the latter:—

"Worcester School Board and Witherington. *Ex parte Witherington.*
I am of opinion that there was no contract on the part of the Board, express or implied, to adopt the best plan submitted. All of the plans submitted might have proved objectionable, and the approval was necessarily a matter entirely in the discretion of the Board. The contract is in substance merely that the architect whose plans are approved shall have the superintendance of the work. Now it cannot be said that Mr. Witherington's are approved; for it is Mr. Day's plans which are approved. It does seem, indeed, that Mr. Day's plans were not set in in due time, for the fact of the 31st December falling on a

Sunday clearly would not extend the time until the Monday and therefore they ought not to have been received, or, at all events, not to have been looked at until it should have been ascertained that none of the plans sent in in due time were of sufficient merit; but inasmuch as Mr. Day's plans were received, and were adjudicated upon simultaneously with the others, the circumstance of their being sent in too late does not alter the fact that it is his plans which are 'approved,' and consequently that Mr. Witherington's are not. As above intimated, what is chiefly secured by the advertisement is, that the plans which are approved shall not be handed over to some other person, for him to execute the work.

In Ward v. Lowndes, 1 Ell. & Ell., 940, it seems to have been admitted that the plaintiff had become entitled to the premium, and the questions were only as to enforcing payment.

In point of fact, the advertisement is illusory, it not being such as to entitle the architect who produces the best plans in every respect, although admitted to be suitable, to have them adopted, but really leaving everything short of the misappropriation of them, in the power of the Board.

If the competition (such as it was) were to be opened, at Mr. Witherington's instance, and he were simply to send in his present plans again, he would probably not be entitled to retain the cheque for 300; but, under the circumstances, I can only advise him to acquiesce in what appears to me to be a very irregular and unjust decision on the part of the Board, and in that case I conceive he will be entitled to enforce payment of the cheque if resisted by the Board. (Signed) LUCIUS KZZLX, *Inner Temple, February 9th, 1872.*"

Sir,—Replying to the intimations of your correspondent, "Dies Non," permit us to observe, that we should be "astounded" to be told that our estimate "emanated from a firm of builders whose faith," &c., because no representative of any building firm, nor person connected with any member of the board, saw our drawings until after they were in the possession of the board's secretary. B. & G. C. HADDOS.

LOUTH HOSPITAL AND DISPENSARY COMPETITION.

The committee, after considering the merits of the several designs sent in, have selected the one submitted by Mr. John Johnson, of Moorgate-street, London, and have given instructions for the working drawings to be prepared. The arrangement of the wards is on the pavilion system. The accommodation provided on the ground floor consists of general sick ward, and an accident ward, with operating-room. Bath-room, lavatory, ward, scullery, and w.c. conveniences have been provided adjoining the entrance. The matron's room is near the entrance, and has a window for overlooking the sick ward, and the out-patients' department is kept distinct, and has a large waiting-room, medical officers' examination-room, and dispensary, with separate entrances; the dead-house and post-mortem room faces north, and is lighted by a large skylight. The dining-room for the convalescents has a south aspect. The administrative portion is well separated from the hospital, and comprises kitchen and scullery, with pantry, larder, dry goods, clothes, and other stores; the laundry, washhouse, and drying-closet being at the extreme end of the building. Servants' w.c., coal, wood, and beer stores, are conveniently placed.

On the first floor the women's sick ward is similar to the ward below, and the children's and separation ward is adjoining. A nurses' room, servants' bed-room, and clean linen store-closets are provided; also a private w.c. for the matron and nurses.

The exterior will be of light yellow brick, with red bands and arches, the dressings generally being of Ancaster stone. The works will be commenced as early as possible.

THE LAW COURTS COMPETITION.

Sir,—I am surprised to find that a statement of mine, that Mr. Street accepted the appointment of sole architect of the new Courts of Justice without previous communication with me, has been denied by Mr. Street. I shall, therefore, feel obliged if you will allow me to re-assert emphatically that such was the case. I first saw the news *in print in your columns* at a club. Disbelieving it, I made inquiries; and, having learned its accuracy, I wrote to Mr. Street, who then for the first time told me of it *in reply to my letter*, but neither then nor subsequently did he consult me in any way respecting it.

Having received the award of the judges as to what were declared the "vital points" of the competition, I have always felt that the award was substantially a judgment in my favour, though I have been willing to waive my exclusive claims in favour of a joint appointment with Mr. Street, as advised by the judges. Those who will take the trouble to read the whole correspondence as laid before Parliament will see

that this line has been taken in all my letters from the first.

I feel bound to mention this, as some garbled extracts have appeared elsewhere.

EDWARD M. BARRY.

FORESTERS' HALL, WILDERNESS-ROW.

WILDERNESS-ROW is not an inappropriate name for the place so called (which is close to Charter House), so ragged and rugged is its aspect. At one end of it, and somewhat in a corner, a new hall has been built, for that respectable and very numerous body the Foresters. The style of the exterior is of a mixed character, not very congruous, the stone porches absolute Gothic, and the rest of the structure what we must call Victorian. Still it has an agreeable air, and typifies a well-to-do body, desiring to stand equally well in the eyes of the public. We cannot, however, speak so contentedly of the interior. The large meeting-room, or "hall," with its gallery, is certainly the ugliest apartment we have looked at of late years, and is not likely to raise the taste of its occupants. The removal of the large pilasters and little arches with which the walls are adorned would improve it. The foundation-stone, which bears the name of the builders, Messrs. Henshaw, does not indicate that any architect was employed, and this may account for what we have objected to.

WESTMINSTER CHAPTER-HOUSE.

SIR,—Touching your description, last week, of the Chapter-house, Westminster Abbey, many of your readers will be gratified to learn whether and when it is probable that, like the cloisters leading to it, its useless solitude may be broken for the gratuitous instruction of the general public, who have paid for the restoration.

"How reverend is the face of this tall pile,
Whose ancient pillars rear their marble heads
To hear aloft its arch'd and pond'rous roof.
By its own weight made steadfast and immovable,
Looking tranquilly."

I presume there is some occult motive for carefully concealing the existence of the crypt. Doubtless it is a dark place; but surely this is not sufficient reason for keeping such an intensely interesting relic entirely out of sight. Some light is cast on its character by a view and plan in your volume for 1853, pp. 67, 198.

E. L. TARBUCK.

SIR,—In your interesting notice of the restored chapter-house, I notice two inadvertencies:—
1. "The seats of the abbot, the friar, and the sub-prior, with probably those of the chancellor and the precentor." 1. The prior and the sub-prior of course are the intended reading.
2. The stalls of the precentor and chancellor in this position are peculiar to chapter-houses of secular cathedrals. The duties of the chancellor are given in my "Traditions and Customs of Cathedrals," just published by Longmans. He was a dignitary in such foundations. In monasteries, the corresponding office was represented by the precentor, in addition to his common duties.

However, I am able to allot these five stalls, on the authority of the MS. Custumal of Westminster, to the abbot, the major prior, the sub-prior, and the custodes ordinis, the third and fourth priors, whose duty it was to hold chapter and collation. I printed a brief note of it in the *Ecclesiastic*.

MACKENZIE E. C. WALCOTT.

THE SEWAGE QUESTION.

London.—An inspection of the sewer works in the neighbourhood of King's-cross has been made by Mr. Bazalgette, who, in reference to the overflow of sewage, states that to effectually remedy the defects complained of would require the construction of an independent line of sewer for storm-waters only, at a probable cost of 70,000*l*. A communication to this effect was laid before the Clerkenwell Vestry, at its last meeting, and a resolution was adopted approving of Mr. Bazalgette's proposition.

Thames Sewerage Commission.—A deputation of gentlemen connected with several of the water companies of the metropolis has waited upon the Home Secretary, to point out the serious consequences that would follow Mr. Bazalgette's plan for purifying the Thames from sewage between the metropolis and Windsor. Mr.

James Clay, M.P., who headed the deputation, adduced in detail many reasons why the proposed scheme should not be carried out. The idea was to convey the sewage of twenty-four towns, containing a population of 300,000, all situated below the in-take of the West Middlesex, the Grand Junction, and the Vauxhall Water Companies, through many miles of sewer to a point above the in-take of the water companies, and discharge it in a part where in all probability the streams in Chertsey and the neighbourhood would be contaminated by it, and the water companies would thus become the distributors of impure water. For this reason the scheme was opposed by large landowners in the neighbourhood. The great object of the deputation was to prevent the impurity from being taken so close to their works. Other gentlemen urged the importance of Government interference, and the Home Secretary promised to give the "most serious consideration to the very grave objections that had been raised."

Cambridge.—On the 31st ult. a meeting of the University Syndicate held an interview with Mr. Charles Bateman, of Westminster, who had been called in under the sanction of the Senate to advise them upon the various schemes which have from time to time been submitted by Messrs. R. R. Rowe, Bazalgette, G. W. Stephenson, and J. Bailey Denton respectively, for the diversion of the sewage of the town from the river. The town surveyor (Mr. Stephenson) attended the meeting, and the whole of the previous designs, schemes, sections, and other drawings were placed at Mr. Bateman's disposal. On the following day, Mr. Bateman (accompanied by Mr. B. T. Moore, of Pembroke College, and the Town Surveyor) went over the town for the purpose of examining the existing sewers, and surveying the colleges, in order to ascertain if it were possible to utilise the existing sewers as a portion of a scheme to be submitted for consideration. After Mr. Bateman had minutely inquired into the various details, he made a survey of the different sites in the locality that had been previously inspected and reported upon as suitable for sewage-irrigation; and his opinion, we understand, coincides with those previously given by the other engineers, that the Chertsey and Milton neighbourhood is pre-eminently favourable. The Town Surveyor, according to the local *Chronicle*, is still in communication with Mr. Bateman.

Oxford.—The Drainage Committee having recommended that Mr. Bailey Denton be appointed Consulting Engineer, and that it be referred to the committee to settle the terms on which Mr. Denton is to be employed, the report has been adopted by the council.

THE PROPOSED NEW BUILDING ACT.

The Bill has been again revised, and is being prepared to be taken into the House. It is, however, by no means settled, and may even be divided, the sanitary portion from the constructional, before it is brought in.

LINCOLN WATERWORKS.

THESE waterworks, which have been in the hands of a private company, incorporated by Act of Parliament, have been transferred to the local Board of Health.

An Act of Parliament obtained last session for increased powers, contained an agreement for a sale of the waterworks undertaking to the Local Board, at a price to be fixed by arbitration. The arbitrators and umpire having been appointed, Mr. Cawley, of Manchester, on the part of the company; Mr. Hunter, of Wigan, on the part of the local Board; and Mr. Bancroft, of Manchester, the umpire; a hearing took place at the Westminster Palace Hotel last month, when Mr. Charles Pollock, and Mr. Brogden, instructed by Messrs. Twedd & Carline, solicitors, appeared as counsel for the company, and Mr. Horatio Lloyd and Mr. S. D. Waddy, instructed by Mr. Hebb, solicitor, appeared as counsel on behalf of the Local Board.

The sittings occupied four days. The scientific witnesses called on behalf of the company, were Mr. J. W. Leather, of Leeds, C.E.; Mr. Pasge, the company's manager; Mr. Thomas Fenwick, of Leeds, C.E.; and Mr. T. B. Foster, of Manchester, C.E., whose valuations averaged over 70,000*l*. The skilled witnesses called for the Local Board were Mr. Medlock, chemical analyst; Mr. Edward Ryde, of Westminster; and Mr. Henry Goddard, of Lincoln, surveyors;

Mr. Jno. Taylor, of London, C.E.; Mr. Jno. S. Norris, of Nottingham, C.E.; and Mr. Joseph Quirk, of London, C.E. The evidence of these gentlemen went to show a value for the whole concern, of from 40,000*l*. to 45,000*l*. Counsel having addressed the court, the arbitrators took time to consider their award.

URQUHART CASTLE, IN THE COUNTY OF INVERNESS.

ABOUT half-way between the two extremities of Loch Ness, the loch is suddenly reduced by about one-third of its ordinary breadth by the projection from its western shore of a bold head-land, under cover of which the glens of Urquhart and Moriston open upon the loch, and contribute to it, across a marshy deposit of gravel and peat, their respective waters.

The headland which is thus partially isolated between these waters and the loch is moderately lofty, and slopes down steeply towards its extremity at the north-east, again to rise and finally to terminate in an oval and rugged knoll of rock, which stands out from 50 ft. to 100 ft. above both the water and the contiguous land. Upon and covering this knoll is placed Castle Urquhart, which is thus a very prominent object from Lochness, and combines, in a very remarkable degree, natural and artificial defences upon its *enceinte* and within its area.

The rock, open at each end, and along its north-eastern side towards the loch, is protected on the land side by a deep and broad ditch, quarried across the neck of the peninsula from shore to shore, not, indeed, to the level of the water, but from 10 ft. to 12 ft., but to a depth which at one point gives a precipitous height of 30 ft. to 40 ft. to the rock forming its scarp.

In general plan, the castle, like the rock it stands upon, is an irregular oval, reduced to something of an hour-glass figure by the indentation of a small cove near its centre. At the north and most prominent end, is the rectangular keep. On the landward front is the gatehouse, and in the side opposite appears to have been a small tower. The *enceinte* is completed by curtain-walls, ranging in thickness and height from 4 ft. to 9 ft., and from 20 ft. to 40 ft., according as they supported buildings within, or occupied weak or strong points in the defences.

The entrance is by a causeway of masonry, 12 ft. broad, having a roadway between parapets, and about 80 ft. long from the counterscarp to the scarp of the ditch. At about 40 ft. from the counterscarp, and 6 ft. beyond the centre of the ditch, there is a deep, is an opening of 20 ft., formerly occupied by a draw-bridge, beyond which the parapets are higher, and probably formed part of some kind of advanced work, for the management and protection of the bridge. This part of the defence occupied the remainder of the causeway proper, about 20 ft., the ditch here being 80 ft. broad, and a platform of 20 ft., with a rise of 6 ft., intervening between the end of the causeway and the gate.

The gate is removed about 6 ft. to the south of the line of the causeway, so as to check a rush upon it. It is a plain round-headed portal of 9 ft. opening, between two half-round towers, and above it is the usual small look-out window of the portcullis chamber. Just within the gateway is the square groove, in which hung the portcullis, and beyond is a barrel vault, ribbed at intervals, for gates, and having a lodge door on the left hand. The passage ends in a plain but good round-headed gateway, the coigns and ring stones of which are of excellent ashlar, and which is set in the inner face of the gatehouse. This is a rectangular building, with two half-round towers flanking its outer entrance, and on each side of the central passage is a chamber also barrel-vaulted, but having semicircular and semi-domed west ends. One of these rooms, as mentioned, opens from its side into the passage, and the other from its end, into the court. The gatehouse had an upper floor, also vaulted, and apparently also a second floor, of which traces remain. Fragments of a chimney-shaft which has fallen from its front, encumber the causeway.

Emerging from the gatehouse, the rugged character of the interior comes at once into view. On the right is a path between two knolls of rock; that on the left moderately high, and not quite extending to the waterward curtain; that on the right high and steep, and its perpendicular face forming the landward curtain, the

wall crowning which is 9 ft. thick. At the south-east end, where the two ridges unite, is a small circular eminence, which may have been a beacon. This part of the outward is a fortress in itself, and upon its highest ground are traces of buildings. A fragment of the waterward curtain still stands about 30 ft. high, and 6 ft. thick; but there are no traces in this quarter of mural towers.

The gatehouse opens upon the narrowest part of the wall, where it is indented by a small cove. The curtain was carried round this cove, and contained a postern, whence a path led down to the water, here shielded by the cliff. There is a window in the curtain,—a part probably of a building for the protection of the postern and the galleys below.

The way from the gatehouse towards the left leads to the keep. It rises by a steep curve between, on the right, a high wall of some ruined building, and on the left a curious knoll of rock, scarping steeply into a rectangular figure, about 30 ft. high, and on the top of which are foundations of a building, 15 ft. by 30 ft., which must have been as tall as the upper floor of the gatehouse, and have commanded the adjacent curtain, from which it is separated by a narrow hollow way. Following the curved road, a cross wall is reached, which cuts off the inner from the outer ward, and formed an out-work to the keep. This ward is three-sided,—a sort of quadrant, the keep being at the apex. The land and waterward curtains form the two sides, and the base is a shallow curved ditch, in which is built the wall, and against it are two buildings like barracks. Between their inner ends was the entrance. This ward was exceedingly small, and is now thickly encumbered with ruins.

The keep is an excellent example of the stern rectangular Scottish fortalice of the fifteenth century. It is about 40 ft. square, of four stages, and built on the steep, so that its basement is above ground on the outer, and below it on the inner, or court side. This basement is 16 ft. by 18 ft., within, barrel vaulted, with walls, 10 ft. to 16 ft. thick, with a loop rising to the light on the land side. It was evidently the prison. The floor is opposite to the loop, and opens into a small lobby, having on the left the foot of the well stair, and in front a postern, 4 ft. wide, flat topped, and closed by a door, which opened on a small platform, about 25 ft. above the loch, which is reached by a steep winding path. The turnpike stair is 8 ft. in diameter, and is contained in the north-east angle of the tower, opening upon each floor, and finally upon the battlements. It makes no external projection, but is seen within, cutting off an angle from each floor. The basement and the highest floor are the only vaulted chambers.

The first floor is lighted by a segmental arched window to the court, and by small square-headed loops towards the water. These vary from 6 in. to 2 ft. in breadth of opening, and each has a little below it, an oilet-hole, which opens from the window-seat. No fire-place remains, but the east wall is destroyed, in which it may have been. This chamber seems to have been entered only by the well-stair.

The second floor has also openings under flat segmental arches, and on the south side is the main door, reaching about 20 ft. above the ground, and reached either by wooden steps or some other means now destroyed.

The third floor, or fourth stage, differs from the rest in that a small chamber is contained in the south-eastern angle, the door into which is in the south wall, near its east end. This may have been an oratory, but as the east wall of the keep is gone, and with it the east end of this chamber, which also is inaccessible, such details as may remain have not been examined. In the west wall of the main chamber is an excellent flat segmental arch in ashlar, which spans a fireplace and a window looking down the loch. This upper story was covered with a vault, in the west side of which are traces of a side arch, covering that over the fireplace and window. Most of the main vault has fallen in.

There do not appear to be remains of any garbages. The parapet is gone, but the wall is crowned by a bold moulding, and beyond this, at each angle there is a row of short corbels, which probably carried the usual bartizan turrets. Over the door, at the top of the wall, are four bold corbels, which evidently carried a machicolation for its defence.

Urquhart is far more extensive than most Highland castles, and the traces of barracks

show that its area was turned to full account. It would contain a garrison of from 400 to 500 men. Though the masonry is rough, it is good, the proportions of the keep are excellent, and the ashlar work used for the doorways, quoins, and window dressings, is well executed. What arches remain are roundheaded or segmental, not pointed. At the north-east angle the keep has a small short buttress set on anglewise, and one, also short, of a pilaster character, and slight projection, set on the west face of the north-west angle. The curtain springs from the keep, half of which is outside it.

Urquhart is one of the chain of fortresses, which stretched across the great glen from Inverness to Inverlochy, and were employed from an early period to defend and overawe the country. By some accounts it is spoken of as belonging to the Comyns of Balconch, but certain it is that when Edward I. was at Kildrummy, near Nairn, in 1303, he despatched a party who laid siege to this castle, and with some difficulty took it, putting Sir Alan de Bois, its governor, and the garrison to the sword. In 1331 it was held for Bahol by Sir Robert Lauder, of Quarrel Wood, as governor; and the office seems to have been hereditary, for Lauder's daughter married Chisholm, and their son, Sir Robert Chisholm, of Chisholm, who had Quarrel Wood, had also the constablership of Urquhart, then, and probably always, a royal castle. Chisholm's title, however, was insecure, for in 1359 David II. disposed the barony and castle to William Earl of Sutherland, and John his son.

After this, Urquhart was held under the crown by the Grants of Freuchie, afterwards of Castle Grant, who, as chamberlains for the Crown, got possession of most of the adjacent lands. In 1509, James IV., under an Act of the Scottish Parliament, granted three-fourths of Urquhart Lordship, and of the Baronies of Urquhart and Glenmoriston, to Grant of Freuchie, and his two sons, from whom descended the Grants of Glenmoriston and Corrimony. The castle has since remained in the Grant family, and is now the property of the Earl of Seafield, whose house of Balmacraan is in the lower Valley of Urquhart.

It appears that the Knights of the Temple had an establishment in the Bay, and brought into cultivation the lands on its eastern shore. Probably they were constables of the Castle. On the farm of Pinnians is still a place called Temple.

Until after the rebellion of 1745 Glen Urquhart was in a very disturbed state. Grant did not reside there, and the people were continually attacked by the clansmen from Glengarry, Locheil, and Kintail.

It is difficult to establish with any precision the date either of the early or the present castle of Urquhart. The ditch is no doubt much older than the siege of 1303. The remains of the castle now standing can scarcely be older than the fifteenth century, and probably it was one of those built about the middle of it, in accordance with the strong recommendation published by James I. on his return from his captivity in England.

An excellent account of this part of the Highlands, and of the descent of the Urquhart property, will be found in the "New Statistical Account of Scotland, for Invernesshire," p. 43.

G. T. C.

HULL DOCK COMPANY'S NEW OFFICES.

The Dock Company have taken formal possession of their new offices. The building stands on a triangular piece of ground, facing Junction street, New Cross-street, and the Queen's Dock respectively, the centre of the side next to the Dock projecting forward, and its plan consequently presenting much difficulty, especially as a maximum accommodation was required upon a comparatively limited area. The architect, by designing the building to follow the outline of the complete site, has utilised the whole area, and obtained space for a central court for light and ventilation. There being so much water in proximity to the site, the Italian style of architecture, of the "Venetian" type, has been adopted for the building, which is arranged with three façades, corresponding with the frontages. The main façades are connected with each angle by short circular façades, but having projecting porticos, with detached Ionic columns, on the ground floor, which serve as buttresses to towers and cupolas surmounting these angles.

The entire building is faced with selected Ancaster stone, excepting the principal sculptures, which are of Portland, and the basement, which is of Bramley Fall. The roofs are covered with Westmoreland slates. The whole structure is surrounded by an iron railing, the uprights formed of ornamental tridents and barpoons placed alternately, with solid square standards at intervals, capped by escutcheons and crowns.

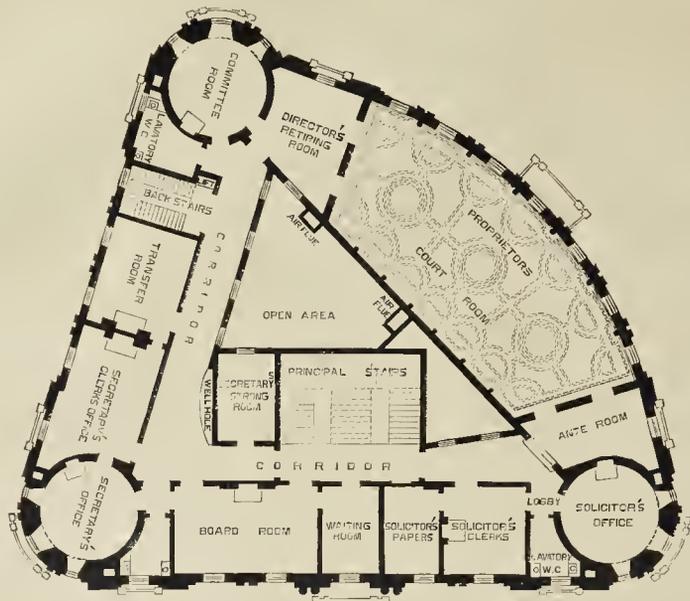
With regard to the plan of the building, the main entrance is placed in the centre of the Junction-street front; a portico and vestibule lead to a handsome entrance-hall, out of which, on the ground-floor, are arranged the various offices appertaining to the resident engineer and the superintendent dock-master, and from which a wide staircase of Portland stone, bordered by a wrought-iron railing of good design, leads to the landing of the first floor. From this landing are entrances to the board-room and waiting-room, a corridor to the right leads to the secretary's department, the accountant's office, strong-room, &c.; and one to the left conducts to the solicitor's offices, and to an ante-room, in which a memorial tablet,—containing the names of the chairman, directors, and officers of the Dock Company, and the architect,—has been placed; and to the proprietors' court-room, an apartment, 70 ft. in length, 29 ft. in width, and 21 ft. 6 in. in height, the highly-decorated ceiling of which is supported on each side by marble columns 16 ft. high, with ornamental Corinthian capitals and entablature, and a cresting over. The wharfage department is kept distinct from the other offices, having its entrance from the centre of the quay frontage. The wharf office is 100 ft. by 29 ft. and 18 ft. high.

Within the building is an open court: this affords means for thorough ventilation and lighting. The warming and ventilating arrangements are effected by means of a fan, worked by a small steam-engine.

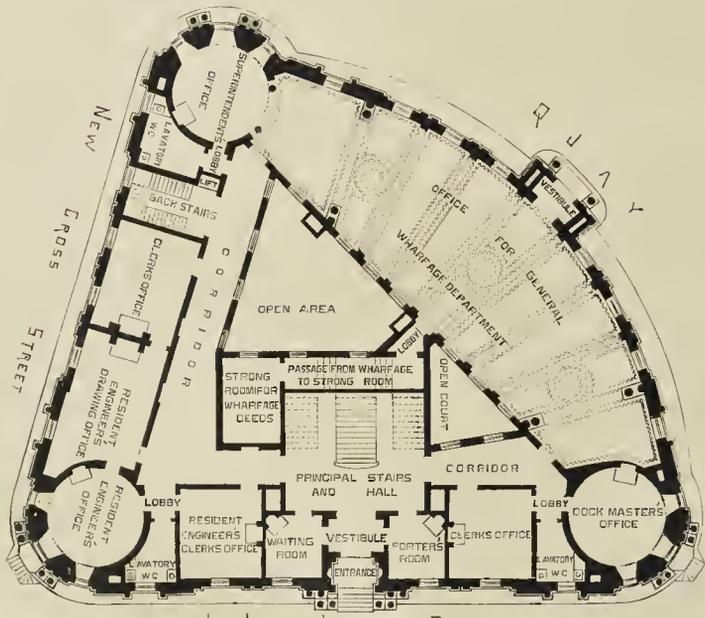
Mr. C. G. Wray, of London, was the architect. The erection of the building generally, including the brickwork, masonry, carpenters' and joiners' work, and painting, has been carried out by the Dock Company's own staff of workmen, under the superintendence of their resident engineer, Mr. R. A. Marillier, C.E. The whole of the structure is made fire-proof, the floors being formed of arches of Messrs. Dennett & Co.'s patent material. The arrangements for warming and ventilation were carried out by Mr. W. W. Phipson, of London. The sculpture in the tympanum of the pediment, the trophies over it and the quay front, and the figures in the spandrels of the centre arch in Junction-street, are the work of Mr. John Underwood, of London; and the modelling for the other parts of the carving, and for the internal enrichments, was also executed by him, under the immediate supervision of the architect. The carving of the main portion of the building, including the capitals, friezes, and panels, has been executed by Mr. Thos. Frith, of Hull. Mr. Thomas Welpton, of Hull, superintended the castings of the ornamental portion of the plasterers' work; and Messrs. Young & Wood, of Hull, supplied the inclosure iron railing. The wrought-iron railing to the principal stairs was executed by the Milland Architectural Metal-workers Company, of Coventry. Messrs. Strove, of London, supplied the sun-burners; Messrs. Howard & Sons, of London, the parquettes for the border of the court-room floor; and Messrs. Blanchard & Co., of London, the terra-cotta ridge cresting, &c. From the architect's design. Messrs. Richardson & Son, of Hull, glazed the windows with plate-glass, including the three engraved windows on the staircase.

The directors of the company, at their last annual meeting, recently held, made a very encouraging report. Considering that the capital of the company has been doubled, and more than a million of money spent in the new Albert Dock, it is satisfactory, and more than was expected, that nearly 4 per cent. on the capital thus increased was realised in the first year after the completion of their new dock. The reserve fund was created out of former dividends, expressly to make good the expected deficiency for the first few years after the increase of capital spent on the Albert Dock.

We hear that from the 1st to the 20th of January this year, there was an increase in dock duties alone of 700l. beyond what was gained in the same period last year, so that there would seem to be every prospect of increased revenue.



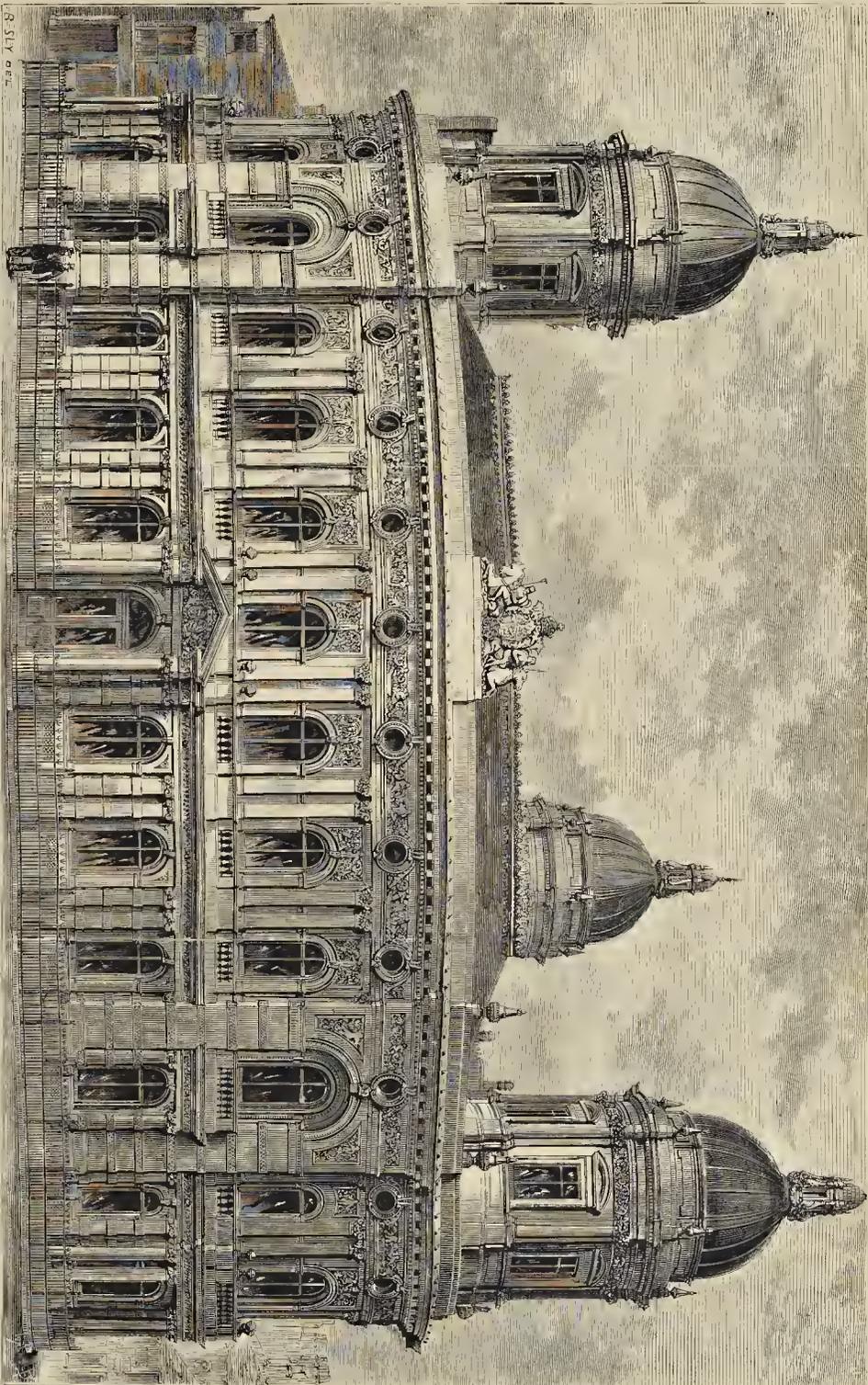
FIRST FLOOR PLAN



JUNCTION ROAD
GROUND PLAN

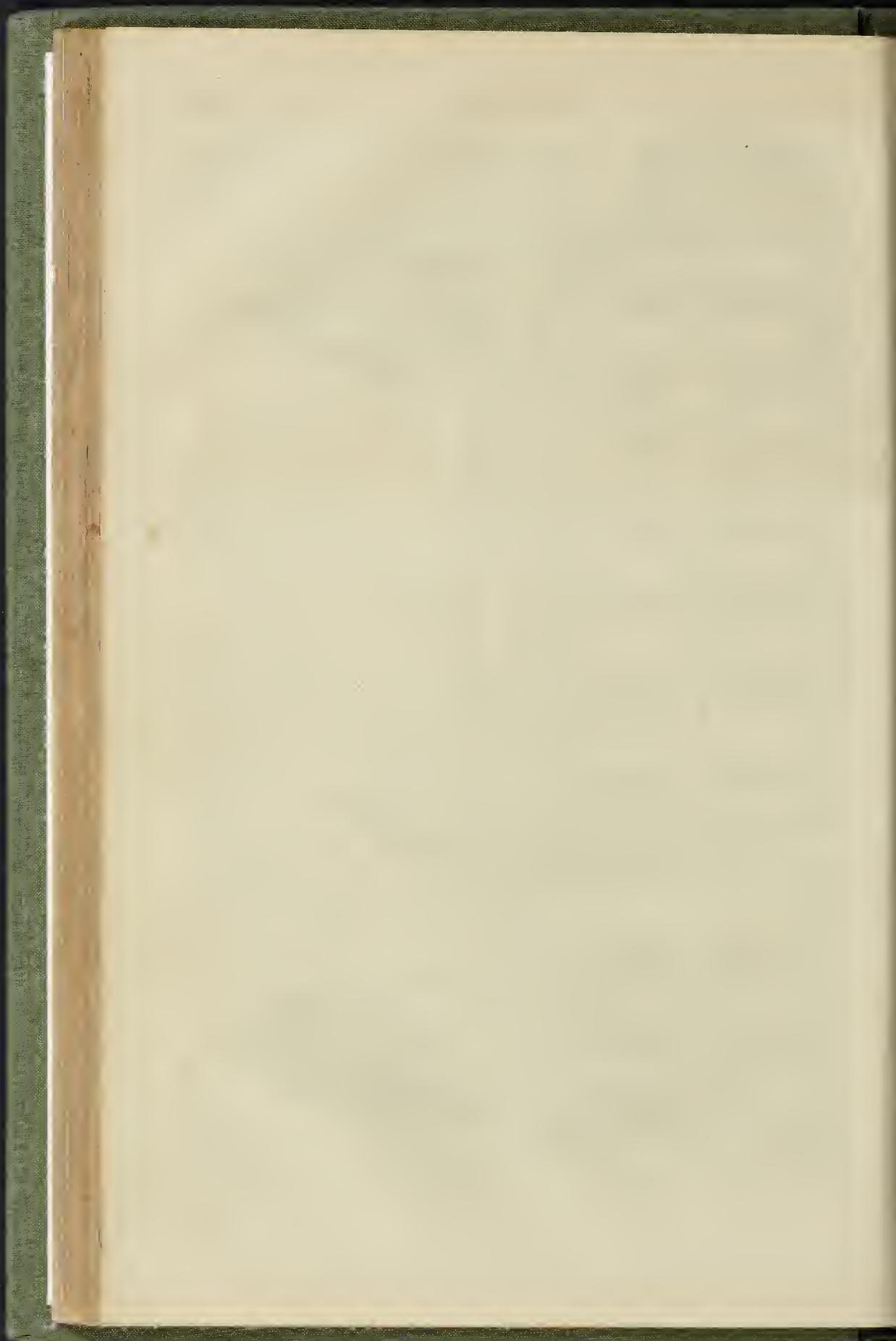
SCALE OF FEET

THE HULL DOCK COMPANY'S OFFICES.



R. SLY DEL.

THE HULL DOCK COMPANY'S NEW OFFICES.—MR. C. G. WEALE ARCHT. RSC.





THE LYONS EXHIBITION BUILDINGS, PARK, AND LAKE.

LYONS UNIVERSAL EXHIBITION.

OUR readers know that a Universal International Exhibition of Agricultural and Industrial Products and Works of Art will be opened at Lyons on the 1st of May next, and closed on the 31st of October. It will be held in enclosed galleries and in an open space adjoining. We give a view of the building, which is constructed on land furnished by the City of Lyons, and known as the Parc de la Tête d'Or.

Articles for exhibition will be received at the building from the 1st of March to the 1st of April, 1872, inclusive, and applications for allotments of space should be made at the earliest possible moment, addressed to Mr. Edmund Johnson, Hon. Secretary of the London Committee, 3, Castle-street, Holborn, London.

Certain charges will be made to exhibitors for space.

At a committee meeting recently held in the Mansion-house, under the presidency of the Lord Mayor, for the purpose of considering the best means to be taken to insure the proper representation of the United Kingdom at the Exhibition, it was announced that the Minister of Agriculture and Commerce had promised that the French Government would furnish the medals to be awarded by the international juries, and that the committee of organisation at Lyons would defray the expenses of the London committee to the extent of 6,000 francs. It was resolved to communicate with the various chambers of commerce in Yorkshire, Lancashire, and elsewhere, and to suggest to the mayors of the cities and towns most interested in Continental trade the advisability of immediately forming local committees to obtain exhibitors. The productions exhibited will, it is said, be divided into nine groups, viz.:—First, silk, raw material, machinery, and manufactures; secondly, textile fabrics, clothing, and other objects worn on the person; thirdly, furniture and decorative objects for use in dwellings; fourthly, machines, implements, and tools; fifthly, products of the extractive industries; sixthly, alimentation; seventhly, agriculture and horticulture; eighthly, materials and processes of the liberal arts; and, lastly, works of art. All facilities will be given to the exhibitors for the sale of their productions, but no object exhibited must be withdrawn until after the closing of the Exhibition.

Group III. will include Furniture, Upholstery, and Decorative Work; Paper-hangings in all varieties; Porcelain, Earthenware, and Glass; Gold and Silversmiths' Work, Cutlery, Jewelry, Bronzes and other Artistic Castings, and Repoussé Work; Apparatus and Processes for Heating and Lighting.

* Group IV. will include a Workmen's Class:—Articles of all kinds produced by men working on their own account, with or without the aid of their families or apprentices; Machines and processes illustrative of work executed at home; Work specially illustrating the skill, intelligence, and taste of the workman.

Group IX. will consist of Oil Paintings on Canvas, Panels, &c.; Water-colour and other Drawings; Sculpture and Die-sinking; Architectural Designs and Models; and Engraving and Lithography.

We understand that the applications from English producers are fairly numerous.

THE PROPOSED CONVICT PRISON AT DENMARK-HILL AND THE HOME SECRETARY.

THE Government proposition to erect a convict prison at Denmark-hill is encountering much hostility, and a determined opposition on the part of the residents and the owners of property in the district, and public meetings to protest against the project are being held in different parts of Lambeth, Kennington, Camberwell, Brixton, and other places. On Saturday, a numerous and influential deputation, consisting of several members of Parliament, including Sir J. C. Lawrence and Mr. McArthur, the representatives for Lambeth; and Col. Beresford and Mr. Locke, the members for Southwark; together with representatives from the several local and parochial bodies in the district, clergymen, and others, waited upon Mr. Bruce, the Home Secretary, with whom was Mr. Winterbotham, the Under-Secretary, for the purpose of representing to the right hon. gentleman the evils and the injury that would be caused to the neighbourhood by the erection of the proposed prison in the neighbourhood. Sir J. C. Lawrence, in addressing Mr. Bruce on behalf of the deputation, referred to the opposition which he had offered in Parliament last session to the proposal for the enlargement of the Brixton prison, which the Government had now abandoned, and added that the site now selected at Denmark-hill was still more objectionable, and that there were numerous other more suitable sites which the Government might have selected. Several members of the deputation having pointed out the serious injury and deterioration in the value of property in the neighbourhood which the erection of the prison would cause, the Home Secretary in his reply, admitted the force of the objections which had been urged by the deputation against the site, and

added that, whilst the Government were fully impressed with its eligibility, they were quite ready to reconsider the matter if an equally accessible and eligible site could be found in another district. We understand that a site at Brockley, consisting of seventeen acres (which is the same in extent as that selected at Denmark-hill), has been offered to the Government by the St. Olave's board of guardians, to whom it belongs, for 400*l.* per acre; whereas it is said that the price of the Denmark-hill site is upwards of 1,200*l.* per acre. The site at Brockley is also said to have the advantage of being nearer to a railway station than that at Denmark-hill. The offer made by the St. Olave's guardians is stated to be under the consideration of the Government.

WHAT IS STONEHENGE; AND AVEBURY OR ABURY?

MR. FERGUSSON'S BOOK ON THE STONE MONUMENTS.

SIR,—I am glad that you imply a demur to Mr. Fergusson's theory as to the origin and purpose of the "Stone Monuments of all Ages and of all Countries," which book you reviewed on the 3rd inst. The unwarranted conclusions at which he arrives are distasteful and unsatisfactory to those who have given long and deep attention to this mysterious subject. I have studied these remains under all aspects of belief for more than twenty years, and I join absolute issue—as the lawyers say—with Mr. Fergusson, and with all his school, as to their supposed explanation of these monuments. These stones are all votive and hieroglyphic, and they are connected with Buddhism, or Buddhism; for this religion was that of all the world at one time. The mythic cradle, from which radiated as expressions all these stones, was India; and Professor Max Müller, in his reading of the religious traditions, is equally at fault, and equally misleading as his brother (stone-blind) worker, Mr. Fergusson. Even the name Buddhism is systematically mispronounced and misspelled. It should be *Bhuddism*—as the most profound among the Jains pronounce or sound it. The first syllable is an aspirate, in the same manner expressed and emphasised as the Æolic digamma, "*Bhudd*—*Fudd*—*Futt*—ism. Thence probably, *Bid*—*Böt*—*Föt* of the Indians and of the Chinese—*B*, *P*, and *F*, being interchangeable radically in all languages. A vast amount of philology, and of recondite ætrebology and theosophy, is under all this.

To return to the stone memorials, the importance of which cannot be overrated. They are stupendous historical expressions and land-

marks. I am fearful of occupying your space, or I could present such an array of facts, and of deductions elicited from every direction, as would fully convince. The conclusion of those who have gone the closest in their examination of all these mysterious stones, is that they are *plastic* in their character, and idolatrous in their purpose. What lies farther and under is excessively curious and interesting, and even sublime in its way, because so totally mistaken in subsequent times.

HARGRAVE JENNINGS.

ACCIDENTS.

Fall of a House.—At Trewellard, in Cornwall, the end wall of a substantial cottage fell, at a moment's notice, carrying with it the roof, the greater part of the other walls, and some of the furniture. The house and its contents were completely wrecked. A lode in East Levant had been followed too near to the surface. Recent heavy rains loosened and shifted the soil under the foundations of the house. Fortunately, no one was injured.

Fall of another House.—During a storm, and by night, a dwelling-house, situate at the back of Cliff-street, Mevagissey, also in Cornwall, containing three tenements, fell, and the inmates narrowly escaped with their lives, leaving the greater part of their furniture hurled in the ruins. It appears that the building had shown marked signs of sinking for some time past, and that the occupants had been on previous occasions warned, but owing to disputed ownership of the property by rival claimants, the inmates enjoyed shelter without paying rent.

Fall from a Scaffold.—A fatal accident has occurred at the new goods shed recently erected for the Lancashire and Yorkshire Railway Company at Barnsley. A labourer was engaged in whitewashing the top of the interior of the building. He stood on a single plank, and as he was reaching upwards, he overbalanced himself and fell. In falling, he caught hold of a spar, but released his hold, and fell on the second floor, and thence into the basement story, where he alighted on his head, and was killed on the spot.

THE RAILING ROUND ST. PAUL'S.

Sir,—It has puzzled me as well as several friends to find out the reason why the railings round the front of St. Paul's are not removed; for, of course, there must be one, and a very strong one, to prevent such a palpable improvement, both in the appearance and convenience of our crowded City, as would be effected if it were laid out similarly to the front of the Royal Exchange.

G. S. S.

THE SOCIETY OF ENGINEERS, WESTMINSTER.

MR. J. CHURCH, C.E., recently elected to the position of President of the Society of Engineers, has delivered his inaugural address.

Among the chief subjects were water-supply and drainage, land transit, gas consumption, and the probable duration of our coal supply. Mr. Church spoke in favour of sewage irrigation. "The purification of the sewage by irrigation," he said, "in respect to its soluble constituents,—the removal of which is the chief difficulty in the sewage problem,—is more than twice as effective as any of the processes of precipitation and of upward filtration; it is scarcely so complete, however, as the method of intermittent downward filtration." "Irrigation has now undergone the test of extreme practical application under greatly varying conditions, but with an almost uniformly satisfactory result. To the all-important question, 'Does the system effectually remove the sewage nuisance?' I think we are in a position to answer with confidence in the affirmative."

In speaking of the coal question, the views as respects the continuance of a supply from deep mines were in accordance with those lately urged in the *Builder*:—"Should the advance of science enable us to work coal at these prodigious depths, the cost of work will most assuredly be proportionately increased; and when fuel has thus become dearer, its consumption will be checked, and the stock will therefore hold out correspondingly longer. But this implies the crippling of the strong arm which rears our national wealth. True it is that there are vast and almost inexhaustible coal-fields in other parts of the world

yet untouched, and while coal is to be had there would be the opportunity of purchasing it. But,—in the words of the Coal Commissioners,—"It may be well doubted whether the manufacturing supremacy of this kingdom can be maintained after the importation of coal has become a necessity."

DEATH IN THE DRAIN.

A FEW days ago the whole of the persons employed in the winding-room at the mill of Messrs. Woods & Hampson, Swillbrook, Preston, became suddenly very ill, and were compelled to cease work. An examination of the premises revealed the existence of a drain from which noxious, and, in this case, deadly exhalations were emitted, filling the whole apartment, and rendering the atmosphere highly dangerous. The drain emptied itself into an adjoining water-course, which flows into the Ribble. When there is a "fresh" in the river arising from heavy rains, as during the past week, the sewage is backed up the drain, and prevented from getting away. Hence the present casualty. When the sufferers were taken home, medical aid was at once called in. Several, we regret to say, have died. On the discovery of the cause of these fatalities immediate steps were taken to remedy the defective drain, and to prevent the possible recurrence of so sad an event. Illness and death are constantly resulting from similar circumstances, as we have pointed out for years, though the cause of the effect, not being so obvious, is often unrecognized.

THE TRAMWAYS IN CAMBERWELL.

ALLEGED OBSTRUCTION TO THE THOROUGFARES. The tradesmen in Church-street, Camberwell, High-street, Peckham, and portions of Camberwell-road, have combined in an agitation to compel the Tramway Company to take up their double line of rails, on the ground that experience has already shown that in narrow thoroughfares the double rails are not only an annoyance to the inhabitants, but a great inconvenience to tradesmen, and a source of danger to pedestrians. At a numerously attended meeting, held a few days ago, several tradesmen spoke, and a resolution was passed to the effect, that the double line of tramways, in the narrow parts of the highways of the parish, was injurious to the interests of the ratepayers and tradesmen, in the very narrow margin left between the tramways and footpaths, and seriously interferes with the tradespeople and the general public.

ARCHITECTURAL ASSOCIATION.

THE members' annual *soirée* took place on Friday evening, the 9th inst., at the Rooms in Conduit-street. The walls of the galleries were rendered interesting by the exhibition of the Society of Female Artists. The public, of course, need not be admitted to the inner mysteries of a meeting strictly limited to members of the Association. It can, however, do no harm to record that the stage was neatly appointed, the actors full of their parts, and their acting of spirit. The awful warning lodged in "A Congregational Lesson" was pressed upon the bachelor members—the majority by long odds. Afterwards a roaring farce alleviated the serious spectacle of a worthy waterfamilias disturbed by rating questions. The skit on matters of current architectural gossip, looked for once a year by the initiate, was more creditable to Mr. E. J. Tarver's draughtsmanship and sense of fun than to his critical acumen.

RICKMANSWORTH AND ITS SANITARY ARRANGEMENTS.

A LOCAL correspondent writes us, complaining of the state of matters in his vicinity. He says the town has no Local Board, but sanitary arrangements are carried out under a committee of gentlemen and tradesmen, employing a paid surveyor. The case he refers to is, he says, probably one of the worst cases that have come under notice for some time. From what information he can get, the part of the town in question was drained into an open ditch running through different properties, the outlet end being "open, with a common privy standing across it; then passing through the next property with a barrel drain, and terminating with a common

privy; next comes a 4-in. stoneware drain, emptying itself into the last-named privy; and, going on further, we find a 6-in. stoneware drain; still following the chase some distance, we come to a brick drain, 9 in. wide, 9 in. high, arched over at the top, and full of solid matter from end to end. The ground around being very porous, is of course thoroughly saturated with sewage that must have been soaking in for years. I am at a loss to know how this state of things comes about. Surely the committee cannot be doing their duty." There are pig-sties, he says, on the top of the old brick drain, not 30 yards from dwelling-houses; and he speaks of the family illness (and no wonder) which has arisen from all this. The medical man urged a thorough inspection, which revealed the facts now stated. Our correspondent writes to us in the hope that there may not only be a thorough cleansing, but that when the place is properly drained, both trapping and ventilation will not be neglected.

WHY THE MÈTRE?

If you have space in your columns for a few more remarks supplementary to my last letter on the metric system, in which I pointed out that by adopting a 10-in. standard, to which I gave the name of a palm, we could not only obtain decimal notation for our own measures, but also such ready means of commensuration with the *mètre* as would, I hope, supersede in reasonable minds any demand for the introduction of that objectionable standard. I should be glad to offer an example of the working of the rule I gave for converting the French to the English measure, and *vice versa*, and in so doing I would propose a modification of so much of it as relates to square and cubic measures, for the purpose of adapting the rule better to the memory, and, indeed, with an increase of accuracy. The rule, as I now propose it, is as follows:—Let the 40-in. measure, which is compared with the *mètre*, be called an *ell*. Then, to bring *ells* into *mètres*, add 16 per mil.

Once according as the measure is—	lineal.	square.
Twice "	"	"
Thrice "	"	"

To bring *ells* into *mètres*, subtract 16 per mil, once, twice, or thrice, according as the denomination is lineal, square, or cubic.

The true ratios between *ells* and *mètres* are,—

337708 = 4	metres lineal.
1550060 = 16	" square.
6102710 = 64	" cubic.

Let our example be to reduce 16 *mètres* into *ells*.

Then 16,000	}	100 1 per cent.
256		80 1 per cent.
15,744	}	157
252		79
15,492	}	14
252		

Compare this with 155,006, and we see that the error is less than 1 in the fourth place of figures; indeed, the errors are all exceedingly small and quite inconsiderable beside the probable errors of the measurement. In the six cases contemplated in the rules the errors are as follow, viz., in the rule for converting *ells* into *mètres* lineal the error is $\frac{1}{10000}$; square, $\frac{1}{100000}$; cubic, $\frac{1}{1000000}$. The above are in excess. In the rule for converting *mètres* into *ells* lineal the error is $\frac{1}{10000}$; square, $\frac{1}{100000}$; cubic, $\frac{1}{1000000}$. These are in defect. It should be noticed that, although the errors in the square and cubic denominations appear to exceed the lineal, it is not so really when brought into comparison with the errors of measurement, because any small constant error in measurement, either arising from difference in rods or from personality in the measurer, would also be doubled in the square, and trebled in the cubic result; so that these resolve themselves into the lineal comparison after all, and such an error as 1 in 3,600 means unattainable accuracy in general practice. Deal and iron measures, for instance, are liable to as much extension or contraction as this from ordinary atmospheric influences.

F. C. PENROSE.

Sir,—Mr. Penrose, in his letter to you under the above heading, proposes a scheme which he modestly says renders it "quite unnecessary to introduce that most inconvenient standard, the *mètre*," into this country. After remarking upon the "great length"—though it is only 397 inches more than the yard,—and asserting what he would find very difficult to substantiate, viz., that the centimetre is too coarse, and the millimetre too fine, for ordinary use,—he proceeds to explain his scheme, which,

It appears, is to cross a new standard having a length of 10 m., designating it a "palm," using the decimal notation in connection with it, and then in mercantile transactions applying it to the metre by taking $\frac{1}{10}$ palms=90 inches,—and reducing by the same change, or the reverse process, of bringing up the metre to the $\frac{1}{10}$ palm measure by adding a per-centage.

When it is remembered that a different per-centage would necessarily be required for length, for area, and for cube; that these fractions would have to be added or deducted as the case might be; that to apply the divisions of the metre to those of the palm would involve a further complicity,—it can hardly be considered so simple a scheme as its author maintains.

Moreover, the accuracy with which the requisite calculation could be made is another important consideration,—especially in these days when accuracy is everything,—and from the impracticability of using a perfectly exact per-centage fraction, and possible errors of arithmetic, it is extremely doubtful, to say the least of it, whether the necessary precision could be obtained,—leaving time out of the question altogether, though in practice that is always an element of great consequence.

With reference to our weights and measures of capacity, Mr. Penrose says, "to reduce quarts to litres and pounds to kilogrammes by an easy per-centage offers no difficulty;" but,—looking to the difficulty in respect to the weight, which is the more difficult of course, the simplest of all,—the statement admits of a query. He says, "these per-centages might be readily taught at the schools," but some parties are so far from being in order to reduce the system of measurement to another, we must of necessity be acquainted with both. How can you possibly teach a child the way to reduce yards to metres, pounds to kilogrammes, quarts to litres, &c., without at the same time teaching most of the metric system? If your correspondent's scheme were adopted it would come to this,—that the scholar's memory would be burdened with both systems in addition to the method of applying the one to the other.

Now, as one of the principal reasons for changing our weights and measures is to lessen the labour of the schoolmaster, it is not to be wondered at that the labour can scarcely be said to render it "quite unnecessary" to introduce a system which can unquestionably be taught with a greater ease than the one at present in use. Let any one look through a common school table-book, and observe the extraordinary variety of measurements which children are expected to learn! To the young mind, the metric system, and its seven securities, much less retain, a complete knowledge of them. They consist of a multiplicity of distinct terms and figures, having no connecting links between them, and must be committed to memory as so many separate and dry facts. On the other hand, the metric system is so built up on a common basis, that it is incomparably easier to learn,—and it is so related, that one can be deduced from another, and there is scarcely a possibility of forgetting it when once mastered.

I know, sir, it has been urged against it that "centimetres" and "kilogrammes" are hard terms for children to recollect; but the difficulty is soon got over, and that objection, together with the fact that it would cause some little embarrassment at first, is completely vanquished by the arguments originally advanced in its presents: advantages which are recognised widely on the Continent, where the chief States have already adopted it, and where it is fast becoming general. It is almost exclusively used throughout the scientific world, which done is a sufficient proof of its greater accuracy and superiority. Like all other great improvements it has met with opposition, and even scorn, and it is the most successful of modern times—originally with the most determined and spiteful opposition, and as they eventually became that resistance, so the metric will inevitably supplant the crude, disconnected, and harassing system now used in this country. F. A.

THE STATE OF GLASTONBURY.

Sir,—Allow me, if not too late, to give you a warning against believing the statements, as put forth by "A Subscriber" in your valuable paper of February 3rd, and in your issue of the 10th, in respect to my best thanks or your efficient teaching a few years since.

The truth is, sir, the town proper of Glastonbury can at present boast of a perfect system of pipe-sewers, amounting in extent to about four miles, and which I and I trust shortly to have the pleasure of further enlarging, you, and all whom it may concern, that the Local Board will have then finished the drainage; carried the outfall a distance of one mile and a half below the Railway Station; and that our little historical town, the centre on Somerset, will not only pride itself on its attractive and magnificent ruins and surrounding scenery, but on its perfect system of drainage, laid down with all the latest improvements in sanitary science; and we shall also be enabled to boast of a sewage farm and efficient waterworks for the supply of the town. I trust by the time we have our next county hall that the parties attending it will be better enabled to distinguish between the sulphurous vapour thrown off from the defective gas and the supposed poisonous effluvia arising from the sewers; not that I think there will be any cause to find fault with either in the future. I would just add that the lady mentioned in "A Subscriber's" letter resides about five miles from Glastonbury, and in a neighbourhood where there has been no sewer for some time past. JOSEPH DAX, Surveyor to the Local Board.

CONCRETE BUILDING AND THE BOARD OF WORKS.

At Wandsworth Police-court, Mr. Ingham heard a case of considerable interest to the building trade, in a summons at the instance of the Metropolitan Board of Works with reference to the building of a concrete wall in Lombard-road, Battersea, which was not conformable to the bye-laws of the Metropolitan Board of Works. Mr. Ingham, the district surveyor, said "packing," consisting of pieces of pottery, &c., had been used with the concrete, and in making it, an iron bar, 1/2 in. diameter, was used in the wall he was bound to say it was extremely hard. He, however, said that the materials should be mixed and conglomerated together on the ground before being put in the wall. The bye-law in question is to the effect, that the wall would not stand without "packing." Mr. Newton, engineer, gave a description, with the assistance

of a model, of the use of "packing." He said there was a layer of concrete, then a layer of pieces of brick, stone, and so on, which formed the wall, the materials being thrown in by unskilled labour. He proceeded to say that the whole of the concrete was made of a mesh, but the "packing" was added to increase the strength of the wall. He argued that the use of "packing" was in compliance with the Act, which required walls to be properly bonded together. Therefore, the Metropolitan Board had a licence from the Board was unnecessary. Mr. Ingham said that the last witness had convinced him that the wall was not properly bonded together. According to his description, a wall of that sort might be properly bonded together, but there was no security that it would be. He was clearly against the defendant. Mr. Nasmyth, who was retained for the defence, asked to have a case granted for a superior court. He said it was a question of great importance, as contracts had been entered into for the construction of blocks of Peabody buildings with similar walls. Mr. Ingham said he would grant a case, but he eventually dismissed the summons, as it was found that there had been an informal notice.

LONDON CITY AND THE MAIN DRAINAGE.

In replying to the statement that notwithstanding the enormous expenditure on the main drainage many sewers expended themselves into the Thames, already mentioned in our pages, Mr. Bazalgette gave a reply at the last meeting of the Court of Common Council:—

He remarked in that the sewage formerly passing through and from the City into the river was discharged from an area of about 10½ square miles, the bulk of it flowing into the Thames near the City's western boundary, and therefore passing along nearly the whole of its river frontage. Of this upwards of nine-tenths had been diverted from the City since 1861, and now discharged at a point twelve miles below the City, and only a small amount of at low water and at all other states of the tide as formerly. Nearly half the whole area of the City had thus been dealt with, and works were now in progress by which the sewage of a considerable portion of the remainder would be intercepted within about two months. The diversion of the sewage from the comparatively small tract left would not involve works of an extensive character, but as the sewage operations required would traverse very narrow thoroughfares already overworked with heavy traffic in the close vicinity of lofty warehouses, of wharves, and the like, the sewerage operations required much previous consideration and very careful examination of the various localities and the special drainage arrangements. The requisite works being complicated by these considerations would be difficult and excessively costly in their execution, and could only be carried out as opportunity offered. Portions of those works would, however, be executed in the spring. There had been no want of foresight in providing for the drainage of this small remaining area, for the low-level sewer which passes through its centre affords a deep and sufficient outlet for all its sewages. Referring to Mr. Hayward's report, Mr. Bazalgette states that of the nine so-called main sewers only three were in fact main lines, from one of which the whole, and from the two others nearly four-fifths, of the sewage had been intercepted, and was discharged at the Barking Creek outlet. The other six were comparatively of an unimportant character. The nineteen called minor sewers were 200 feet, insignificant, and discharged but little sewage into the river; the greater number of them did not exceed 200 ft., and some were less than 100 ft. long, draining for the most part wharf and warehouse property. Of the 334 district sewers, they appeared in nearly all cases branches falling into the other outlets; upwards of ninety had been intercepted and the sewage was discharged at Barking. A large proportion of the remainder were much the same, and the sewage of six courts, mews, yards, alleys, and the like, the whole of which drained but little more than half a square mile.

ARCHITECTS' ACTIONS.

W. G. COLBOURNE V. REV. DR. COLLIS.

This was an action in Stratford-on-Avon County Court, to recover 25*l.* 2*s.* 6*d.* for designs, plans, and surveying the proposed site for the erection of a church at Ludington. The action had been heard in the absence of the defendant at the August Court, and the verdict given for the plaintiff. The defendant subsequently applied for a new trial, which application was granted. It was heard at this Court before a jury. Mr. Warden for plaintiff, and Mr. Lane for the defendant.

Mr. Warden, in opening the case, said the action was brought to recover 25*l.* 2*s.* 6*d.* under the following circumstances.—On November 18th plaintiff received a letter from defendant to call upon him on a matter of business, and in pursuance of that letter he did so, and a conversation took place. Plaintiff then proceeded to make a rough pencil sketch of a church. Plaintiff saw defendant frequently and listed the plans of the proposed church, and made tracings and plans for the church. Defendant called at plaintiff's office and approved of the plans and tracings shown. On the 31st of March plaintiff received a letter rejecting those plans. The plaintiff had always been under the impression that he alone was preparing plans. He had received express instructions from the defendant to prepare those plans. The plaintiff was never limited in the amount the church was to cost, and was never told that any one else was preparing plans. Plaintiff received an intimation on the 31st that Mr. Cotton's plans had been accepted. The tracings were retained by the defendant, but are now produced. An application to defendant to pay the amount now claimed resulted in the defendant offering to pay 10*l.* 10*s.* out of his own pocket, as it could not come out of the Ludington Church Fund; or the matter should be laid before a referee. The plaintiff declined to accede to these terms; hence the action.

The plaintiff having deposited to this,— Mr. Bateman, architect, Birmingham, said he had

examined the plans and specifications produced in court, and the charges for them were correct. The plans were prepared in the usual manner, and the charges very reasonable. If the works were carried out, the architect would be entitled to five per cent. on the cost, and if his plans were not carried out, then to two and a half per cent.

Mr. Newby, architect, was also called, and said the charges for the work done were fair and reasonable.

Mr. Constan, architect, Birmingham, quite agreed with Mr. Bateman and Mr. Newby.

Mr. Lane, on behalf of the defendant, addressed the jury to show that the plaintiff had exceeded his instructions, and that the plans were not suitable for the building required, and that the plaintiff was told that the cost of the building was not to exceed 700*l.*

In the course of the evidence on this side,— Mr. Hopkins, architect, said the per-centage charged was fair if no sum for the church was mentioned; but if 700*l.* was mentioned plaintiff would not be entitled to any.

Mr. Chamberlain, architect, said if the plaintiff had exceeded the estimate his plans would be rightly rejected; but he would be entitled to charge for making the survey and some other work pointed out.

The jury, after a very brief consultation, returned a verdict for the plaintiff upon all the points stated, and for the full amount claimed, with costs.

THE QUESTION OF "AN INDEX."

Sir,—On receipt of your issue of December 23rd ult., I was much pleased with the suggestion of one of your correspondents as to an index for the thirty years' volumes of the *Builder*, which this year will be completed. Being the fortunate possessor of twenty-nine volumes of your valuable publication, I have compiled for my own use an index of important subjects (not alone from the *Builder*) in two ways: the first system is arranged alphabetically as usual, the second classifies the subject matter according to the style discussed or illustrated, noting title of work, volume, and page, for reference.

By this means I am enabled to refer without unnecessary loss of time to any statement, opinion, or fact which I may wish to recall, and to any illustration of executed work, under its style or period. The index itself, however, has become cumbersome, because written, and needs the art of the typographer to reduce its bulk. As the undertaking, if carried out on the system above stated, would be costly, requiring much time of a professional expert to compile it, will you permit me to suggest that an announcement to the effect that such an index, separately bound or otherwise, will be issued for a certain price at the close of the present year, would, in my opinion, produce a demand for the same sufficient to reimburse the outlay at least, and at the same time, you would confer another lasting benefit upon your subscribers. A. F. M.

St. Charles, Missouri, U.S., January 19, 1872.

Sir,—There can be no doubt that an index is much required; but it can only be perfected with the aid of numerous subscribers,—for the work could not be done without much labour and some expense. An index, with the aid of subscribers, has been made of the first, second, and third series of *Notes and Queries*,—thirty-six volumes altogether,—which is very useful, and sells at a separate volume for 1*s.* An index of the thirty volumes of the *Builder* might be prepared in one volume, and the sale might be sufficient to justify the outlay, yet it would not be prudent to undertake the work without the guarantee of a sufficient number of subscribers before publication. Persons, therefore, who desire the index, should give their names, &c., forthwith. C. A. COOKE.

THE NEW CEMETERY, BUILDINGS AND RECREATION GROUNDS, AT BARROW-IN-FURNESS.

ONE of the most remarkable instances of the conversion of an open waste or rabbit-warren into a large and flourishing town, in the course of a few years only, is the borough of Barrow-in-Furness, in North Lancashire, which now contains a population of more than 40,000 inhabitants, with two large docks, and another dock or float, 200 acres in extent, in course of construction; whereas twelve years ago there were not more than 100 houses in the place, whilst only a few years before that time there were none.

Amongst the public buildings and other places of resort which have from time to time been erected and formed in rapid succession, the town council of the young and prosperous borough are now engaged in the construction of a large and handsome cemetery, which is not to be used for the purposes of interment only, but is also to combine with its pleasure-gardens and a lake, so as to render it a general object of use and recreation to the town. The land for the cemetery proper, consisting of 40 acres, has been given by his Grace the Duke of Devonshire, and the ad-

joining land for recreation purposes has been purchased from the Barrow Iron and Steel Company and the Railway Company. The laying out of the cemetery and recreation-grounds has been entrusted to Mr. Kemp, landscape gardener, who has a reputation for the laying out of cemeteries and parks. The contract for the erection of one of the chapels and some other buildings has just been taken by Mr. Garden, for 4,750*l.*, and the works will be immediately proceeded with. It is intended to open a portion of the cemetery for interments by the 1st of June.

It is stated that, although building has been going forward on a large scale at Barrow during the last few years, the demand for houses is greater than the supply, in consequence of the large number of artisans now employed in ship-building, the iron works, and the shipping of the new port, and in many cases more than one family are compelled to reside in the same house. This has led to the formation of a co-operative building society.

THE REMOVAL OF ST. MILDRED'S CHURCH, POULTRY.

THE preliminaries have this week been gone through in connexion with the removal of St. Mildred's Church, in the Poultry, which is about to be demolished in order to make way for City improvements. Messrs. Fuller, Horsley, & Co. have disposed by tender of the interior fittings, consisting of the seats, galleries, pulpit, and other articles, whilst the valuable and artistic monuments and tablets are being transferred to St. Olave's, Old Jewry, with which St. Mildred's parish has been united. The bodies in the churchyard are about to be removed to a spot in Hford Cemetery, which has been specially selected there; and the Ecclesiastical Commissioners have made a grant of 1,000*l.* for the purpose of erecting a handsome monument over the vault in which the remains will be deposited. In consequence of the two parishes of St. Mildred's and St. Olave's being now united, no new church will be erected in place of the old edifice which is about to be removed, but 4,000*l.* are intended to be expended in church enlargement in the parish of St. Olave, and a new residence is also to be built in the parish for the rector of St. Mildred's, at a cost of 2,000*l.*

EARL OF WARWICK'S SEWAGE FARM NEAR LEAMINGTON.

THE general scheme of irrigation presents some new and interesting features. It is on a scale of unprecedented magnitude, of which the following may be taken as a brief sketch.—One object has governed the whole scheme: to secure it all details have been subordinated, viz., to regard the sewage for its value as a manure, with the assistance of water as a carrier for its distribution, and for summer irrigation. Therefore, as a fixed sum will be paid for the sewage, the object has been to utilise it over the widest possible area, in order that a system of mixed and alternate husbandry may be adopted, including not only the ordinary operations of farming, but of wet and of dry farming, changing from one to the other systematically. In winter the sewage to be used simply as a manure on bare fallows, for spring cropping. To each of the eight hydrants on the rising main a "bend" is attached, with its mouth on the surface of the ground. This mouth is inclosed in a brick chamber. On opening the screw valve, the sewage enters the chamber, and is distributed by regulated outlets into stone-ware pipes; these pipes, working under a head pressure of from 8 oz. to 2 lb. on the square inch, carry the sewage to the exact point wanted. As may be imagined, the pipe work is extensive; the pipes were manufactured by Mr. T. C. Edwards, near Ruabon, North Wales.

SCHOOL-BUILDING NEWS.

Barking.—The new Infant School at Holy Trinity, Barking-road, was formally opened on the 12th inst., by Sir Antonio Brady, with the Rev. A. B. Delap, vicar of the parish; the Right Rev. Bishop Cloughton; and others. The building is of stock bricks, with Portland stone dressings. The architect is Mr. Henry Ough, of Stratford; and the builder, Mr. John Palmer, of Old Gravel-lane, St. George's East. The cost of the building, including architect's commission, is about 600*l.*

Hackney.—A project has been started for the erection of new schools in connexion with the Church of St. Michael and all Angels, London Fields, South Hackney, for 750 children. The estimated cost of the building, including a master's residence, is 4,500*l.* Grants from societies have been obtained to the extent of 2,347*l.* 10*s.*, and the list of local subscriptions amounts already to 650*l.*

Lensford.—The new schools for the district parish of St. John's, Lensford, have been opened. The school-house contains two well-lighted school-rooms, the dimensions of which are 35 ft. by 20 ft., and apartments for the schoolmistress. The buildings have been erected by Earl Cowper, with the aid of grants from the Diocesan Board of Education and the Education Department of the Privy Council. The schools will be conducted as public elementary schools under the Education Act of 1870.

Maldenhead.—The new Roman Catholic School, at the corner of Forelance-lane and Bridge-street, is now nearly completed. It consists of two rooms. One on the right as you enter, 31 ft. in length by 17 ft. in breadth, is the main school, capable of containing by Government measurement 64 children. The walls of this room are 8 ft. 6 in. in height; but as the roof is quite open, it gives a full height of 18 ft. The walls to the height of 3 ft. 6 in. are covered with cement, and the above are coloured with a light shade of blue. The roof is open, showing all the timbers, and in place of being plastered is covered in, the boards stained and varnished. On the left as you enter is a class-room, giving accommodation for 32 more children, making a total accommodation of 96 children, allowing 8 square feet of space for each child. The class-room is similar in character to the main school; but advantage has been taken of the peculiar shape of the ground to make one octagonal. Ventilation is provided for by windows opening in their centres, and also by adoption of the method of ventilation recommended by the Poor-law Board to be used in all workhouse hospitals. The passage between the rooms is paved with coloured tiles. At the back of the schools are out-offices, furnished with Moule's patent earth-closets, coal-house, &c. A yard, 18 ft. by 22 ft., is reserved for the children's playground. The site and a contribution were given by Mr. Wilberforce, of Ives-place. Mr. C. G. Wray, of London, is the architect of the schools; and the contract was taken by Mr. Price.

Malmesbury.—New schools are about to be built at Lea, near Malmesbury, upon a site given by the Earl of Pembroke, and in accordance with the requirements of the Committee of Council on Education. Mr. C. J. Phipps, of London, is the architect.

Books Received.

"A Year's Voluntary Work after Office Hours among the Costermongers of Golden-lane." By W. J. Orsman. 1871. London: Passmore & Albaster." Lord Shaftesbury is the president of this mission, of which we have heretofore seen reason to speak favourably. The institution has been in existence for ten years, and its usefulness has received praise from many of the London newspapers and magazines. The committee, it seems, are greatly in need of funds, not only to carry on the numerous religious, educational, and benevolent operations of the mission, but also to erect a plain building in Golden-lane; notice having been given by the owners of the building at present rented of their intention to sell it for other purposes. Their bankers are Messrs. Barclay, Bevan, Tritton, & Co., of Lombard-street. "Pamphlet and Crime: a True Cause and a True Antidote; dedicated to H.R.H. the Princess of Wales." By Robert Hill. London: Kelly & Co., printers." There is no trace in this title of the real purpose of this pamphlet, which is to advocate the establishment of the Alexandra Palace and Park on a new basis, with lower charges for admittance and for season tickets than heretofore proposed. The prospectus of the new company here referred to, however, will do doubt speak for itself, when we may recur to the subject.—*The Public Ledger*, a well-known daily newspaper, published at Philadelphia, U.S., has issued the "Public Ledger Almanac for 1872," gratis to subscribers. It contains some useful information as to local institutions and state officials, &c.—*The Pedlars Act, 1871*,

has been published among the "Penny Statutes for the People." Kent & Co., Paternoster-row."—*The Lithographer*, No. 20, Vol. ii., for February, shows that the lithographic trade patronise their own class journal, which contains some useful matter on various subjects.

Miscellaneous.

The Nine-Hours Movement.—On Saturday evening last, a meeting of the metropolitan carpenters and joiners, consisting of delegates from the various societies, shops, and jobs, representing about 5,000 society and non-society men, was held at the Brown Bear Tavern, Broad-street, Bloomsbury, to ascertain the opinion of the trade as to the propriety of memorialising the master builders in favour of the nine hours. There were 200 delegates in attendance, and nearly the whole of the large firms were amongst those represented. Mr. Hawkins, a member of the provisional committee, occupied the chair. The delegates having given in their reports, a discussion took place, which resulted in the following resolution being adopted, with one dissentient:—"That a circular be sent to the master builders of the metropolis on the 1st of March, informing them that the carpenters and joiners in their employ would, on and after the 1st of July next, require that the working hours be nine per day, or fifty-one hours per week, with payment at the rate of 9*l.* per hour, and to respectfully request them to reply to the circular by given at the expiration of six weeks from its being received." The questions of overtime and piecework stood over for further consideration at an adjourned meeting.—We are asked by some of the employed to mention that Mr. George Jennings has adopted the Nine Hours system.—The workmen who are employed at Messrs. Fletcher & Co.'s Masson Ironworks, Litchurch, Derby, have given a complimentary dinner to their employers in commemoration of the satisfactory adjustment of the nine-hours movement. The party was 250 in number, and the feast took place in the St. James's Hall. The Mayor of Derby presided, and Mr. Barton, a very old servant of the firm, was in the vice-chair. The proceedings throughout the evening were of a very satisfactory character.

Society for the Encouragement of the Fine Arts.—On Thursday evening, the 8th, Mr. Hyde Clarke delivered a lecture at the Society's meeting, entitled "How Art Declines: the Lower Empire," at which Mr. F. W. Rowcell presided. The lecturer referred to the history of art in Rome as imported from Greece, and to the abundance of great works and models, the number of artists, and the profusion of patronage; notwithstanding all this, a period arrived of progressive declension when everything wanted truthfulness. There was not merely debasement of material, but of form, in architecture, painting, and sculpture. This was affirmed to be contemporary with the corruption of manners and morals which pervaded the Government and all society. After instituting a comparison between the earlier and later schools of art in Rome and in England, and pointing out that art had most flourished in those States which had been free or still retained the traditions of freedom, the lecturer argued that proficiency in art could not be expected solely from material appliances, but was chiefly dependent on moral causes. Mr. Hyde Clarke referred not only to the schools of Italy and the Low Countries, but to Spain and the epochs in France of Louis XIV. and XV. and the two Napoléons. A discussion followed.

Public Park for Warrington.—The Warrington Town Council have resolved to purchase Bank Hall and Grounds, the seat of Colonel Patten, for the sum of 22,000*l.* It is intended to convert the hall into a town-hall, police-station, fire-engine depot, and other purposes connected with the Corporation. The grounds will be made into a public park. The total cost is estimated at 50,000*l.*

Rector of St. Andrew's University.—Mr. Ruskin's election to the Rectorship of St. Andrew's University has been declared illegal, under an Act of Parliament prohibiting a Principal or Professor of any University from being eligible for the post. The office falls to Lord Lytton, the unsuccessful candidate at the recent contest.

Trade and Navigation of United Kingdom.

—The following and other results, from carefully-prepared tables of the Statistical Department of the Board of Trade, and from similar sources, have been issued in a form by Mr. J. B. Redman, of West-
 London. Total tonnage of British and foreign
 ships with cargoes and in ballast engaged in
 foreign trade, entered and cleared at ports in the
 United Kingdom:—

Tons entered.	Tons cleared.	Total tons.
4,657,795	4,781,872	9,439,667
18,113,364	18,926,818	37,040,182

that in thirty years the trade of the country
 quadrupled itself. The same with cargoes
 in both tables include repeated voyages:—

Tons entered.	Tons cleared.	Total tons.
1,163,208	3,322,628	7,437,836
14,910,742	16,713,988	31,624,730
16,413,102	19,953,132	35,406,234

shows a still higher rate of increase in
 foreign trade. The ports of London and Liver-
 pool with nearly one-half of this enormous
 trade:—

LONDON.		
Tons entered.	Tons cleared.	Total tons.
1,904,918	1,683,463	3,588,381
4,953,366	3,026,916	7,116,282

LIVERPOOL.		
Tons entered.	Tons cleared.	Total tons.
1,635,315	1,659,939	3,295,254
3,416,633	3,326,139	6,772,772

importation of coal into the port of London
 the following remarkable results:—

Tons seaborne.	Tons inland.	Total tons.
3,553,304	81,675	3,634,979
2,885,710	3,775,207	6,760,917
2,762,712	4,464,718	7,227,430

Railway Amalgamations.—A meeting
 held by the Provost of Dundee, has been held
 at the Kinnaird Hall there in terms of a requisition
 to consider the probable consequences to the
 interests of the public of the extensive railway
 amalgamations recently proposed, and also the
 expediency of the State taking over the entire
 railway systems of the country. The Provost
 stated that the requisition had been signed
 by a large number of the leading citizens, traders,
 gentlemen holding official positions in the
 city. Mr. Brandon was present and explained
 the proposed scheme for shilling, sixpence, and
 penny journey-fares for all distances. It
 resolved "that this meeting regards the pro-
 posed railway amalgamations over the country
 as being in its general and commercial inter-
 ests, and also maintains that it is not possible
 to have restrictive clauses so as to insure com-
 plete protection to the public in any Amalgama-
 tion Bill which does not have the effect of up-
 lifting competition;" and "that in the opinion
 of the meeting the time has now arrived when it
 is the duty of the Government, in the inter-
 ests of the nation, to acquire the entire rail-
 way systems of the country, and for this purpose
 to form a branch of the National Rail-
 way Association in Dundee."

Society of Biblical Archaeology.—At the
 meeting on the 6th inst. a communication
 was received from M. Clermont Ganneau, an
 inscription in Hebrew or ancient Phœnician
 characters of the time of the kings of Judah,
 discovered at Siloam-el-Fokani, near Jerusalem.
 In a paper M. Ganneau related the discovery
 of incised tablets, executed on the wall of
 a rock-cut chamber or scullery, near to
 the tomb of the Sheikh of Siloam. The inscrip-
 tions are in the old Archaic character now
 known to the archaeological world in the famous
 Siloam stone. Some Christian had, about the
 middle of our era, wilfully mutilated the
 text of the writing, but enough still remained to
 identify its extreme value as a palæographic record.
 The first four lines of the first tablet
 contained a name believed to contain the name
 of the deity Baal, and to denote a votive dedi-
 cation to him by a functionary, whose name
 was given in the period of the later kings of Judah.
 The author inclined to think that the cavo had
 originally dedicated to Baal at a still earlier
 date, probably by one of Solomon's Moabitish
 kings, and that it was afterwards added to and
 altered in a subsequent reign. These are the
 chief, or nearly the chief, positively Hebrew
 inscriptions in existence.

Improved Industrial Dwellings
 in London.—Since our notice of the report to
 the Hon. H. Waterlow's meeting was given, the
 tenth half-yearly meeting has been held
 and the report adopted. A dividend at the rate
 of 10 per cent. per annum was declared. It was
 stated that out of the rent collection only 10%
 had been lost.

Heat and Light.—Dr. John Tyndall, F.R.S.,

in delivering a lecture at the Royal Institution,
 on "The Identity of Light and Radiant Heat,"
 said that, although once it was doubtful whether
 the two were identical, it was now known that
 such was the case. Radiant heat could be polar-
 ized like light, and Faraday had discovered a
 method of magnetising a ray of light strictly
 parallel to that found effective in a case of a ray
 of radiant heat. To say, however, without modifi-
 cation, we may remark, that light and radiant
 heat are identical is rather too much of an iden-
 tification; there is difference as well as identity.
 What causes the difference? In our volume
 for 1854 (p. 580), about the time when Dr.
 Tyndall states that he began his researches
 on this subject, we showed, in an article on
 the nature of "Electricity," what we believed
 to be the true nature of this difference, as
 well as of this identity; and the progress of
 science since has only led to a closer approxima-
 tion to that view of the nature and co-relation-
 ship of light, heat, and electricity, as physical
 forces.

Heavy Penalty for Breach of Building

Regulations in Newcastle.—At the New-
 castle police court, Miss Margaret Martha
 Ishella Dean has been summoned, at the in-
 stance of the corporation, for enlarging and
 altering an existing building, according to plans
 which had not been approved by the corpora-
 tion. The building in question is the Royal
 Music Hall, situated between Dean-street and
 the Side, and which has recently been opened
 to the public. It was stated, on the part of the
 corporation, that the defendant sent in a plan
 of alterations, which was passed by the corpora-
 tion, but that it afterwards came to the notice
 of the authorities that the defendant was erect-
 ing the building in defiance of the plan, and of
 sanitary considerations. The decision came to
 was to fine the defendant 5l., and 10s. per day
 for 146 days. On the main point, which related
 to the stage and a covered open space, it was
 stated for the defendant that she must go to the
 Queen's Bench upon it. Other cases, one for
 not having proper egress and ingress, were
 adjourned for a fortnight.

Death of Mr. Joseph Pease.—One of the

most successful men and largest employers of
 labour in the North of England has died at his
 residence, in Darlington. Mr. Pease, who was a
 Quaker, with his father, Mr. Edward Pease,
 George Stephenson, and others, initiated our
 present railway system, in connexion with the
 Stockton and Darlington Railway, which was
 the first line, and was opened in 1825. The
 deceased gentleman, then a young man, drew up
 the prospectus. Mr. Pease was the founder of
 Middlesbrough, by buying up the land upon
 which the present town is built, with others, and
 making it into a port for the shipping of coal,
 and a general maritime trade. His capital and
 enterprise had no small share in developing the
 immense iron trade which has attained such a
 degree of prosperity in Cleveland. It was,
 however, with the coal trade of South Durham,
 and the formation and extension of railways in
 the North of England, that Mr. Pease was chiefly
 associated.

The City Architect's Office.—At a meeting

of the Court of Common Council, on the 8th
 inst., in answer to Mr. Paterson, the architect
 (Mr. Horace Jones) said that his chief clerk
 (Mr. Carver) had been absent from his office,
 through illness, for between nine and ten
 months. Mr. Paterson: The Officers and
 Clerks' Committee are aware that great delay
 occurs in the business of the architect's office,
 and this frequently arises in consequence of the
 absence of the chief clerk. Mr. H. Gover
 moved that the re-appointment of Mr. Carver
 be not made. Mr. D. Rogers seconded the motion.
 Mr. Rudkin: As he is ill, do not let Mr. Carver
 think you have discharged him. I will move, as
 an amendment, that he be re-appointed for three
 months, pending the report of the Officers and
 Clerks' Committee. Mr. Lawley seconded the
 amendment, which was put and carried.

Deafness and Compressed Air.—In the

construction of a bridge over the Rhone between
 St. Maurice and Bex, M. Cuenod, the engineer,
 used an apparatus for fixing the piles beneath
 the level of the water in a gravelly soil. He
 noticed a curious but well-known effect upon the
 men employed within the compressed air. In
 the case of some, their deafness became sensibly
 diminished. Artists ought to have found in this
 fact something suggestive.

The Rebuilding of Chicago.—The Chicago

people are not only making great progress with
 the rebuilding of their city, but are illustrating
 the buildings re-erected by engravings published
 in a periodical called "The Landowner: a
 Journal of Real Estate, Building, and Improve-
 ment." In the issue for February are views of
 various extensive and important buildings now
 erected or in process of erection, including the
 new chamber of commerce and several extensive
 blocks of building for commercial purposes, the
 Equitable Life Assurance Society's premises, the
 Fire Monument, already illustrated in the
 Builder, and others. From a statement of the
 erection of the "Central Union Block," com-
 prising the Union National Bank, State Savings
 Institution, an insurance office, printers', sta-
 tioners', and other premises, all "in sixty days,
 by Hon. W. E. Coolbaugh and Messrs. Wheeler
 & Powers," we should fear that the rebuilding is
 going on at too fast a rate.

Land in the City.—From a report of the

City Lands Committee, quoted by the City Press,
 it appears that the following land has been let
 by them during the past year:—Two pieces
 described as lots 1 and 2, at the corner of Lud-
 gate-hill and the Old Bailey, to Mr. J. K. Farlow,
 80 years,—peppercorn for the first year, and
 525l. for the remainder of the term; a piece
 described as lot 3, on the east side of the Old
 Bailey, to Messrs. H., C., & E. Gilbertson, 80
 years,—peppercorn for the first year, and 200l.
 per annum for the remainder of term; three
 pieces of land, described as lots 4, 5, and 6, on
 the east side of the Old Bailey, to Mr. J. King,
 80 years,—peppercorn for the first year, and 550l.
 per annum for remainder of term; a piece of land
 forming the site of the late Debtors' Prison, in
 Whitecross-street, to Mr. W. Braham and Mr. A.
 Wells, 80 years,—peppercorn for the first year,
 1,450l. for the second year, and 2,900l. for re-
 mainder of term.

The Croydon School Board.—The report of

the general purposes committee was read at a
 recent meeting. It recommended "that the
 committee proceed to obtain from architects
 named by the Board plans, specifications, and
 estimates for a group of boys', girls', and infants'
 schools, with teachers' residences." The Board's
 opinion as to the detailed plans that were to be
 referred to architects was that it was expedient
 that certain general rules should be laid down
 for the guidance of architects. It was ulti-
 mately moved as an amendment, "that the
 meeting of the Board should adjourn till Friday
 next, and then go into the questions of detailed
 internal fittings of schools in general to be re-
 ferred to the architects." This was seconded,
 and the report of the committee was adopted.

The New Well, Guildford.—The new well

now only requires its covering to complete it.
 The water is so clear that the different seg-
 ments of the cylinder can be seen to its entire
 depth, 35 ft., as well as the pipe which supplies
 the water from the well. During the progress of
 the works the water has been pumped at the rate
 of 200,000 gallons per hour, and this only re-
 duced the water about 2 ft. 6 in. The supply
 required for the town is not likely to exceed 18,000
 gallons per hour. The pumping powers consist
 of the old water-wheel and an engine. The pipes
 are laid to within 5 ft. of the bottom of the
 new well. The ceremonial of testing the well
 has just been conducted by the mayor. The
 analysis of the water will be made by two an-
 alytical chemists.

Heating Apparatus.—Mr. Thos. Parker,

of Newcastle-upon-Tyne, architect, has patented
 a new hot-water heating apparatus. The princi-
 ples of the invention are comprised in the use of
 pipes of small bore for the flow and return of the
 hot water, laid chiefly on the floor of the build-
 ing; and also the use of heaters, similar to
 those used in railway-carriages, placed in the
 pews (if the building be a church), and in an-
 analogous positions in other buildings. The
 chief advantages claimed for this invention are
 greater efficiency, by the local application of the
 heat; a great saving of cost of apparatus; and
 flues, &c., under floors are dispensed with.

Technical College for Glasgow.—A move-

ment has been initiated at Glasgow to establish
 a Technical College there. It is proposed to
 raise 50,000l. for the purpose, and the college
 will be connected with the Andersonian Univer-
 sity and other local institutions.

* Within the metropolitan area the stipulations of the
 Building Act would render necessary some modification in
 this respect.

Enlargement of King's College Hospital.

Within the last few months King's College Hospital has been undergoing a considerable enlargement, by the addition of another wing at the north-east end of the building. The new portion which, architecturally, is uniform with the rest of the structure, increases the length of the hospital by 15 yards, and furnishes accommodation for upwards of 100 additional in-door patients, besides providing greatly increased space and convenience for the medical staff. The works have just been completed, and the large area in front of Portugal-street has been laid out, and planted with evergreens and other ornamental trees.

The Science and Art Museum for Nottingham.

At a recent meeting of the Town Council Mr. Cole's letter as to the establishment of a museum at Nottingham, which we lately quoted, was read and considered, and it was resolved that the council gratefully accept Mr. Cole's offer; that the Exchange-hall be used temporarily for the purposes of the exhibition till other arrangements be made; and that a committee be appointed to attend to the matter. It was urged in the council that a scheme for a new town-hall was at the root of the present movement; but what Mr. Cole could have to do with that it is hard to see.

Font for Overton Church, Raabon.

A font has just been presented to this church by the tenants and friends of Mr. Edmund Peel, of Brynnyps, to commemorate the birth of a son and heir to the Brynnyps estates. It is the work of Messrs. Cox & Sons, of London, and is in Caen stone, with marble pillars and richly-carved capitals supporting the bowl, and is octagonal in form. The eight panels are divided by marble pillars, and contain alternately the subjects of the baptism of our Lord, Christ blessing little children, the crossing of the Red Sea, and the dove repairing to the ark; the others being filled with foliage.

Thanksgiving Day and the District Surveyors.

At the last meeting of the Metropolitan Board of Works, in reply to Mr. E. Dresser Rogers, it was stated by the superintendent architect that the district surveyors of the several districts through which her Majesty passed would be held responsible for the safety of the platforms and places erected for the purpose of viewing the procession.

The Government Sanitary Bill.

It is understood that the measure which Mr. Stansfeld will introduce on Friday will include not only a consolidation of the existing sanitary laws, but also a rearrangement of areas; a reconstitution of suitable boards (chiefly by consolidation) to preside over these simplified and extended areas; and a great extension of the sanitary service of the country.

Proposed Statue of Cardinal Wolsey.

A committee is being formed for erecting a fitting statue of their late fellow-townsmen by the leading men in Ipswich. It is just 400 years since Cardinal Wolsey was born, and it is suggested that the present time is very opportune for raising a monument to so illustrious a native of Ipswich. It is proposed that the statue should be placed in the archedway.

A Good Example.

The following notice was posted at the entrance of Messrs. Chubb & Son's works, Wolverhampton, on Saturday morning:—"This manufactory will be closed on Tuesday, February 27th, the day appointed by the Queen as a thanksgiving-day for the recovery of his Royal Highness the Prince of Wales. Messrs. Chubb & Son will have much pleasure in paying the day's wages in full to each man and boy."

St. Paul's Cathedral.

The preparations in the Cathedral for the National Thanksgiving are going on steadily. Messrs. Myers & Sons are erecting the galleries in the body of the building and Messrs. W. Cubitt & Co. are fitting up the choir. The whole of the sanitary arrangements have been entrusted to Mr. George Jennings, under the direction of Mr. Taylor, of Her Majesty's Office of Works.

The New Reservoir, Oswestry.

A report has been made by the engineer to the local Board, as to several slips that have taken place during the progress of the works of the new reservoir for the water supply of Oswestry. The engineer, Mr. Minshall, of Wrexham, recommends the lining of the reservoir with bricks.

Paris Theatres.

We understand that the theatre of the Porte Saint Martin is to be rebuilt, in Classic style, with a grand pediment supported by eight enormous columns. A most extraordinary proposal with respect to theatres has been made. An architect proposes to erect four or five new theatres at the Place of the Château d'Eau, and the Commission of Dramatic Writers support the proposal.

A Roman Catholic Cathedral for Carlisle.

Miss Lowry, a Roman Catholic lady, who recently died at her residence, Darrahill House, near Carlisle, has by will left a large sum of money for the erection of a Roman Catholic Cathedral in Carlisle.

The Inner Temple.

A handsome clock tower, of stone, which serves also as the staircase, has been added to the Inner Temple Library, from the design of Mr. Arthur Cates.

Keighley.

On Friday, the 9th of February, Mr. Henry Alty, C.E., of Halifax, was unanimously appointed Borough Engineer and Surveyor to the town of Keighley.

TENDERS

For concrete and brick foundations for St. Luke's Church, Redcliffe-square, South Kensington. Messrs. G. & H. Godwin, architects. Quantities supplied by Messrs. Gardner, Son, & Theobald:—

Myers & Sons	£2,715 0 0
Nightingale & Walker	2,638 0 0
Hill, Keddiel, & Walker	2,187 0 0
Henshaw	2,295 0 0
Stimpson & Co.	2,285 0 0
Manley & Rogers	2,187 0 0
Dove, Brothers	2,165 0 0
Hibbins & Co.	2,152 0 0
Cowland	2,145 0 0
Arts & Co.	1,884 0 0
Hill & Sons	1,863 0 0

For the iron apparatus, cast-iron main pipes, consumers' meters, service pipes, &c., for the Audlem Gas and Coke Company, Limited, Cheshire. Mr. T. A. Hedley, civil engineer, Wolverhampton:—

Hill & Smith	£1,462 0 0
Newton, Chambers, & Co.	1,350 0 0
Jennings & Sons	1,235 0 0
Porter & Co.	1,220 0 0
Holmes & Co.	1,170 0 0
Poole	1,120 0 0
Willey & Ford (accepted)	1,054 0 0

For alteration to premises, Harbour-street, Ramsgate, for Messrs. Syrett & Son. Exclusive of hot-water apparatus. Mr. John R. Collett, architect:—

Harrison	£200 0 0
Green	228 0 0
Osborn	215 0 0
Englen	197 0 0
Smith & Son (accepted)	170 0 0

For enlarging retort-house at the gas-works, Ramsgate:—

Horne (accepted)	£608 0 0
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For house, offices, stores, and stabling, to be erected in London-street and Conduit-place, Paddington, for Messrs. Flower & Sons, of Stratford-upon-Avon. Messrs. Lee, Brothers, & Pain, architects. Quantities supplied:—

House and Stores		Offices, Stabling.	
Myers & Sons	£2,315	£3,285	
Thorne & Co.	2,200	5,200	
Bayes & Ramages	2,085	5,019	
Howard & Co.	1,987	4,981	
Thompson	1,934	4,938	
Temple & Forster	2,060	4,618	

For villa, Pengo-rod, on the Crystal Palace Park Estate. Mr. John Norton, architect. Mr. S. J. Thacker, surveyor:—

If Picked	
Deals.	
Moore & Grainger	£2,121
Staines & Son	2,088
Wright, Brothers, & Goodchild	2,023
Hammond	1,975
Stephenson	1,951
Saull	1,827
Baxter	1,823
Gooding	1,800
Waterson & Co.	1,758
Aitchison & Walker	1,600

For plots 31 and 32, on the Crystal Palace Park Estate. Mr. John Norton, architect. Mr. S. J. Thacker, surveyor:—

If Picked	
Deals.	
Staines & Son	£3,966
Stephenson	3,627
Mundy	3,608
Moore & Grainger	3,549
Wright, Brothers, & Goodchild	3,575
Waterson & Co.	3,460
Baxter	3,465
Aitchison & Walker	3,425
Hammond	3,250
Saull	3,059
Gooding	2,940

For three cottages, and addition to drying-room, at West Drayton, for Messrs. Wilkinson & Co. Mr. G. D. Martin, architect:—

Festridge	£417 0 0
Staines & Son	376 0 0

For finishing houses in Sparholt-road, Horsey-rhe, Mr. E. Gover, architect. Quantities supplied by Sharsole:—

Bridgman & Nuthall	£1,595 0 01
Wilkins	1,545 0 0
Tripp	1,450 0 0
Whiteman & Allen	1,416 0 0
Wright	1,395 0 0
Smith & Evers	1,380 0 0
Mundy	1,371 0 0
Langan	1,370 0 0
Winship	1,325 0 0
Odley	1,290 0 0
Blackmore & Morley	1,280 0 0
Day	1,275 0 0
Freedy & Son	1,150 0 0
Turrell	1,123 0 0
MacFarlane	1,055 0 0
Wannell (accepted)	1,048 0 0
Evans	1,055 0 0
Parker & Co.	830 0 01

For additions and alterations to house at Catford-bridge for Major Forster. Mr. W. H. Fletcher, architect. Quantities supplied by Mr. T. Ladds:—

F. J. & J. Wood	£4,134 0 0
Staines & Son	4,298 0 0
Willcombe & Oakley	4,150 0 0
Jerrard	4,078 0 0
Allpress	4,055 0 0
Stimpson & Co.	3,785 0 0

For partially rebuilding and restoring Boughton Church, Norfolk. Mr. R. J. Withers, architect:—

Bardell, Brothers	£835 0 0
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For rebuilding Whitechurch Church, Pembroke-shire. Mr. R. J. Withers, architect:—

Evans & Morgan	£833 0 0
Thomas & Woodward	785 0 0
James & Lewis	697 0 0
Evans	687 0 0
Hughes	690 0 0
Hughes	660 0 0

For rebuilding Silian Church, Cardiganshire. Mr. R. J. Withers, architect:—

Davies	£875 0 0
James & Son	614 0 0
Morgau	505 0 0

For building All Hallows' village hospital, Ditching-ham, Norfolk. Mr. R. J. Withers, architect:—

Bardell, Brothers	£3,126 0 0
Fery & Co.	2,915 0 0
Bretwright	2,853 0 0

For alterations and bar-fittings to the "Anchor and Hope," Pond's-place, Chelsea, for Mr. J. Parker:—

Leggett	£648 0 0
Fenner	640 0 0
Sunnerville & Co.	614 15 0
Porter & Co.	493 0 0
Terry	489 0 0
Brown (accepted)	330 0 0

For erecting a villa at Staines, for Mr. J. P. Wall. Mr. R. J. Worley, architect. Quantities supplied:—

Bostel	£1,010 0 0
Bostel	885 0 0
Vaughan	775 0 0

TO CORRESPONDENTS.

J. M.—A. J. B. H.—J. R. C.—Mears. C.—W. B.—T. A. R.—E.—H. S.—T. P.—S. O.—H. J.—W. J. O.—R. G.—J. J.—W. H. K.—W. T.—S. & Son.—A. R.—A. S.—R. J. W.—C. P.—A. J.—T. L.—J. & Co.—L. M.—J. L.—One Employed.—Constant Reader.—H. A. R. G.—W. S. W.—C.—J. R. need be under no apprehension. Such letters could not be viewed as "libelous"—E. B. F. (next week).

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily in publication.

Note.—The responsibility of signed articles, and papers read at public meetings, rests of course with the authors.

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NINTH BONUS MEETING, January 4th, 1872.

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2.—Financial Position of the Society on June 30th, 1871. The Substantive Assurances on the 30th June were 8,679 in number, amounting, with their Bonus additions, to the sum of 5,445,025*l*. The Assurance Fund at the date of Valuation was 41,824,438 10 9 And the total calculated Liability 1,477,179 17 3 Leaving a Surplus of £34,278 13 6 Deducting therefrom the permanent Reserve Fund of 50,000*l*. pursuant to Sec. 37 of the Society's Special Act of Parliament, there remains to represent the profit of the 5 years of the Bonus 28,278 13 6, an amount equal to 26 per cent. of the total Revenue from all sources during the 5 years, and exceeding by 43,821*l*. 6*s*. 6*d*. the surplus of any previous Quinquennium.

3.—Results of the Division. "Of the sum now to be divided, five-sixths, or 235,906*l*. will fall to the Assured, and will produce a reversionary addition to the Policies of 2*s*. 6*d*. This Reversionary Bonus will average 4*s*. per cent. or vary according to age from 3*s*. 4*d*. per cent. on the Premiums received in the Quinquennium on all the Policies amongst which it will be distributed. The next DIVISION OF PROFITS will take place in JANUARY, 1872, and Persons who effect New Policies before the end of June next will be entitled at that Division to one year's additional share of Profits over later Entrants. The Report above mentioned, a detailed account of the proceedings of the Bonus Meeting, the returns made to the Board of Trade, and every information may be obtained of GEORGE CUTCLIFFE, Actuary and Secretary, No. 13, St. James's-square, London, S.W.

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The Builder.

VOL. XXX.—No. 1516.

The Coming Event.



THE announcement of a General Thanksgiving Day and a State Procession to St. Paul's Cathedral has naturally led to a great routing out of old documents which might supply official precedents, and long quotations from contemporary

descriptions of similar ceremonies during the last and present centuries, more or less interesting, but displaying all these discrepancies in the details which have ever been found, and overall he found, unavoidable in accounts of a great public spectacle, by various eye-witnesses, however observant or truthful, placed in different positions, and deriving information where their knowledge may have been at fault, from different sources. The "leading journal" led us as might be expected, opening the ball with a reprint of the description of the procession of George III. in 1789, in the *Imperial Magazine* that day, communicated by Sir Digby Wyatt, which we were told that the Lord Mayor wore a cloak of purple velvet, which covered his horse well as his lordship,—a piece of intelligence which might have misled the right honorable gentleman who now fills that high office into the unnecessary extravagance of wasting a considerable sum in Genoa velvet of that "Imperial" description before he discovered, from less picturesque but more reliable authorities, that his predecessor was attired in his official gown of crimson velvet, as customary on such occasions, and which, as he could conveniently think in it, could scarcely have been of such ample dimensions as would be inferred from the above description. The *Morning Post* followed the last week, by a reprint of the report of the same ceremonial from its own issue of the 24th April, 1789, principally remarkable for the account of its politics at that period; and the *Daily Telegraph* of Monday last, extracted from the *funct Morning Herald* the narrative of the procession of the Prince Regent from Carlton House to St. Paul's, on the 8th of July, 1814, to offer up thanks for the restoration of Peace, complementing it with direct contradictions by the *Examiner* of the same date. We may ourselves venture to dispute the statement that "After the Royal carriage came two of the Grenadiers in costume on horseback." Other accounts have appeared, and may yet appear in other periodicals before this number of the *Builder* can be in type, and the official programme of the forthcoming ceremonial probably simultaneously with our publication: we shall therefore trouble our readers with repetitions of what we already all must have perused during the last few days, but indulge in a little gossip concerning such subjects in general. In the first place, the illustration of our opening observations respecting the impossibility of relying on minute details in even official documents, we will refer to the state procession of Queen Mary, through

London in 1553. Stowe, in his account, describes her Majesty as "sitting in a chariot of cloth of tissue, drawn with six horses, all trapped with the like cloth of tissue." Strype, on the contrary, says she was in "a litter," not mentioning horses; while Monsieur de Noailles, the French ambassador, who was actually in the procession, says in his official despatches, "The litter, covered by a canopy of cloth of gold, was borne by two mules, covered also with gold, and high upon it was seated her Majesty, dressed in a long mantle of cloth of silver, with a head-dress of silk;" therein again contradicting Stowe, who says she was "attired in a gown of purple velvet, furred with powdered ermine;" and also a MS. of the period which describes her as "richly apparelled with mantle and kirtle of cloth of gold, furred with minever and powdered ermines, having upon her head a circlet of gold, set with rich stones and pearls," which Stowe asserts was so massy and ponderous, that "she was fain to bear up her head with her hand." Here is circumstantial evidence with a vengeance! But "no more upon that head," as Dr. Pangloss has said before us. We could fill pages with such conflicting statements, to prove that the wisdom of our ancestors in these matters was not greater than our own, and that "errors" were not "excepted" in the accounts of the most ancient reporters, or, to speak more respectfully, the old gentlemen of the press. In pomp and splendour, however, there can be no doubt these Royal progresses infinitely surpassed those of modern days. In Nichols's accounts of those of Queen Elizabeth and King James I., the sense is almost wearied with the mere mental contemplation of the profusion of cloth of gold and silver in the dresses of the persons in the processions, the decorations of their litters or chariots, the very saddles and harness of the horses in some instances being "covered with cloth of gold, and furred with ermines, powdered," and in others with "crimson satin and velvet." Fuller, in his "Church History," commenting on the necessity for dispensing with the customary Royal procession from the Tower to Whitehall on the accession of Charles I., the plague being at that time raging in London, defends it also on the score of economy, as it would have cost his Majesty "threescore thousand pounds to be disbursed in scarlet for his train [i.e., retinue; observe, not mantle], a sum which if then demanded of his exchequer would scarce receive a satisfactory answer thereunto." Sixty thousand pounds of the money of that day to be spent for scarlet cloth alone! Fancy the Right Hon. Robert Lowe receiving a little bill amounting to the relative value at present as one item only in the expenses of the 27th inst!

Queen Anne went seven times in six years to St. Paul's to return thanks on various occasions; and George I. for his peaceable accession to the throne of these kingdoms. We do not remember seeing it mentioned that George III. went twice in state to St. Paul's; the second time being in 1797, to return thanks for the great naval victories obtained by Howe, Jervis, and Duncan; the procession being diversified on that occasion by three artillery wagons containing the French, Spanish, and Dutch flags captured during the various actions, attended by many of the gallant officers and men who had served in those actions, from the admirals to the powder-monkeys, with detachments from the marines at Chatham and Portsmouth as guards of honour. With the exception of this interesting variation, these processions, at least from the reign of Queen Anne, being arranged according to precedent, resembled each other as closely as the two black boys, Caesar and Pompey, who are known to have been "very much alike,—particularly Pompey;" and, therefore, although only one out of all, that of 1789, was to render thanks for the mercy of health restored, it is no more a

precedent for the order of the procession, or the regulations of the military and police, than that of the Regent in 1814, the latest of these particular national solemnities. For the graphic illustration of them we may direct the attention of our illustrated contemporaries to a very fine engraving published in 1789, representing King George III. and family passing through St. Paul's Cathedral, which is lined with the grenadier companies of the Guards in the act of presenting arms, a copy of which ought, we imagine, to be found in the print-room of the British Museum; at all events, one may be seen framed and glazed in the Earl Marshal's Court at the Herald's College. We may point also to another print representing the procession to St. Paul's on the Thanksgiving Day in 1713, which Queen Anne was unable to attend in person; and for the rabid archaeologist, to a print which was formerly, and, we presume, still is, in the possession of the Society of Antiquaries of London, representing King James I. and his queen, Anne of Bohemia, entering in procession Old St. Paul's, as it is stated, in 1616. This curious painting is engraved as a frontispiece to one of the volumes of Nichols's "Progress of James I.," and in his description of it he suggests that it was painted in anticipation of the visit of James in 1620!—a most amazing effort of imagination. We will not attempt to solve the mystery. It could not be misdated, and represent the procession in 1620, as James's Queen (Anne of Bohemia) died in 1619, and there she is in the procession. We will only undertake to assure our readers that an inspection of the engraving or of the original picture will not give them the slightest idea of the procession of Tuesday next, when we earnestly hope that the weather will not be guided by the precedent of 1789, on which occasion, to use the remarkable expression of a writer in the *Gentleman's Magazine*, it was most "offensive" to the general public, and the poor Guards, who were under arms as early as half-past three in the morning, the rain falling incessantly till noon, when their Majesties entered their carriage, and the sun came forth to greet them, and gild the refined gold of the royal liveries and equipages. The great gilt coach, however, which was built for George III., and first used in 1762, was not brought out on this occasion, so that there is a precedent for her Majesty's using what is commonly called the dress-carriage, in which she has lately proceeded to open Parliament, drawn, we trust, as in the former instance by eight of the noble cream-coloured Hanoverian horses,—a sight worth seeing alone.

It may be expected the *Builder* should say something about the various constructions in the streets, and the ornamentation of the houses in the line of the procession. There will be no pageants; no angel in green blowing a trumpet; no Gogmagog and Corinens at Temple Bar; no Dutchman perched on the cross of St. Paul's; no Spaniard capering on a tight rope from the Cathedral to the Deanery; but there will be triumphal arches, we trust, tastefully designed, and something like uniformity in the decorations of the houses. Cloth of gold and silver, gorgeous tapestries, rich embroidery as of old, are not to be expected; but fine effects can be produced by colour and arrangement with much less costly materials. The grandest spectacle of all, however, will be the thousands of loyal and loving subjects who will through those streets and crowd those houses to their roofs and parapets, personally to express their deep and genuine sympathy in all that affects the welfare of her Majesty Queen Victoria and her amiable family.

A New Infirmary in Southwark.—The St. Olave's Board of Guardians have just decided to erect a new infirmary in their district, and have also resolved that the new structure shall be built upon the model of the St. Luke's Workhouse, in the City-road.

CONVENTIONALISM IN SCULPTURE AND ARCHITECTURE.

BRIEFLY glancing at the relation of the subject we have been treating to architectural design,* we may appropriately say a word as to the position occupied by sculpture, the art which forms to some extent the connecting link between painting and architecture, in reference to nature and realism. In regard to the imitation of nature, this art occupies a different ground, and is practised under different conditions from the art of painting. The object here is to repeat and reproduce form as it really is, not as it appears under certain conditions and from some particular point of view. So far, then, it is direct, literal imitation of nature; the shaping of a solid bulk of material, instead of the suggestion of bulk by lines and shades upon a flat surface. Now, why not pursue the *évidance* by imitating the form, thus wrought out, with the actual lines and colour of nature? It is not altogether an idle question, because arguments have been brought forward, and may be again, by men of ability, in favour of such a treatment. The answer is twofold. In the first place, no imitation of natural colour and detail can, as before observed, be absolutely successful. We cannot, even with the more delicate resources of the painter's art, rival nature in her infinite imitation. Still less could this be accomplished by any such colouring process as would be possible on marble or other such hard and durable substance, and when every portion must be equally finished, and no devices of artificial shadow can be resorted to in aid of the effect. Yet it is just in this case that failure would be most glaring, owing to the very fact that the form is literally reproduced, which would bring into more relief the coarseness and comparative failure which must characterise any further and closer attempt at imitation. And if we could succeed in this, the success itself would be the greatest of failures, so far as the real aim of art is concerned. Imagine, in place of the orthodox white marble, a collection of images with flesh and draperies painted in imitation of the reality. The poetry of the art would have fled, and we might almost as well be in a waxwork exhibition. And the cause of the failure would be simply this, that the attention of the spectator would be directed so much to the success of the mere imitation,—so much, too, of the common realities of life would be suggested by it,—that little scope would be left for the contemplation of the work as an exponent of the higher expression and ideal of which the human form may be made the medium. By abstracting certain elements of reality, by limiting the imitation to that of form expressed in an artificial medium, we leave the sculptor's creation in a world of its own; we separate it in execution from the trickery of mere mechanical imitation, and in idea and association from the material realities of life, and leave it an abstract embodiment of the poetry of form and figure and action. Absolute mimicry of life in sculpture has not, we believe, been attempted by any civilised and educated artist; but the move made by our late distinguished countryman, Gibson, was a hazardous step in this direction, and one which we must be thankful has not been followed or carried further by succeeding artists. His professed object was to relieve what he had persuaded himself was the monotonous appearance of white marble: this would have been a good reason for choosing another material, or for adding a little decorative colour, perhaps, to certain of the accessories, but not for entirely colouring so beautiful a natural material, and impairing the delicate lustre in high lights which forms one of its chief charms. In fact, however, the celebrated Venus of the '62 Exhibition was an evident aim at the indication of flesh tint, and was only saved from something perilously near to vulgarity by the fact of its stopping considerably short of the full colour and tone of nature.† Laying aside the question of applied colour, the treatment of sculptural subjects requires to be carefully adapted to the material, and to the conventional expression of which alone, in its untouched

* See p. 67, ante.

† It may be doubted whether any representation of the nude figure in sculpture, so coloured as to be decidedly imitative of nature, would not be pronounced, in the present time and country, an offence against good taste, even by those who would never dream of supposing such a charge to be valid against similar works in the virgin material. Habit may have a good deal to do with this; but on æsthetic ground, at all events, the instinct which would prompt the objection is correct.

state, it is capable. This is a point, again, which has been overlooked in some popularly admired works of modern sculpture. The now well-known "Reading Girl" (to revert to another of the '62 examples), was an instance of this. So realistic a work in sculpture was a novelty, and found worshippers accordingly; but the ruffled dress and rash-bottomed chair were really out of place (the latter especially); because, in the first place, it is not worth while to spend so costly and durable a material, and so much labour, in working out such commonplace forms; there should be a *dignus vindice nodus*,—the best marble is well expended in perfecting the delicate contours of a beautiful figure, but not on dress and furniture; and, in the second place, these accessories were out of keeping artistically with the material. The chair was a realistic imitation of a commonplace article of furniture, thrust into a composition the very material of which removed it completely from reality. In a realistic painting the chair would have been well enough; in a conventional material like marble a conventional or ideal seat was required, not merely for the sake of beauty, but to avoid the confusion of two different classes of associations. This is a solitary instance; but the application, as we hope our readers see, is a wide enough one.

But in sculpture we are not limited entirely to the conventionalism of material or accessory. Under certain circumstances we may conventionalise the figure itself; we may eliminate some of the delicacy of contour and detail in nature, and substitute a simpler and grander line, a more massive and "built up" figure, so to speak.* This is the case to some extent with some of the finest antique statues, in which (as the able superintendent of the art classes at the London University has been pointing out recently) the anatomy differs materially from that habitually seen in the "Life" studio. But the cases in which conventionalism of form has been, and may be, justifiably carried to a great extent in sculpture, are almost invariably those in which the sculpture is to be used in close connexion with architecture. It is in this view that we referred above to sculpture as the "connecting link" between architecture and painting. The extent to which it may become so is exemplified in the Egyptian sphinxes and colossal sitting figures, of which, situated as they are in intimate connexion with the architectural design, it would almost be difficult to say whether they really are more sculptural or architectural in character. The same remark, perhaps, would apply to the Assyrian winged bulls, and in a considerable measure also to much of the sculpture of the Mediæval buildings. All these are specimens of sculpture designed and executed, not for its own sole interest as a central object, but as subordinate to a total architectural effect. In regard to their position, the *life* is more or less petrified out of the figures; they are reduced to an architectural stiffness and rigidity, so as to appear not so much figures added to the architecture, as portions of the architecture which have taken the type and some of the form of living objects. We are thus led, through sculpture, to architecture, and the manner in which we are so led is suggestive. We see that in proportion as we approach architectural art, in that proportion do we quit nature, and quit the representation of living sentient form. Architecture is of all the arts, the conventional art—the one which deals with principles and types of nature, instead of natural form. Accordingly, we could not use the higher forms—*sentient* forms, as we have termed them—of nature, as a portion of architectural design, without so altering them as to lose much of the sentient character, and even then we can only reduce them to a kind of neutral position. But if we descend from the sentient to the inanimate forms of nature—from the animal to the vegetable kingdom,—we find that we are then able to use the natural form as an integral part of the decoration of a building, with much less alteration, or conventionalising than in the other case. In all these cases, indeed, conventionalism is requisite, were it only in regard to the nature of the material in which the ornament is to be executed, and which is almost always of too coarse a texture to render with any fidelity the minutæ of nature. But the relation between the ornament and the general design of the building has to be con-

sidered also. In a style in which, as in the Gothic, the general outline and character of the building may suggest somewhat of the irregular and picturesque outline of nature, we can compound with a very near approach to nature in the small ornamental details; but even here those specimens of Gothic foliated ornament in which nature is decidedly conventionalised, though imitated in general form and type, are the most satisfactory to the judgment. In a style which, as the Greek, is completely rigid and artificial in its main outlines and composition, a much higher degree of conventionalism is requisite to render the ornament in keeping with the building; and the nearest approach to nature in this style, the Corinthian capital, is in fact highly artificial, while in that masterly and almost unequalled architectural feature, the Doric capital, the conventionalism is so complete, that we almost lose sight of any natural type at all; and were it not so, the feature would be, however elegant, too weak for the heavy and severe treatment of the general structure. In the ornamental detail of the Renaissance period there is much admirable conventional treatment, quite in keeping with the general character and expression of the buildings it was designed to adorn; the defect of the ornament of this period lying not in its intrinsic manner, but in the sameness of treatment and want of thought in its working out; defects very characteristic also of a great deal of modern Gothic ornament. But it is important to observe how universal has been the rule, in all the architectural decoration which has been recognised as the most beautiful and successful, of avoiding direct copying, and especially of sentient nature. In this respect the carving of birds and animals in the capitals of piers, initiated in some early, and imitated in some modern Gothic work, is a mistake, partaking a little of that kind of art which belongs to a half-civilised period. Such carvings, if allowed, must be looked on as part of the architecture, as mere additions to it; the restlessness and activity which we connect with the bird and the hare will not suffer such representations to blend with the immobile character belonging to architectural design. But surely it is more satisfactory that all detail that can be called architectural should appear as part and parcel of the constructive design, rather than as a picture affixed to conventionalised details, of which Mr. Ruskin in one of his lectures made sport. It might be a question whether any semblance of an animal feature was in place at all there; but there can be no question that, if it were used, it was right to conventionalise it, to bring it into harmony with the artificial character of the architecture, rather than to have the most life-like realistic model stuck on as an impertinence. We may mention, as a similar example, the conventional ornament, suggesting a winged lyre, in some of the internal capitals of the Paris Opera House. A realistic resemblance would have been commonplace; but the designer has cleverly managed to suggest this appropriate idea, while entirely preserving the proper character of carved architectural detail. Before quitting this subject it may be observed that in conventional decoration, as in conventional painting, there is an interest beyond the mere beauty of the feature employed, arising from the evidence of thought displayed on the part of the designer, and of his peculiar mode of looking at the thing. Thus, though the Corinthian capital is a more elegant and richer object than the Doric, yet the latter will probably always be regarded as the most interesting by the architectural critic, on account of the more subtle thought displayed in its treatment. To the same cause we may trace much of the interest of the beautiful Saracenic school of ornament, where every feature of natural form is discarded, and where only the metaphysical beauty of nature,—that which springs from order, proportion, repetition, variety of contour,—is made the basis for that endless play of fancy on the part of the designers which has given to this school of ornament so high a place in the history of decorative design.

The consideration of conventionalism as applied to architectural ornament suggests also a word in reference to one or two forms of art which can only be used in conjunction with architecture, though distinguishable as separate arts. In the treatment of stained-glass ornament, a good deal of very good work has been done of late years in England, if not elsewhere. But in the treatment of figure-subjects in this

* "This is building a man, not drawing one," said some one to Fuseli, on seeing his sketch in a figure with eagle in his peculiar energetic hyperbole of manner.

material there has been little real success, failure having resulted from two opposite misapprehensions in the mode of design and treatment. The naturalistic German school have erred in attempting the perfect realisation of the natural figure in a medium in which such realisation is absolutely impossible; the result being obvious failure, and an impression of coarseness and vulgarity of treatment. As to the attempts of the Munich school to paint landscape and distance on their windows, that is a kind of thing which we are totally unworthy to lenounce, and for which the English language applies no strictly Parliamentary terms at all adequate to the occasion. But in the English school of glass design, on the other hand, a mistake has been made in the opposite direction. The necessity for conventional treatment has been perceived, but it has been sought for in the adoption of the stiff, misshapen angular figures of the Gothic period. To treat the figure thus is not to conventionalise, but merely to distort it. However the artist may depart in such a case from the freedom and flow of line and attitude in nature, he is bound, nevertheless, to preserve perfectly the true balance of the figure, the true relation to each other of all points of the construction; the process of conventionalising in this case must merely take the form of a simplification, not a falsifying or contradicting, of nature. Unfortunately the modern glass designers have become very generally possessed with an idea that all which the Medieval men did was right, and we have had but few attempts to conventionalise the figure on true principles; or which the best hints might be found in some of the designs of Flaxman. The principle applies to mosaic; and here the true treatment of the figure has been better recognised, chiefly because the most important attempts in this art which has been made in England, the work has been in the hands of really able and educated artists. Yet there has not been wanting a demand, openly laid by some of our architects, for a return to the completely rigid and stiff forms of the early Byzantine mosaics, which, in fact, have been reproduced in all their archaism in sundry creos decorations in college chapels, and elsewhere. The demand is an unnecessary, not to say absurd, one; the material, when used in suitable positions, and at the requisite distance from the eye, not demanding more than a certain severity of line and dignified breadth of composition, to bring it completely into harmony with the exigencies of the case, and with the relation which the mosaic picture bears to the architecture in which it is set. The totally unnatural treatment demanded for it by mosaic would only be necessary if the mosaic were as much an integral part of the architectural design as are the winged animals of finials and Persopols. But it is not so: its rique texture, if not its brilliant colour, prevents its becoming so: it is simply an indestructible picture set in an architectural framework, and demands only so much conventionalism as will exclude it from presenting a harsh contrast with the lines of the architectural design, or with the evident restrictions imposed by the material.

Such are a few of the reflections not unnaturally suggested by a consideration of the manner in which Art deals with the natural forms and objects which compose the language by which she speaks to our feelings and intellects. The principle of conventionalism,—the question how near to each language of art, we may safely or rashly approach to direct imitation of nature, affects every method in which men have endeavoured to realise ideal beauty. The essential drama is in itself one great conventionalism, and we have it on the authority of one of Goethe's biographers, that when the author of *Wieland-Meister*, in his earlier days, superintended the production of tragedies at the Court Theatre at Weimar, so impressed was he with the importance of preserving the conventional consistency of the drama, that he would allow little action on the stage, and scarcely permitted the performers pointedly to address one another, regarding them simply as media for the delivery of the author's ideas. This was perhaps veridical conventionalism, even if we allow for possible exaggeration of the narrator; but the story is interesting as suggestive of the view of his form of art taken by the man who, of all great poets, seems to have possessed the artistic and critical faculties in the most evenly-balanced proportion. The precise preservation of proportion between realism and conventionalism has been rarely achieved in art. In the bas-reliefs of

the Parthenon we may see it, perhaps, in perfection, and in some of the Greek plays more perfectly than in any poetry, even that of Goethe, since Giotto appears to have attained the perception of it more perfectly than most of the great painters, falling short only in technicalities of execution; Raffaele in some of his noblest works, though not universally. Among modern English artists Mr. Leighton and Mr. Watts seem to have hit the mean more nearly than most others. To the English public the very idea of conventionalism as an important element in art is for the most part a thing as yet unthought of; how far this is the case we may conjecture from the total ignoring or misunderstanding of the subject evident in a large proportion of the writings put forth as "art-criticism;" it is fair to conclude that the writers of such criticism are in the main in advance of their readers, hard as such a conclusion seems to be as against the latter. This and cognate subjects in connexion with art are not likely, however, to be widely understood among us until this most unceremonial of civilised nations awakes to the perception that such matters really are worthy of serious study and thought, and that there is more in art-criticism than a mere question of liking or disliking.

THE QUEEN'S PROCESSION TO ST. PAUL'S AND FINE ART.

It would be not a little curious to find out, were it possible to do so, in how many ways, and in what special ways, modern "improvement" is in advance of the old ways of doing things in by-gone times. One thing is certain, that we are getting rid of what are called time-worn "prejudices" and old-fashioned modes of amusement and getting rid of time. *Fornalities* of all kinds are going out of date, and most of them, as the famous "processions" of past times, are now almost unknown. The modern world of business is too much occupied for such trifles and waste of human energy and time; it has something better to do, and certainly something more profitable. But the days were, when not only were processions, Royal processions, and others, of very great and absorbing public interest in themselves, but they were the foundational ideas on which a good deal of the fine art and sculpture of those times and countries were built up and found their origin. Modern enlightenment and extended education, as they are thought to be, have a natural tendency to ignore such things, both the things themselves and what they are so well fitted to encourage. Modern education means "book learning," but in times before a "book" was all-in-all, and the *description* of a thing or an event almost of more importance and interest than the thing or event described, a great procession from one spot or building to another was a notable event, and the occasion of bringing before the eyes and senses of the multitude not only graceful and brilliant costumes, but graceful and mentally impressive action. And not only were these improving and artistic doings accomplished with human beings and costumes, but opportunity was offered for the display of fine animal life, as is to be seen in the Parthenon frieze of Greek times, and in the triumphal procession of the Emperor Maximilian in the Dark Ages. These old processions and displays also gave opportunity for showing "improvements," if that be the word, in carriages and chariots and cars of different kinds. Indeed, in the old ways of doing these things, there will be found to occur perpetual opportunities for the exhibition and portrayal of objects of use and ornament which served to record the then state of the fine and useful arts. But these things are, it is to be feared, of the past, and but little likely to return, except perhaps by fits and starts;—an unfortunate circumstance, for where things are so rarely done they are likely to be done but indifferently well.

We are led to these thoughts on the old methods and ways of life, and the fine art which followed from it, by the rare and unusual occurrence of a Royal procession to St. Paul's. It would be impossible to imagine a case wherein things could well be in a more inadequate state of preparation; and it may be of some interest to hint at a few of the things needful, and at the differences between one of the old antique and quaint processions of past days and this coming modern one; and the great questions naturally present themselves: How is it to be done? what is the apparatus with which to do

it? what is its artistic value, if it have any? and can anything be done with it artistically afterwards by way of record of the event which it commemorates? But, first, a word on the old processions, such as the Greek carrying the "Populus" to the Temple—shown so accurately and completely in the Greek frieze in the British Museum—and which gave the sculptor Phidias his work. In that world-famous "procession" everything was evidently ready, and thought was had to the beauty and interest of its artistic completeness. The forms we see are plainly enough, and that fine horses, fine chariots, and fine men and women—not shut up in close carriages—made up the beauty and interest of it. As far as forms went, we know all about it, but the colours we can only guess at, though feeling sure that they must have added to the beauty everywhere present in it. Nothing could well have been added to increase the effect produced, and intended to be produced, on the minds of the spectators; and, to complete the charm of the whole, the Temple itself to which the procession walked, and the gateways to it, and the whole of the buildings on the way, were, as we see by the remains of them, worthy of the great art-loving race who produced them. It would be impossible to find, all the world over, a finer or a more glorious artistic embodiment of a national thought. Can we do anything in any way approaching to it? Have we any idea of a procession in a fine-art sense, and as expressive both of a national thought and an artistic way for carrying out that thought? Money, certainly, we have in sufficient abundance; money, more of it than the old Greek would ever have dreamed of. May we mention, as an instance of its plenty, that no less a sum,—we speak from personal knowledge,—than 7000. sterling has been offered and refused for the windows of a house in St. Paul's Churchyard commanding a good view of this very procession. But what is there to see, we may ask? Where is to be the artistic element in it? It is curious to note these things, and to look at them by an antique light. In our "Lord Mayor's Show" so curious a compound of show and glitter, and manners, and shabbiness, there is, as all know, the gilt coach itself, the only artistically quaint thing in it, the smart and new sherrif's carriages, the mounted band, and, what is more than all, as a telling part of it, the City companies' banners, borne by the shabby-looking watermen. All the rest of it is made up of the ordinary dull-looking vehicles seen everywhere, and of attendants in little else than ordinary costume. Will Tuesday's procession be better or worse than the Lord Mayor's Show?

It is perhaps only by contrast that we can come to anything like a fair estimate of the probable value of such a display, and of its artistic significance. We would therefore call to mind the fine old Middle Age procession, called the "Triumph of the Emperor Maximilian." The plates representing it were exhibited at one time at the South Kensington Museum, on the walls of one of the passages, and gave a good and true idea of what the men of the Middle Ages thought a triumphal procession should look like. Everything is firmly and carefully designed, and the harmony of the whole is most complete; for the dresses, carriages, horse furniture, banners,—indeed, everything in it, go to make up a complete and harmonious whole. It may well be contrasted with the Greek procession,—so unlike it, yet both so artistic and descriptive of the times that produced them. Can we do anything like this Maximilian Triumph, the Greek way of working out of the question? If we can, then will there be something to go out to view, irrespective of those exalted personages whom all London will be delighted to see; if we cannot, then may we ask, what is modern art, and are we in advance of the dark ages, or behind them, in matters artistic? Why, the fact really is, that the powers that be are at this moment thinking about what to do, and how to do it; and no man, in spite of an advanced education, can afford any sort of answer. We may also note in this place how differently, in different ages, men record things. In the old Greek days Phidias commemorated the procession of his time in enduring marble on the walls of a marble-built temple, dedicated to Wisdom. In Maximilian's days they left a record in fine and bold drawings, which it would be for us impossible to rival. In the days of Queen Victoria, in this art-enlightened nineteenth century, any one may buy a "view of the Lord Mayor's Show;"—a coloured one, too,—for a penny. We have one by us at this moment, and can but advise every curious reader to buy

one as well; for, we can assure him that it will be sold on the coming procession-day as a veritable representation of the Queen's progress! Who shall say that these are not art-loving times, with plenty of opportunities, and a whole world of competent executive artists to do the work, and a "Royal Academy" to exhibit it to the public, and Government schools to teach it!

But, again, can nothing indeed be done to make this procession, so notable in many ways, a little interesting and expressive? Can it be made artistic? Can it be made worth the trouble of recording it in any sort of material,—in marble, or stone, or wood, or even in the smallest of wood blocks, to be sold for a penny? Surely it is a test, and a fair one, of our art-capacity and power of meeting a new difficulty, and if possible mastering it. Comparatively very few people will see the procession itself, and still fewer the inside of the cathedral, and what is to go on there; but all might see adequate representations of it. The difficulty is twofold; to wit, to make the show itself worth the looking at, and then to represent it afterwards. If we might be permitted to offer a hint or two about it, it would be,—to include in it important personages, to keep the procession as close together as possible, and not to leave large blank spaces between carriage and carriage; and, above all, not to blot the whole show with a number of shut-up, close, dirty-looking vehicles, always somehow or other to be seen in such-like displays of professional favour. It is unfortunately only as a passing crowd that such a show as this can be of interest, for to go into detail in any way would be to abandon the subject altogether. There can be no artistic workmanship or design in it. No one expects it, or can do so; it would seem to be altogether out of or beyond the power of the age we live in. But that such should be the fact, is surely to describe the age as one in which the condition of practical art and fine art is not over-satisfactory.

THE PROCESSION AND THE PUBLIC SAFETY.

It will not be amiss on our part to direct attention to the character of a portion of the constructive preparations making for the event of Tuesday next. Up to the hour of writing these remarks we have journeyed twice over the entire route of the intended procession. We have been more concerned in our examination of those erections which have been and are being put up for the support of vast numbers of people, than those designed for pleasing effect, and the results of our observation may be simply stated.

There are some of the timber platforms or stands which do certainly not err on the side of strength, and there are others of very faulty construction with supports of not sufficient thickness in scantling. There is yet time to add to their security. Among the number of strong and substantial "stands" covering a large space, and calculated to accommodate several hundreds of people, may be instanced those occupying the frontage of the New Law Courts in the Strand, those at the junction of Fleet-street and Ludgate-hill, the Old Bailey, and those on either side of the Viaduct. Some large stands are being erected in Hyde Park, on each side of the carriage-drive near the Marble Arch. The platforms put up in front and at the side spaces of several of the churches in the line of procession in the Strand, Fleet-street, Ludgate-hill, though possibly secure enough, in consequence of their not having a very great depth, and being, moreover, protected in front with railings and their stone bases, are in other respects not very commendable specimens of constructive ability. The time to see them was when in course of erection, and when the scantling was naked, and not now, when their whole front view is hidden from sight with hoarding. It is not our wish to cause any alarm; yet we are anxious to point to defects capable of remedy. In constructing public platforms or stands for the support of human weight averaging several tons, tier upon tier, there is one consideration, and an important one, that should not be overlooked. A dead weight is not only to be provided for; but, in addition, an active moving vibrating weight. The axiom that the strength of a body is only equal to its weakest part, holds unalterably true also in regard to a roof or a timber platform. When a "stand" receives its living cargo, throughout the whole time it bears, it has also to resist strain: so it is most essential that

the strain should be counteracted sideways, or from front to back, by strong cross diagonal bolted bracing timbers. Now, in the majority of instances we have examined, the diagonal bracing is of a very inferior description, and bolting is the exception, not the rule. Cut-iron spike nails, and cut iron nails large and small, seem to have been the most in requisition. We took the trouble of examining the bolting of a few of the platforms, and we found that bolts were driven in, but not through, as no nuts were to be observed. The object obtained in this instance is obvious, but a simple spike nail of good quality would have been more honest and secure. The carriage or bearing pieces of public stands of the large dimensions we are describing should not be mere planking, but heavy timber; and the flooring for the seats should never be under 1½ in. or 2 in., and even then the bearing pieces should not be distant. It is nothing less than criminal folly to act according to the common opinion, that because a thing is for a temporary purpose any sort of construction will answer. If private individuals wish to speculate they are at liberty to do so, but there ought to be circumscribed limits to speculating at the cost of other people's lives. Given a large area, a guinea a seat would pay well a speculator in the building trade for the cost of his venture on his own account, as his timber would turn in again for use very little the worse for wear. At some of the clubs half a guinea the seat is found to pay all the cost.

We notice that the platforms surrounding some of our churches are ostensibly put up for the purposes of charity, the proceeds being intended for objects in that direction.

From the Holborn Viaduct to the Marble Arch there are hardly any available vacant spaces or waste grounds on which stands can be erected. In consequence, the householders and shopkeepers are making the most they can of their windows. Some have taken their windows out altogether where they were large, and have erected seats within the rooms tier on tier in first and second stories. In old houses this is rather dangerous work.

St. Paul's is, of course, as the chief point of interest, well attended to in the matter of space; every available angle of sight will be utilised as the piles of timber construction erecting within and without, as we write, testify. Here, at least, one expects to find structural security; and, so far as it has gone, there is no reason to complain. Every possible care has been shown.

The tall timber structure, the two piers of which enclose the stone obelisks, at the foot of Ludgate-hill, and which is intended as a triumphal arch, is strongly and firmly raised, and the heretofore unsightly iron railway bridge is getting a coat of bronze, and the City arms are being made conspicuously golden. A wooden roofing or canopy is raised above the bridge, and the aspect here and around, above and below, will be a most enlivening, though a rather overcrowded one.

The painting, festooning, and decorative part of the preparation on the entire route, have begun, but will of course be the last in hand. These works are not sufficiently advanced, as we go to press, to allow us to speak of them in detail.

We would again impress on all concerned, the necessity for the utmost caution, and the Police Commissioners and the City authorities would do well to act in unison, and with the advice of competent professional men, as to the security of the public erections in several parts on the line of route.

To be forewarned is to be forearmed, and there cannot be too many precautions adopted on this most exceptional event, for the preservation of human life and the public safety.

THE POLICY OF PUBLICITY.

An architect and member of the Institute writes to us as follows:—

"Do you think that a few remarks publicly made will have any effect on the Council of the Royal Institute of British Architects, with regard to the publication of the papers read at their meetings? There used to be a pleasure in reading the lectures in your paper, a few days after they were delivered, when all came fresh to one's mind, was looked for with interest, and made a greater impression upon the memory than when delayed. But now all interest is gone. A lecture was delivered on January 22nd, and only partially printed by you, which I should have liked to read in full, and no doubt many others had the

same liking; but up to this day, Wednesday, February 21st, no copy has reached me; and what interest I felt at the time has now quite passed away. The excuse cannot be on account of the time taken to print, because most of the lectures are given from the printed copy. Why do you not print the lectures, as formerly? I can hardly believe that the Council place any impediment in your way. It would be a great benefit, both to non-members as well as to members of the Institute, for you to publish the papers, and let the outer world know what is passing within the walls of the meeting-room. As to the Transactions, if the papers were printed in double column, instead of as they are now, they would be read with much more comfort, and readers would not run the chance of losing their place, in reading long lines, as in a lease, where one has to make use of one's fingers at each end of a line."

We have received a repetition of the inquiry why we do not print the papers in full from a friend of one of the lecturers who had, as the writer knew, enabled us to do so. The answer is very simple. In many cases we would willingly print the papers in full if we could do it immediately after delivery, and should do so, but we have received an intimation from the Council that they do not consider it desirable to allow the papers to be published by us *in extenso* before they are issued by the Institute. We are not about to quarrel with this decision,—conveyed to us in the most courteous terms, we desire to add, by the secretary of the Institute; but we must repeat the expression of our regret that such a policy still prevails there. We believe it to be short-sighted, narrow, and injurious,—altogether a mistake. We believe the Council would best fulfil their mission by seeking to obtain the widest possible publicity for all instructive papers connected with the profession and our art. It is not easy to find a sound reason for the opposite course. At one time it was said that publishing the papers in our columns lessened the chance of sale to outsiders of the Transactions issued by the Institute, but no one will venture to quote that as a reason now. There is no such sale under either arrangement. The sole reason, so far as we can learn, is that the members of the Institute may receive their own copy of the paper read before they see it in a public journal accessible to all; the result being, that information sometimes valuable is shut up and put away in a comparatively few thousands. Other associations have learnt this truth, and act upon it. At the congresses, for example, held by the Social Science Association, the addresses by the heads of departments are put into type, and even before they are delivered are gladly supplied to the newspapers far and wide for reproduction.

Enough, however, for the present. As we have already said, we are not quarrelling with the Council on the subject of their policy. It is a question of judgment, and they have perfect right to an opinion on the subject. We desire, however, to state emphatically that we believe their judgment to be wrong, and we trust, speaking in the interest of the Institute, the profession, and the art, that before long better counsels will prevail.

HINTS ON HOUSE BUILDING.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At a meeting of the Institute on Monday, the 19th inst., a paper entitled, "Some Practical Hints on House-building," by Mr. Edward Roberts, F.S.A., was read. The reader said his desire was to invite attention to such subjects as these:—

1. Site, soil, and drainage.
2. Utilisation and disposal of water.
3. Artificial Lighting.
4. Warming and ventilation.

After treating of the first, he spoke of the utilisation and disposal of water:—"I may state that it is by no means uncommon for us to leave plumbers and other workmen to do as they please, and therefore, for want of consideration, we have supply-pipes to closets inserted in the same cisterns whence water is drawn for drinking purposes; soil pipes arranged so that they convey sewer-gas into the dwelling; and waste-pipes from wash-basins and sinks carried into closet traps, and although in the last case intermediate traps may be fixed, yet every time the closet-pipe is drawn the draft on the pipe empties the trap, and allows the foul air to escape through

to pipes into the rooms. Mr. Seddou and others have taken up the subject of sewer-gas. In the her cases the remedies appear to be either to use separate cisterns for the supplies for the several purposes, or to have partitions placed in such a manner as that the drinking-water cannot be contaminated; and in reference to wastes-pipes to carry them down separately into pipes from sewage-gas. In cases where supplies are by heads of water, whether by public companies or privately, if the water be stagnant in the pipes, freezing and bursting are the consequences of cold weather. The remedy appears to be to have the supply-pipes laid with a general fall towards the mains, so that when the pressure taken off the pipes may be emptied by gravitation; and disregarding companies' directions, to down ball-cocks to allow the flow to continue while the pressure is on, the stop bands which show distress in winter might then be dispensed with. In the case of intermittent supplies, there seems to be no other method than taking with sandcast or hay-bands.

Rain-water in the country is of primo importance, but is usually a cause of much labour and expense, first to conduct it to tanks, and next to pump it to the places where it is wanted. I am aware if any one has given a thought to this subject, except as to the form and ornamentation of gutters, pipes, and heads, and the description of force-pumps. I have found it more economical to provide for the water remaining where it falls, the top of the building. I thus save the expense of the down-pipes and tanks, the pumps and rising mains, and what is of far more importance, I avoid the labour of pumping it when it came, and every one of us must know how late is the time and force engaged in that operation in country residences. I produce one or two plans where the cisterns are introduced into the roofs for rain-water. In that of Christ Church, Finchley, not an ounce of the rainfall is allowed to escape; it is directed to a series of cisterns which supply the upper lavatories; an overflow supplies a second cistern, whence the water lavatories are served. Should these not retain the whole of the fall, it overflows to a tank in the basement, it being desirable to retain as much as possible.

The cisterns contain over 9,000 gallons, and the tank, 1,500 gallons. In the tower is a cistern for hard water, which supplies the closets, and in times of drought the rain-water cisterns are filled from the tower, but in only one case since its erection in 1860 has it been necessary to draw largely upon that source. I have invariably adopted this principle wherever possible, and I find it universally satisfactory.

It may be worth consideration how far the steam injector can be made available for filling cisterns. I have only once made the attempt, it abandoned it on account of the position of the cistern precluding the application of the injector, because of the water, when elevated, being also raised in temperature; the steam being from it is objectionable, and the boiling itself may tend to limit the use of the water itself. In factories it would appear to be perfectly admissible.

Although I have been referring to rain water in the country, I am not sure that its use need be limited to rural districts. The storm-water of towns is a difficulty; perhaps if rain-water were to be stored it would obviate some of the evils of sewer construction, and provide means for flushing in exceptionally dry seasons. The rain-fall on roofs in London, for instance, is probably one-sixth of the whole year, quite enough to make a sensible difference in the contents of the sewers, which are sometimes ruptured by the normal pressure of storm-water.

I pass now to the third part of our considerations—artificial lighting.

I am alive to the difficulties of the subject, and to the impossibility of saying any one thing authoritatively which may not prove in other cases to be wholly untrue and inapplicable.

I suppose it will be generally admitted that, regarding natural light, a skylight (except for very special purposes) is the worst light that can be adopted. It produces shadow from the person bending over any object; it causes cold in winter by the vertical radiation, and heat in summer by direct rays;—indeed, except where the light cannot be obtained, it is indefensible. Admitting this, who will say so of artificial light? That it is inconvenient if placed overhead is certain, and not one of us has felt the discomfort of such a light, and shifted our chairs in order to avoid the shadow of either head or hand,—and yet we constantly adopt it.

Does it never occur to us that whereas side-light in the case of daylight is the best and most convenient, artificial light from a similar point is equally proper? I believe that in our offices and libraries alone do we feel (and that I fear without studying the subject) that a lamp on our table, near to hand, removable at pleasure, and perhaps with the light deflected, and the eyes screened by a green paper shade, is approaching the perfection of light for use.

It has always appeared to me that every room should be lighted according to the uses to which it is to be applied.—a dining-room, for instance, should have a brilliant light, but soft on the table itself, with a softer light around the room, so that no part is gloomy, though absolutely free from prominence and glare; and, whether candles, lamps, or gas be the means, the light should be in the middle, somewhat akin to billiard-table lights, except as to the deflecting shades.

The mention of billiard-room lights induces me to give expression to my belief that, although, as a rule, no sufficient attention has been paid to other lighting, in that case it is nearly perfection, avoiding, as it does, shadow on the balls and cushions. Direct vertical light in other places may be unbecoming. I well remember the consternation and dismay said to have been caused to the Court beauties on the opening of the new ball-room at Buckingham Palace; and, whether true or not, this very fairly illustrates the position I take. The ball-room was at first mainly lighted by sun-burners; and the effects of the shadows from the ladies' brows, noses, and chins were such as to drive those sensitive creatures from the room. Since then candelabra and other lights have been introduced, and there is a feeble attempt to do that which, without knowing of that instance, I have frequently endeavoured to accomplish, but have not found my clients venturesome enough to indulge me,—namely, lighting by gas outside glass screens in the walls. If windows are the best lights which can be obtained, it seems to follow that similarly-placed artificial lights would be best at night. It would probably involve a great expenditure of gas, but the inside would be free from the damaging and uncomfortable effects of combustion.

We now come to the final item in my list,—*Air*, and here I am aware I shall be met by every variety of favourite theory and practice. I have, of course, one of my own, but it is not universally applicable, nor even generally so, except with varying adaptations.

Ventilation is not properly understood by the public, and is repressed or prevented in almost every case where provision is made for it, by the piling up of gratings, and so forth. Ventilation to be perfect should be the admission, by the means we choose, of an equal amount of fresh and pure air to that extracted. As self-acting extractors I have frequently adopted Chowne's air-syphons in two positions; the one from near the ceiling, to withdraw the merely heated air arising from gas or other lamps, and the other from the floor level; the latter, invariably in places where large numbers of persons congregate, for the extraction of those impurities which cause discomfort; for, relatively, carbonic acid gas is heavier at equal temperatures, and falls to the lower strata of atmospheres. This must have been experienced by every one in such places as omnibuses with closed doors, and in the old-fashioned church pew; in such cases the opening of the door is an immediate relief from headache and oppression, and the drowsiness for which the sermon usually gets the credit.

The admission of fresh air is another matter not generally considered. How constantly do we find gratings fixed in skirtings at which fresh cold air is to make its entry, and it takes the opportunity of making itself known by almost cutting off our feet with its keenness, and rendering the lower limbs sensibly lower also in temperature, causing those catarrhs which we never know how we have caught. On the other hand, warmed air is as frequently admitted from gratings in the floors or through vertical pipes. In both cases the converse systems should be adopted. *Cold air should always be admitted vertically*, and, if possible, at a level above the shoulders of sitters. Cold air thus admitted will ascend several feet without departing from its columnar form. As it is the same with warm air, which, when admitted, we require at the very lowest part of the room, it follows that it should be *invariably admitted horizontally*, thus

ensuring the benefit of its temperature and freshness, instead of receiving it, vitiated, after it has been up to the top of the room.

Mr. Roberts closed his observations by advising negatively:—

1. Never allow pervious drains in pervious soils.
2. Never allow a cesspool or drain near a well.
3. Never select gravel as a building-site if well-drained clay can be obtained.
4. Never allow drinking-water to be drawn from a cistern supplying a water-closet.
5. Never allow waste-pipes to be inserted into water-closet traps.
6. Never allow rain-water to run to the ground if it be required above.
7. Never allow water to stand in exposed pipes in frost.
8. Never allow pipes to be fixed so that they will not empty themselves.
9. Never ventilate except by pipes; inlets and outlets being equal.
10. Never use glazed earthenware pipes for upward flues.
11. Never allow chandeliers to be the exclusive light merely because it has been customary.

DESIGNS FOR FOUNTAINS.

SOME time ago Messrs. A. Handyside & Co., of Walbrook, desiring to obtain a good design for a fountain, to be executed in cast iron, at the cost of 400l., invited a competition, and offered premiums of 30l., 10l., and 5l. for those considered first, second, and third in merit,—all of these to become the property of the manufacturers. By a special note "Gothic designs were not invited."

In reply to the proposal, thirty designs were sent in by the time named, January 31; and from these the Messrs. Handyside have selected designs by Mr. Hugues Protat, first; Mr. G. A. Ilston, second; and Messrs. Batten & Edwards, third.

We are not moved to any warmth of expression by an examination of the drawings, which are for the most part of very ordinary character. Mr. Protat's design, which is entirely French in style, is to be executed forthwith, at a greater cost, we opine, if properly done, than the sum named. If the full-sized drawings are well made, the figures which constitute its chief merit finely modelled, and some improvement be made at the summit, where now stands an over-large vase, the result, we have no doubt, will be a very handsome fountain of its class.

ON INVENTIONS CONNECTED WITH BUILDINGS.

ON the 1st inst. Mr. Banister Fletcher resumed the consideration of this subject.* In the course of his paper he said,—

I endeavoured on the previous occasion to show what we architects considered good and what bad; and, further, what we considered was still required. I thought I should by so doing provoke discussion, and therefore sound conclusions would be arrived at.

I then dealt in detail with thirty-nine subjects. On the present occasion it is proposed to limit the discussion to three subjects. The first (its importance demanding that position), the improvement of the dwellings of the people of this country; the second, health; the third, as relatively least important, the security from thieves of our houses.

To treat, then, of the least important first, I should mention that much attention has been directed to sash-stops and fastenings, and I have instructions from Colonel Henderson to make and report to him on all sash-fastenings and sash-stops that may be submitted to me, and that I am determined to try and find out every invention relating to this class. I have already inspected some inventions, and desire to see every invention and patent, with the earnest desire that my report may contain notice of every invention. When my report is sent to Col. Henderson, he will select a committee to sit thereon. I would mention to his praise, and to show how far in advance in this day are some of our officials, compared with those we read of in days gone by (which some still call the "grand old days"), that he has told me he will send a circular to the inhabitants of this great City, embodying the result of that investigation.

* See p. 24, ante.

It may appear to some a rather trivial matter; but if such could see the reports, they would understand that it is no such thing. The great proportion of the robberies of this day occur through the ridiculously easy method of obtaining entrance to houses by the simple application of the knife. I write all present to help me to prevent this easy ingress. It is attributable chiefly to two causes,—first, the reliance we all place in the police; secondly, to the absence of shutters (the old security), or, if they exist, to their non-use. In ending this part of the subject, I would say any information sent to me and specimens shall receive my best attention, and will be reported upon. They must be sent me in the course of next week.

Surely this is a field in which the noblest efforts are required to make the homes of the people of England less of a disgrace to this country. I am sure if we only consider what home is,—how much time may be spent therein, even by the disolute,—how thoughts and actions have their origin there,—we shall be led to reflect on its overpowering influence for good and evil. Well has the poet said:—

"If solid happiness we prize,
Within our breast this jewel lies,
And there are fools who roam:
The world has nothing to bestow;
From our own selves our joys must flow,
And that dear but, our home."

But can any one imagine that the poet was alluding to such homes as I have shown exist? Much rather would the description which appeared in the *Builder* (p. 52) apply:—

"This is the roof and the soaking rain,
Dripping right through in search of the drain,
In the new house that Jack built."

We next come to the second subject, and the last; and while it is, perhaps more than any other, occupying men's minds, I shall be very brief, and summarise only a few of the leading points.

1st. That the main sewers of this city and other large towns are most defective, and, in short, are but elongated cesspools.

It is useless for any man to make a statement unless he confirms his views. I will briefly do so, and show conclusively how defective at this day are our arrangements.

I quote from the minutes of Mr. Robt. Rawlinson, C.E.

"By a return recently made relative to the sewers in West Derby, it appears that about eleven miles of public sewers have been constructed, and that in these sewers there are seventy-five ventilating shafts. It is considered necessary for safety to the public health to ventilate public sewers at intervals not further apart than 100 yards, or eighteen ventilating manholes and grates in each mile of main sewer. This rule requires that there should be in the eleven miles of West Derby main sewers 108 ventilating shafts, or 123 additional to those now in use. Rain-water spouts may serve to ventilate house-drains; but these should not be reckoned in reductions of main sewer ventilation. With means for sewer ventilation as indicated, the air in the sewers may be comparatively pure. There cannot be concentration or stagnation at any part of the system, and it is in concentration and stagnation that danger to health arises. With profuse ventilation there will not be perceptible smell at the ventilation-grates at any one point, as the diffusion and dispersion of sewer-gas will be increasing.

Foul smells and dangerous results of sewer-gas only take place from sewers inadequately ventilated. The West Derby Local Board has more fully ventilated the sewers of the district than many other local boards; but, to be safe, the additional number, as now recommended, should be constructed."

Wherefore, it would appear that the only remedy proposed is to give back to us to inhale diluted gas; and it is considered by doubling (about) the number of such outlets, the air may be comparatively pure.

It is often talked about what will that New Zealander say that Lord Macaulay invented, when he stands on the ruins of London Bridge. But what, I would ask, would our grandfathers say, if they could arise to-day, and find us not talking about getting pure air, but that all the vanished science of the day, the ambition of the scientific world, seemed to consider comparative pure air as the *summum bonum*. And remember, this result is only to be obtained by great additional outlay.

Take, again, the *Times*, at the close of the long discussion in that journal, in a leader devoted to summing up the result:—

"One correspondent after another points out new danger, until the case of the average householder might well seem hopeless. He learns that no trap is to be trusted, and that he and his family are, in fact, separated from typhoid fever by but 2 or 3 in. of treacherous water. Even if some totally new arrangement of pipes would afford protection, it is not every one who is in a position at once to reconstruct the internal mechanism of his house; and it may as well at once be recognised that the idea of reconstructing the whole system of metropolitan drainage is for the present Quixotic. Are we, then, without any available means of escape from this terrible enemy of health, and must we submit to pay a certain

tribute of lives as the condition of enjoying the decencies of life? Our readers, it would seem, may all, at a comparatively trivial cost, provide themselves in very great measure with the protection which we are in search of. To obtain a real additional guarantee against typhoid fever, would be well worth a definite and moderate expenditure, even if we cannot altogether exclude so invidious a foe."

To add to our misery, the *Saturday Review*, in a clever article on sanitary reform, says:—"What are now regarded as the best established conclusions of sanitary science may be discredited in a few years, and precautions supposed to be important to-day may by to-morrow have come to be accepted as essential."

There, then is a subject for the inventive genius. Next, the deduction I drew in the last paper was, that as it is impossible to return to the old cesspool, it behoves the engineer to find a remedy. Listen, again, to what the *Times* says:—

"It is plain that everything we wish to get rid of can be discharged out of the house, and there dealt with quite separately from the interior arrangements. It must have a ventilation, and that must be entirely distinct from the ventilation of the house. It has often been pointed out that it may be immediately subjected to a general system of ventilation by means of pipes and sewers conveying in ventilating shafts, carrying the effluvia high over our heads, above the level of gutters, cisterns, and soft-water supply. Why not? There was a time when there were no chimneys for smoke, but we have them now, many and tall. It is a mere affair of mechanism to bring every nuisance in this metropolis within the draught of public ventilation, and whether those ventilations be worked by steam, by furnaces, or by natural draughts, is only a small matter. Even if it costs something, it is an important matter as water supply. Let it be considered that an ordinary wind changes the whole upper atmosphere of this metropolis once every quarter of an hour, so that an effluvia once transmitted to the upper regions is effectually got rid of. Its mischievous power consists in its lurking down below, or being actually confined in our houses. What we say is, that the object is quite feasible, and the means of escape are sad impostors if they cannot tell us how it is to be accomplished."

I contend this is no remedy; it is merely repeating what was done with the sewers when cesspools were done away with. It was then said, "Use plenty of water, and send all into the river, and there's an end of it." We know to our cost how wrong that was, and most certainly in time we shall discover, if we follow this advice, that we shall have around and above a stratum of death-giving vapour.

I now proceed to the internal sanitary arrangements. The great defects I would point out are the frequent use of bell-traps, for the reasons I have explained,—the absence of ventilation of drains. Take the usual soil-pipe closets on each floor: it will surprise those who do not understand it, but if the soil-pipe is trapped at the bottom, the using of the bottom closet will often empty the traps above of all their water, and for the simple reason that "nature abhors a vacuum."

To show again how little this is appreciated, I do not suppose one in twenty of those who fancy they understand sanitary matters can say if the receiver in a pan-closet is air-tight; can say if he would draw the water out of the pan. The result would appear to indicate great ventilation, to prevent air-bound pipes and to prevent foul air confined in the sewer forcing its way into the house.

The result then seems to be, as to drainage:—

- 1st. Plenty of ventilation.
- 2nd. If possible do away with the pan-closet, because of the receiver.
- 3rd. Improve the valve-closet, which at present is imperfect.
- 4th. Adopt D traps instead of the bell, until some better trap is invented.
- 5th. Find some means by which (no matter how long summer may last) evaporation shall not take place to such an extent that traps in areas and sunlike exposed positions shall cease to be traps.

It has occurred to me whether oil would not have the effect of preventing this evaporation; it is used successfully in gasoliers.

Next, as to ventilation in houses. I think for economy and for health the ash and frame I propose, made from my design, appear to combine those advantages which are requisite, namely, easy ventilation without draft. It is clear (at least, I quote from a very large experience) that no ventilation will be tolerated by the people where the slightest feeling of air coming in is felt. Another model I produce, which I invented many years since and have often employed, also giving the upward current which is necessary, and is so cheap as to come within the reach of all. I have used it for stables as well as for rooms.

Water:—There should be a constant supply.

I have seen two self-closing taps that seem cheaper and to meet the requirements demanded by the water companies; but some tap is wanted which, while cheaper, shall be as effective, if not more so.

I close these few remarks with a quotation from *Punch*, because we may be sure if it comic papers treat upon such a subject it is much occupying attention. *Punch* is speaking to King Christmas:—

"Let us heap on more wood, and while the roaring log emits its festive fireworks, let us drain a foaming goblet in your honour."

"Let us heap on nothing of the kind," said the old gentleman, blantly. "The room is too hot already; but until we get rid of hearths and stoves, and have air-pipes, rooms will never be properly warmed."

If a spur be wanted to increased exertions, I would thus supply it. Surely, if the physician is more than armies to the public well, how much greater than he must be that man who, by his inventions, limits or prevents the necessity of calling in the physician.

FROM MOSCOW.

Moscow! holy Moscow! the ancient capital of Muscovy, the idol of every Russian's heart, whose shrines are to him the holiest in the empire, hallowed by centuries of grand historical events. What associations do not arise at the name? Moscow, the beautiful Moscow! the unfortunate. What vicissitudes of good and evil fortune has this city not passed through? Four times nearly consumed by fire—in 1536, by accident; in 1572, by the Tartars, when over 100,000 persons perished in the flames, or by the sword; in 1611, by the Poles, who destroyed by fire a great portion of the city; and lastly, in 1812, when the Muscovites gave up their ancient, holy, and beautiful city to the devouring element, the grandest sacrifice ever made to national feeling. The plague of 1771 diminished the population by several thousands, from which it has never recovered, and the history of its battles and sieges would alone fill many volumes. Take, for instance, one of the entrance-gates to the Kremlin, say the Nitrovolny Gate, under whose arches the troops of Tokhtamysh, of Sigmund III., and of Napoleon, have all marched within four centuries. In 1408, it witnessed the siege of Moscow, by Edigei; in 1551, the invasion by the Crimean Tartars; and in 1611-12, the battles between the Poles and the Russians for the possession of holy Moscow; and in 1812, Napoleon passed through it when it was partly destroyed by his orders, but subsequently restored by order of the Emperor Alexander I., of Russia.

But in this letter it is not my intention to revert to much of its ancient history, only so far as it is connected with its modern aspect. And now let me place myself on the top of the tower of Ivan Veliki, and take a bird's-eye view of the town, and let down what appearance it presents. In my various wanderings I have travelled through Asia Minor and the north of Africa, and I have floated on the Golden Horn, with Constantinople within my view; but I have never yet seen any town or city which presented a *coup d'œil*, so truly Oriental or Asiatic as Muscovy's honoured capital, the view from the summit of this tower being certainly one of the most striking and unique in Europe. I have immediately under and about me the most ancient and most historical part of Moscow, and four of probably the most interesting buildings in the world, all within a stone's throw of each other. 1st, the Kremlin, for centuries the palace of the ancient Tsars of Muscovy, which has been the happy home of many, but also the scene of the most deplorable and wicked acts of which history is cognisant. 2nd, the Blagoveschenski Sobor, or Cathedral of the Annunciation, where the Tsars were baptised and married. 3rd, the Uskenskii Sobor, or Cathedral of the Assumption, where the Tsars were and still are crowned. 4th, the Arkhangelski Sobor, or Cathedral of the Archangel Michael, where the ancient Tsars were buried, the present dynasty finding their last resting-place, as I have in a former letter informed you, in the Cathedral of St. Peter and St. Paul, at St. Petersburg. Thus truly you may pass from the "cradle to the grave," for here he buried emperors of such good repute that they have been immortalised by their subjects as saints, with others whose characters are too truly depicted by the cognomen they bore, and such a one was John the Terrible. All these buildings are in the Oriental style of architecture, with scores of

les and gilded minarets sparkling in the mid-
sun. The late Emperor Nicholas added a
ne and handsome façade to the old palace,
th extending its interior accommodation for
tern requirements. The Kremlin Palace,
th its cathedrals, monasteries, and other
dings, is enclosed within battlements of
d masonry, and pierced with five gates, the
cpical of which is the Spiski, or Redcemer
h, which is the "Porta Sacra" and "Porta
mphalis" of Moscow. Over it is a picture
h Redcemer, held in high veneration by the
odox. An omission to uncover the head
to passing under this gate was anciently
shelable, and the traveller should not fail to
to the respect to old traditions here exacted:
n the Emperor himself conforms to the
don. Criminals executed in front of this gate
ad their last prayers on earth to this image
h Redcemer. Beyond we see a city whose
unference is about twenty English miles,
it totally irrespective of form, but presenting
he eye a pleasing negligence and picturesque
gularity: houses large and small, public
ldings, churches, and other edifices, are
ngled confusedly together, and the streets
lute continually, and thus offer from time
e points of view, whence the eye is able to
ge over the vast area of housetops, trees, and
led and coloured domes. The profusion of
rches (370 in number) is a characteristic
ture of the city. The other objects which
st attract the observer are the Foundling
spital, the Treasury, the Arsenal, the Bazaar,
University, the Museum, the great Riding
ool, the Strastny, the Donskoi, the Simonoff,
i Novopaski Monasteries, and the Novo-
vichii Convent, the Petroski Park and Palace,
d the Hermitage and Zoological Gardens.

And now I descend from the Ivan Veliki
er, and enter the ancient part of the Kremlin
ace by the red steps, which are now only used
important occasions, such as when the
per goes to the Cathedral of the Assump-
n. These steps lead to a gold court, an
ence-chamber, and banqueting-room, and
to the Hall of St. Vladimir, to which the
ers proceed immediately after their coronat-
n, and take their seat upon the throne for
the first time, adorned with all the Imperial
gria, and afterwards dine amidst their nobles,
rined heads being alone seated at the same
le. We now come to a very interesting part
the palace, the terem, anciently devoted to
Tsarevna and her children. The rooms con-
n many objects of great curiosity, among
ich are the bed of Alexis, father of Peter the
eat, just as he left it when carried to his
ave; seals of many of the sovereigns, espe-
ally a gold seal of John the Terrible, which
is sealed the doom of thousands, and which
is most painful to behold from its unhappy
ccasions. There more rooms, such as the
all of the Patriarchs, &c., too numerous to
ticularise, on to the modern part of the
lace, built by Nicholas. There we have on the
ground floor all the private apartments of the
upper and Empress, and the upper floor, con-
nning the State apartments, which are as grand
d as gorgeous as an autocratic emperor like
holas, with untold means at his command,
uld make them. There are several large halls,
mong which the Hall of St. Andrew and the
all of St. George, 200 ft. long, 68 ft. broad,
d 53 ft. high, where the names of each indi-
idual decorated with this order since its foun-
ation is to be found inscribed upon the walls
n letters of gold; the furniture is black and
ange, the colours of the order. There is also
a picture-gallery, containing, among others, some
e pictures brought here from the Royal Castle
Warsaw.

R. RICHARDSON GARDINER.

DESTRUCTION OF ST. MARY'S CHURCH, CRUMPSALL, BY LIGHTNING.

At a recent meeting of the Manchester
Library and Philosophical Society, a paper was
ad by Mr. Joseph Baxendell, F.R.A.S., on the
struction of St. Mary's Church, Crumpsall, on
4th of January, by fire, from a lightning
scharge.

The interest taken in the question, he said,
duces me to submit to the Society the following
ints of a careful examination of the lightning
ndicator, spouts, gas-piping, &c., at the church
d rectory, which I made on the 27th ultimo.
he lower part of the conductor passes through
iron down-spout, and terminates in a common
n-pipe at a distance of only 3 ft. 9 in. from

the lower end of the spout, and at a depth of
only about 18 in. below the surface of the
ground. It has, therefore, no direct connexion
with the earth, and is in consequence absolutely
useless for the purpose for which it was in-
tended. The iron down-spout through which the
conductor passes received the end of a lead
gutter, which extended the whole length of the
church to the top of a similar iron down-spout
built in the wall inside the rectory, and connected
with another iron spout outside the wall by a
lead bend pipe. This leaden bend was above
the floor of the vestry, and at a distance
of 18 in. from it, and below the floor there
was a lead gas-pipe connected with the large
gas meter, which received its supply from a
main laid in the street leading to the rectory.
There was a small meter under the tower, but no
part of the piping connected with it approached
the conductor, the spouts, or the lead gutter,
within a less distance than 3 ft. Assuming,
then, that the lightning struck the top of the
conductor, its course would be through the lead
gutter to the iron down-spout in the vestry, and
then by a disruptive discharge from the lead bend
to the lead gas-pipe under the floor of the vestry,
and through the meter to the street main. The
lead gas-pipe would be melted and the gas
ignited. . . . I have assumed that the light-
ning struck the top of the conductor, but I must
state that I was unable to discover the slightest
trace of any action tending to support this view;
and it is at least equally probable that the stroke
fell directly on the top of the iron down-spout at
the east end of the church. . . . In either case,
however, whether the discharge took place upon
the top of the conductor or on the top of the
down-spout in the vestry, the ultimate results
would be precisely the same. Had the con-
ductor been directly connected with the gas
main, as suggested by Mr. Wilde, the accident to
the church would have been prevented, but not
that at the rectory. The practical conclusion,
therefore, to be drawn from a consideration of
all the circumstances of this disastrous oc-
currence is, that in towns and districts where
systems of gas and water-mains and pipes exist,
all lightning conductors should be directly con-
nected with the mains of both systems.

THE GOVERNMENT AUDITORS AND THE CORPORATIONS.

TROUBLES to public bodies, any more than to
individuals, do not come alone. "What luck,
Tim?" asked an Irishman, one morning, of an
old acquaintance, who was in the habit of avoid-
ing a meeting in consequence of his indebted-
ness for a small loan. "By the table of war,"
replied Pat, "I've seen a ghost." "Thin,
maybe," replied the other, with a touch of dry
humour, "'Tis the ghost of three and ninepence
I lent you." This authentic anecdote has its
application just now in the matter of some cor-
poration ratepayers and auditors. If a bomb-
shell were to be suddenly sent into the midst
of a quiet family party, it could not cause
more panic or consternation than the announce-
ment to certain corporations and public Boards
that a Government auditor was despatched with
due authority to look over and balance their
accounts. In the sister island there is a little
reign of terror inaugurated; but, unlike former
Irish outbreaks, it is a wholesome public panic.
On the 19th of December, a letter was addressed
to the lord mayor of Dublin, by the Under
Secretary for Ireland, in reference to the appoint-
ment of auditor for the borough of Dublin, with
copy of the warrant appointing Mr. Finlay,
signed by the Marquis of Hartington, and lodged
by Mr. Finlay with the town clerk. These were
accompanied with the opinions of the law ad-
visers and law officers of the Crown. Also a
notice, dated the 6th of January, 1872, was
given by Mr. Finlay to the town clerk, in pur-
suance of the 34th and 35th Vict., cap. 109, re-
lating to the corporation accounts.

Strange to say, these communications got into
the hands of certain members of committees, and
were not brought before or under the notice of the
council until several days had elapsed, and a
deputation was organised in the meantime to
wait upon the Under-Secretary, at the instance
of a committee, who held the document lodged
by Mr. Finlay, and not with the knowledge of
the council. The deputation were asked by the
Under-Secretary to put their views upon paper.
This, it seems, they have done, and up to the
time of our writing, nothing but a formal
acknowledgment has been received.

The object of the deputation to the Under
Secretary was to throw obstacles in the way of
the audit.

Of course there were several reasons alleged
why the audit could not take place. It was urged
that the corporation experienced nearly insur-
mountable difficulties in bringing the Local
Government Act into operation. We do not doubt
this for a moment, but not for the reasons advanced
by the committee of the corporation. Now, be
it known that all the ratepayers of Dublin are
unanimous in having a Government audit, for
they have reason to fear that matters are far
from being right. They would willingly pay for
the expense of the audit, for the satisfaction of
heholding what their eyes have never yet feasted
upon these many years.

The second trouble of the corporation lies in
the announcement made by Mr. Justice Fitz-
gerald in his address to the city grand jury.
He confessed that in looking over the calendar,
he missed one case he had expected to find,
—"He did not find any indictment, although
there should have been one, against some one
for a public nuisance. As the lord mayor was a
member of the commission, it might not be con-
sidered a proper tribunal before which to insti-
tute such a proceeding; but they could not slant
their eyes to the fact that in many quarters the
state of the streets was such that an
indictment for a public nuisance might lie
against those in whom the law had cast the
responsibility of keeping the streets in proper
order."

This, we would think, ought to have been
sufficient to stir any public body into action, and
rouse up its latent spirit, if it had any.

There are two other corporations in Ireland
who are likely to be fixed and transfixed by the
action of the Government auditors. Here, in
London, in the east and in the south of the
metropolis, we hear of some vestries likely to
come to saddle grief, on the head of illegally-
signed cheques, passed out by members of
certain committees, without the knowledge of
the council. There is one vestry in South
London who have erred to the trifle of a few
thousands, not hundreds, extending over a not
very long period.

THE PUBLIC HEALTH.

In the House of Commons, Mr. Stansfeld has
brought in a Bill relating to public health. This
measure was, he said, a logical consequence of
the Local Government Bill of last year, which
consolidated in one department the old Poor
Law Board and the Medical Department of the
Privy Council, amalgamating under one super-
vision the laws relating to poverty and the laws
relating to health. It was a sanitary Bill, and
nothing more; and it was founded upon the
report of the Sanitary Commission, with some of
the recommendations of the Rivers Pollution
Commission. The two great objects of this Bill
were the construction of local sanitary authori-
ties, and the institution of new sanitary powers.
He looked upon the first as of the greatest im-
portance. He thought the House would come to
the conclusion that among the foremost objects
of sanitary reform was the establishment of an
efficient machinery for enforcing sanitary regu-
lations. To this end, they required Government
supervision, definite authority with definite
responsibility. By definite authority, he meant
that there should be one, and only one authority;
and by definite responsibility, he meant that
legislation should cease to be permissive, and
that distinct responsibility should be placed on
these local bodies. He proposed to divide the
authority into urban and suburban; that the
urban authority should be the Town Council,
the Improvement Commissioners, or the Local
Board; and that the rural authority should be
the Boards of Guardians, with the exception of
those guardians who represented the urban por-
tion of the unions. He would confer upon the
rural authority all the powers both of the
Sewage Utilisation, and of the Nuisance Re-
moval Acts. To the urban authority would
be allocated the same powers, in addition to
the powers conferred by former Acts. Then
it was proposed to combine those powers
for certain purposes: the local authorities would
have power not only over nuisances outside a
house, but inside; they would also have power
to test the purity of water supplied by water
companies, and to deal with the adulteration of
food. They proposed that the sanitary bodies
should have the power of providing hospitals for

the treatment of epidemics, and he should ask the House to give the local government boards with respect to the country the same power which the Poor Law Board possessed with respect to the metropolis, of requiring the institution of public dispensaries and the supply of drugs. They proposed to call on the local authorities, to appoint the necessary sanitary officers, including medical officers. With the aid of these officers they hoped to be able to furnish statistics of disease in the same way as statistics of death were now supplied.

Sir C. Adderley said that he intended to introduce a Bill himself, but his measure was for the purpose of the consolidation and codification of the existing laws, which were in a state of great confusion. The sanitary laws of the country were less defective than confused, and they would not have a good sanitary system till they were simplified.

Mr. A. Johnston expressed a hope that the status of the executive officers should be improved, and that they should not be so much under the thumb of those who elected them.

Mr. F. S. Powell pointed out several improvements that ought to be made, such as closing of impure wells, the establishment of public mortuaries, and the providing of disinfecting apparatus.

Leavo was given to bring in the Bill.

CASES UNDER METROPOLITAN BUILDING ACT.

THE DISTRICT SURVEYOR OF HAMMERSMITH v. HAWKINS.

The defendant in this case, tried before Mr. Ingham, at Hammersmith Police Court, is a nurseryman, carrying on business at Shepherd's Bush, the ground he occupies being nearly covered by glass-houses of various heights, all standing upon brick walls, and each heated by hot water. Two chimneys have been built recently, and attached to some of the houses in question; but no notice had been given, and the district surveyor, Mr. Knightley, summoned Mr. Hawkins for not giving notice for one of these.

His answer was that the chimney was not a building, and that if it was, he was exempt on the score of distance, as glass-houses were not buildings, and, if they were, the Act exempted them. The District Surveyor quoted sec. 38, sec. 6, rule 15, sec. 21, sec. 20, rules 4, 6, 9, and 10, and secs. 31 and 68. The magistrate took time to consider, and eventually gave a decision in favour of the District Surveyor, observing that the intention of the Act of Parliament was clear, that all such constructions were to be considered as buildings; if not so, they would be entirely exempted, instead of which the Act definitely exempted only a proportion of such buildings. Notice of appeal was given; but upon the recommendation of the magistrate, the chimneys were measured, to ascertain if they were exempted on the score of distance, and the appeal was eventually abandoned.

THE MONTREAL CATHEDRAL CASE.

SIR,—With reference to your article on the cathedral at Montreal in the last number of your paper,—*Ward v. Bethune*—and your comments thereon, I am in a position to give you the actual facts of the case; and I must begin by saying that I not only have no kind of interest in the matter even indirectly, but the plaintiff and all the counsel are strangers to me even by sight.

The old cathedral was burned down, perhaps, sixteen years ago, and plans for a new one got out. The architect for the new one died, and another was appointed,—an Englishman,—who was instructed to carry out the plans of his predecessor. The foundations of the buildings were a separate contract, and as they were completed about the time of the new appointment, tenders were advertised for by the architect from the plinth upwards.

The present cathedral consists of a central spire (of considerable height), rising from the intersection of the transepts with the body of the church; and as the foundations were not calculated for the great extra weight on the nave arches, there was a settlement, and, of course, various parts of the building abutting upon them went down to the extent of some inches, making it unsightly. The contractor was refused the amount sued for in consequence of this, and pleaded that at least his own work was properly done, and the architect had certified it, who was strict in his requirements. So far is not of itself disputed; but the position the cathedral authorities take is this:—"We agreed to pay you for a building to be first-class work. Surely it is not necessary to say there must be no settlements or sinkings. The nature of

any kind of contract supposes this. If we ask a man to use the bottom of a trunk that seems to us sound, and put sides and a top to it; supposing further that when it comes home we find it useless, because the bottom is rotten,—do you think we are going to pay him in full? He ought to have told us; and so you, if you are going to spend 40,000*l.* of money we can never raise again, should look to the foundations you are using; you should have satisfied yourself and us. You are a man of skill; none of us are. Our contract was with you to build,—not an architect. The architect who designed them is no more. You are the man. If the fault had been open and apparent, nobody would have been required to be responsible. Let the cause be what it may we can only pay for complete work." I have no knowledge of law, but perhaps some of your readers can say if this is "common law" or statutory, and as such local in its application.

One thing is clear, that an analogy often relied upon by architects, that they are after all much in the position of other professional men, like lawyers and doctors, does not hold, because a man must die sometimes, and yet a doctor have earned his fee well; and in every case one lawyer must lose. Yet there is no "must" about the stability of a building. M. A.

THE LAMP STANDARDS ON THE THAMES EMBANKMENT.

THE mention made in our last of the lamps recently put up on the Victoria Embankment has brought us some inquiries concerning the dolphin standard which bears them. We have already given some particulars, but will willingly repeat that this standard was designed by Mr. George Villiamy, the superintending architect of the Board, and was put up in the shape of a plaster model some time ago in competition with two others. The plaster model was executed by Mr. Mabey, of Storey's Gate, Westminster, from careful drawings by the designer. From this model another was made in brass, highly finished, from which the standards to the top of the caps, from which the foliated arms extend which carry the copper globular lanterns, were cast and fixed by Messrs. Holbrook, iron-founders, Manor-street, Chelsea (selected in competition with other founders), in 21*l.* each. They are good specimens of iron casting, in very bold relief, the drawbacks, &c., necessary being 500 or 600 in number. The arms and lanterns above the capitals were made and fixed (in competition also) by Mr. Parkes, gas-engineer, London-street, Paddington, at 13*l.* each, fixed complete, and this, with about 1*l.* each extra for some little necessary adjuncts, gives the total cost of each, fixed and ready for lighting, which they will be on the night of the Thanksgiving, as 35*l.*

Mr. Villiamy may be complimented on the production of a very successful work. The same standard will be used on the Albert Embankment.

THE ARK IN THE EAST.

SIR,—Will you allow one who does not make architecture a "profession" to inquire, through the medium of your valuable journal, why the architect of the synagogue for Liverpool has placed the ark at the east end of the building? (See *The Builder*, 6th of January.)

What a great and pleasurable study to some men is the art of construction, the origin of form, and the use of the various parts of a building; they look upon the great buildings of antiquity as a hieroglyphic history of much of the social, heroic, and religious habits of the people of past generations; and it is because the Liverpool architect appears to violate the Jewish custom that I have asked the question as to the ark in the east. One cannot give the "thousand and one" reasons in a letter why the ark should not be at the east end of the synagogue; but one or two may for the present suffice; and, first, the law given to Moses (*Exodus* xxv. 9) appears to be in contradiction to idolatrous worship, and that the Israelites should turn their back upon all false customs of worship. "The seat of the congregation" set up in the wilderness had the only entrance on the east side, and the "tabernacle was reared" on the west "side;" and in the tabernacle to the west stood the ark, and over it the "mercy-seat" above the ark. King David appears to have been the architect of the first temple; for "he

gave to Solomon the pattern" of every part (see *1 Chron.* xxviii. 11, 12); nor was there any alteration as to position, the only entrance to the temple proper being at the east, and the ark at the west end. The ark was removed from the tabernacle to the temple. The Jewish synagogues appear to have numbered about 480 at one time in Jerusalem; but it is not likely that they would have been built contrary to a law which was given, for obvious reasons. The Prophet Ezekiel (viii. 16) speaks of turning and bowing towards the east as the very climax of "abominations;" and Josephus relates the fact of two young men, learned in the Jewish law, breaking down the eagle and other work that Herod the King had set up to beautify the temple. The eagle had direct relation to the same idolatrous customs, and was carried with the armies to battle, perhaps on the same principle that the Crusaders carried the cross.

The first cathedral built in this country appears to have been after the plan of the temple; for we are told, "the Archbishop of Canterbury had erected a cathedral of stone on the model of a Roman basilica. There, in imitation of St. Peter's, the altar was erected, not at the east, but at the west end of the church;" it was the ancient form of the Eastern Church, not yet discarded in the West" (653 A.D.). Perhaps the change did not take place until long after that date. J. C. CURTIS.

SCHOOL BOARDS.

MR. FORSTER, in reply to a question in the House of Commons, said building grants have been promised, since the 1st of August, 1870, to 999 schools, the amount of the grants being 168,131*l.* Of these 918 are denominational schools, whose grants amount to 160,850*l.* There are still 1,901 applications under consideration of these 1,287 have been approved by the office, subject to fulfilment of conditions, and 614 are waiting information from managers; 213 applications have been refused, and 194 have been withdrawn. Of these 999 cases it is quite possible that some of the promised grants may not actually be paid. The average grant to each will be about 168*l.* I think I shall make an outside guess if I say that the grants to meet all applications that have been made since the passing of the Act will amount to about 400,000*l.* This sum will represent 2,400 schools, providing, in rough average, for about 400,000 children. Taking the average of the last four years, the Parliamentary grant has been slightly less than one-fifth of the total cost of a school; so that this 400,000*l.* out of taxes will be met by 1,600,000*l.* private subscriptions, and will make provision for 400,000 children, which, without the grants and private subscriptions, would have cost the rates 2,000,000*l.*

The School Board of London have invited the following architects to send in designs for a public elementary school, to be erected in Johnson-street, Stepney, to accommodate 1,000 children, viz.—Messrs. E. Barry, Saxon Snell, Roger Smith, A. & C. Harston, Jarvis & Son, and A. Newman. The building is to be designed upon the principle of class division, sometimes called the Prussian system.

The Halifax School Board have come to the decision to erect four new schools, at an expense of 15,000*l.*

At the last meeting of the Wolverhampton School Board, a communication from the Central Department agreed with the Board that accommodation in new schools should be provided for 1,500 children; and they pointed out that their inspector in Wolverhampton had recommended that there should be—(1) a school in Green-lane, Dudley-road, for 250 children; (2) between North-wad and Stafford-road, for 350; (3) between Monmore-green and Horsely-fields, for 300; and (4) at Springfields, for 100. The tender of Mr. Clarke for the needed alteration at the late British school, in Walsall-street, was accepted, at 925*l.*

The Liverpool School Board have agreed to erect their first school on the class-room system.

Leeds School Board.—Messrs. Alexander & Henman, of Stockton and Middlesbro' have been appointed architects to the School Board School to be erected by this Board in Burley-road, Leeds.

Middlesbro' School Board.—At their last meeting this Board decided to build their first school from the designs of Mr. Blessley, architect, of Middlesbro', and their second from those of Messrs. Alexander & Henman, architects.

OLD ST. PAUL'S CATHEDRAL.

At the present time, when the subject of the completion of St. Paul's Cathedral is so much discussed, it may not prove uninteresting for us to retrace our thoughts into the past for a few moments, and to muse on the glorious old edifice which preceded Wren's magnificent achievement. I will not call the modern cathedral of London the master's *chef d'œuvre*, for such an assertion may be open to question; though the largest work he ever accomplished, still some of his other City churches have been by many considered more successful. I feel no little hesitation in reverting to so well-known and trite a subject as that of our lost old St. Paul's; but having investigated its history either attentively a year or so back in the course of some studies, I now venture to speak of it.

A little time since the Institute of Architects proposed in their list of subjects for medals and prizes a set of drawings illustrative of the restoration of old St. Paul's Cathedral founded upon Hollar's plates, engraved in Dugdale's *Monasticon*.^{*} No competitors, however, came forward, for those very sufficient reasons,—that the drawings, if made out to the specified scale of 8 feet to the inch, would have been of so gigantic a size as virtually to preclude their completion. The same subject was in the next session again inserted in the programme,—considerably modified, however, *i. e.*, drawings for the restoration of the choir alone being required. Having advanced during the previous year with the designs for the restoration of the whole cathedral, I had been led to study the entire question in all its bearings. In the following notes several of the characteristics that distinguished our beautiful cathedral are touched upon, every care being taken to avoid needless repetition of points that may have been previously discussed.† One of the earliest discoveries made was that of the numerous inaccuracies and discrepancies in Hollar's plates. To take one instance only among many. The arrangement of the various steps indicated in the ground-plan is contradictory. It may be remarked, in passing, that in 1646 (see Timbs's *Curiosities of London*)[‡] a considerable accumulation of rubbish had taken place, so that the entrances of the cathedral were buried, and thus a great loss to the dignity appropriate to such a temple was involved. It is questionable whether the plates show the pitch of the lead-covered roofs correctly; for the latter are so exaggerated in height as to seemingly crush the substructure. Very possibly the ancient inclination had not been preserved, for in 1561 a fire took place, destroying the steeple and the upper roof of the church and aisles. It is singular that no external doors to the cloisters appear. Generally speaking, in old examples there are two or three, or sometimes more, external doors, without counting those leading into the cathedral to which they are attached. The Chapter-house was not small, only 32 ft. 6 in. in internal diameter. In comparison with the spacious Chapter-house at Westminster, it must have appeared diminutive. Had this building been of large dimensions, it would have been difficult to contrive space for it in the middle of a cloister garth. The cloisters must either have been much extended, or otherwise the Chapter-house would have looked cramped and "boxed in." According to the scale marked on Hollar's ground-plan of the cathedral, the internal width of the tower was about 40 ft., a great span for walls but 7 ft. thick. Most of our cathedrals, even with smaller towers, appear to have walls 8 ft., 9 ft., or 10 ft. thick. Very probably these most striking features in Old St. Paul's, the pinnacles and flying buttresses springing from the lower part of the tower, were not portions of the original design, but were added during the progress of the building to strengthen the falling walls. The tower rose to a great height before the base of the spire was reached, and as most likely it was treated as a lantern, the internal effect must have been exquisite. The Consistory Court, as it appears in Hollar's plan, may, perhaps, be in its primary position, but I cannot find any Mediaeval examples in a similar situation, *i. e.*, placed in such way as to block up a portion of one of the nave aisles.‡ In

Billings's "History of Durham Cathedral," page 34, it is mentioned that the Consistory Court occupied a space under the crossing over the tomb of Bishop Langley (A.D. 1106-1437). This is almost the only case in which the position of this court is mentioned at all, as far as I know. It was unusual in cathedral plans to see large central doors to the transepts (Ickfield), however, being an example to the contrary, but no doubt, in an immense city such as London, it was desirable to have means of exit in these positions in addition to the western entrances. The Rev. Mackenzie E. C. Walcott, in his "Church and Conventual Arrangement," says that porches were frequently built on the town side of the cathedral, as at Salisbury, Wells, Hereford, &c. Referring to Hollar's illustrations, the piers in the western part of the choir have indications of being portions of the original Norman church, which might have been afterwards "cased" in the Early English period. The easternmost bay was probably wider than the others,—a somewhat unusual occurrence, the more general plan being to make the end bays narrower than the remaining ones. In none of the plates are there any appearances of a wall-passage, a truly remarkable fact in so magnificent a church. Far more probably, however, owing to the loose manner in which Hollar's views were engraved, it was not thought worth while to show them. The list of the general dimensions given in page 17 of Dugdale's *Monograph* does not seem accurate. For instance, the total length of the cathedral there specified (630 ft.) cannot refer to the *building*, but probably supplies the length of the *churchyard*. The scale on the ground-plan makes out the length of the cathedral from east to west, inclusive of walls, about 603 ft.

The situation of the chapels or chantries between the external buttresses of the choir is rather unusual, but nearly similar examples exist in connexion with the choir of Exeter Cathedral, and at St. Alban's Abbey. The treasury, with some show of probability, might have occupied such a position as this. Probably many of your readers have examined the quaint old painting in the possession of the Society of Antiquaries, representing an external view of old St. Paul's. This picture was executed in the reign of James I., and at a date consequently anterior to the publication of Hollar's plates in 1646. Turret-like pinnacles crown the apex of the gables to the east front and south transept; they would appear to form part of the original design, and did not exist when Dugdale's book was brought out. Such features are not very common, but we have instances in the south transept at York Cathedral, and the north transept, Westminster Abbey. The wide bay in the choir probably marks the junction between the earlier portion, commenced in 1222, and the easternmost bays soon afterwards added. It may have been treated (in the manner of design) as "intermediate;" that is, partly following the details of the older work, and likewise being executed in character with the new. In fact, the treatment may have been similar to that adopted at Westminster Abbey. "I think the older part may have included one bay of the great arcade and aisle, or, to say the least, some of its details were continued in that bay."^{*}

We do not find anywhere in Dugdale's work the position of the ancient scerity described; it does not appear that it formed an external structural feature in the building. Is it possible that the undercroft of the Chapter-house was used for the purpose? It is much to be regretted that no really accurate geometrical drawings of this fine cathedral exist. Yet with respect to the western front, Inigo Jones has, I believe, published elevations in his works. I might go on to expatiate upon the many striking features of old St. Paul's; its nave and choir, each with twelve bays; its noble transepts, which were unusually long; and its lofty tower, surmounted by the leaden spire. The writer of every popular article, however, upon Mediaeval London, has invariably, of course, alluded to this subject, and dilated upon its beauties and characteristics. May London ere long be able to boast of a complete Renaissance St. Paul's, a worthy successor to that edifice now gone for ever from among us.

EDMUND B. FERREY.

Court, in St. Paul's Cathedral, has been arranged as a morning chapel. The Holy Communion was celebrated in it for the first time on Thursday morning, on the occasion of the Bishop of London's ordination.—*The Rock*, quoted in the *Times*, December 27, 1871.
* Gleasons from Westminster Abbey (G. G. Scott, R.A.).

PRESBYTERIAN CHAPEL AND SCHOOL, BRECON.

The style adopted is Early Decorated. The walls are built with native stone rubble, and Bath stone is used for the dressings. The spire is 85 ft. in extreme height above the road level. The tower contains, in a semi-octagonal projection at the side, the staircase to a gallery across the front end of the chapel. The two front entrances are connected internally by a corridor, separated from the body of the chapel by a glazed screen, with doors in it, opening into the chapel. The chapel is 33 ft. wide and 58 ft. long in the clear, with an apse at the back. The pulpit is on a platform in front of the apse-arch. The accommodation, including the gallery, is for about 400 persons. The ceiling is arched in outline, the apex being 10 ft. below the ridge of the roof. Deal ribs divide the ceiling into panels, and these, as well as certain parts of the walls, are ornamented by chocolate-coloured distemper work. In the rear of the chapel is a school-room, 22 ft. by 39 ft., as well as a class-room and vestry, for the use of the minister. The woodwork throughout is stained and varnished. The cost of the chapel and school, including heating, lighting, and fencing, was 2,186 l. The architect was Mr. W. F. Poulton.

THE CLERKENWELL AND SMITHFIELD BRANCH OF THE LONDON JOINT-STOCK BANK.

The building forming the subject of the accompanying illustration stands on an irregularly-shaped plot of ground at the corner of Saint John-street and Charterhouse-lane, having a frontage of 68 ft. to Saint John-street and 53 ft. to Charterhouse-lane.

The principal entrance to the bank is at the splayed angle between the two streets, and has a grey granite architrave round the doorway, flanked by two polished Aberdeen granite columns, surmounted on the first and second floors by oriel windows, and terminating above the main cornice with a segmental pediment.

Above this rises an effectively grouped composition, comprising a chimney-stack ornamented with swags of flowers falling over a recessed panel, in which is carved the date of the erection.

The elevations are Italian in style, the ground-floor order being Doric, surmounted by three ranges of grouped windows. The building is rusticated at the angles, and over the third-floor windows runs an enriched frieze; above which a bracketed cornice finishes the whole composition. The facades are executed throughout in Portland stone.

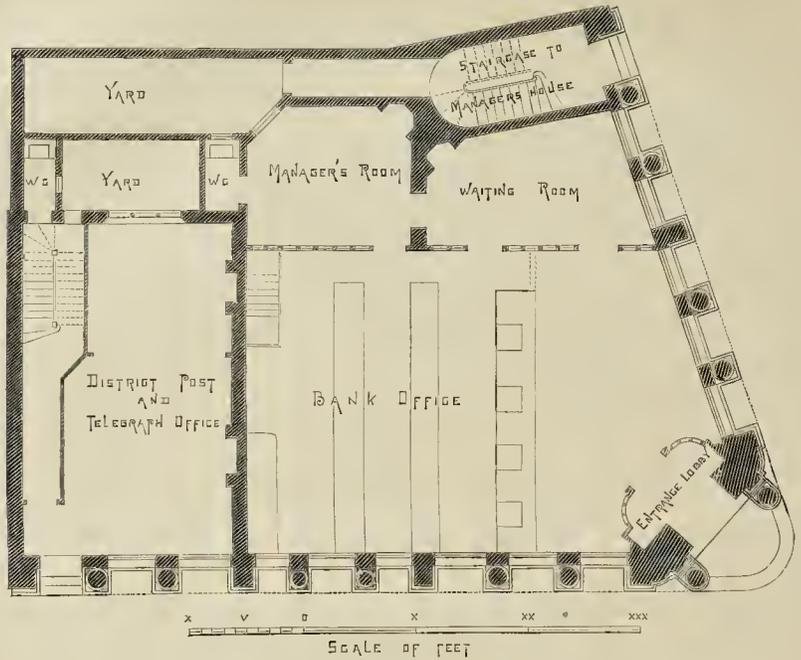
Internally the basement contains the necessary lavatories, closets, and other accommodation for the clerks, a messenger's room, three strong-rooms, and a fireproof safe for books and papers. The ground-floor is divided into two portions, the larger containing the bank office (11 ft. by 27 ft.), with manager's room, waiting-room, and private entrance to the residence above; the smaller portion, with entrance in St. John-street, is sublet as a District Post and Telegraph Office. On the first floor are the manager's dining and drawing rooms, with the usual domestic offices, and the second and third floors are occupied as bed-rooms.

Messrs. Brown & Robinson were the contractors, the total cost being about 12,000 l. The subsidiary trades were distributed as follows:—The iron girders and rolled-iron joists were supplied by Messrs. M. T. Shaw & Co.; the fireproof flooring was executed by Messrs. Dennott & Co.; and the carving was entrusted to Messrs. Bell & Almond; and Messrs. Mannelle supplied the polished granite. The sanitary appliances were manufactured by Mr. George Jennings; the strong-room doors and iron safes by Messrs. Leadbeater & Co.; and the gas-fittings by Mr. Hugh Mather.

The whole of the works have been executed from the designs and under the superintendance of Mr. Lewis H. Isaacs, architect, of Vernal-hill-buildings, Gray's-inn. Mr. Tracey was the architect's clerk of the works, and Mr. Cornish represented the contractors.

Rochester Cathedral.—It is proposed to supplement the work of restoration at the Cathedral, undertaken by the Dean and Chapter from funds at their disposal, by filling the new windows at the east end of the choir with stained glass, the funds to be raised by subscription.

* All the remarks here referring to Hollar's plates point to Dugdale's *Monograph* on old St. Paul's.
† I contributed a short article on old St. Paul's to the *Builder* (vol. xxvi, p. 165), to which I would refer those interested in this matter for further particulars.
‡ The Consistory Court in the modern St. Paul's, till very lately, occupied a similar position to that in the Mediaeval Cathedral. † What was formerly the Consistory

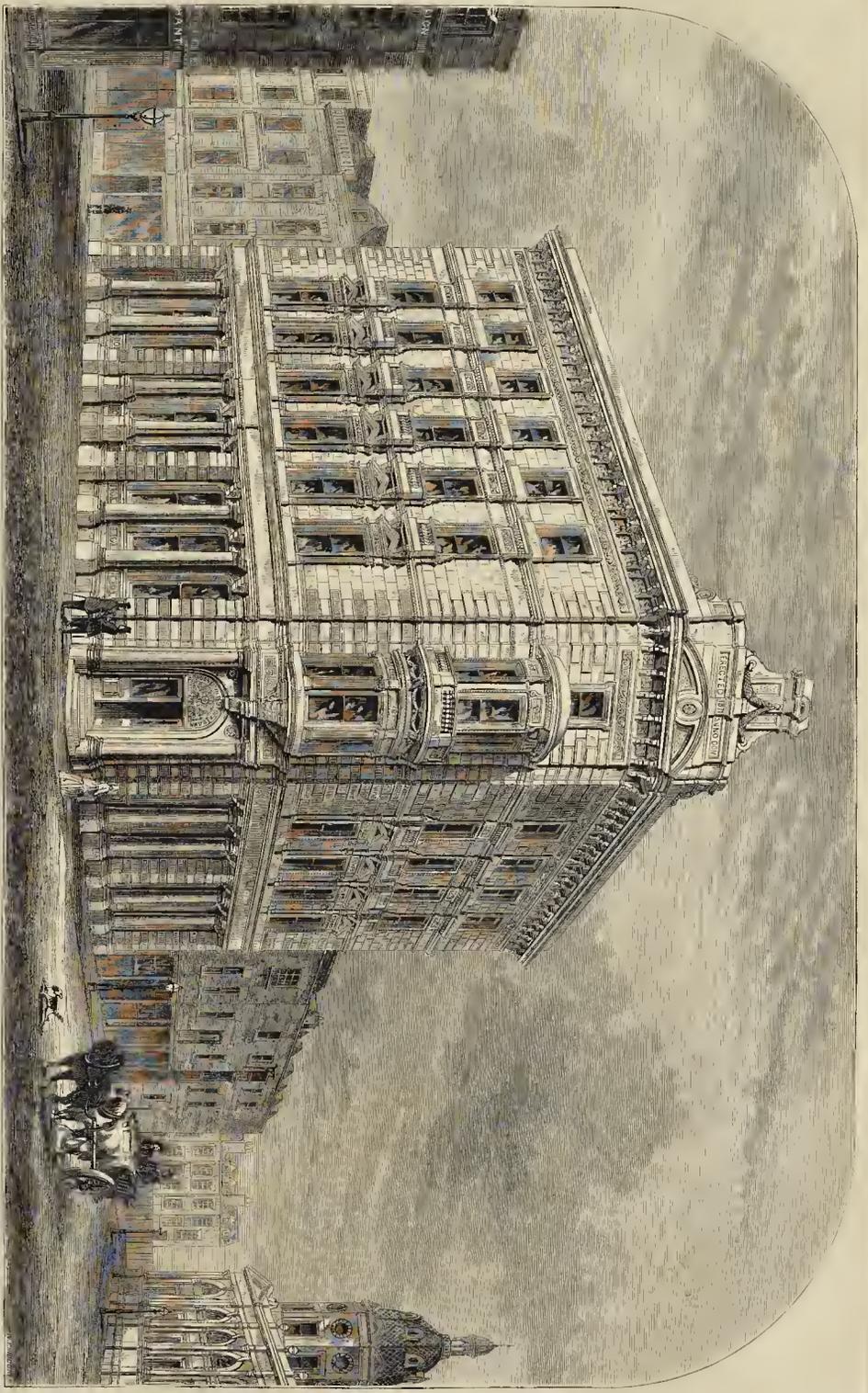


THE CLERKENWELL AND SMITHFIELD BRANCH OF THE LONDON JOINT STOCK BANK.

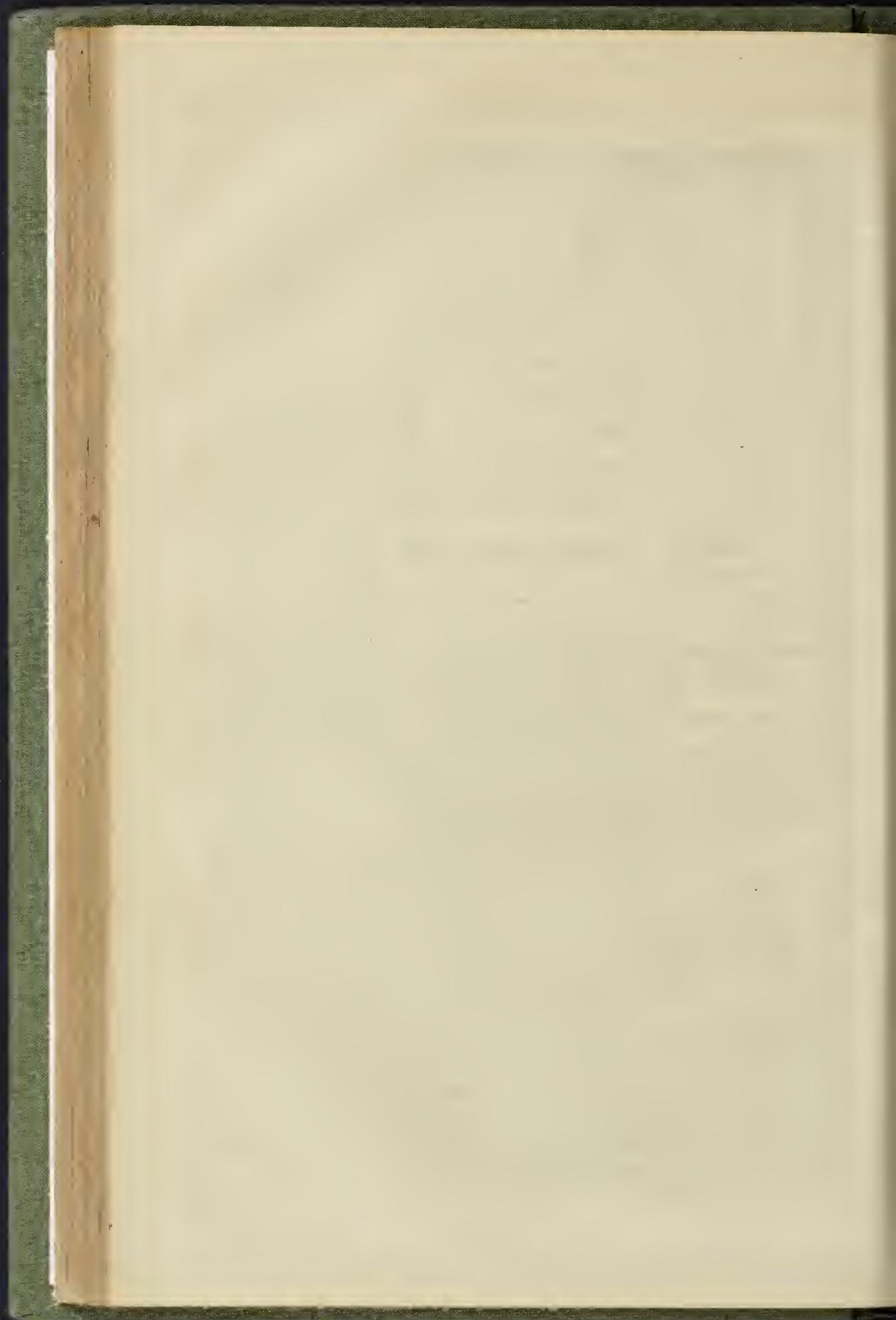
Plan of Ground Floor.



PRESBYTERIAN CHAPEL AND SCHOOL, BRECON.—MR. W. F. POULTON, ARCHITECT.



THE OLD BANK AND SMITHFIELD BRANCH OF THE LONDON JOINT STOCK BANK.—MR. LEWIS H. ISAACS, ARCHITECT.



FORM FOR "CONDITIONS" OF BUILDERS' CONTRACT.

AFTER long consideration and numerous revisions the following Conditions of Contract, on the basis of Headings sanctioned by the Royal Institute of British Architects, have been prepared by the London Builders' Society:-

1. The contractors are to provide everything of every kind necessary and requisite for the due and proper execution of the several works included in the contract according to the true intent and meaning of the drawings and specification taken together, which are to be signed by the architect and the contractors, whether the same may or may not be particularly described in the specification or shown on the drawings, provided that the same are accurate and obviously to be inferred therefrom, and in case of any discrepancy between the drawings and the specification the architect is to decide which shall be followed.

2. The contractors are to conform in all respects to the provisions and regulations of the Metropolis Local Management Act and the Metropolis Buildings Act, and to the regulations and bye-laws of the Metropolitan Board of Works and of the local authorities, and they are to give all notices required by the said Acts to be given to any local authorities, and to pay all fees payable under any of the said Acts to any such authorities or to any public officer.

3. The contractors are to set out the whole of the works, and during the progress of the works to amend on the requisition of the architect any errors which may arise, and to provide to provide the necessary appliances or furnish the necessary vouchers to prove that the several materials are such as are described. The contractors are to provide the quantity of the architect, to which materials and workmanship being the best of their respective kinds; and the contractors are to leave the works in such respects clean and perfect at the completion thereof.

4. Complete copies of the drawings and specification signed by the architect are to be furnished by him or by his clerk to the architect and the contractors for their own use, and the same or copies thereof are to be kept on the buildings in charge of a competent foreman, who is to be constantly kept on the ground by the contractors, and to whom the architect is to give by his certificate. The contractors are not to entitle the works or any part thereof without the consent in writing of the architect.

5. The architect is to have at all times access to the works, which are to be entirely under his control. He may require the contractors to dismiss any person in the contractor's employ upon the works, who may be incompetent or misconduct himself, and the contractors are forthwith to comply with such requirement.

6. The contractors are not to vary or deviate from the drawings or specification, or execute any extra work of any kind, unless ordered in writing by the architect, and to comply with any of the provisions of any of the Acts of Parliament, regulations, or bye-laws herebefore mentioned, or unless ordered in writing by the architect, and to be sufficiently shown by any order in writing, or by any plan or drawing expressly given and signed or initialed by him, as an extra or variation, or by any subsequent written approval signed or initialed by him. In cases of day work, all vouchers for the same are to be delivered to the architect or clerk of the works at latest during the week following that in which the work may have been done; and only in cases of day work, or in cases of such as may have been authorized by the architect to be so done, unless the work cannot from its character be properly measured and valued.

7. Any authority given by the architect for any alteration or addition in or to the works is not to vitiate the contract, but all additions, omissions, or variations, made in or to the works, shall be at a price not to have been previously agreed upon, are to be measured and valued, and certified for by the architect, and added to or deducted from the amount of the contract as the case may require, and in any process of amendment, or where the same may not apply, at fair measure and value.

8. All work and materials brought and left upon the ground by the contractors or by their order, for the purpose of the works, are to be at the disposal of the contractor as the property of the employer, when payment shall have been made of the amount of any certificate in which the value thereof shall be included, and in such case the same are not to be removed or taken away by the contractors or any other person without the special licence and consent of the architect; but the employer is not to be in any way answerable for any loss or damage which may happen to or in respect of any such work or materials either by the same being lost or stolen, or injured by weather or otherwise.

9. The architect is to have full power to require the removal from the premises of all materials which in his opinion are not in accordance with the specification, and in case of default the employer is to be at liberty to employ other persons to remove the same without being answerable or accountable for any loss or damage that may arise or happen to such materials; and the architect is also to be at liberty to require the removal of any materials not to be substituted; and in case of default the employer may attend such removal and substitution are to be borne by the contractors.

10. Should any of the works be, in the opinion of the architect, executed with improper materials or defective workmanship, the contractors are, when required by the architect during the progress of the work, forthwith to re-execute the same, and to substitute proper materials and workmanship; and in case of default of the contractors, the employer may employ other persons to re-execute the work, and the cost thereof is to be borne by the contractors.

11. Any defects, shrinkage, and other faults which may appear within months from the completion of the building, and arising out of defective or improper materials or workmanship, are, upon the direction of the architect, to be amended and made good by the contractors at their own cost, unless the architect shall decide that they ought to be paid for the same; and, in case of default, the employer may employ other persons to re-execute the work, and the cost thereof is to be borne by the contractors.

12. The contractors are to insure the building against loss or damage by fire, in an office to be approved, in the event of the contractor's neglect, or in any other way, the value of the works executed, until it shall be covered in,

and thenceforth until completion in three-fourths of the amount of such value, and are, upon request, to produce to the architect the policies and the receipts for the premiums for such insurance. All moneys received under any policy for loss or damage by fire, or towards the rebuilding or reparation of the works destroyed or injured. In case of neglect the employer is to be at liberty to insure and deduct the amount of the premiums paid from any moneys for injuries to persons or for structural damage to property.

13. The building, from the commencement of the works to the completion of the same, is to be under the contractors' charge; they are to be held responsible for, and are to make good all injuries, damages, and repairs occasioned or rendered necessary to the same, by fire or by causes over which the contractors shall have control, and they are to hold the employer harmless from any claims for injuries to persons or for structural damage to property happening from any neglect, default, want of proper care, or misconduct on the part of the contractors or of any one in their employ during the execution of the works.

14. The employer is at all times to have free access to the works, and is to have full power to send workmen upon the premises to execute fittings and other works not included in the contract, for whose operations the contractors are to afford every reasonable facility during ordinary working hours, provided that such operations shall be carried on in such a manner as not to impede the progress of the works included in the contract; but the contractors are not to be responsible for any damage which may happen to or be occasioned by any such fittings or other works.

15. The contractors are to complete the whole of the works (except painting and papering, or such other works as the architect may desire to delay), within calendar months after the commencement of the same, unless the works be delayed by reason of an inclement weather, or causes not under the contractors' control, or in case of combination of workmen, or strikes, or lock-out, or other causes of labour, or matters of which the allowance shall be made by the architect, and then the contractors are to complete the works within such time as the architect shall consider to be reasonable, and shall from time to time in writing advise and in case of default, the contractors are to pay or allow to the employer as and by way of liquidated and agreed damages, the sum of £ per week for every week during which they shall be so in default, until the completion of the works (except as aforesaid) shall be so completed, provided the architect shall in writing certify that the works could have been reasonably completed within the time appointed.

16. If the contractors shall become bankrupt, or compound with or make any assignment for the benefit of their creditors, or shall suspend or delay the performance of their part of the contract (except on account of causes mentioned in clause 15, or on account of being restrained or hindered under any proceedings taken by parties interested in any neighbouring property, or in consequence of not having proper instructions for which the contractors shall have duly applied), the employer, by the architect, may give to the contractors or their assignee or trustee, as the case may be, notice requiring the works to be proceeded with, and in case of default on the part of the contractors or their assignee or trustee for a period of days, it shall be lawful for the employer, by the architect, to enter upon and take possession of the works, and to employ any other person or persons to carry on and complete the same, and to authorise him or them to use the plant, materials, and property of the contractors upon the works, and to make such changes therein as may be necessary for carrying on and completing the said works are to be paid to the employer by the contractors, or may be set off by the employer against any money due, or to become due to the contractors.

17. When the value of the works executed and not included in any former certificate shall from time to time amount to the sum of £ , or otherwise, at the architect's reasonable discretion, the contractors are to be entitled to receive payment at the rate of 80 per cent. upon such value until the difference between the per centage and the value of the works done shall amount to per cent. upon the amount of the contract, after which time the contractors are to be entitled to receive payment of the full value of all works executed and not included in any former certificate, and the architect is to give to the contractors certificates accordingly, and when the works shall be completed, or possession of the building shall be given up to the employer, the contractors are to be entitled to receive the balance of the amount remaining due, according to the best estimate of the same that can then be made, and the architect is to give to the contractors certificates accordingly, and the contractors are to be entitled to receive the balances of all moneys due or payable to them under or by virtue of the contract within months from the completion of the works, or from the date of giving up possession thereof to the employer, whichever shall first happen. The contractors are to be entitled to receive any sum reserved for painting and papering or otherwise, on the completion thereof. Provided always that no final or other certificate is to cover or relieve the contractors from their liability under the provisions of clause No. 11, whether or not the same be notified by the architect at the time or subsequently to granting any such certificate.

18. A certificate of the architect, or an award of the referee hereinafter referred to, as the case may be, showing the final balance due to the contractor, shall not be conclusive evidence of the works having been duly completed, and that the contractors are entitled to receive payment of the final balance, but without prejudice to the liability of the contractors under the provisions of clause No. 11.

19. If the employer shall make default in paying any moneys to which the contractors may become entitled, for days after the amount thereof shall have been certified, or if the works be delayed for months by or under any proceedings taken by any other parties, the contractors are to be at liberty to suspend the works, and to require payment for all works executed, and all materials wrought up, and for any loss which they may sustain upon any goods or materials purchased for the works, and in such case the contractors are not to be bound to proceed further with the works contracted for. The contractors are to be entitled to such interest and at such rate as the architect shall certify upon all moneys payable to the contractors, payment of which may have been unduly delayed.

20. Provided always that in case any question, dispute, or difference shall arise between the employer, or the architect on his behalf, and the contractors as to what amounts, if any, ought in fairness to be made to the amount of the contract by reason of the works being delayed through no fault of the contractors, or by reason of, or on account of any directions or requisitions of the

architect, involving increased cost to the contractors beyond the cost properly attending the carrying out of the contract according to the true intent and meaning of the signed drawings and specification, or as to the works having been duly completed, or as to the construction of these presents, or as to any other matter or thing arising under or out of this contract except as to matters left during the progress of the works to the sole decision or requisition of the architect under clauses Nos. 1, 3, and 10, or in case the contractors shall be dissatisfied with any certificate of the architect under clause No. 7, or under the proviso in clause No. 15, or in case he shall withhold or not give any certificate to which they may be entitled, then such question, dispute, or difference, or such certificate, or the value or matter which should be certified, as the case may be, is to be from time to time referred to the arbitration and final decision of the architect, or in the event of his death or unwillingness to act, then of his death or unwillingness to act, then of an architect being a Fellow of the Royal Institute of British Architects, to be appointed on the request of either party by the President for the time being of such Institute, and the award of such referee is to be equivalent to a certificate of the architect, and the contractors are to be paid accordingly.

LEAKY SEWERS.

Sir,—Will any of your readers kindly afford me information on the following case? A barrel sewer, 2 ft. internal diameter, has been constructed of brickwork, 4½ in. in thickness, set in Portland cement, the top of the arch being from 1 ft. to 2 ft. below the general level of the ground. No connexions of any kind have been made, the end of the sewer being closed. Upon testing it, however, the sewer was found to leak to the extent of about 110 gallons per chain per twenty-four hours, the soil through which it is carried being rather damp.

I should be obliged for any information from practical experience as to whether this amount of percolation is excessive; and if so, about what would be a fair allowance for normal leakage. B. A.

ENLARGEMENT OF CUMBERLAND INFIRMARY.

It has been resolved by the governors of the Cumberland Infirmary to enlarge it. The intended additions and alterations consist generally of the re-arrangement of the present buildings, with such modifications as will adapt it to the requirements of medical science, the removal of the dispensary from the centre of the building, and so separating the in-door and out-door patients, and the increase of the total accommodation, by means of new wards, from 72 to 100 beds. The cost of the new buildings is estimated at 7,000l. Messrs. Cory & Ferguson are the architects employed. A committee has been authorised to carry out the plans, subject to any subordinate alterations which appear necessary to them in the progress of the work. The committee at the same time are requested to renew their efforts, in order to raise the further sum which shall be found necessary for the completion of the work.

THE RATING OF THE ALBERT HALL.

At the Court of General Assessment Sessions, held at the Guildhall, Westminster, Sir W. H. Bodkin, presiding, the corporation of the Hall of Arts and Sciences, Kensington-gore, appealed against the assessment committee of St. George's Hanover-square Union, in respect of the rating of the Albert Hall. From the statement of Mr. Poland it appeared that the parish of St. George's, Hanover-square, had set down the gross annual value of the Albert Hall at 12,000l., and the net rental at 10,000l., upon which they proposed to charge a rate of 8s. 4d. in the pound. Mr. Poland said that the expenditure of the corporation exceeded the receipts, and that under the terms by which the corporation were limited in their charter, they never could make it a profitable speculation. He called Mr. Cole, the secretary, who stated that although some of the boxes on the first tier were worth 1,000l. each, they became the property of the holders of them for all time, and they had the right to use them whenever the hall was open to the public. There were 800 seats reserved for the Commissioners of the Exhibition of 1851, who had contributed 80,000l. towards the expenses of the hall. There were about 3,000 left for the use of the public. There were about twenty musical entertainments in nine months, exclusive of competitions by organists. As a rule members did not let their

* The Council of the R.I.B.A. require that this blank should be filled in with the name of a Fellow of the Institute.

seats, for they were very frequently empty. The number of persons present at the entertainments varied from 3,000 to 10,000. At the close of the case, the chairman said the Bench were impressed with the belief that nothing had been shown to justify the high value set upon the place by the parish, and reduced the gross annual value from 12,000*l.* to 1,500*l.*, and the rateable value to 1,250*l.*, with costs.

FORESTERS' HALL, WILDENESS ROW.

SIR,—Referring to your article in last week's issue, under the above heading, the last clause of which runs as follows:—"The foundation-stone, which bears the name of the builders, Messrs. Henshaw & Co., does not indicate that any architect was employed," &c.,—we beg to inform you that the original architect of the building was Mr. W. L. Gomme; but, by some arrangement unknown to us, Messrs. George Lansdown & Pollard were appointed by the committee to superintend the execution of the works.

W. HENSHAW.

THE PROPOSED NATURAL HISTORY MUSEUM AT SOUTH KENSINGTON.

In the House of Commons, on Monday night, Lord Elcho asked the First Lord of the Treasury whether a vote of 30,000*l.* on account having been taken at the close of last session for the erection of a Natural History Museum at South Kensington, according to a design by Mr. Waterhouse, he would, before proceeding with the work, cause the design to be exhibited alongside of the three designs which were selected, after public competition by the Commission appointed by the Treasury in 1864, to award the prizes for the best designs for a new Natural History Museum. And whether, as these designs were submitted to the public in the Victoria Gallery, while the design of Mr. Waterhouse had not been obtained by any public competition, and had only been seen by a few members of the House of Commons, where it was exhibited in the Library at the flag end of the session, he would choose some more public place for the exhibition of the designs.

Mr. Gladstone replied that the matter had advanced beyond the stage at which it would be possible to do what his noble friend wished. The House of Commons had passed the Bill, and 30,000*l.* had been given towards the actual erection of the building in reference to a particular design; and it was the duty of his right hon. friend the First Commissioner of Works to proceed in due course to give effect to the intention of Parliament. For that purpose all the specifications had been drawn and tenders invited for the contracts.

SANITARY EDUCATION.

The people of this country are not well informed as regards sanitary matters,—poor-law relief, &c. Could not the Post-office be made a means of distribution through the length and breadth of the land of short, pithy papers on these subjects, written in the form of tracts,—no official look about them, but simply well-printed, neat bills? They might be sent by millions, to every house, at a little expense. Acts of Parliament, if seen, are seldom read. Many people seldom see a newspaper; and if anything on sanitary matters were in it, it would not be read; but attention would be fixed on such papers as I have described, if sent to people's houses.

Educate the people on these matters: the results would be good. Tell them that filth and bad drains mean fever and small-pox; cleanliness and thrift are the way to independence.

CONSTANT READER.

MICKLEHAM, NEAR DORKING.

The chancel of the parish church, restored by the munificence of Mr. W. M. Praed, the lord of the manor, with an organ-chamber added at the cost of the parishioners, was re-opened on Saturday, February 17th, with an afternoon service. There was a large attendance of the neighbouring clergy, and others, the friends of the rector, the Rev. W. H. Hanks, who met the Bishop at the rectory. "The Church's One Foundation," No. 320 of Hymns Ancient and Modern, was sung as the procession entered the church. The

Bishop of Winchester preached an impressive and appropriate sermon, from Rev. ii. 12, in which he expressed the strong hope that the restoration of the chancel would be soon followed by the rebuilding of the nave in a style corresponding thereto. He spoke in a well-deserved strain of condemnation of the sham arches of wood and plaster, of the inconvenient galleries, and the wretched accommodation for the poor, and urged that no remedy of an effectual kind, short of rebuilding the fabric, could be attained; and, looking at the wealth of the parish, this end ought easily to be secured.

The chancel is in keeping with the Norman character of the church, having a large arch of oolitic stone. A stone screen traverses the upper opening of the organ-chamber. A reredos in alabaster and marble, and a light communion-rail in oak, decorate the east end; and memorial windows, by Clayton & Bell, have been added by relatives of deceased parishioners.

The whole work has been carried out from the designs of Mr. Joseph Peacock, by Goddard & Son, of Farnham, the contractors.

The only part of the church supposed to be of genuine antiquity is the tower, which could probably be retained, under a new design, for the body of the church.

DAMP WALLS.

HAVING nearly completed the construction of a house on the banks of the Dork, a few miles from Dartmoor (where wind and rain are copiously supplied), I was advised by local residents before commencing to give my attention to the construction of the inner and outer walls, in order to resist the action of the weather, and, as they term it, the perspiration of the stone. Acting on their advice, I constructed the outer walls of 18-in. rubble limestone, from a neighbouring quarry, and mortar made with the lime burnt from the same stone, casing them inside with 4½-in. Bridgwater bricks, leaving a cavity of 2 in. between, and bonding the casing to the main wall occasionally with headers.

The whole of the inner walls and partitions I constructed entirely of bricks, thereby preventing the dampness so complained of, arising out of stone when fires, &c., are in use.

The entire surface externally is coated with Cleavers & Mist's Portland cement (properly gauged), which was completed in the fall of last year; and from that period up to the present there has not been the slightest appearance of dampness.

While constructing the house I also gave my best attention to the construction of the joiners' work. The window-frames are solid, with sashes hung.

I had taken such precautions as were laid down in an article on windows, appearing in the columns of the *Builder*, October 7th, 1871; but in this instance, under its present arrangement, I have failed. Can any of your correspondents, used to building in exposed situations, assist me?

BERRY POLKOV.

SIR,—The evil complained of by your correspondent "Devonian" is, indeed, a serious one, but I think it is remediable.

In the first place, he is in error in lining his walls with rubble slate: its utter non-absorbency and its natural coldness cause it to condense the water out of the contiguous saturated air. Internal damp walls commonly arise from this cause, as the quantity of water in suspension in the atmosphere increases with its temperature: thus a cubic foot of air at 70° will hold a given amount of moisture greatly in excess of air at say 50°; but if that air at 70° impinge upon a surface of say 50°, the air will deposit upon that surface an amount of moisture equivalent to the different points of saturation.

The course I should propose in new buildings, is to build the outer walls of rubble, say 10 in. or 12 in. thick, according to local custom, and leaving a clear air space of say 3 in.; build the inner walls of good absorbent brick, bonding the two together with iron bond 9 in. long, two bonding-irons to each superficial yard of wall, canked at the ends, and bent down in the middle to drip off any moisture that may find its way to the cavities.

The cavities should be kept clear from mortar-droppings during the execution of the work, and air-bricks left top and bottom for ventilation, and means of drainage provided. The wet can never drive through such a wall, and there are no means of conduction except the window-cills,

and these should be of non-absorbent stone, and the windows should have backs and eilows, and plenty of ventilation behind them.

I should recommend "Devonian" to weather-slate the outside of his house (it can be made ornamental), and to batten the inside, leaving a 2-inch clear cavity from bottom to top, &c., below the lowest floor to the cavity of roof, with plenty of air to it. The wet will then be prevented from entering the solid wall from the outside, and the saturated internal air from being condensed by contact with the cold slate lining.

THOMAS CHARLES SORBY.

SIR,—Can any of your correspondents give a cure for ground-damp? I have cut a drain 12 ft. deep, and laid drain-pipes 2 ft. below the cellar, 2 ft. apart; but it does no good. I know the almost impossibility of effecting a cure, but thought it possible that some of your readers may have applied themselves to the task; and, if not found a cure, have found some means of mitigating the evil, and should be obliged if they would say a word.

A. B.

SIR,—In the case where rain drives through the walls of a house already built, the most effectual remedy is to protect it with verandahs on the ground floor, and to case the walls above with roof tiling or slating. Painting or coating with soap and alum washes may be sufficient in some cases, and Portland cement facing in others; but none of these are so permanent or efficient.

A. J. B.

THE PROPOSED CHANNEL TUNNEL.

SIR,—I have read with great interest your remarks upon the proposed Channel tunnel, printed in the *Builder* of the 27th ult., and most thoroughly agree with your opinion, that the work would be of the greatest difficulty and expense, even if not impossible; and I submit that the experience I am about to describe to you quite hours you out in your opinion.

I have during the past three years been engaged as engineer in carrying out a system of deep intercepting sewers for the city of Norwich, which, from the quantity of water met with, have cost 110,000*l.* The city stands on a subsoil of sand and gravel resting upon the upper chalk, which in parts comes to the surface, and the low level sewers, which are about four miles in length, are all from 5 ft. to 19 ft. below the water level, were nearly all executed by tunnelling, frequently 50 ft., 60 ft., and even 80 ft., below the surface of the ground, and were chiefly excavated in the chalk, although between 2,000 ft. and 3,000 ft. of running sands were met with in some portions of the work. You mention that at Dover, which is close to the sea, water is found in wells at the sea level: now, the ordinary level of the rivers Yare and Wensum is only about 2 ft. 6 in. above the mean level of the sea at Liverpool (Ordnance datum), and Norwich is about twenty miles from the sea, yet in sinking our shafts in any parts of the works we always met with water at about the level of the river, the soil beneath this level being quite saturated.

To enable us to work we were obliged to employ a large amount of steam power, for the chief part of the time thirteen engines and pumps being at work day and night, and from seventeen to twenty millions of gallons of water being pumped up in every twenty-four hours. By continued pumping the water level for a radius of about three miles round the city was lowered several feet, varying with the distance, those wells nearest the works being, of course, dried to a greater depth and sooner than those at a distance. The chalk here, being the upper chalk, has continuous beds of flints at intervals of about 4 ft. or 5 ft., and the chief runs of water were found to be along these beds, the re-deposited chalk, here known as "chalk-marl," was partly encountered and was much less porous. The proposed Channel tunnel being entirely under the sea, and in the upper chalk covered by many fathoms of water, and, doubtless, saturated, it is difficult to understand how it will be possible to carry on the work unless it is executed in short lengths and at once lined with cast-iron segment plates. No masonry could be built, as it is clearly impossible to lower the water level in a porous soil, beneath the sea, and the percolation of the water would be so free and strong that any cement would be washed away before it could set. Even in our works this was clearly shown. When, through any accident

o the machinery, if the bricklayers were at work, he portions they were employed upon were aimed, and although every possible care was taken to make the work water-tight, many leaky laces have occurred, and it is found to be extremely difficult to stop these, even under a head of water of less than 20 ft.; how much more difficult would it be under a pressure of as many fathoms?

Bearing in mind the difficulties and anxieties experienced in the works now mentioned, and which were under my own observation, I feel called upon to give you this information to strengthen the opinion you have expressed.

The risk to life would also be terrible. In our case, if a pump stopped through accident the water rose so fast that, in many places, if working only a few hundred feet from a shaft, all had to run for their lives. What chance, therefore, would men have at even one mile from a shaft, to say nothing of eleven miles? There is nothing so troublesome to deal with as water, as all those who are in the habit of so doing know to their cost.

ALFRED W. MORANT.

A NOBLE OFFER.

THE people of Aspatiria, in Cumberland, want a new Market-hall and Assembly-room; and at a public meeting, held on the 17th instant, to receive the report of a committee on the subject, it was unanimously—nay we not add, magnanimously—resolved that the sum of two guineas should be offered as a premium for the best plan of a building, embodying the principles laid down by the committee. We sincerely hope the proposition will meet with the response it deserves.

A PARK FOR BIRMINGHAM.

At the quarterly meeting of the Birmingham Town Council, on Tuesday, the Mayor read a communication from Mr. Alderman Ryland, containing a proposal from his relation Miss Ryland, of Barford-hill, Wandsworth, to present to the town a piece of land for the purposes of a public park. The land consists of about 54 acres, about two miles from the town-hall. In the event of the acceptance of her offer, Miss Ryland is prepared to lay out the land in an ornamental manner, at an expense of about 5,000l. The proposal was accepted with warm expressions of gratitude.

THE TRADES MOVEMENT.

Oxford.—A meeting of the master builders in this city has been held, to consider the demands of the men in their employ to have their hours of labour reduced from fifty-eight hours and a half to fifty-four hours per week. After some discussion it was agreed that they would concede two hours per week to the men, requesting them to work ten hours per day the first five days, and allowing them to leave work on Saturdays at one o'clock. This decision has since been communicated to the men, who held a meeting, and resolved not to accept the proposal. Should the builders refuse to comply with the request of the men, a strike is intended to take place on the 1st of March.

Shields.—The joiners and house carpenters of North Shields have come out on strike. They asked for 28s. per week, instead of 26s., and to work fifty hours per week. They have nearly come to terms. The masters conceded the time and advance in wages; but they wanted the change to take place in May instead of March.

Sunderland.—A meeting of the bricklayers, masons, and plasterers of Sunderland has been held, when it was decided to demand fifty-four hours and 38s. per week, notices to be given at once, and expire on Monday, the 4th of March.

Dundee.—A meeting of about 300 sawmill workers in Dundee has been held, to consider the advisability of adopting a fifty-one hours' limit. Mr. William Stewart was called to the chair, and a resolution was passed to the effect that fifty-one hours should be a week's work, the change to commence on the 1st of April. It was also agreed to demand that wages should be paid weekly, instead of fortnightly, as at present; that all overtime should be paid at the rate of "time and quarter" for the first two hours, and "time and half" afterwards.

York.—A strike has taken place in York, possessing the new feature that it was a strike of one class of employes against another, and not between them and their masters. At the railway

Plant Works, a class of workmen called "strikers," engaged and paid by the smiths, had struck against the latter on a demand to be paid 8s. in the pound instead of by the day, and ultimately the smiths, who, by the absence of the "strikers," were thrown out of employment, were compelled to succumb, and grant the requirements made of them. Following their example, the "strikers" at the Phoenix Ironworks at York have made the like demand of the smiths employed at that place, and the two bodies have stood out against each other. Between the two stools the masters come to the ground.

CROWDED OUT.

Now, while Parliament is sitting on all subjects of reform, dilly-dallying with the people, to defer a coming storm, 'T would be well and wise, I'm thinking, if our magnates would look down

On the overcrowded dwellings of the suffering poor in town. We are told all men are equal, and that life's a common lot, Yet very different tenements have different people got; One resides in a palace, where luxuriousness is law; Another in a cellar finds a bed of rags or straw.

Have they ever seen St. Giles's?—ay, or noted Bethnal Green? Or Golden-lane? or many a like abominable scene? If they had, they'd hold my notion,—'tis a scandal gross to find How little rich folk care about the humbler of mankind.

In foul courts and dismal alleys, scarcely fit for beasts of prey, Tens of thousands of the sons of toil are thickly stow'd away.

Can their boys grow up in vigour? Can their girls be pure and fair? Drinking only poison'd water, and inhaling stagnant air? I have seen one small apartment, measuring sixteen feet by ten, Habited by thirteen persons, women, girls, and boys, and men;

I have heard their awful language, I have mark'd their savage glare, As they came in from the reeking street to lie down—anywhere.

Can we wonder that our prisons should abound in youthful crime? Or that countless numbers perish every year before their time?

In the rookeries of London 'tis that pestilence begins, To punish not the poor alone, but rich folk for their sins. For commerce, banking, merchandise, proud buildings large men will raise;

With money that has oft been made in very dirty ways; But, save a Peabody, a Couits, or Shaftesbury, again, How few have thought of decent homes for London working men?

There's a loud cry for more churches, yes! and more church livings, too, But is there not as urgent work for Christian men to do? Let them build schools and houses for the young, and horey land, And they'll prove as noble altars as can grace our favour'd land.

Let Puritans who argue for an arbitrary clause, To put down grown-up vices, just consider nature's laws; Men cannot thrive, as rats do, in a sewer or a sink, And from holes that are not homes arise the evils born of drink.

It is not by means coercive, by invidious rules and Bills, The demon can be thwarted who both soul and body kills; Sow the seeds of moral beauty where rank weeds now daily creep, And a better human harvest we in God's good time shall reap.

Oh, Ministers of ancient Truth!

Oh, Ministers of State!

Whose proud ambition 'tis to see

Our country good and great;

Put aside your party warfare,

In a common cause combine,

And your names as saints and sages

In the Book of Life may shine.

G. LINNEUS BANKS.

A CONCRETE HOUSE.

SIR,—Having nearly completed a handsome Gothic house in the new material, Portland cement concrete, I should be happy to allow any one interested in the subject to inspect the same for the next ten days on presenting his card to my gardener on the premises. The house is within sight of the Addlestone Station on the London and South Western Railway, and about twenty miles from London.

G. B. EDWARDS.

CAUTION TO ARCHITECTS.

SIR,—Let me caution architects and assistants in the provinces against a person who called at my employer's office on the 10th under pretence of seeking employment as draughtsman, but in reality begging; he got a trifle from me by making statements which I have since ascertained to be entirely false. If any gentleman visited by this individual will have the goodness to detain him, and send me a note or telegram, I shall be delighted to prosecute. He is of middle height, shaves his chin, his whiskers and moustaches being brown, inclining to grey; was dressed in a worn-out frock coat, tall hat, flannel shirt, and narrow red necktie; carried a roll of tracing engravings, which he offered for sale, representing himself as having had twenty-one years' experience; named some very well-known London firms as his former employers; said he had been five months in hospital with fever, &c.; and made attempts to shed tears, and so on.

C. HANBURY.

39, Castle-gate, Nottingham.

ASPHALTE AND ITS PROGRESS.

SIR,—In a recent number of the *Builder*, a correspondent says,—“However the question of using asphalt for roadways may be decided, we are convinced that good, natural mineral asphalt may be properly and efficiently used for footways, and the attention of parish authorities may very properly be called to the subject. Very few specimens until now were laid down for footpaths, but the General Asphalt Company having obtained permission of the Board of Works to lay down their asphalt on the footpaths on the south side of the Victoria Embankment leading to Blackfriars Bridge, we shall have opportunity for judging.” Allow me to state that mineral asphalt has already been used to a very large extent for footways in the parishes south of the Thames, where I have laid several miles of my asphalt, known as “Wright's Tar Pavement,” and as I am still engaged in laying down considerable quantities, I have every reason to believe that experience has proved this material to be a success.

W. WAHAR.

VENTILATION OF RAILWAYS.

SIR,—May I appeal, through your influential columns, to the various Railway Companies (except the Metropolitan, which has a sensible arrangement), to adopt a little sanitary measure much needed; videlicet, to make the small ventilators over the doors permanently fixed open without the possibility of their being closed. No one who has to travel daily from a near-London station can fail to realise the sickening nausea produced on leaving the breakfast-table and fresh air, and plunging into the atmosphere of a railway carriage, in which several obese specimens of both sexes have, for the previous thirty miles, carefully bottled and corked themselves, without the slightest possible inlet for fresh, or outlet for foul, air.

The dread, but almost imaginary bugbear “draught” would do but a trifle of mischief compared with the injury to health caused by the poisonous atmosphere.

A. J. * * * “Draughts” are no imaginary evil, and work more rapidly even than vitiated air; but railway carriages may be properly ventilated without necessarily incurring this evil,—and should be.

ARCHITECTURAL EXAMINATIONS IN THE COUNTRY.

SIR,—It seems to me a great mistake to confine the examination of architectural students to London. It is not all of us, especially assistants, who can come up to London for a week or a fortnight, whereas the papers might be sent down from the Institute to the different large towns, and put into the hands of the local architectural associations, and so students from that town or district might come up to be examined. After each examination I would publish the questions and a list of candidates, successful or otherwise. I think, then, in a very short time, almost every student would present himself for examination, especially if architects would also make it a point to accept no assistant that had not passed the preliminary. At present principals are indifferent about the education of their pupils, and parents are ignorant of the advantages of an examination. Depend upon it, if the subject were well ventilated, a great revolution would be effected in the education of the profession. Both parents and principals would be proud to have it known that their sons or pupils passed with honours the examination. In fact, principals would be obliged to see to the education of their pupils for their own advantage. It would soon be known that pupils from such and such an office never presented themselves at the examination or failed to pass it: the why and wherefore would be asked, and thus the working of that office would be exposed. In giving a list of candidates, I should say from whose office they came. I think the matter could be worked easily and inexpensively.

E. SCOTT RIDSDALE.

CHURCH-BUILDING NEWS.

Upper Arnhem.—Christ Church has been consecrated. The style of architecture adopted is Early English, of the twelfth century. The plan comprises a clearstoried nave, with north and south aisles and chancel, with organ-chamber and vestry on the north side. Beneath the organ-chamber is the heating-chamber. At the west end of the church, opening into the nave by an arch, in three orders, is the tower, 20 ft. square at the base, and rising to a height of 117 ft. It is divided into ringing-chamber and belfry-stages. The entrances to the church are by means of a south porch and south entrance in chancel. There is also a separate entrance to the vestry. The nave is 83 ft. long and 32 ft. 4 in. wide, and is divided into five bays by an arcading, resting on moulded columns, having moulded and carved caps and moulded bases. The chancel is 33 ft. long and 24 ft. wide, and is separated from the nave by a moulded chancel-arch, having moulded piers and moulded and carved caps and moulded

bases. The total internal length of the church, from east to west, is 137 ft.; width, 60 ft.; height from nave-floor to ridge, 56 ft. The windows throughout are lancet, with coupled lights in the aisles and triple lights in the clearstory. The chancel lights are similar, but bolder in treatment, and having nook shafts with moulded caps, bands, and bases. The east window is tripled, with a vesica light over. The ringing-chamber in the tower is arcaded. The belfry-stage has coupled openings on each face, fitted in with louver boarding. The floors of the passages are laid with cleansed Bradford flagging. The chancel floor is laid with tiles, in geometrical patterns, and there are wood floors under all the seating. The seats are open benches, of pitch pine, with ornamental-cut ends. The reading-desk, of oak, is placed at the south pier of the chancel-arch, and the pulpit, also of oak, at the north pier of the chancel. The communion-table, and framework for tablets are also of oak. The font, which is of stone, is placed under the tower. The roofs are open timber, with principals, having curved braces, purlins, ridge, &c. The rafters are framed. The whole of the roofs are double-boarded, and covered with green Westmoreland slates, having a moulded stone ridge. The roof of the tower is leaded. The walls throughout are of stone, of great thickness, faced externally with double-broached sandstone, from the Horsforth quarries, and plastered internally. The stone dressings throughout are tiled. The church is lighted by means of gas-standards and brackets made of bronze. The church, which is heated by means of hot air, will accommodate 651 adults; but this amount can be greatly increased, if found necessary, at a future time. The total cost of the church, including site, bells, and clock, will be between 7,000l. and 8,000l. The whole of the works and fittings have been carried out from the designs of the architects, Messrs. Adams & Kelly, of Park-square, Leeds, and under their superintendence. The following are the contractors:—Mason and joiners' work, Mr. Thomas Whiteley, Leeds; slaters, Messrs. Watson & Wormald; plumber and glazier, Mr. Geo. Wilson; iron-founders, Messrs. Heaps & Robinson; plasterer, Mr. Walsh, Upper Armlay; painter, Mr. W. E. Switbank. The pulpit has been made by Mr. Tomlinson, of Leeds; the font, by Messrs. Fielding & Dark. The carvings have been executed by Mr. Stevens. The gasfittings and ornamental ironwork have been supplied by Messrs. Jones & Wellis, of London; and the heating-apparatus by Messrs. Haden, of Trowbridge.

Marton.—The quaint old timber church at Marton, whose history extends back to the thirteenth century, has recently been undergoing the process of restoration,—a work rendered necessary by the dilapidated and unsafe condition of the original structure. The imroads of time had reduced it to such a ruinous condition that an effort was made by the incumbent, the Rev. J. P. Firman, and others interested to bring about a much-needed restoration. It had been found, upon an examination of the lower part of the main timber supporting the tower and spire, that the portions below the surface were completely gone. Mrs. Barber, the daughter of the late Rev. John Darcey, incumbent of Marton for thirty-eight years, offered to restore the chapel at her own expense, if Mr. Firman would promise her his aid and superintendence in the undertaking. The offer was accepted. The state of the building having been gone into by Mr. Butterfield and Mrs. Barber, plans were at once drawn by the architect and submitted to the incumbent and parishioners, and afterwards to the bishop, whose united sanction and approval they at once secured. Upon examination it was found that the timber supports for the tower were in a very decayed condition, and it was found necessary to renew the four square compound posts at the angles of the tower, which are strengthened by struts in the form of buttresses. How they have kept their position so well is a marvel, having no foundation to rest upon beyond that of a large stone simply sunk into a bed of loose sand. In digging out for the new foundation some pieces of ancient tiles and a portion of what seems to have formed the surface of some wall-painting; also some copper coins, of Queen Anne's reign. Among the old tiles turned up was one bearing on its surface a clear representation of two keys, with an unsheathed sword between them, in yellow glazed work on a red ground. The surrounding farmers placed their teams at the disposal of the incumbent for the conveyance of materials. Under the direction of the builders, the work through-

out has progressed satisfactorily. The spire, in its new garb of oak shingles, gives the appearance at a distance of being a stone erection. The chancel, which is now in timber and plaster, to correspond with the nave, adds to the general effect, and is an improvement upon the old brickwork, while internally the work of restoration accomplished is such as to conduce to the comfort of the congregation. Perhaps one principal alteration that has been effected has been the flight of nearly twenty stone steps, leading from the road up to the west entrance, which hitherto has not been made use of, as its nearness to the road indicated it ought to have been. Part of these steps are outside, and the remainder within the tower. A new oak font, lined with lead, has been designed to harmonise with the general materials of the church. The entire windows are filled with stained glass. Figures of St. Andrew and St. James occupy the east windows of the aisles, and simply quarry glass with some little colour is used in the others. The entire work has been carried out under the supervision of Mr. Butterfield, the builders being Messrs. W. & H. Restall, of Bisley, Gloucestershire.

Bromsgrove.—It is proposed to erect a new church at Bromsgrove, from the design of Mr. John Cotton, architect. The present state of the subscription warrants the supposition that it will be carried out to the full extent of the plans. The origin of the structure was a sum of 500l. bequeathed by the late Rev. More-Molyneux, provided the church was begun within twelve months of the date of the bequest, otherwise the money was to revert to the Diocesan Church Building Society. The twelve months alluded to will expire towards the end of April, and consequently the work must be commenced in a few weeks. Nearly 3,000l. have already been raised towards the estimated cost of about 4,000l., which will include 3,500l. for the building and the rest for improvements to site, boundary walls, and other incidentals. The originator of the building fund, the Rev. More-Molyneux, was connected with the town through relationship with the Rev. G. W. Murray, the present vicar of Bromsgrove. The Bishop of Worcester gave 500l., and the Diocesan Society made a grant of 250l. The site was purchased of Mr. Chesshire, of Birmingham, and contains about three-quarters of an acre. There will be no burial-ground, as there is a capacious cemetery for the use of the town and district. The architect has chosen the Early Decorated style. There will be an apsidal chancel, with organ-chamber and vestries for clergy and choristers, nave and aisles, south porch, and tower at north-west corner. The tower will have a tapering spire, the altitude of the spire being about 175 ft. from the ground. There will be 600 sittings, most of them free, exclusive of the choir benches in the chancel. At first, chairs will be used in the nave, but eventually red deal benches will be fixed when the funds are forthcoming. The church is intended to be built with the local sandstone, the walls being lined inside with buff coloured bricks, relieved with stone stringing and bandings; the dressings, arches, window tracery, &c., being executed partly in Bath and partly in local grey sandstone. A basement will be sunk to accommodate the heating apparatus. The system of warmed fresh air will be adopted, ventilators being arranged in the roof to carry off the vitiated air.

Malling.—It is proposed to erect a new chapel at the workhouse. Towards this project the sum of 200l. is still required, only 750l. having been yet subscribed. It is necessary that the work shall be begun as early as possible in the forthcoming spring. Plans have been adopted, designed by Mr. E. W. Stephens, and the tender of Mr. Church, of East Malling, has been virtually decided upon.

Syston.—The parish church of Syston has been restored, at a cost of 1,000l., and re-opened. The earlier vestiges have as far as possible been replaced in the new work or otherwise conserved. Additional accommodation has been obtained by the redistribution of the seats. Much remains to be done to render the church complete and provide a sufficiency of accommodation. The peal of bells has been re-adjusted. The church is warmed of a genial heat, needed here by the absence of the porch, which for the present has been deferred from lack of funds. The greater portion has been executed by Mr. Thomas Black, builder, Barrow, assisted by Messrs. Moss & Sharp, of Syston; the heating apparatus by Messrs. Hunt & Pickering, of Leicester; the hell-founders being the firm of

Taylor, Loughborough. Mr. Ordish, of Syston, was the architect employed.

Ponn (Wolverhampton).—The church has been restored and enlarged. The peculiar situation of the edifice at a junction of roads permitted of an extension in one direction only,—the east; and in that direction the extension could only be made after overcoming the sharp rise in the ground. The plan was to take down the chancel and entirely rebuild it, after lengthening the nave by the addition of two bays. This has been done, according to the plans of Mr. Paley, architect, Lancaster, by the Messrs. Higham, builders, Wolverhampton, at a cost of 3,000l. The nave has been lengthened by the addition of two bays, and provides increased accommodation to the number of about 150. The new seats are open low pews of pitch pine. The seats of the other parts of the church have been altered to the same pattern. The roof of the nave, as of the chancel and the chancel aisle, are open and of oak. The chancel is divided from its aisle by three ornamented and moulded arches. The old stained window of the chancel is left into the aisle, while the chancel itself is lighted by a new stained glass window of five lights. Messrs. Bratt, of London, were the artists. The reredos is of alabaster, inlaid with mosaic, representing in the centre a cross, on one side a vine, and on the other corn, emblematical of the bread and wine of the Lord's Supper. To these are added the emblem of the four Evangelists, two upon each side. The lower large undecorated slab of alabaster was found in the church during the alterations. The chancel is floored with encaustic tiles, the altar-rails and screens are of wrought iron work, and the chancel stalls are of carved oak. A new organ, built by Walker, of London, will be placed at the east end of the north aisle. The whole of the church has been re-floored, and is heated by an apparatus supplied by Mr. Blakemore, of Wednesbury.

Ipswich.—The church of St. Mary, Stoke, has been again enlarged and re-opened. The enlargement determined upon was to build a new nave and chancel on the south side of the existing church, so that the old nave and chancel should become a north aisle to the new building. This was perhaps the only way in which the church could be enlarged; but it was attended with the serious drawback that, without going to great expense, it was impossible to give the building an imposing external appearance. The new nave and chancel are the same height throughout, and are covered by a continuous roof, the style which has been adopted being the Perpendicular, to which the older portions of the church belong; the nave nearly equals in length the older nave and chancel, and the new chancel extends 10 ft. to the eastward, the natural and unavoidable consequence being that what with north aisle and transept, vestry, south porch, and a small south transept used as an organ-chamber, the irregularities are too great to be pleasing. The walls of the new part are faced with cut flints, with dressings of Bath stone; the gable of the east end and also the upper part of the south porch, which has been rebuilt with considerable alterations, being ornamented with alternate squares of flint and white stone. The large east window has been filled with stained glass, by Mrs. Lacon, of the Goldrod, in memory of her late husband, Capt. Lacon, R.N. Each of the five lights contains a representation of one or more of the leading incidents of the life of our Saviour. This window was supplied by Messrs. Clayton & Bell. The architect employed was Mr. Butterfield, and the contractor was Mr. G. Hewitt, of Ipswich. The stonework was done by Messrs. Chinnock & Co. The additional sittings number 318.

Engwardine.—The parish church has been restored and re-opened. The sloping walls between the transepts on either side the church obstructed the view and interfered so seriously with the hearing, that the question of how to remedy this objectionable state of things became a most difficult one to deal with. This difficulty, however, has been overcome by the erection of a longitudinal arcade on either side of the nave, and also transverse arches to carry the transept roofs, so converting the double transepts into gabled aisles. The external parts of the building have not been altered more than was found to be absolutely necessary to carry out the design of restoration, the only additions being the building of a vestry on the north, and an aisle on the south side of the chancel, for the organ and the accommodation of the children. The plain arch which separated the chancel from the nave has

replaced by an arch the entire width of the aisle, enriched by moulding, in keeping with the early work. There also at one time existed an arch between the tower and the nave which I been closed up, but has now been opened, it exposes the west window of the tower to the west. The nave and northern transept roofs have been restored without any alteration in the sign. The roofs of the southern transept, the chancel aisle, and vestry, are all new and in keeping with the other parts of the building, and the high pews of bygone days have been replaced by modern low seats of varnished deal. The font is of hard blue stone, and stands at the north side of the nave, near the tower transept. The pulpit is of oak on a stone base, and the whole of the chancel fittings are oak, as also the lectern. The main entrance is through the tower, and now that the screen has been taken down from the tower arch, the whole church is thrown into view. There is a second transept at the west end of the south aisle, as well as an entrance for the clergy through the stry. The lancet window at the side of the chancel has been restored, and a three-light window, moulded and in keeping with the chancel arch, has replaced the poor modern window which formerly existed. The transept windows have all been restored, and the little Norman window is introduced at the west end of the south side. The east window has been filled with leaded glass, supplied by Clayton & Bell, of London, at the cost of Mr. Hutchinson, of Longworth. The floor is laid with encaustic tiles, manufactured by Mr. William Godwin, of Lurgardine. The work has been carried out by Mr. James Bowers, of Hereford, under the supervision of Mr. F. R. Kempson, at a cost of nearly 9000.

Eastcheap, London.—St. Clement's, near Eastcheap, has been re-opened, after re-arrangement by Mr. Butterfield. The whole of the ancient oak carving has been preserved, and the canopy over the pulpit is decorated. The seats are in modern fashion, all open. The organ has been approved by Messrs. Gray & Davison. The fitting has been brought out in colour.

Malmesbury.—The church at Lea is about to be restored under the direction of Mr. C. J. Phipps, of London, architect.

SCHOOL-BUILDING NEWS.

Sheffield.—The formal opening of the boys' portion of All Saints' Schools has been celebrated. The schools are in connexion with the church erected by Sir John Brown, on Ellesmere-road, and they occupy a site, given by the same donor, immediately in the rear of that edifice. The building is in three blocks, one of which is the boys' school; the second, the infants' school; and the third, the girls' school. It is in the Gothic style of architecture, so as to correspond with the church. The entrances of both the boys' and girls' schools are surmounted by bell-towers, 45 ft. high. There is sufficient accommodation for 300 boys, the same number of girls, and an equal number of infants. Considerable attention, we believe, has been paid to ventilation. The architects were Messrs. Flockton & Abbott.

Leek.—The St. Luke's Church boys' new school has just been opened for use. The school-room is 60 ft. by 26 ft., 14 ft. high at the eaves, and 23 ft. in the centre. It has class-room, porch, &c. It is of red brick, with stone dressings to the buttresses, windows, gables, &c. Mr. Sugden was the architect.

Burton-upon-Trent.—A Primitive Methodist new school-room has been erected here, and has been opened also for divine worship and Sunday-school tuition. The building is in the Romanesque style of architecture, is 52 ft. by 28 ft. in size, has two class-rooms and out-offices; and the society now connected therewith numbers twenty members, and about ninety scholars. The school-room will accommodate 300 children.

Castle Fields, Shrewsbury.—The new schools for the district of All Saints have recently been opened by the Bishop of Lichfield. The building consists of an infants' school, with porch and lavatory, and a girls' school and class-room, on the ground-floor. A square bell-turret, with tiled roof, contains the stairs leading to the upper or boys' school, which has also a class-room. The total number of children for which provision is made is about 260. The walls are built of red brick, relieved with bands, &c., of white and blue brick, and the roofs are covered

with Staffordshire tiles; wooden frames, mullions, and tracery are used for windows. Mr. Edward Haycock is the architect, and the work has been carried out by Messrs. Bowdler & Darlington, for 8521.

Stapleton (Shropshire).—The first stone of a new school for this parish has been laid, by the Venérable Archdeacon Allen. The school will stand on a convenient site, facing the east end of the church. A mistress's house will be provided. Brick, with stone dressings, are the materials to be used. The roofs will be covered with Ridge Hill brindled tiles. The contract has been taken by Mr. W. Jones, builder, Stapleton, for 4741. Mr. Haycock, of Shrewsbury, is the architect.

Easton (Bristol).—The chief corner-stone of new school premises for the parish of St. Gabriel, Easton, has been laid. The site adjoins the church. The schools, which have been a little while in progress, are being built in accordance with the requirements of the Education Department, from designs by Mr. Neale, of Bristol, architect. The building will be of brick, in a similar style to the church, and the rooms will have open-timbered roofs. There will be provided two schoolrooms, 65 ft. by 20 ft., with a class-room, 18 ft. by 20 ft., to each; together with master's residence. The contract has been taken by Messrs. Wilkins, at 1,2601., but, owing to the depth of the foundations, the total cost, including fittings, will amount to 1,5501. The school, when complete, will accommodate 600 children.

Tunstall.—National schools have been opened here. The two schoolrooms on the ground floor have been considerably increased in height, and are used, one as the girls' school, and one as the infants' school. On the upper floor an additional room, which is used as a boys' school, has been added, 71 ft. by 26 ft., and is so arranged that in connexion with the old one on the same floor it forms one adapted for public gatherings in the district. The façade of the building, which has a considerable frontage to King-street, is in the Gothic style, executed with red bricks, and relieved by bands, &c., of white and blue bricks. The central portion of this front projects slightly before the sides, and is carried up in a gable form surmounted by a lofty bell-turret, finished on the top with a gilded iron cresting. The whole is from the design of Mr. G. B. Ford, architect, Burslem, and executed by Mr. Beech, builder, Tunstall.

VARIORUM.

"The Pocket Technical Guide and Mensurer for Builders and Surveyors. By A. C. Beaton (Lockwood & Co.)," professes to give in a waist-coat-pocket book, 3 in. by 2 in., a complete explanation of the terms used in building-construction, technical directions for measuring work in all the building trades, and complete specifications for houses, roads, and drains, and of course it does not do it. "Distilled books," says Bacon, in one of his Essays, "are like distilled waters, flashy things." And this is true, even when they are distilled by a knowing hand; but what is to be said of a work of this kind when it is performed by one who can thus instruct anxious students,—"The mouldings running round arches . . . is termed an archivolt;" "The upright bar of a window is called the Mullion;" and (more instructive still) "A Pinnacle, or Spire, is that part of any building which rises above the roof." We have no pleasure in breaking a butterfly on a wheel, but good nature has its limits.—The *Law Magazine and Review* (Butterworths) has become a monthly journal of jurisprudence for both branches of the legal profession at home and abroad. The change from a quarterly to a monthly journal will make it a more effective organ of the profession than it has hitherto been throughout its long and useful career. "Every lawyer feels that the changes coming upon us both in regard to law and procedure are of the very gravest possible nature. The fusion of law and equity, the alteration of the procedure of our courts, the reform of our system of appeals, of our land laws, of our jury system, are sufficient to indicate how important are the questions which are already to the front. Other journals will discuss them from the point of view of the public, the *Law Magazine* from that of the legal profession." The first number, now before us, includes a very interesting notice of the late Mr. Edwin Wilkins Field, the artist-lawyer, written with a right appreciation of his energetic character and genial qualities.

Miscellaneous

Watchman's Electric Tell-tale Clock.—Messrs. J. Bailey & Co., of the Albion Works, Salford, have just introduced to public notice a new tell-tale clock, as a certain detector of the watchman who is remiss in his rounds. The apparatus is the invention of Mr. F. M. Pratt. It consists of an ordinary clock, to which is attached a cylinder, revolving upon a vertical axis, and driven by the mechanism of the clock. The cylinder is covered with a sheet of paper, attached to it by spring clips, so that it can be removed when used, and a clean sheet substituted for it. Each sheet of paper is divided longitudinally into hours, and, if necessary, into parts of hours, and crosswise into as many divisions as there are places to be visited by the watchman. Each cross division has a corresponding marker, which indicates, by the impression it makes upon the paper, the time the watchman visits the place connected with that marker. The markers are actuated by electromagnetic apparatus, and in each room to be visited is an actuating knob. One objection to all such apparatus is, that the watchman of premises has his attention perpetually distracted by being made watchman of the tell-tale clock; and while listening to some suspicious sound, or watching some suspected spot, is liable to come under suspicion himself by forgetting all about the time and the tell-tale just when he is attending most diligently of all to his duties, unless, indeed, he be more concerned about watching the clock than the premises.

The Railway Interest.—It has lately been shown that 14,247 miles of railway are now being worked in the United Kingdom, on which have been expended a sum than 500,000,0001., which is five times the amount of the annual value of all the real property of Great Britain, and two-thirds of the national debt. The gross net annual revenue of the railways in this country, after deducting all working expenses, exceeds 22,000,0001. sterling, more than the total revenue, from all sources of Belgium, Holland, Portugal, Denmark, Sweden, and Norway. The companies have in their direct employment more than 100,000 officers and servants. The value of the rolling stock exceeds 30,000,0001. The consumption of coal and coke by railway-engines amounts to between 2,000,000 and 3,000,000 tons a year; so that in every minute of time throughout the year above 4 tons of coal are consumed, and 20 tons of water are flashed into steam. The consumption of fuel is about equal to the amount of coal exported from Great Britain to foreign countries. There are more than 3,000,000 tons of iron laid down in rails alone, and the chairs would weigh nearly 1,000,000 tons; so that there are not far short of 4,000,000 tons of iron on the permanent ways of the United Kingdom, and of these about 30,000 tons of rails have to be every year replaced. No one will deny that our railways make a figure in the world.

Book Publishers.—In the last issue of "Fors Clavigera," Mr. Ruskin says, "I find, in the present state of trade, that when the retail price is printed on books, all sorts of commissions and abatements take place, to the discredit of the author; and, I am convinced, in the end, to every one else's disadvantage. I mean, therefore, to sell my own books, at a price from which there shall be no abatement—namely, 9s. 6d. the plain volumes, and 19s. the illustrated ones. My publishers, Messrs. Smith, Elder, & Co., will sell all my books at that price over their counter; and my general agent, Mr. G. Allen, Heathfield Cottage, Keston, will supply them at the same price, without abatement, carriage paid, to any person in town or country, on remittance of the price of the number of volumes required. This absolute refusal of credit or abatement is only the carrying out of a part of my general method of political economy; and I adopt this system of sale, because I think authors ought not to be too proud to sell their own books, any more than painters to sell their own pictures."

The Institution of Civil Engineers.—At the meeting of the members of this Society, on Tuesday, the 20th instant, Mr. T. Hawksley, the president, being in the chair, it was moved, seconded, and resolved unanimously, "That in consequence of Tuesday, the 27th of February, having been appointed by Her Majesty to proceed to St. Paul's Cathedral to offer Thanksgiving for the recovery of his royal highness the Prince of Wales; the meeting be adjourned until Tuesday, the 5th of March.

Silicate Paint.—A curious deposit of almost pure silica was recently discovered in one of the hills in North Wales. The deposit lies in a basin of volcanic origin, at a considerable level above the sea, and forms the bed of a small lake about two miles in length and one mile in width. Amongst its uses, it is stated that it would be especially suited for producing crystal glass, and in the manufacture of porcelain, especially if the small percentage of oxide of iron were removed from it. At present the only use made of this silica is in the production of paint. For this purpose it is especially suitable, as it mixes freely with the pigments and oils, and is worked with ease. Moreover, it entirely resists the action of any acid, and withstands the action of heat. Added to these advantages, are those no less important, that the paint has no metallic base in its composition, and when laid on it becomes extremely hard, and polished on the surface. The proprietors of this deposit have for some little time past been producing this paint at the works of the Silicate Paint Company, Fenwick-street, Liverpool, and extended trials have been obtained with it. Time is necessary to establish the correctness of what is stated about this paint, but it seems deserving of trial.

The Antiquities of Surrey.—At a committee meeting of the Guildford Institute a printed circular from the secretary to the Surrey Archaeological Society was read, containing a resolution adopted by the Council, affirming the desirability of obtaining a museum in the county in which to place the antiquities of Surrey belonging to the Society. The circular alluded to the various places in which a museum might be established, as Guildford, Reigate, Kingston, Croydon, and Southwark; and in reference to the first, remarked that it had been observed in favour of Guildford that it was the county town. Alluding to Croydon, the circular mentioned that the town had a fine literary institution, which had offered to place a room at the disposal of the Council, and take charge of the collection entirely free. The committee considered it very desirable to take steps towards securing the collection at Guildford, and appointed a sub-committee, with power to add to their number, to communicate with the Archaeological Society on the subject. Acting on the part of this committee, Mr. Capron, on the 6th inst., asked for information as to the probable space which would be required for the collection, both at the present time and for some future period. The correspondence was to be laid before the Council on the 21st.

Stained Glass for Christ Church, Oxford. A correspondent of the *Times*, describing the work recently done in the Cathedral of Christ Church, Oxford, says,—“The whole of the choir has been relaid with a beautiful design of costly marbles, with inlaid emblematical figures of Maltese workmanship, which struck me as being of extreme beauty; and I am informed that new stalls and woodwork are being prepared for the whole building. The cathedral never had any ancient glass except a few fragments of great richness. But a lady connected with the cathedral has offered to defray the cost of the rose-window and the four Roman lights below. A window has already been filled in memory of the late lamented Mr. E. Denison, M.P., and others are in progress in memory of Mr. John Walter, jun., and Mr. F. Vyner; and the friends of the late Marquis of Lothian will be glad to hear that the present Marquis proposes to give a large window in memory of his distinguished brother.”

Destruction of Brambridge House.—A fire has taken place in the extensive mansion of Mr. Thomas Fairbairn, situated at Brambridge, on the Itchen. Since it has been purchased by its present occupier a new drawing-room and conservatory, with other expensive alterations, have been carried out at a cost of 25,000*l.* The fire originated in the flue of the nursery in the top story, and gained such a mastery that it was not got under until the entire front of the building down to the ground-floor ceilings was gutted, and a large portion of the back part also destroyed. The sewers had been employed in the room adjoining the nursery on the previous day. All the valuable pictures are saved, but scarcely any portion of the mansion but the walls is left. The damage done cannot be less than between 50,000*l.* and 60,000*l.* Near the house was a small Roman Catholic chapel, where Mrs. Fitzherbert is said to have been secretly married to George IV.

Brickdust Mortar.—According to the *Journal of the Franklin Institute*, in the Spanish dominions ordinary brick-dust, made from hard-burned, finely-pulverised bricks, and mixed with common lime and sand, is universally and successfully employed as a substitute for hydraulic cement. The writer, during an engineering experience of six years in Cuba, had ample opportunity for testing its merits, and found it in all respects superior to the best Rosendale hydraulic cement for culverts, drains, tanks or cisterns, and even for roofs, whether for setting flat tiles, or for making the usual tropical concrete flat roof. It is regularly known there as an article of commerce, sold in barrels by all dealers in such articles at the same price as cement. The proportions used in general practice are one of brick-dust and one of lime to two of sand, mixed together dry, and tempered with water in the usual way. The Romans, our readers will remember, used pounded bricks in their mortar. Its presence serves to distinguish Roman work in England.

Water Supply of the Metropolis.—In the House of Commons Mr. Stapleton asked the President of the Board of Trade whether it was intended to take any steps under the Metropolis Water Acts, 1852-72, in consequence of the polluted state of the water recently supplied by some of the water companies. Mr. Forster in reply said a water commissioner has been appointed to examine, at least once a month, whether the water of the various companies is fit for use, and to make a report respecting it both before it undergoes the process of filtration and before it passes into distribution. He is also instructed to make a special report when there is any necessity for such a step. In the case to which the question refers he was asked to make a special report, which I have just received. After the consideration of that report I shall be able to decide whether there should be any further inquiry into the water supply of the particular companies referred to.

Sewer Gases and External House-Protecting Drain Traps.—The passages by which sewer-gas usually enters houses are soil-pipes from water-closets, and waste and overflow pipes from cisterns, baths, lavatories, bath and lavatory safes, and sinks. Water-closets may be ventilated by extending the soil-pipe through the roof, or by means of two small pipes tapped into the D trap and carried through an external wall. There is a new trap (Mansergh's), manufactured by Donlon & Co., of Lambeth, which is intended to prevent the ingress of sewer-gas by the second set of passages, and is always to be placed outside the house. When waste-pipes are connected to house-drains by such means, the hell-traps, now commonly attached to sinks, and the syphon-traps on cisterns and other overflows may be dispensed with, as this arrangement cuts off the communication between the house and the sewer.

Northwich Workhouse.—At the last meeting of the Northwich Board of Guardians, the clerk said that tenders for the erection of infectious wards at the Workhouse had been sent in and examined by the committee, who submitted the following for the consideration of the Board:—Mr. Peter Hodgkinson, Booth Lane Head, Sandbach, 745*l.* 10*s.* 6*d.*; Mr. W. Leicester, Northwich, 750*l.*; Mr. James Bostock, Northwich, 750*l.*; Mr. Joseph Molyneux, Winton, 769*l.* 15*s.*; Mr. W. Joynton, Northwich, 755*l.* 12*s.*; Messrs. Vernon & Done, Tarporley, 878*l.* 10*s.*; Mr. J. P. Cardwell, Altrincham, 739*l.* (accepted); Mr. Tomlinson, Manchester, 890*l.*; Mr. H. J. Bennett, Northwich, 900*l.*; Mr. J. Owen, Bowdon, 769*l.* The architects are Mr. Redford, of Manchester, in conjunction with Mr. Davenport, of Over, near Winsford, Cheshire.

Preservation of Paste, &c.—A scientific contemporary states that the decomposition of paste may be prevented by adding to it a small quantity of carbolic acid. It will not then become offensive, as it often does when kept for several days, or when successive layers of paper are put on with paste. In the same way, the disagreeable smell which glue often has may be prevented. If a few drops of the solution be added to ink or mucilage, they will not mould. For whitewash, especially when used in cellars and dairies, the addition of one ounce of carbolic acid to each gallon will prevent mould and the disagreeable odour which sometimes taints milk and meat kept in such places. We have found clove-oil, mixed with water, and a few drops of dextrose, mixed with water, and a few drops of olive-oil, keep for months, while used as paste.

From Jerusalem.—Some time ago a rock-hewn passage, leading southward towards the Temple area from the subway at the Convent of the Sisters of Zion, was opened. Mr. Schick has found a continuation of this passage, or rather aqueduct, as it is now proved to be, towards the north, and has traced it from the Convent to the north wall of the city, a little east of the Damascus gate. At this point the aqueduct has been partially destroyed by the formation of the ditch, cut in solid rock, which lies in front of and communicates with the well-known caverns; it is therefore older than these, and can hardly be assigned a later date than that of the kings of Judah. It may also be the “conduit of the Upper Pool,” mentioned in Isaiah and the Second Book of Kings.

Railroad Enterprise in Peru.—The *New York Evening Express* says:—“The Peruvian Government proposes a railroad 14,000 ft. above the level of the sea. It will connect different parts of the country (by railway and steamboats), the former going over the main ridge and valleys of the Andes, at an elevation of 14,000 ft. above the level of the sea, or 7,000 ft. higher than the highest point of the Sierra Nevada, crossed by the Central Pacific Railroad, the elevation being within 1,000 ft. of perpetual snow. The combined railway and steamboat communication will cross the continent at its widest point, and M. Meigs, the contractor, has had contracts in this country amounting to over one hundred million dollars.”

Sales at the International Exhibitions.—The Royal Commissioners for the Exhibition of 1851, although they do not agree with those who believe that the interests of art, or those of the public, would have been injured by the proposed sales of manufactured objects, not in the Exhibition itself, but in the annexes, in accordance with conventions entered into with the French and Belgian commissions, have resolved that, as the French and Belgian commissions have liberally relinquished the rights accorded to them, her Majesty's Commissioners, with the view to reconcile conflicting interests as far as possible, will adopt the rules, as respects sales, laid down for the Exhibitions of 1851 and 1862.

The Preservation of Victoria Park.—At a meeting of the Board of Works, Mr. Runtz said it was necessary that the Board should come to a decision at once with regard to the Victoria Park land question. He therefore moved that the Board purchase certain portions of the land about to be sold by the Government at a cost of 20,450*l.* Mr. Newton seconded the motion. Mr. Dresser Rogers, Mr. Alderman Stone, Mr. Lawrence, and Mr. Saunders addressed the Board, and after considerable discussion a resolution was moved that the Government undertake the care of the land so purchased, and include it in Victoria Park. The resolution was carried by a large majority.

New Goods Warehouses on the Metropolitan Railway.—In conjunction with the Great Northern and Midland Companies, the Metropolitan are about to erect new goods warehouses between Farringdon-street and Redcross-street in the City, and they are also negotiating with the South Eastern Company for the erection of similar warehouses near West-street, Smithfield. The chairman of the Metropolitan states that in a very short time the sales of surplus lands will enable the company to reduce the capital invested in them by 100,000*l.* He also further states that their rentals from land and other property which they have to let is being considerably increased, and that it was being considered that such surplus property would shortly realise about 50,000*l.* year.

Sewers in London.—The St. George's Hanover-square, surveyor, reporting on the state of the sewers in the parish, says, “I regret to find that in so large a portion of this parish (the drainage is in many cases highly unsatisfactory.) In the in-wards, sewers flat-bottomed and unsound, ill-shaped, and unnecessarily large, with the advantage of a good fall, are little, if at all, better than those in the out-wards, which, though sound and of better form, yet having a very little fall, are liable to accumulate deposit, which cannot be removed without flushing.” The estimate for flushing is 423*l.* 15*s.* The report was understood to be adopted.

Paternoster-buildings, St. Paul's.—Mr. Alfred M. Ridge writes to say that these buildings were erected from his designs, not from designs by the City architect, as stated in our last.

The Restoration of Warwick Castle.—A proposal has been made in New York for the nation of an American committee to co-operate with the English committee in the undertaking to find funds for the rebuilding of Warwick Castle. The *New York Tribune*, in an editorial notice of the project, says,—"The formation of a fund to restore the burned portions seems to have originated in a general feeling among Englishmen that the castle was a possession in which the whole nation had an interest; but we just as well say that it was the inheritance of the whole Anglo-Saxon race; and we, too, claim our share in the honour of contributing to the costly work of repairing it."

The Metropolitan Board of Works and the Southern Embankment.—The Metropolitan Board of Works having declined to include the southern embankment in the Bill which they are about to present to Parliament, having reference to the cost of lighting and maintaining the northern embankment, the Vestry of Lambeth have decided to present a petition to the House of Commons, praying that both embankments may be placed upon the same footing, and that the cost of lighting and maintaining the embankments be equally borne by the whole of the metropolis.

Fresco-Painting.—A return to an Order of the House of Commons contains a copy of Reports to the First Commissioner of Works and Public Buildings on the frescoes in the Houses of Parliament. This Report emanates from a committee of artists employed in the decoration of the Westminster Palace, and is signed by Messrs. Cope, Watts, Ward, Armitage, Herbert, S. Barff, and E. J. Poynter. These gentlemen see that, notwithstanding the ill-success which it attended it of late years, the use of fresco-painting ought not to be abandoned. The failure it is said, probably due to the want of experience in the method among English artists.

Improvements at Morecambe.—The Morecambe Pier is to be greatly lengthened, the works having been let to Mr. Horne for 4,550*l.* The work is to be commenced immediately, and to be completed by the middle of June. The pier will extend the pier-head 60 yards, making it 100 yards in length. The contractors for the new station at Morecambe have commenced work, and excavations for foundations are now being made. The contractors for the new sea-wall and promenade on the road to Eysham are making satisfactory progress.

London Association of Foremen Engineers and Draughtsmen.—The nineteenth anniversary festival of this institution took place on a Saturday evening last, at the City Terminus Hotel, under the presidency of Mr. James Howard, M.P., who was supported by Admiral Sir Spencer Robinson, Lord Elcho, Mr. B. Amelsson, M.P., Dr. Tyndall, Mr. J. R. Ravenhill, C.E., Mr. C. B. Vignoles, and several other gentlemen, some of them connected with leading engineering firms. The company numbered nearly 300.

A Foot Bridge at Cannon-street.—A few days ago, a footway for passengers by the side of the South-Eastern Railway, crossing the river at Cannon-street, was opened for pedestrians, which provides a new means of communication between the north and the south sides of the Thames. The entrances are from Dowgate-street, on the Middlesex side, and from Clink-street (leading to the Borough Market), on the Surrey side, and the toll charged being one halfpenny, as at Hingerford and Charing-cross. The footway is open from five in the morning till nine in the evening.

Land Register and Transfer Book.—A new register-book is proposed by Mr. W. Streeter, barrister-at-law, to include all lands, whether rehold, copyhold, gavel-kind tenure, borough English, and all other land whatsoever in England, "for making land available as a mercantile security, and also for simplifying the registration of the title to real estates; and to serve the purposes of sale and transfer of land, as well by way of absolute ownership as upon trust, or by way of mortgage."

South Kensington Museum.—The arrangements for the special loan exhibition of ancient musical instruments at the South Kensington Museum, which will be opened in June next, are now in active progress. The exhibition will include instruments noted for their decorative, archaeological, ethnological, or intrinsic technical merits.

Lost Land.—The *Stamford Mercury* states that a survey has recently been made at Cleethorpes of land which has "gone to Humber," or been devoured by tidal action upon the Cleethorpes. It is computed that upon the Humber stone foreshore alone, by throwing up a substantial sea-bank, 500 to 700 acres may be reclaimed at an expense of 10*l.* per acre. Lord Carington is the owner of the frontage. When Domesday Book was compiled, this land extended to a point near to the present mid-channel of the Humber.

Proposed New City Market.—A special meeting of the Court of Common Council was held at Guildhall last week, to consider whether it was advisable to erect a new market adjacent to that in Smithfield for the sale of meat and poultry. The scheme was recommended by the Markets Improvement Committee, at a total cost of 167,500*l.*, of which 50,000*l.* was for the land. Four petitions were, however, presented against it, and the debate arising upon the subject was adjourned.

The African Diamond and Gold Fields.—A shilling "map of the South African republic or Transvaal; showing the newly-discovered gold diggings in the diamond-fields in the Orange River state, adjoining," has been "published by authority, and mapped by Matthew A. Purcell, C.E., 18, Buckingham-street, Strand, London." A detailed map of this new district of country has been much wanted, it seems, and has now been supplied, at great cost and trouble.

Mining Property in Chili.—Some of the most renowned copper and silver mines in Chili, the property of the late Mr. Sampson Waters, who realised a large fortune, have lately changed hands through the agency of Messrs. Driver, the auctioneers. They were the whole of the San Pedro, and parts of the Desembriador copper mines, and shares of the Juana and Colorado silver mines, with valuable plant, and realised upwards of 106,000*l.*

New Works on the Lancashire and Yorkshire Railway.—The total amount of share capital to be raised for the new works for which the company are going to Parliament amounts to 1,300,000*l.*, and amongst other new stations, and other works proposed to be erected out of this sum are two large new stations, one at Bradford, and the other at Blackburn, in addition to the widening of a long viaduct on the company's line to Liverpool, near Wigan.

The Railway Bridge in Southwark Street.—At their meeting last week the St. Saviour's Board of Works authorised the clerk to give notice to the London, Chatham, and Dover Company that if their railway bridge in Southwark-street were not made water-tight within fourteen days, so as to prevent the water from percolating through it as at present, proceedings would immediately be taken against the company by indictment.

Oxford Architectural and Historical Society.—The First Evening Meeting will be held on Tuesday, February 27, when papers will be read "On the most important Archaeological Discoveries during the past Year, in the Neighbourhood of Oxford," by Mr. J. P. Earwaker, Merton College; and "On the Garford Barrow, near Abingdon, lately opened," by Mr. James Parker.

Institution of Surveyors.—By permission of the Council of the Institution of Civil Engineers the Ordinary General Meeting, of Monday, February 12th, was held in the Lecture Theatre of that institution, when the discussion on the Paper, by Mr. E. J. Smith, entitled "Land," was resumed, and, after a lengthy debate, was adjourned to the next meeting, to be held on Monday evening, February 26th.

Copper Gas-Pipes.—The *Journal de l'Eclairage* states that on the occasion of a workman cutting through such a pipe with a file, an explosion occurred, by which he was much burnt. It appeared, upon examination, that the pipe was coated with a black matter, which was found upon analysis to be an acetate of copper, liable to explosion between 203 and 245 degrees. The circumstance is not unprecedented.

Leek.—To the Congregational church and schools, a new lecture-hall, &c., is about to be added. All the buildings arc of stone, in the Early Decorated Gothic style. Mr. Sugden, of Leek, is the architect.

Asphalte Roadways.—The Corporation of London have given instructions for Princes-street, Mansion House, to be laid with asphalte, by the Montrotier Asphalte Company, on a substratum of concrete, made with the natural hydraulic cement from Lyme Regis. The enormous traffic in this part of London will prove a crucial test for roadways executed in the manner proposed.

Winchester Assize Courts.—The designs for new Assize Courts, Winchester, by Mr. H. T. Wyatt, obtained in a limited competition, are, we believe, to be carried out by Messrs. Hill & Sons. The buildings are Gothic in style, and the cost will be something like 30,000*l.* The old courts will be retained for witnesses, and form part of the general design.

St. Andrew's Church, Holborn.—The Church of St. Andrew's, Holborn, is to be decorated under the superintendence of Mr. S. S. Teulon, architect, a sum of 750*l.* having been decided upon by the trustees to be expended. The specified suggestions of Messrs. W. Phillips & Son, of Baker-street, Portman-square, have been accepted for the execution of the work.

The Liverpool Tramways.—The corporation have resolved to purchase the tramways within the borough, and to keep the tramway system in their own hands. They are supporting a Tramway Bill to these ends in Parliament, with power to borrow 250,000*l.*

Sunderland Workmen's Dwellings Competition.—The second premium was awarded to Mr. Thomas Tillman, of Sunderland.

TENDERS

For sewer and boundary-wall and gates to land at West Brompton, for the managers of the Metropolitan Asylum District. Mr. John Giles, architect:—

	Sewer.	Boundary-wall and Gates.
Avis & Co.	£2,815 0 0	... 2,535 0 0
Clarke	2,658 0 0	... 518 0 0
Wignacre	2,425 0 0	... 450 0 0
Crockett	2,370 0 0	... 610 0 0
Marshall	2,344 0 0	... 529 0 0
Thirst & Co.	2,321 0 0	... 618 0 0
Killingback	2,250 0 0	—
Nowell & Robson ..	2,165 0 0	... 656 0 0
Keable	2,127 0 0	... 695 0 0
Cole	2,069 3 0	... 707 10 0
Morris	1,998 0 0	... 715 0 0
Henshaw & Co. (accepted)	1,993 0 0	... 527 0 0
Potter	1,993 10 0	... 549 0 0

For rebuilding All Saints' Schools, Wandsworth. Mr. John M. K. Hahn, architect. Quantities supplied by Mr. Morris Evans:—

	Extra on Internal Brick Facing.
Dove, Brothers	£2,475 0 0
Easton, Brothers	2,195 0 0
Atkinson	2,185 0 0
Parsons	1,977 15 0

For the erection of villa residence, stables, and gate-lodge, at Biggleswade, Bedfordshire, for Mr. E. H. Adeock, Mr. F. N. Kemp, architect:—

Residence.	
Smith	£1,950 0 0
Twelvetrees	1,825 0 0
Kidd (accepted) ..	1,793 0 0
Crapper (for plumber's work) ..	200 0 0
Stables.	
Smith	£1,025 0 0
Foster	1,000 0 0
Daily	850 0 0
Twelvetrees	880 0 0
Kidd (accepted) ..	870 0 0
Lodge.	
Kidd	£340 0 0
Smith	339 0 0
Twelvetrees (accepted) ..	322 0 0

For alterations and additions to Meverton House, Hallsham, for Mr. M. Meyer. Mr. R. K. Blessey, architect:—

Peerless	£340 0 0
Skinner	584 0 0
Stonestreet	565 0 0

For alterations and additions to No. 3, Samuel-street, Woolwich, for Mr. Henry Shersby. Messrs. William Gosling & Son, architects:—

Hiscock	£311 0 0
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For alterations and additions to stables, coach-houses, &c., Shooter's-hill, Kent, for Mr. William Barrington Brown:—

Hiscock	£306 0 0
Williams	385 8 10
Fearn & Harwood ..	375 0 0
Daniels	369 13 0
Blackmore & Morley ..	308 0 0
Loneragan	250 0 0

For baker's house and three shops, at Dover. Mr. J. Edwin Bolton, architect:—

Bourne	£1,170 0 0
Adcock & Rees	1,097 0 0
Tucker	1,050 0 0
Richardson	1,053 0 0
Humphrey	1,040 0 0
Bushell	875 0 0

For cottage and greenhouses, at Dover. Exclusive of hot-water apparatus. Mr. J. Edwin Bolton, architect:—

Cottage. Greenhouses.	
Parks	£390
Adcock & Rees	385
Richardson	319
Humphrey	277
Bourne	276

For the erection of a villa residence, at Folkestone. Mr. S. Singsby Stallwood, architect:—

Bowley	£1,120 0 0
Uwins	986 0 0
Holdam	960 0 0
Brooks & Co.	830 0 0
Webster	875 0 0
Trebble	855 0 0
Newman (accepted)	820 0 0

For house at Wantage, Berks, for Mr. H. P. Gibbons, Mr. E. Dully, architect:—

E. & E. Johnson	£2,599 0 0
Gibson Brothers	2,538 0 0
Castle & Co.	2,400 0 0
Selby	2,250 0 0
Wheeler & Gregory	2,214 0 0
G. Jones	2,154 0 0
Honour & Castle	2,194 0 0
T. Jones	2,140 0 0

For laundry, kitchen, and bakehouse machinery and fittings, to the new Louth Workhouse, Kingtoningham lane, including all incidental builder's work. Messrs. R. Parris & T. W. Aldwinckle, architects:—

Jakes	£3,757 0 0
Smith	3,391 0 0
Benham (accepted)	3,217 0 0

For restoration and additions to Jevington Rectory, Sussex. Mr. H. Evesau Rumble, architect:—

Avis	£2,493 0 0
Peelers (accepted)	2,435 10 0

For finishing eight houses (now in carens), at Charlton, Kent, for Capt. Davis. Messrs. Dean, Son, & Matthews, architects:—

Gough	£2,405 0 0
Welch	2,294 0 0
Roddam	2,165 0 0
Wood	2,050 0 0
Phillips	1,945 0 0
Dover & Co.	1,896 0 0
Blackmore & Morley	1,880 0 0
Stentford	1,680 0 0
Waterson & Co.	1,600 0 0
Button	1,690 0 0
Day	1,385 0 0
Stovell	1,487 0 0
Hull (accepted)	1,475 0 0
Pigg	1,395 0 0
Tripp	1,390 0 0
Tier	1,340 0 0
Dennis	1,337 0 0
Meadows	980 0 0

For restoring Saxmundham Church, Suffolk. Mr. R. M. Phipson, architect:—

Cornish	Nate, & Co. Chancel. Porch.		
£1,887	£339	£183	
Smeth & Son	1,369	269	181
Luff	1,359	212	167
Carier	1,339	209	125
Tooley	1,275	290	120
Grimwood (accepted)	1,175	300	108

For relief office and dispensary at East-street, Marylebone, for the parish of Marylebone. Mr. H. Saxon Snell, architect:—

	Buildings in York-court.	Houses in East-street.	If both erected under one contract.
Lathey Brothers	£2,868	£1,823	4,691
Chappell	2,984	1,610	4,594
Carier & Son	2,763	1,432	4,195
Howard	2,793	1,367	4,160
Crockett	2,850	1,284	4,134
Staines & Son	2,736	1,296	4,032
Gibson Brothers	2,587	1,547	4,134
Manley & Rogers	2,627	1,249	3,876
Hearle	2,565	1,197	3,762
Largan	2,399	1,061	3,460
Saul	2,318	1,188	3,507

For alterations at the "Anchor and Hope" Public-house, Chelsea.—The lowest tender states that in last week's list one tender was omitted, namely, that of Mr. Simpson (418.), who prepared the plans and specifications.

TO CORRESPONDENTS.

J. D.—J. T.—M. C.—R. P.—T. W.—A.—T. C.—H. S.—W. R.—M. M.—R. W.—T. W. S.—Messrs. D.—M.—J. L.—J. G.—W. H.—E. J.—C. C.—H.—R.—S.—W.—J. E.—B.—G. L.—B.—T.—H.—G.—B. E.—W. T.—Inquirer.—J. E.—Admin. O.

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

Not.—The responsibility of signed articles, and papers read at public meetings, rests of course with the authors.

Bath and other Building Stones of Best Quality.—RANDELL, SAUNDERS, & CO. Limited, Quarrymen and Stone Merchants. List of Prices at the Quarries and Depots, also Cost of Transit to any part of the United Kingdom furnished on application to Bath Stone Office, Corsham, Wilts.—[ADVT.]

Ashton & Green, Slate and Slab Merchants and Quarry Agents.—Shippers, Merchants, and Contractors furnished with Prices lists of every description of ROOFING and MANUFACTURED SLATE, Railway-rates, &c. Agents for London and Country for the Sale of the celebrated WHITLAND ABBEY GREEN SLATES. Drawings and Prices of A & G's RED RIDGE TILES, specially prepared for use with these Slates, on application.—Offices and Show-rooms, 14 and 15, Barry-street, St. Mary Axe, London, E.C.—[ADVT.]

Turret Clocks.—Mr. Streeter, 37, Conduit-street, London, W., Manufacturer of Turret Clocks (with gravity or dead-beat escapement) for Churches and Public Buildings. Estimates and plans on application. Price:—Village clocks, from 15*l.*; church clocks, from 40*l.* The wheel-work throughout these clocks is of best hard brass or gun-metal. No iron wheels used. Timekeeping and durability guaranteed. Wholesale Entrance—Burlington Steam Works.[ADVT.]

Architects, before committing themselves to any system of Warming, should send to TRUSWELL, BROTHERS, & HOLDEN, 100, Nottingham-street, Sheffield, for a prospectus of their Improved Patent Hot-Air Apparatus.[ADVT.]

NO PAINT—NO RUST. GREAT DISCOVERY. BRONZED IRON.

BY ROYAL LETTERS PATENT. TURNER & ALLEN (Sole Patentees), ART-FOUNDERS, ENGINEERS, MERCHANTS, AND CONTRACTORS, 201, UPPER THAMES STREET, LONDON, E.C.

Extract from Paper read at the Royal Institute of British Architects, December 4, 1871, by Henry Carr, esq., C.E.:

"The great desideratum of the day, no doubt, is some means of permanently protecting iron from rust: this is now said to be done by Messrs. Turner & Allen, of 201, Upper Thames-street. If the process of coating iron with copper can be successfully carried out on a large scale, it will be one of the greatest boons of our time."

J. L. BACON & CO. MANUFACTURERS OF IMPROVED HOT-WATER APPARATUS,

FOR WARMING AND VENTILATING Private Houses, Churches, Schools, Hospitals, Manufactories, Greenhouses, &c.

OFFICES AND SHOW-ROOMS:—476, NEW OXFORD STREET, LONDON, W.C. WORKS:—FARRINGTON ROAD. Publishers of a Pamphlet on "Hot-Water Heating."

TO BUILDERS.—TENDERS are invited for a new HOTEL to be built at Kerkley-nax Lowestoft, containing about thirty rooms, Plans and specifications may be seen on or after FEBRUARY 26th; and Tenders are to be sent in by TWELVE o'clock on FRIDAY, the 5th day of MARCH. The lowest or any Tender not necessarily accepted. GEO. GLOVER, Architect. Lowestoft, February 20, 1872.

TO BUILDERS.—TENDERS are REQUIRED for the ERECTION of TWELVE HOUSES. Plans and specifications may be seen at the Office of Auctioneers, on the 26th and 29th FEBRUARY, and the 1st MARCH, at 10 o'clock, and to be returned when Tenders are delivered. The lowest or any Tender not necessarily accepted.

TO BUILDERS.—The Directors of the Lichfield Brewery Company desire to receive TENDERS for the ERECTION of a NEW BREWERY at Lichfield. The drawings and specifications can be seen at the Office of the Company, or at the Architects, Mr. GEORGE SCAMMELL, 18, Great George-street, Westminster, on and after MONDAY, the 26th inst. Quantities will be supplied free two guineas (which will be returned) to the bank in Tenders, and copies may be obtained from the Surveyors, Messrs. CURTIS, 1, Chancery-lane, Old-barrack-street, London, E.C., on and after THURSDAY, the 1st MARCH, at 10 o'clock. Tenders are to be sent in, addressed to the Secretary, on or before THURSDAY, the 7th day of MARCH, 1872. The Directors do not bind themselves to accept the lowest or any Tender. Lichfield, 20th February, 1872. JOHN GILBERT, Secretary.

TO BUILDERS.—MOSS HALL ESTATE. The ARCHITECT—TENDERS will be received on and after MONDAY, the 26th inst. Full particulars, specifications, &c. may be seen at the Estate Office, 7, Alexandra-grove, on and after MONDAY, the 26th inst. Security for the execution of the contract. Tenders to be addressed to S. G. Carr of Messrs. Hest & Carter, 11, St. Helen's-place, E.C., up to the 1st of MARCH.

TO BUILDERS.—The Corporation of Carmarvon are prepared to receive TENDERS for the RESTORATION of the Guildhall.

Drawings and specifications may be examined at the Office of Mr. J. THOMAS, Architect, Castle-square, Carmarvon. Tenders to be delivered at the Borough Surveyors Office, sealed and addressed "Tenders for Guildhall Restoration," on or before SATURDAY, the 2nd day of MARCH. The Corporation do not bind themselves to accept the lowest or any Tender.

TO BUILDERS and CONTRACTORS.—Persons desiring to TENDERS for the ERECTION of the BRISTOL and WESTERN COUNTIES RACE-COURSE and OFFICES at Upper Knowle, Edinminster, near Bristol, may see the Plans and Specifications of the Work at the Office of Mr. S. H. HYDE, 59, Queen's-square, Bristol. Tenders to be sent in addressed to "The Bristol and Western Counties Race-course Company (Limited)," on or before MONDAY, the 4th of MARCH next. The lowest or any Tender not necessarily be accepted, and no payment will be made for any Tender sent in. GEORGE B. HOLLAND, Architect, New-ascot, Feb. 19th, 1872.

TO BUILDERS and OTHERS.—TENDERS are required for the ERECTION of a YEOVMANRY DRILL HALL, with corrugated iron roof, at the Star Tavern, No. 45, Pease-pool, Aylesbury. Apply to Mr. J. W. GIBBS, Architect and Surveyor, 4, Franco-road, Windsor, where the plans may be seen on or before the 5th day of MARCH, at 10 o'clock. Tenders to be returned on receipt of a blank Bill Tender—Tenders addressed to Mr. A. WILSON, 10, St. Andrew-street, London, E.C., up to the 4th day of MARCH, 1872, endorsed "Tender for Drill Hall."

TO BUILDERS.—Builders desirous of TENDING for the REBUILDING of the certain ALTERATIONS at the Viarage House, Canewdon, near Rochester, may see the Plans, specifications, and conditions at the Viarage House on or before the 5th day of MARCH. Tenders for the work are to be forwarded to the Viarage, addressed to Mr. Rev. T. A. WILSON, 10, St. Andrew-street, London, E.C., up to the 31st of MARCH next. The lowest or any Tender will not necessarily be accepted. GEORGE WOOD & SON, Solicitors, Bechford, Essex.

February 18th, 1872.

TO CONTRACTORS.—BUILDERS wishing to TENDERS for the ERECTION of a MANSON at Teborch, near Baywin, in the County of Carmarvon, for Mr. HIGGINS & CO'S use, may see the plans and specifications of Messrs. HIGGINS & CO'S Office, 10, St. Andrew-street, London, E.C., on or before the 5th day of MARCH, between the hours of NINE a.m. and SIX p.m. Tenders to be sent in on or before the 5th day of MARCH, at 10 o'clock. The lowest or any other Tender will not necessarily be accepted. Any further particulars may be obtained from Mr. R. G. THOMAS, Architect, Mansel Bridge. February 12th, 1872.

TO CONTRACTORS.—The Directors of the Louth Water Company are prepared to receive TENDERS for the CONSTRUCTION of a SEWER, ENGINE and PUMPER HOUSE, and other works; also for the Supply and Laying of Water Mains, Distribution Pipes, Valves, &c. for the Supply of the Borough of Louth with Water.

A printed copy of the schedule of quantities and specification can be obtained from the Office of the Engineer, at the Works of Messrs. SHELDON & ROBINSON, 7, Westminster Chambers, S.W. Tenders to be addressed to the Secretary of the Company, WILLIAM WYTHE, Fox Box, Louth, Leicestershire, and specifications may be seen on or before MARCH 1st, 1872. The Directors do not bind themselves to accept the lowest or any Tender.

TO CONTRACTORS.—SCOTSWOOD, NEWBURN, and WYLLAM RAILWAY.—NOTICE is hereby given that the Directors are prepared to receive TENDERS for the CONSTRUCTION of the GREAT SECTION of the above RAILWAY from Scotswood to Newburn, consisting of a double line of Railway, 2 1/2 miles in length. Plans, sections, drawings, and specifications may be seen and schedules of quantities obtained on and after MONDAY, MARCH 19th, 1872, at the Office of the Engineer, Messrs G. A. HARRISON and W.M. GEO. & E. LAWS, Central-buildings, Grange-street, Newcastle-upon-Tyne. Sealed Tenders, addressed to the Directors, and to be sent in on or before THURSDAY, the 22nd day of MARCH, at 10 o'clock. The Directors do not bind themselves to accept the lowest or any Tender. Newcastle-upon-Tyne, February 16th, 1872. W.M. COCKBURN, Secretary.

N.B.—The Plans, &c. for the Second Section from Newburn to Wyllam, will be ready in a few days.

PARISH OF CHELSEA.—Notice is hereby

given that the Vestry of this Parish will meet at SIX o'clock in the evening, to receive TENDERS for the SUPPLY and ERECTION, from the 26th March, 1872, to the 25th March, 1873, both days inclusive, of the following ARTICLES and WORKS:—

- Sewerage's Brooms
- Sewerage and Watering
- Sewerage, Watering, and Removing Dust, &c. Kensal New Town.
- Carriage and Horse Hire
- Collection and Removal of the Dead, Ashes, &c.
- Street Lamp-post Fixing, and the Supply and Fixing of Lanterns, Fittings, &c.
- Coal and Coke
- Plinths
- Graffiti, of different kinds, broken.
- Do. do. do. for delivery at Kensal New Town.
- Mason's and Pavier's Work and Materials.
- Red Gravel Hoopings.
- Gravel, Shingles, and Gravel Hoopings.
- Bricklayers' Work, Sewers and Drains.
- Collection and Removal of the Dead, Ashes, &c. Kensal New Town.
- Watering the Roads.
- Supply of Fuel and do. do. Kensal New Town.

The Tenders (except those for the supply of water, &c. for watering the roads) are to be open printed forms, which, with further particulars, may be obtained at the Office and copies of the brooms, lamp-post lanterns, &c. required may be seen at the Surveyors Office, here daily, between the hours of TEN o'clock in the morning and FIVE o'clock in the evening, on and after MONDAY, the 26th day of MARCH, at 10 o'clock. Tenders are to be sent in, addressed to the Secretary, on or before THURSDAY, the 7th day of MARCH, 1872. The Directors do not bind themselves to accept the lowest or any Tender.

The Vestry reserve to themselves the right of making special contracts for any of the above trades and for any of the above articles and works, if they shall see fit, and do not bind themselves to accept the lowest or any Tender.

The Tenders are to be delivered sealed, addressed "To the Vestry of the Parish of Chelsea," and endorsed "Tender for—" by or before TWO o'clock on the said 4th MARCH proximo. Each Tender must be enclosed in a separate envelope.

All contract-bills will be presented to the Vestry. If any article or work be not supplied or executed to their satisfaction, the Vestry reserve to themselves the right of making special contracts for any of the above trades and for any of the above articles and works of other parties at the expense of the contractor. Parties Tending must appear personally at the time the Tenders are opened.

By order of the Vestry, CHARLES W. VESTRY, Clerk. Vestry-hall, King's-road, S.W. February 22nd, 1872. Each person tendering, as a guarantee for the execution of the works, is required to bring (but not to enclose) a bank note, value ten pounds (£10), which shall be retained until the work is completed. The note will be returned should the Tender not be accepted. The notes brought with Tenders subsequently accepted will be retained until the contract deeds are fully executed, or until the contracts are otherwise completed.

The Builder.

VOL. XXX.—No. 1517.

Contemplated Legislation as to Employers and Employed.

It is announced that the important question of the relations between master and workman will come to the fore in the course of the present session of Parliament. Even if no specific enactment had been contemplated on the subject, it must have cropped out in the course of the discussion of other matters,—such, for instance, as the Bill for the regulation of collieries. In all questions affecting workmen's clubs or benevolent institutions, strikes, conspiracies, payment of wages in cash or in kind, one general principle is involved. It becomes, therefore, extremely important that this true

principle, which underlies all the relations of our and capital, should be distinctly understood. It is very possible that exaggerated fears, or equally disproportionate fears, may be entertained as to the effect of legislative action on those relations. All the more is it expedient steadily to contemplate the question in the white light of truth, undisturbed by the taint of controversy.

It is unnecessary here to go far back into the history of the relations of employer and employed. The only reason for any reference to this part of the matter is to be found in a fact, that the condition of the agricultural labourer presents features from which the state the manufacturing operative or craftsman has come almost entirely dissociated. While the ancient laws as to villenage, ascription to the lord, or any of the successive steps from serfdom to freedom, are only to be studied in actual operation in Russia, or in non-European countries, they have yet left their mark on our institutions. The tie between a pauper and his parish is a relic of these laws. And in our remotest rural districts, the day labourer is, in point of fact, though not by the enactment of law, very much under the command of the resident farmers, who are the sole distributors of employment. So much is this the case that a certain amount of female and infant labour in harvest time is in some cases compelled, as a condition of agricultural employment for the man. No view of the case, therefore, can be adequate that fails to glance at those instances where the influence of the feudal system, and of a social state older and under an feudalism, has not yet become entirely operative.

Without touching upon the ethics of the case, may be stated as the preliminary condition of inquiry that the relations between the employer and the employed are regarded, according to the genius of the age, as simply matters of contract, the sanctity of contract is a subject especially congenial to the English character. There can be little doubt that the tendency of modern legislation, as well as of modern thought, is to trace all the relations of society more and more

upon the basis of contract, either actual or implied, and perhaps fictitious. Labour is theoretically regarded as a commodity. The labourer has something to sell;—the strength of his muscles, in the humblest cases,—the intelligence and skill of his eyes and fingers,—the experience and ability developed by the practice of his craft. The higher and rarer the power he brings to the service of his fellows, the higher his pay. One man can only guide a plough; another can move an army in the field. To each according to his ability should be his remuneration.

If contract, then, be the basis on which the employment of labour is to be regulated, the next point is that contract should be rendered at once free and binding. In its inception it should be perfectly free; as free, that is to say, as the condition of civilisation will admit. Its permanent and enforceable character is an element as necessary to its proper action as its freedom of origin. And enforcement involves penalty. For all parties to be free to contract, there must be a third party, that is to say, the law, to take care that a contract, freely and duly entered into, shall not be treated as a dead letter.

This, we hold, is the main principle to be borne in mind. Details may be numerous, and modifications may be necessary. But with one luminous principle kept distinctly in view, countless squabbles may be arrested. It is as when a sailor guides his course by the stars or by the compass. With every shift of the wind he may tack or veer; with the encounter of every wave, he may deflect to the right or to the left; but his object is fixed, and his course, infinitely variable in its momentary direction, is, in the main, straight.

Freedom of contract, however, implies one important preliminary. To be real and effective, there is requisite, not equal, but equivalent, knowledge and intelligence on the part of the contracting parties. Here, again, the principle is clear, although the application may become extremely complex. Legislation recognises this truth, by rendering contracts in certain cases invalid. Infants,—legal infants, be it understood,—are considered incapable to contract. So,—shall it be said to the honour of the civilisation of the day?—are married women. If a contract be shown to have been entered into in consequence of fraudulent representations,—that is to say, in consequence of one party receiving information superior to that of the other, and making an unscrupulous use of such information,—the contract may be void or voidable. The common sense of justice entertained by mankind confirms this rule. If the case of the soldier who has enlisted when he was drunk be cited as an exception, the answer is that drunkenness, itself a crime, cannot be pleaded as an excuse for any act committed during the temporary unintelligence of the actor. A man cannot be allowed to plead his own *fort*.

It is evident that so long as there exists a great disparity between the education and the means of information possessed by different classes of society, there will exist a cause of disturbance in the freedom of contract. But all that legislative action can contemplate, by way of interference in the matter, is, to give relief in case of actual fraud. Hardships there must and will be, and mistakes many; but under troubles of this kind the education of the whole people makes its way. The more widespread is education of all kinds, especially, in this case, knowledge of what is actually going on in the special occupation to which the contract refers, the more thoroughly free will be the inception of contracts.

Having regarded thus far the general state of the case, the next point to consider is the relative or counterbalancing advantage possessed by the employer and by the producer of labour. It is not equality, as we have hinted, that exists or should exist between the parties

but equivalence. All barter, all exchange, all contract, are based on one man having something with which he is willing to part, in exchange for something with which some other man is willing to part. An African savage, for whom bountiful nature supplies the fruit and the leaves which form his sole food, clothing, and furniture, is the best example of what we may call a self-contained man. What does he need to buy or to sell? First, indeed, he has to buy a wife; and here comes his initiation into commerce. Later, he has found out,—and so much the worse for him,—that by stealing and selling his brother he may acquire a certain quantity of ardent spirit, or of gunpowder; and so, little by little, he enters into the comity of civilised nations. With every increase in art and in industry, with every new division of labour, the difference between the producing value of man and man increases, while, on the other hand, the artificial bonds of mutual interdependence are in the same degree drawn more closely together.

The tendency of the present course of affairs, in almost every instance, is to throw the balance of advantage on the side of the owner or producer of labour, as compared with the employer. We do not say that this balance is, at this moment, on that side. The inquiry necessary to solve that question would be intolerably minute; and by the time that it was completed it would be necessary to re-commence it. But as to the direction of the change which is taking place, we think it can admit of no doubt. That all, or nearly all, the advantage was originally on the side of the master, cannot be denied. What, and where, will be the upshot, is not easy to foresee. But that, in contracting together for the execution of a common object, which neither party can at present separately attain, the actual workman is, more and more, becoming able to fix his own terms, is a fact that must be steadily borne in mind in any useful investigation of the subject.

In our large manufactures,—such, for example, as the iron trade,—this tendency of the scale to turn in favour of the labourer as against the capitalist may be most plainly pointed out; and so long as competition is the principle that regulates trade, this movement of the scale must go on; for it will be seen at once that the increased facility of obtaining information which modern science is daily yielding is, mainly, an advantage to the workman. It is to his interest to communicate knowledge to his fellows, while it is to the interest of the employer to keep it to himself. Let us take such an instance as the arrival of a large foreign order. Suppose that the Russian Government wishes to purchase 50,000 tons of rails. Every iron-master who catches scent of the commission will maintain the utmost possible silence. He will seek to make use of his knowledge in order to obtain the job. The fewer of his competitors who tender, and the less those who do tender know of the course of business adopted by the Russian Government, as to inspection, mode of delivery, mode of payment, and other details, the better will it be for his chances of securing the order. On the other hand, with the workmen the case is diametrically opposite. "Here is our master," they will say, "with a heavy contract round his neck. He is no doubt under penalties as to time. It is a good opportunity for obtaining an increase of wages." The more fully this knowledge is spread among the producers of labour, the more united and effective will be their action. And it is evident that, from year to year, it will be more and more difficult for the masters to obtain exclusive information, and more and more easy for the men to communicate intelligence. It is hard to see how the continuance of the competitive system among manufacturers can fail to involve them in constantly increasing difficulties. Unless something in the nature of a vend, or syndicate, be introduced into the great trades, our manu-

facturing industry contains within its bosom the elements of its own destruction.

This view of the case is, no doubt, new, neither to employer nor to many of the employed; but it has never, so far as we are aware, been brought before the public. Its importance is immense. Then it must be remembered that the capitalist is, in almost all respects, far more dependent on what we may call the goodwill of his particular establishment than are the operatives. He has given heavy securities in the form of land, buildings, machinery, organised staff, and other expensive outlay, the value of which depends altogether on the activity of his establishment. Great works, unless in full swing, are productive of nothing but vexatious loss. Labour, on the other hand, is free both to migrate and to emigrate. The displacement of the abode of a labourer is a matter of very little difficulty. In fact on great public works, especially our railways, have been principally carried out by floating, migratory labour. After a time the "navy" grows tired of his locality, usually passes a long boat in the public-house, makes a ten or twenty mile march, and offers to a new-found employer nothing but his sturdy arms, and perhaps, if unusually provident, a shovel or a pick. The perfect freedom of contract thus secured did, however, in point of fact, turn out very well for all parties during the construction of our great lines of railway.

With the agricultural labourer on the other hand, the case is reversed. Tied to his cottage, and burdened most likely,—owing to the discontinuance by the farmers of the good old habit of keeping their workmen beneath their roof,—with a wife and child or children before he is one-and-twenty, the rustic can only look for an amelioration of his condition to a large increase in his own educational activity. So fully is this understood by his employer, that we have known instances of strong objections being made to the teaching of geography in village schools, lest the labourer should learn that all the world was not as his parish, and that other parts were accessible to his feet.

To pass from that portion of the case which is still rapidly undergoing transformation to the second part, the sanctity of the contract, the first thing desirable seems to be that there should be a thorough universal definition of what such contract is. We should not be left to common law,—that is to say, to a state of things which no man can be expected to understand except on condition of heavily paying a lawyer to tell him, who, ten to one, may tell him wrong. We require such a plain, simple, authoritative definition of the law of contract between the labourer and his employer as may admit of no mistake. The first element in such a law is a definition of the time of hiring. This varies in different cases. It may be a question of minutes. In the case of a fire, the rupture of a dyke, a railway accident, or the like, every available hand may be required for a very brief time. On the other hand, in the case of the agricultural labourer, a year is the shortest time that should be contemplated by an engagement. Domestic servants, foremen, skilled artificers, operatives, exercise numerous vocations, to each of which some term of contract is most appropriate. This should be broadly and intelligibly defined. The time for which each party is bound, not by vague special agreement, misunderstood, it may be, by either at will, but by distinct general regulation, should be unmistakable. This is an essential part of any true freedom of contract.

The question of wages should be no less distinctly regulated. It is a disgrace to our age that we should yet be called upon for legislation to protect the workman from the truck system, under one disguise or another. The main points required are, that the rate of wages should be fairly stated at the commencement of the employment; that they should be paid in money, without deductions, at fixed dates, at the place of employment, and not at any public-house. For weekly payments, it is of the greatest importance to the workman, and therefore of real service to the employer, that, as we recently urged, the pay-day should be on a Friday. Connected with this should be a provision, to be enforced under stringent penalties, that any goods supplied by the employer to the workman should be supplied at cost price. Were this once enforced, the truck system would be at an end.

It might tend to the establishment of that perfect understanding which is an essential element of all harmonious organisation, if a printed agreement, on a penny stamp, were rendered imperative. The revenue would benefit;

its officers would, at all events, be credited with the ability and the desire to scent out any infractions of the law; and the tax is one that would be sweetened to the tax-payer by the great benefit accomplished by the clear definition of his position.

With these provisions, which may be said to be altogether in favour of the workman, were it not for the consideration that the higher is the actual position of the latter, as regards education, intelligence, and the self-respect of a citizen of a great country, the better is the condition of the just, competent, and upright employer,—must be coupled distinct guarantees for both the freedom and the fulfilment of contract. The legal recovery of any sums due for wages must be simplified to the very uttermost. For instance, the penny stamped agreement, in the absence of a receipt, might be taken as sufficient evidence of debt. If a magistrate had power to make summary order for the payment of wages, for any time not exceeding a month, on the production of one of these documents, unless the corresponding receipt were forthcoming, the habits of business-like regularity that would perforce ensue would be of no small value to the community. With measures intended to secure payment, must be coupled measures calculated to insure fidelity of work, industry, and order. We can do little more than indicate this part of the question. But just in the proportion in which caprice on the part of the employer is checked, by defining the rights of the workman, must fidelity on the part of the employed be rendered imperative. We bring forward this view, not as one with which any of us are at the moment prepared fully to deal, but as one which it is essential to discuss, and which must be properly wrought out before any settlement of the question can be more than vague, temporary, and unsatisfactory. Properly regarded, it is to the interest of the operative, as much as to that of his employer, that a broad and trenchant line should be drawn between the idle and the industrious workman. It is lamentable that the action on the part of the workmen themselves, instead of being directed to insure this end, has been lately bent in the very opposite direction. Here lies the main difficulty of the whole case; and, until this difficulty can be solved in a manner consistent with wisdom and equity, here is the seed of the decadence and decay of the industrial eminence of Great Britain.

With any legislation to settle the question of labour, must be blended a sharp and summary penalty against intimidation. In no respect can the freedom of contract exist, while either party is subject to menace or to danger from a combination on the part of others. It is most expedient that this question of combination should be removed from the tangled web of legal construction and phraseology, and dealt with with Draconic simplicity and severity. It may, and no doubt will, be said, that provisions of this nature are mainly protective of the employers. Such is not our opinion. Even if such were the case, so long as that protection is not ineffectual, the masters are entitled to receive it. But as matter of experience, it is the honest, steady, industrious workman who chiefly suffers from intimidation. If civil society is to exist, its members are entitled, as a just return for what they yield to society, to be protected against private war, or the threats of private war. Short, therefore, of such measures as should render the unproved accusation of intimidation anything but a serious offence, the utmost stretch should be given to the law for the prompt and condign punishment of a crime which, more, perhaps, than any other, strikes at the main springs of our national wealth.

We need not disguise the fact that we have regarded the entire question from a lower ground than we would naturally select. Unless the moral, as well as the legal, view of the relation of master and man be true and elevated, we shall effect but little permanent good by legislation. Into that, however, we cannot now enter. While something higher than contract ought to regulate these relations, it is still true that contract is that to which the spirit of the age looks; that with it alone legislation can deal; and that it ought to be free, fair, and sacred.

Metropolitan Fire Brigade.—At their last meeting the Metropolitan Board of Works agreed to advance the salary of Captain Shaw, the chief officer of the Metropolitan Fire Brigade, from 750l. to 850l. per annum. An increase was also voted to several of the other officers of the Board.

THE GENERAL EXHIBITION OF WATER-COLOURS.

The eighth exhibition under this title, now open at the Egyptian Hall, bears out its distinctive epithet by the variety of subject and style of treatment to be found among the large number of drawings (nearly 700) which make up the collection. We have every grade of subject, allegorical and grotesque, ideal and realistic, subjects too ambitious to be successfully treated, others too mean to be worth treating; worked in every manner, from pure water-colour to almost undiluted body-colour. As in all such exhibitions (and as it must be when painting has become so great an extent a competition in successful manipulation) there is, after subtracting whatever might be called really bad, a large residuum of praise-worthy mediocrity,—of works which are simply attaching to them, without any further interest. Of those which go beyond this point, which are marked out by individuality of thought and treatment, we will endeavour to indicate the best, without suggesting that we have exhausted the list.

Among drawings of figures, Mr. S. Solomon's are likely to be most noticed. "Until the day-break, and the shadows flee away" (189) shows three very beautiful and imaginative heads; of his two quasi-allegorical figures, Nos. 73 and 201, the latter, "Dawn," is the best; the other has little distinctive sentiment, and the drapery is too heavy and solid-looking. Mr. Barno Jones will hardly increase his reputation by his solitary contribution (196), also in the allegorical line,— "The Triumph of Fame, Fortune, Oblivion, and Love"—four small drawings in one frame, executed apparently on canvas, after some fashion peculiar to the artist. The first is fine in composition, and the best design altogether; the nude figures in all are unhappily of a most unsatisfactory nature, meagre and starved-looking, and disproportionately long in the trunk. Pity that an artist of real genius should be content with this kind of work, which can only be set down to carelessness or intentional eccentricity. Madame Bisschop's "Sweet, my child, I live for thee" (227), a repetition in water-colour of an oil-painting to be seen recently in Mr. Wallis's Gallery, is open perhaps to the contrary charge of being weaker in idea than in execution. The handling of the two figures and the accessories can scarcely be too highly praised, as a piece of broad, effective treatment in almost pure water-colour. Miss (or Mrs.?) Russell's "Juliet and the Nurse" (307) is a very careful attempt at a realisation of the latter character, so difficult to do justice to: the Juliet lacks intensity of expression. The drawing is a large one, with much brilliancy of colour. "The Iron Way" of Mr. C. Martin (338) has merit of a different stamp. In the interior of a railway-carriage, skirting the Bay of Naples, sits an Italian priest, gazing through the window with a painful expression of dissatisfaction at the present rate of "progress." There is a thought here, worked out with simple and unexaggerated force. Genuine pathos there is in the attitude and expression of the young girl whom Mr. Scott shows us (425), awakened by the morning sun, to lament afresh that "Thou hast left me over, Jamie." Mr. Poynter's two portraits (81 and 100) are interesting and carefully-worked studies of colour and detail in dress and ornamental accessories. "A Sketch" of an old man mending an umbrella (563), by Mr. J. Knight, should not be overlooked. By Mr. Townley Green wished his "St. Giles-in-the-Fields" (574) to be mistaken for one of Mr. Pinnow's drawings, he has, perhaps, succeeded; but he had better look out for a style of his own,—stolen goods of this description seldom bring benefit. The three little drawings,—two of them minute in scale and finish,—of M. Felix Regamy (595, 617, 614) show that he has a style and manner of his own, though an artificial and sensational one. The minuteness of finish in one at least of these reminds us of Meissonier. "Enter certain Maskers" (600) is a title which at once suggests the name of H. S. Marks, whose little drawing, suggestive of the style proper to fresco-painting, will perhaps be judged by not a few to be the best thing in the Exhibition. Two charming little landscape sketches by the same hand (555, 575) give pleasant proof of this artist's versatility; the latter has all the appearance of a rapid *con amore* study by a hand chiefly practised in landscape; no one certainly would, without the catalogue, refer these and No. 606 to

the same author. Mr. W. Crane's "Church of the Capuchins" (182), carefully studied as it is, one really can hardly accept as "water-colour;" there is scarcely a bit of transparent colour in it. Mrs. Stillman (*vide Spartali*) is represented by a large drawing of a monk "In the Cloisters" (167), Mr. F. Dillon by "An Egyptian Effendi" (194), a very highly-finished drawing. Miss Gilbert's "Happy Memories" (170), Mr. Jopling's "Water," head of a young lady (262), and Mrs. Sparker's "Springtime" (387) should be overlooked. Miss Maddox Browne's ambitious and clever work, No. 295, is marred by the total lack of beauty where it should have been most apparent, in the face and form shown in the magic mirror.

Among noticeable landscapes is Mr. Whitaker's fine drawing, "The Coming-in of the Sea-fog, Pwllie, South Devon" (51), where a glow of evening sky above is divided from its reflection in the wet sand and water of the foreground, by the dark mass of cliffs in shadow and partially enwrapped in fog. The whole effect is very fine. Among the rather small class of landscapes which interest by their individuality of style may be mentioned those of Mr. Ditchfield, especially "A French River" (38) and "On the Thames" (208), which in general manner remind one a little of Corot, without suggesting plagiarism. Mr. Field Talfourd's small drawings are still more interesting on a similar account, as showing originality in the artist's view of nature and in the use of his materials; note especially the two little grey sketches, Nos. 320 and 616. Mr. Macallum's "Cutting Peat" (306) is a fine, powerful drawing, with figures of considerable character and interest in the foreground; Mr. Aston's "Tees at Rokeby" (270), a very good piece of pure water-colour treatment, especially praiseworthy for the breadth and simplicity with which the masses of foliage are treated; this drawing has already appeared in a provincial exhibition. Mr. Howard's No. 173 (no title), an evening scene with much light in it; Mr. Pilleau's "Temple of Koom Omhos" (43); Miss Malleson's "On the Look-out" (101), with a great deal of wind in the thin trees; Mr. Parker's "Misty Sunrise" (217); "A Calm Evening" (230), by H. W. Williams; these and some others will repay attention as studies of landscape.

Among drawings of architectural subjects the first place will certainly be given to Mr. Spiers's sketches in "Paris after the Commune" (23, 70, 26, 592), admirable in effect without being in the least laboured. "Temple Bar in August, 1871" (659), by Rose H. Long, a careful little drawing from the Law Courts site, will soon have a certain historical interest.

Among drawings of flowers we must not omit a notice of "Azalea" (45) and "Study of a Japanese Lily" (339), both by Mr. Jopling; the former a fine combination of colour, with its crimson flower and blue and white vase. Among sketches exhibited on the screens are some very good specimens by Mr. Ditchfield and Mr. Slembro.

There is a great deal to look at in this exhibition, especially for students of the various methods of handling possible in water-colour.

ART VERSUS MANUFACTURE, AND THE EXHIBITION OF '72.

THERE would seem to be no possibility of making things artistic stand still, or even go on in some regularly appointed way. We all supposed that the movement set on foot by the Exhibition of 1851 would, without doubt, continue, and, moreover, that nothing much better as an art influence, and as an encouragement to artist workmen, would or could be devised. Nothing, we are sometimes told, succeeds like success, and most surely the 1851 Exhibition was a success, and the only thing which could well add to its good name was that it might be repeated at least once in every ten years. But even to a great success there may sometimes be a drawback, and a something that may have in it an element of failure. So much has been said about that special Exhibition of '51, and on exhibitions generally, that it would almost seem impossible to give utterance to a new thought about them; but the real truth is that most of the talk has been beside the mark, and the world has forgotten to ask, or to keep in mind if it never knew it, what these Exhibitions are really and truly for, and what it really is that they ought to do, or at least endeavour to do. Now, as it seems to us, nothing could possibly be

better than the original idea or plan of the first Exhibition, as it must have struck the mind of any one who tried to understand it. It was simply, though no one actually said so, supplementary in its action to the yearly exhibition of the Royal Academy. The Royal Academy exhibits *pictures and sculpture*. The *bona fide* work of the artist, and the real and true idea of the '51 or first Exhibition was to exhibit and show to the world, not only as the Academy does with its pictures, the works of our own artists, but the work of the foreign artist and workman as well. This was the main idea and the chief and crowning one,—the artist and the artist-workman were those who were to show to the world what could be done with the raw materials and unornamented materials provided by nature and machinery. But was this primitive and good idea realised and truly carried out? We are obliged to confess that it was not, and that not only was it not carried out and fairly acted upon, but that the final outcome of the whole scheme was the direct negative of the main and true idea, and its very reverse. The Exhibition culminated, not with artistic work, but with manufactured work, and it was to the employing *manufacturers*, and not to the executive artists, that the Exhibition gave its prizes, and its commendations, and its applause; and, as all know, everything went off with flying colours, and made up a magnificent success. But there can be no evil, however obscure or little known to the world, without the chance of its growth into something or other, if it be only to assure the world that "progress" is going on and is being made; and it so happens that the idea of art-manufacture, which the Commissioners of the Exhibition accepted for art, throws the whole power of it practically into the hands of, not artists or artist-workmen, but *tradesmen!* It was not the artist's studio, or even the workman's workshop, but the show-shop and the warehouse that got the ascendancy; and the consequence has naturally been, as was only to be expected, that the "goods" exhibited and the character of them became altogether secondary to the selling of them. And not only is this most significant fact to be borne in mind, but it should be understood that the principle of art-manufacture involves the perpetual repetition of the same thing over and over again. The artist, even if he exist, or has done any real work, is soon nowhere; and the "shop" soon grows into gigantic dimensions, and all but smothered out of existence the poor little *work* shop out of which the object, whatever it is, originally grew. All this and more came to pass in the last Exhibition, the small shop grew into a huge national bazaar, and no one seemed to think of anything but the mere selling of the goods and the replacing them by others, as readily and quickly as it could be done; and you soon found, as we did in the French Court, that it was impossible to learn even the name of the artist or artist-workman to whom the real credit was due for any artistic quality any one object possessed. The exhibitor, and the showman and showman, you readily found, but the artist and workman were nowhere. We may, perhaps, be allowed here to instance in proof of this the Renaissance chimney-piece in white marble in the French Court; it contained, in addition to the happy thought of it, the finest example of drapery marble cutting in the whole building, and was a true artistic performance; the showman of it you might see every day, and the name of the selling firm in sufficiently legible letters, but even the name of the man who drew and carved the fine work it was in vain to search for.

Now this, it will be confessed, is a very singular state of things in these modern and advanced and educational days wherein so much, and at such vast expense and trouble, is being done to teach people art and the principles of art; and when there are vast organisations all over the country for the express purpose of encouraging the artist and the workman. The Art Department, with its accompanying museums, costs the country some 100,000*l.* a year; and the simple meaning of that tangible and expressive vote is, that that large sum is in the end for the express purpose of helping towards the recognition of the individual artist and the artist workman. It does not do this, unhappily; but in words and common talk it is compelled to recognise the artist and the art-workman, for there is no one else to pretend to teach.

Do not let any one mistake the significance and meaning of these modern doings and their influence on art and artists; for it is not a little

important just now to get a clear view of things artistic and manufacturing. The important meeting at the Mansion House, presided over by the Lord Mayor, some little time ago, was for the purpose of protesting against the big shop or bazaar system of conducting an artistic show. The meeting thought that the foreigner had had the best of it, and the foremost enemies and the best places in the big window at South Kensington, and consequently the very best chances of show and sale. And so, doubtless, he had; but the real question was, and it is a pity, indeed, that some one of the speakers did not think about it,—did the Frenchman, for instance, show to the world the most individualised work, and did he make any effort at all to evidence this to the world? In other words, did the Frenchman produce true and *bona fide* art-work, and was he so far aware of it and alive to its value and importance as to fairly recognise the executive artist as well as the work that he produced? Unhappily there is but one answer. All were alike; neither the foreign exhibitors nor their British rivals made any attempt to bring into prominent notice the artistic power which made their works of any value. An artist's name, it is true, was here and there to be found out, but it was the rare exception and not the rule; and this it is that brings us, perhaps unconsciously, to the real nature of these exhibitional displays of so-called art as a final result. Artists and artist workmen, of course, did the work. There is no other way after you leave the machine; but they do not work *individually*, but in *gangs*, or one after another, so that it is in most cases really impossible to name the man who did the work: all have had a share in it, no one man can claim it, as in a cabinet picture. The whole system is out of joint, and the real and true nature of art-power, and its proper and only true mode of action, is in no way recognised. What a pity it seems that no one at the Lord Mayor's meeting said one word about it, or even hinted at it; perhaps no one knows anything whatever about it! And yet is it the true cause of the interest and character to be found in the old work of the past. It was not machinery, or "improvement," or "education," or a comprehensive knowledge of every style of art and of every thing or organisation that made the great artists and workmen, or that built cathedrals and old churches, or temples of the gods, but the artist and the artist-workmen acting as individualised powers, and, consequently, original powers; for nature, either directly or indirectly, never repeats herself. The difference may be small, but still there is always a difference. It is wonderful to think how entirely the art-power in human nature is misled, and lost sight of, not here only, but over all Europe and throughout what is called the civilised world. What the London manufacturers were really complaining of, is a free trade and selling affair, with this added, that, seeing as they did the difficulties in the way, they thought it best to object to the shop altogether. But the Royal Commissioners, with their executive officers, cannot evidently see why buying and selling should not go on all through the Exhibition as at the end of it; for the collection being made up of articles manufactured by machinery, and by human agency acting mechanically, and as machines, the work produced *must constantly repeat itself*: the article sold over a South Kensington counter at the opening of the Exhibition is replaced at once by its duplicate, and so on to the end of the show. What is the difference between them? A lot of dinner-plates, for instance, artistically got up, according to the Minton standard of art, are simply repetitions of each other, though the patterns on them may differ; but they are the same things perpetually repeated, for they are the result of a system of manufacture, the individual object passing from hand to hand, or from machine to machine, like a pin, or a nail, or a lock. But all this is not art; for, having looked at one "bit of ware" out of a thousand, you have seen 'em all. This is business, maybe, but it is not fine art, nor the individualised expression of the mind of man, and the work of his hand in material. But it is the latter that the original idea of these Exhibitions was intended to foster.

It would, perhaps, be impossible to exaggerate the importance of this question, as bearing upon future Exhibitions; and we can but hope that in time some of our influential art societies, such as the Institute,—we do not dare to think of the Royal Academy, who are they who *ought* to do it,—will take up and carefully consider this great subject. For ourselves, we would only urge on the Royal Commissioners, who will,

doubtless go on with their bazaar and shop system of show and sale, to *add*, as far as they can, to the alterations of next year's show by devoting a space in their building for the express and *only* purpose of exhibiting the works of the *bona-fide* artists and artist-workmen. This should be done irrespective of "art firms," as they are called. The recognition should be to the actual workman, using that word in its widest sense as well as in its narrowest sense. Given the material, whatever it is, let us know and see the name, at least, of the workman who actually cut or carved it into form, or painted it afterwards, or who moulded it out of formless clay. Let, therefore, but a small corner of the Exhibition be occupied in this way, and delivering there during the Exhibition becomes impossible, for the same object cannot be replaced. It must possess, according to its power, an individual interest of its own, and will bear to be looked at twice. It is the expression of the mind in and through material forms always fresh and new.

AUTOGRAPH ARCHITECTURAL DRAWINGS ABROAD.

IN continuation of a former account of autograph drawings of the great masters in architecture preserved in public libraries in Italy, addressed to the Institute of Architects, Professor Donaldson, having recently visited the libraries of Venice and Milan, which he had not been able to see when he made his former report, has submitted the following memorandum made at Naples.—The Public Library is in the building of the Stadt (or the old Museo Borbonico), now called the Museo Nazionale. The only autograph architectural drawings are contained in ten folio volumes, 17 in. by 11 in., attributed to Pirro Ligorio. They treat of statues, medals, buildings, costumes, ceremonies, &c., of the ancients. The text is beautifully written, apparently by some scribe, in clear characters on blue paper. The illustrations of buildings are generally drawn on white paper. The volumes are divided into our consecutive series of chapters. The three chapters 48, 49, and 50, are more especially devoted to archaeological and architectural subjects, beginning with the history of the burial of the dead, from the origin of burning the corpse among the Romans after the wars of Marius and Sulla, illustrated by drawings of cinerary vases, cups, rings, altars, sarcophagi, and other articles connected therewith. He gives a bird's-eye view of an antique Ustrinum, or place of cremation. Then follow drawings of the tomb of Cecilia Metella, and plans and sections of various tombs and sepulchral temples identical with those published by B. Soria from the drawings of G. B. Montano, the ruins of which peculiar and very curious sepulchres then existed in the Campagna; but which have since the sixteenth century been dismantled of their marbles, and totally destroyed. There is a plan and elevation of the Mausoleum of Augustus. At the end are four drawings of the Piscina or Castel d'Acqua di Marius, and of the Porta Maggiore, and details connected with the distribution of water in Rome. These last are on blue paper, and not on white, as are the other illustrations.

Besides these it does not appear that there are any other architectural drawings preserved in this library. One or two of Pirro Ligorio's volumes relate to ancient medals with exquisite drawings of them, but not specially to architectural medals. The text evinces a large acquaintance with the literature of the Ancients, and perfect knowledge of antique usages.

THE CITY GUILDS.

THE great City companies were anciently, as all know, *bona-fide* guilds of trade,—handicrafts principally, bodies of traders or vendors of goods secondly. The spirit of their formation comprised the teaching of the "mysteries" of the crafts, the protection of the rights belonging to the legitimate calling, the upholding and fostering of the industries established, and the consolidation and perpetuation of these guilds of trade intact. The first change which our City guilds of trade underwent was long subsequent to the date of their early charters, which will be found to particularly specify the rights, duties, and observances attaching. The carpenters, masons, plasterers, bricklayers, goldsmiths, plumbers,—in fact, all crafts,—were once represented by duly-apprenticed persons,—

masters, employers, and journeymen. We will not discuss here some of the exclusive privileges that once appertained to the acquirement or exercise of these crafts, though, perhaps, necessary to a certain extent in early days, when a limited commerce and a limited population existed, and a very limited intercommunication with other parts of this country was attempted. The fact is now clear and patent to us all that the City companies have not for some two centuries back been City guilds of trade, except in name. Many of the first charters date back several centuries. Some few of them may be traced to the walled towns of the Middle Ages. Subsequently, new and renewed charters have also been granted, confirming and enlarging certain privileges, all with a view of fostering and supporting the trades in question. The City companies have not done much for London handicrafts since we entered upon the present century. They distribute many charities, in accordance with wills or bequests made by members some centuries ago; and not a few of the said bequests have been turned or diverted from the original intentions. To be a member of our City companies was once to be also an artificer or manufacturer in reality. The goldsmith was a goldsmith, and not a plumber; and the carpenter did not belong to the Mercers' or Salters' body. The voting of honours to foreigners, or the bestowing of the freedom of the guild on those of no occupation, was unthought of. These innovations belong to very late times indeed; they belong to our time, and the period when the City companies ceased to represent, or were gradually ceasing to represent, their special guild of handicraft or calling.

This brings us to consider the most serious point of the subject,—the funds controlled by our City companies, made up of sundry and numerous bequests extending over some centuries. There is no doubt about the matter, that the majority of all the early bequests were left by members of these guilds, who were actually belonging to the *crafts* the bodies represented. The wording of these legacies will show the wishes entertained by the deceased members, and the direction in which the donors desired their bequests should be expended.

Many relate to alms for the poor of certain parishes and to members of particular trades. Others relate to the apprenticing of orphans, children of members, or in default to strangers' children, that a certain trade might be learned, the trade of the donor. Others, again, relate to religious teaching and primary education, or schooling with a view to apprenticeship to special trades. The aims of the donors were to assist, support, uphold, foster, and transmit the rights, privileges, and preserve intact the existence of *these guilds of trade* for the original objects for which they were formed.

The City companies do not profess to perform their original duties. What is required now is a commission of inquiry, as to the belongings and spendings of our ancient City companies,—not with the intention of abolishing them, but with a view to their reform, and of utilising them for the purpose of assisting, not only in the matter of education, technical and otherwise, but of making them to some extent representatives and encouragers of the special branches of handicrafts, trades, and calling their names would imply.

It is perfectly within the province of every one of these City guilds to establish technical schools of instruction, lecture-halls, libraries, reading-rooms, laboratories, model workshops, or normal schools of art, and annual exhibitions in relation to their own respective constituencies. What a mapped-out field of labour is here before them of practical usefulness, in no way difficult, intricate, or remote of realisation! If every one of our City companies or guilds of trade would set about instituting this reform, each guild of trade nearly would have a technical college or university of its own, in no way interfering with the usual scholastic colleges or universities of the kingdom. The aim of technical instruction is to make men competent workmen, to dignify the calling of the craftsman, to make him feel the same love for his calling as those of the higher professions feel for theirs. By accomplishing this, class animosities will be destroyed, and the bazaar Capital will no longer be feared, for Labour is its parent.

Our City guilds could be made instrumental in doing a variety of practical work. By prolonging their existence, and still allowing them to perform many of the duties that have devolved upon them in connexion with the corporation,

they could subservise by their power and position in this city many other useful ends. That a crisis has been reached at last in their history and function, it would be idle to deny, and foolish to attempt to explain away. If they would protect themselves against a *coup d'état* some fine morning, levelled by some unsympathising but utilitarian minister, it behoves them to be up and doing. The City companies have their ancient charters to fall back upon, which royal warrants do not usually disturb, but Acts of Parliament may repeal or abolish certain rights and privileges lying in abeyance, or only exercised in semblance, or for no useful purpose. What exists for the general good is seldom interfered with, though its origin may date far back than the Hierarchy. The City companies or guilds, by exercising their legitimate functions, will carry the voice of the country with them, and they can plead what is even stronger than law in many particulars—"customs and usages of trade."

We do not desire to see our City companies standing up again rehabilitated with all their antique belongings, as guilds of trade; but we do desire to behold them as useful, practical bodies, really representative of trade, and turning the wealth of which they are only trustees into those channels of education, labour, and social and moral reformation for which it was bestowed.

We should be glad to waken up our ancient guilds to a sense of their position, and to show them how trouble may be averted, and necessary work for the common weal performed, resulting in satisfaction to all and prolonged security to the guilds in particular.

THE ABBEY CHURCHES OF CAEN.

THE ARCHITECTURAL ASSOCIATION.

THE ordinary general meeting of the Architectural Association was held on Friday evening, the 23rd February; Mr. Rowland Plunne, President, in the chair. Votes of thanks were passed to all who had assisted in the visit paid on the 17th instant, to the new City Library and Museum, adjoining the Guildhall, now drawing towards completion; the roofs being covered in, the windows partially glazed, and the fittings in course of execution. This was the first of the Saturday afternoon visits of this session, now a well-recognised part of the work of the Association; and was made by a fair number of the members, the building having arrived at what is deemed a good stage, affording useful opportunities for observing the general design, and the details of construction.

A paper was then read by Mr. R. Phené Spiers, "On the Abbey Churches of Caen," giving a careful description of their general features and details; discussing among others the questions not yet, perhaps, finally solved as to the original design of the clearstory of the nave of the Abbaye aux Hommes, involving interesting considerations with reference to the roof designs of the large churches erected at the end of the eleventh century. Considering also the method of the evolution of the ordinary quadripartite vault of Mediæval churches, and of the hexapartite arrangement which had preceded it. For dates, and the many comparatively recent discoveries which have given firm grounds for constructing hypotheses, Mr. Spiers made use of the elaborate paper read by Mr. J. H. Parker, at the Royal Institute of British Architects, in session 1863-64, and of the researches of M. G. Bouet, given at different periods, in M. de Caumont's "Bulletin Monumental," and in a separate publication; as also of the "Mémoire," published by M. Ruprich-Rohert, the architect, to whom many of the works of the past and for the future, at these fine holdings, owe their designs.

The paper was illustrated by sketches, drawings, &c., with plans of the buildings in question; among the latter, a complete measured ground-plan of the Abbaye aux Dames, as yet unpublished, but destined to form part of a new edition of Augustus Pugin's "Specimens of the Architecture of Normandy," to be edited by Mr. Spiers, and produced forthwith. Strange to say, no plan of this well-known church has been hitherto published, with the exception of a small woodcut in a work by M. Ruprich-Rohert; and it may perhaps seem not less strange that, notwithstanding the large amount of attention devoted to the Mediæval antiquities of Normandy, and the large number of books to their delineation, the drawings of Pugin, as engraved

by Le Keux, published in 1827, remain the most thorough authorities, the standard, practically the only, sources of accurate information on these and other buildings of the province.

In the discussion which followed the reading of the paper, opinions were expressed adverse to the polygonal or circular ends, formed by arching between the buttresses of the chapels round the choir of the Abbaye aux Hommes, Bayeux, Coutances, &c.: it being argued that the very bold forms on plan of the buildings, and the consequent masses of strong shadow, do not prepare the eye for the slower curvatures and want of bold projections to be found above; and further, that the too prominent horizontal divisions abruptly terminating all the vertical lines against the forcible impression produced by the unity of character of a design where the vertical tendency manifests itself from base to skyline. As to the original nave roof, opinion seemed to lean towards a purely wooden roof, without cross arches, as at the Abbaye de Corbie; the high level of the capital of the main pier, as discovered by M. Bouet, in the pocket of the existing vault, being considered as putting a semicircular stone arch across the nave out of the question. Some regret was expressed at the seemingly unnecessary destruction of masonry in fair condition, and the retouching of old surfaces throughout in the course of recent works at these churches.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At a meeting, to be held on Monday, the 4th instant, the Council will recommend that the *Royal Gold Medal* be awarded, subject to her Majesty's gracious sanction, to Herr Ober-Baurath Professor Friedrich Schmidt, President of the Austrian Institute of Engineers, and Architect to the Cathedral of St. Stephen, Vienna, whose works we have assisted to make known in England.

Further:—
That the *Sonne Medalion* (with the sum of £01, under the usual conditions) be awarded to the author of the drawings distinguished by the motto of "Steadfast." (Subject of design—A Town Hall in a Country Town.)
That the *Institute Silver Medal*, with £1. 5s., be awarded to the author of the drawings distinguished by the motto "Per se totum solus ducens." (Building illustrated—Tattersall Castle, Lincolnshire.)
That in the same competition a *Medal of Merit* be awarded to the author of the drawings bearing the motto of "Alta Tullii." (Building illustrated—All Saints Church, Edington, Wiltshire.)
That in the same competition, the two sets of drawings bearing the respective mottoes of "Expirance" (Building illustrated—St. Leonard's Priory, Stamford), and "Leda" (Building illustrated—Pulbow Church, Somersetshire), be distinguished by *Honourable Mention*.

That the *Student's Prize in Books* be awarded to the author of the Design for a Staircase in a Domestic Building, bearing the motto of "Alpha."

That the *Student's Prize in Plans* be awarded to the author of the drawings illustrating the restoration of Eastbury Manor House, and six sets of drawings illustrating the Convent Gateway, Barking, have been submitted by candidates for

After due consideration, and on the report of the sub-committee specially appointed to examine the drawings, the Council have resolved with regard to the drawings of

That the first prize of 42l. be awarded to the author of the drawings distinguished by the motto of "Stet fortuna domus."
That in the same competition the second prize of 20l. be awarded to the author of the drawings bearing the motto "Brigid."
Convent Gateway, Barking.—That the prize of 10l. be awarded to the author of the drawings distinguished by the motto "Ercowwald."

Having received two letters complaining of the awards, we have examined the designs, and find no reason to express any objection to the decision of the Council. Difference of opinion in two or three cases there may fairly be: we think, for example, that the very creditable set of drawings of Inigo Jones's Banqueting Hall deserve Honourable Mention better than one, at any rate, of the two sets which have it; but it is obvious that the Council have given good consideration to the various works submitted, and we do not feel called upon to question the justice of their award.

THANKSGIVING DAY.

THE accounts of the royal visit to St. Paul's, of the decoration of the line of the route, and the illuminations at night, which have been published in the daily papers, are so full, graphic, and for the most part accurate, that repetition in our narrow limits would be foolish. These accounts, produced within a few hours after the event, although they will be taken almost as a matter of course by the millions who read them, constitute a series of

achievements little less than miraculous, and show the amount of ability employed on the periodical press, and the extent to which the division of labour is carried even in literary undertakings.

The structural accidents have been very few. We have heard only of two, both in Pall-mall. Many of the erections were strengthened, we are informed, after the appearance of our notes last week, and disaster may thus have been prevented. The erections within St. Paul's were of the most substantial character; and, if little taste was displayed in the decoration of them, they well answered their purpose. The view of the Cathedral, filled as it was, was remarkably fine, and the service was impressive in the highest degree. Her Majesty the Queen has since given £1,000, towards the decoration of the building, and H.R.H. the Prince of Wales 500l.

London has not been so gaily adorned in modern times, and has never seen a grander sight than the people presented on Tuesday, the 27th of February. Several subjects offer themselves for consideration from our special point of view, but we prefer to take another opportunity to set them forth.

FATAL THOUGHTLESSNESS.

SIR,—Having spent some hours of Tuesday, the 27th, in the parks, my attention was drawn to the crowded state of the trees, they being occupied by Darwinian sightseers, who had in some instances poised themselves dangerously over the heads of less aspiring folks. In one instance, eighteen men (about a ton weight) were sitting on one branch, until it broke and came down with them, killing one, and breaking the limbs or otherwise seriously injuring the rest. This took place in the enclosure of St. James's Park, just previously to the starting of the procession, and near to Buckingham Palace. I had been watching the branch—an immense one, and quite rotten in the centre,—and was not in the least surprised when it broke; my surprise is that many others did not break also, with a similar or worse effect. I suppose none but themselves are responsible for this, but technical education seems sadly wanting, when you see men and women whose wisdom-teeth are things of the past, doing that which the instinct of brutes does not allow them to do! Cannot somebody point out to the masses the breaking strain of timber, and of iron hurdles, the perforating power of perpendicular iron spikes, the scant elasticity of human bones, and the weight of congregated human bodies? Can they not, or will they not, think?

There are many trees in the parks whose lower branches extend most temptingly, and which should be inspected carefully, so as to be propped up or lopped off, according to their state, but should not be allowed to jeopardise human life by a similar catastrophe to that of Tuesday. Had the tree been a few yards nearer the railings, the loss of life would have been terrible; and although people have no right to clamber up the trees, yet they will get there on these occasions, and wholesale mutilation and death are too severe a punishment for an act of stupidity.

RANGER.

PRODUCTIVE PRISON LABOUR.

THE reform of our present wasteful conduct in the management of prisoners has been helped on by a paper at the Society of Arts (21st ult.), by Dr. F. J. Monat, late inspector-general of prisons, Lower Beugal. The conclusions at which the speaker arrived on the subject of prison labour are as follow:—

That the State is bound to provide secure and properly-constructed prisons for convicts, with adequate establishments.

That all prisons should be made schools of industry, and should be rendered self-supporting by the introduction of remunerative labour.

That the industrial system is well calculated to secure the immediate object as well as the end of imprisonment.

That the conversion of gaols into schools of industry is not only consistent with the maintenance of strict discipline, but is the most rational and humane means of enforcing it.

That the utilisation of convict labour in handicrafts is a perfectly legitimate employment of such labour, and that there is no sound economic objection to the adoption of the principle by the State.

That the necessary and accessory incove-

nences of imprisonment are in the imprisonment itself, when properly and strictly carried out on the separate system; and that convict labour should not be used or regarded as a punishment, but treated as an alleviation of punishment, except to the very moderate extent in which labour may be used as a measure of gaol discipline for breaches of prison rules.

That the labour should be strictly confined to the prison precincts, and should, in no circumstances, bring the prisoner in contact with the outer world.

That as punishment and reformation stand very much in the same relation to each other as curative and preventive measures in medicine, all sound systems of prison discipline should subordinate the former to the latter, because the infliction of pain or cure can only affect the individual, while reformation or prevention may influence the many, and the major in all such cases should be preferred to the minor.

NEW MASONIC HALL, LEEDS.

THE foundation-stone of the new Lodge of Fidelity, 289, Leeds, was laid by the W. M. privately, without any ceremonial, last week, and a banquet was held in the evening to commemorate the event.

The new Lodge will comprise an entrance-hall and staircase, a banquet-hall, and lodge-room, and a residence for the Tyler. The designs have been prepared, and are now being carried out by Mr. Bakewell. The builder is Mr. S. Whitley, of Leeds.

THE HABERDASHERS' COMPANY.

THE Court of this company are naturally proud of the success obtained at Cambridge by a scholar of their Monmouth Grammar School, Mr. W. R. Webb, and what they have done in consequence will serve to encourage those pupils of Monmouth School, who, by natural abilities, combined with perseverance and attention, may prove that they have profited well by the education they have received. After offering congratulations to the visitors and masters of the school, the following resolution was ordered to be transmitted to Mr. Webb:—

"At a Court of the Master Wardens and Assistants of the Worshipful Company of Haberdashers, held on Monday, the 11th of February, 1872, William Henry Skyring, esq., Master, it was moved by the Rev. C. Mackenzie, Frendary of St. Paul's, seconded by William Henry Wood, esq., the Father of the Company, and resolved unanimously, That the sum of £100, be granted out of the company's funds, by three annual sums of 30l., to Robert Ramsey Webb, B.A. of St. John's College, Cambridge, a former scholar of Jones's Grammar School at Monmouth, as a mark of the admiration of the Master Wardens and Assistants, the Governors of that school, of his talents and industry by means of which he has attained the very high distinctions of Senior Wrangler and First Smith's prizeman at the University of Cambridge in the present year."

The name of the present Master of the Company (Mr. Skyring) will sound like that of an old acquaintance to many of our readers. Mr. William Hawes, when Master of the Company, brought a number of well-known men from time to time round the table in their handsome hall, and the example is not being lost sight of under the present head.

ROME.

AT the last conversation of the British and American Archaeological Society, Mr. Parker entered into the question of aqueducts. He referred especially to the Claudian and Anio Novus, whose ruins are still so conspicuous, and incidentally to the other aqueducts, nine in all, mentioned by Frontinus, subsequently to whose time, and to the reign of Trajan, were raised ten aqueducts by different emperors. He alluded to the prescribed method of carrying the later added channels over the structures of the earlier aqueducts, and also mentioned the law prohibiting the erection of any other buildings against or within a given space on each side of the aqueduct structures. The Anio Novus, brought into the city along the majestic arcades of Claudius, alone supplied all the fourteen Regions with water, while the other channels reached only a limited number of the civic quarters and houses. The aqueducts were the centre round which other works of the ancient Romans may be considered as historically grouped, and to which antiquarian research may be most efficiently directed. Diverging from that theme, he dwelt upon the ruins of imperial buildings on the Palatine, and maintained his theory (contrary to that of Signor Rosa) that

the aggregate of halls and courts comprising the beautifully-painted chambers discovered about two years ago can be no other than the residence of Augustus, rebuilt for him by order of the Senate, within the Arx of Romulus.

Mr. Hecanus gave an account of the remains of the Temple of Claudius (called Claudium) on the Coelian Hill, where a stately portico of travertine is seen in the gardens of the Passionist Convent. He pointed out the proved identity of those ruins with the magnificent pile forming a sacred inclosure round that temple rebuilt by Vespasian after it had been destroyed by Nero to make room for one wing of his Golden House, and observed the interesting character attaching to that portico in ruin, as the only example before us in Rome of such a cinerary still retaining architectural features round a faner for heating worship.

PROPOSED EXAMINATION IN ARTS AND MANUFACTURES.

THE Committee of the Society of Arts appointed to consider the propositions submitted by Capt. Donnelly, are of opinion that it would be of public advantage if the Society of Arts were to supplement the existing examinations of the Science and Art Department by organising examinations in the science and technology of the various arts and manufactures of this country, and that these examinations should be conducted by a Board of Examiners, capable of testing the practical knowledge and skill required in the application of the scientific principles involved in each art or manufacture.

The Council have decided to call a conference of manufacturers and others likely to co-operate in the matter, such conference to be held shortly after Easter. The Council propose, in case the scheme shall meet with sufficient support from the conference, to make a beginning of the system this present year, and to take up as the subjects the manufactures of paper and cotton. With this view they are forming two special committees respectively to draw up the detailed rules for these examinations, and to settle the necessary programme.

UNSAFE LANDINGS.

THE St. George's, Hanover-square, Vestry have considered the opinion of Mr. Thrupp,—

“That where the vaults are found to be built with upright walls, the Vestry have no power to compel the owners or occupiers of the houses or building adjoining to vault the cellars and to keep such vault in repair afterwards. The only powers the Vestry possess with respect to these vaults are derived from 57 Geo. III., cap. 29, sec. 70, and 18 and 19 Vict., cap. 130, sec. 102, and the former of these sections only applies to the cellars and so much of the covering thereof as forms the opening thereto. But I do not think that the Vestry can compel a lowering of the vaults, unless under 18 and 19 Vict., cap. 130, sec. 38, and then it will take place at the cost of the Vestry. The responsibility for accidents happening upon a landing in bad condition would rest with the parties liable to repair the landing, and I am of opinion that this liability both by the local Acts and public Acts, thrown upon the Vestry (57 Geo. III., cap. 29, sec. 52 and 54; 7 Geo. IV., cap. 28, sec. 25, 26, 32, 35; 4 William IV., cap. 8, sec. 43, 44, 45 and 19 Vict., cap. 120, sec. 103, 25 and 26 Vict., cap. 102, sec. 77, 78, and 95). These sections appear to me to throw upon the adjoining owners or occupiers the first expense of laying these landings, and upon the Vestry the expense of their subsequent maintenance. In the absence of suitable provisions, it is evident from the case of *Robbins v. Jones* (C. B., N. 8, pp. 242, 243), that the repair of these landings would fall upon the public guardians of the highways,—in this case the Vestry. In the case of an accident occurring through the bad condition of the iron coverings, the owner or occupier, probably the latter, would be liable, inasmuch as they are bound to keep these coverings in repair. It will follow from what I have already written, that these landings are regarded by the law as part of the ordinary foot pavement, and should therefore as such be repaired and reinstated by the Vestry, and out of the same funds as the ordinary pavement.”

It was decided to enter this opinion on the minutes.

PARIS.

THE *Société Central des Architectes* has memorialised the Prefet of the Seine, in consequence of proposals made for the complete demolition of the ruins of the Hôtel de Ville. The Society, through its president, M. Baltard, protests against the error of supposing that restoration is not possible, points out how much of the structure remains, the ample authorities that exist for reinstating properly the destroyed parts, and asserts that the destruction of the building would be inconsistent with a love of art and judicious management of the municipal finances. The Society, including, as it does, the professional members of the Academy of Fine Arts, the chiefs of the administrative service,

and the architects most distinguished by ability and probity, is entitled to be heard; and we sincerely hope the memorial will have its intended effect, and that steps will at once be taken to commence the restoration of the building.

Fifteen working men, from Manchester, have given evidence with regard to the condition of English workmen before a committee of the National Assembly appointed to inquire into the subject.

M. Ch. Garnier, the architect of the new opera and the author of a recently-published volume, entitled “Le Théâtre,” will, it is supposed, be elected member of the Académie des Beaux Arts, in place of M. Vaudoyer.

The architect, Léon Vaudoyer, has been struck dead by apoplexy, at the Ecole des Beaux Arts, while examining the works of the pupils. He was born in 1803, received the Grand Prix de Rome in 1824, became member of the Institute in 1868, occupying the seat of M. Lebon. He designed, among many other works, the Cathedral of Mar seilles, the national monument to General Foy, &c.

FROM AUSTRALIA.

Melbourne.—The want of proper market accommodation in the eastern part of Melbourne has long been felt, and in the early part of last year competitive designs were invited by the corporation, and premiums of 200l. and 100l. were offered for the first and second best designs. In response to this, fifteen or sixteen sets of plans were sent in on the 1st of September, and at a recent meeting of the council it was decided, by a majority of 16 to 9, to award the first premium to the design bearing the motto “C'est Ici,” belonging to Mr. John Flanagan, Collins-street; and the second to the plan marked “Mercato,” belonging to Messrs. Reed & Barnes, of Elizabeth-street. The *Australian Illustrated News* gives an illustration of Mr. Flanagan's design.

The present site of the markets covers an area of 2½ acres, and upon this Mr. Flanagan proposes to erect fourteen shops fronting Bourke-street, but not by any means of a costly character. They will occupy 40 ft. in depth of ground, and each will have a counting-house on the ground floor, with dwelling over, having from five to seven rooms in each. The yards and kitchens are on the top, supported by fire-proof floors. Some of the shops have galleries round, about 9 ft. high; and the two ends and centre have attic stories and Mansard roofs. There is a large central entrance to the market from Bourke-street, with a tower over it, rising to a height of 112 ft. The remainder of the ground is to be occupied by the wholesale and retail markets, having entrances from Bourke, Stephen, and Little Collins streets. The wholesale market is roofed in with four spans of 50 ft. each, with wrought-iron curved girders, springing from cast-iron fluted columns, the spandrels filled with cast-iron ornaments. Louvre frames are fixed on top for ventilation, covered with glass running the entire length of each bay. The height of the apex of the roof from the floor is 50 ft. The entrance gates are of wrought-iron, having cast-iron ornaments. The retail market consists of one principal avenue, running parallel to Bourke-street, with three avenues extending from it to Little Collins-street, all having shops on each side, with galleries over for the sale of light goods. At the end of the central avenue a market-keeper's residence is provided; and at the end of the avenue, next Stephen-street and the Haymarket Theatre, closets and urinals are provided for the use of visitors and stall-keepers. Access is provided from the central to the end galleries by means of a wrought-iron lattice bridge, having cast-iron ornaments attached at the intersection of the lattices. The roofs are constructed of wrought-iron ribs, and covered with slates, boarded underneath, stained and varnished. Louvre frames running the entire length of each avenue are fixed on tops of ribs, having glass louvres in sides, and covered on top with glass, giving good light and ventilation. Cellar accommodation is provided under the shops in the avenues for storage purposes, and having entrances from the wholesale markets. The staircases leading to the galleries are to be of cast iron. The floors of the wholesale markets are to be formed of pavers with flagged passages all round for foot-passengers. The buildings are to be of brick, cemented, and the estimated cost is about 87,000l.

There have lately been erected in Little Collins-street West new and commodious premises for ex-

tensive wholesale ironmongers. The structure is erected on the site of buildings traded in for many years by Messrs. Gill, Fowler, & Co. Its length it occupies 127 ft.; it is 40 ft. in width, and is three stories in height. The ground-floor is 17 ft. high, the front portion being devoted to the usual offices of a mercantile establishment. At the rear the ground-floor is asphalted, with a pitched cartway. The first-floor is 14 ft. in height; the second floor is 13 ft. in height. A hydraulic lift raises and lowers goods to the first and second floors, and to the cellar. The building is erected of bluestone, with slate roof, the front being of brick, and cemented, with rusticated basement, sub-zodiac, &c., and the facade crowned with a dentilled cornice. The two upper floors are carried by cast-iron columns. The architect was Mr. Thomas Watts, and the contractor Mr. George Coruwall. The total cost was about 8,000l.

About six months since a new composition, consisting of resin and sand, for use in break-blocks on railways, was invented by Mr. Ross, of Williamstown, and a trial was given to it on the Victorian Railways, by using it in the blocks of one of the engines. Mr. Meikle, superintendent of the locomotive department, has sent in his report on the invention, from which it appears by the old method the number of miles traversed by an engine without any alteration in the blocks was 4,000, but with the new composition the engine ran 6,514 miles. There has been one disadvantage, however, and that is an increased tendency to take fire in proceeding down the declines.

MANCHESTER NEW POLICE COURTS.

The new Police Courts have a frontage to Minshall-street of 182 ft., and to Bloom-street of 117 ft. They are now approaching completion, and the two courts, which are to be appropriated to the police business of the city, have been formally opened.

The style of building is that type of Pointed Gothic of which examples abound in Florence, Verona, Siena, and other cities of Northern Italy. At the angle of Minshall-street and Bloom-street is a large and lofty tower, the lower portion of which is occupied by offices, and the upper by the clock, which has four illuminated dials, 8 ft. in diameter, and strikes a bell weighing upwards of a ton, which is placed in the arched chamber at the top. The principal entrance into the building, for the use of magistrates and persons officially connected with the courts is in the Minshall-street facade. From the entrance a broad flight of steps leads to a spacious corridor parallel with Minshall-street, which is about 6 ft. above the footwalks, and gives access to barristers' dining-room, porters' room, and various other apartments on this floor. In the centre of the Bloom-street facade is the entrance to the public hall, connected with the police-courts, which is 84 ft. by 40 ft., and contains rooms for witnesses in waiting, separated by low glazed screens. A wide staircase from this hall admits the public to a corridor 10 ft. wide, on the court floor, which gives the witnesses and officers access to the two courts, and is terminated by the general office at the angle of Minshall-street and Bloom-street. From the corridor a short flight of steps leads to the balcony connecting the public portion of that portion which gives admittance to that portion which is reserved for spectators only, who are entirely separated from those having business to transact. Opposite to the entrance in Bloom-street, a staircase from the public hall admits witnesses immediately wanted to a gallery which is raised 8 ft. above the hall floor. The ceiling being at the level of the bench (which is 4 ft. above the court floor), admits of the gallery-floor being raised, so that each court may be reached by a few steps, which are so placed that witnesses can pass at once into either court. This arrangement also admits of the court officials calling witnesses wanted either from the hall or the waiting-rooms. The public hall on the sessions side, which has its entrance from Minshall-street, is arranged in a similar manner, with the addition of a refreshment-bar, room for solicitors, and private lavatories. The remaining portion of the ground-floor is occupied by the rooms for prisoners awaiting trial, which are reached by double flights of stone steps from the cells below, and have each a separate stair leading to the docks. These waiting-rooms on the session side are separate from those on the police side by a large open area, 86 ft. long, by 44 ft. wide, with

entrance for the police van to drive into for the purpose of discharging prisoners, and a large courtyard for the police. This area divides the building into two portions, and is an important aid to light and ventilation. Ascending to the court-floor from the magistrates' entrance in Minshull-street, previously mentioned, a corridor of 8 ft. wide is reached, extending the whole length of the building, and gives access to a series of offices facing Minshull-street, connected with the business of the various courts.

The four courts, two of which are appropriated to the police business, and two to the sessions, occupy the centre of the building, and are surrounded by the offices and corridors before mentioned, an arrangement by which the noise of the adjoining streets will be materially lessened. Each court is a large lofty apartment, 53 ft. by 33 ft., and 36 ft. high, and is lighted by sixteen windows, and has a ceiling of pitch pine, panelled and perforated for ventilation; the walls are also panelled to a certain height. The magistrates' stalls on the bench are covered by a canopy the full width of the court. The barristers' seats, docks, witnesses' and public galleries, and the other fittings are of pitch pine also. The object in the arrangement of the court fittings has been to concentrate, as far as practicable, the business of the courts, and to bring the prisoners, witnesses, jury, and barristers as near the bench as possible. In order to give increased facilities for the rapid despatch of business in the two police-courts, speaking-tubes and bells have been arranged to communicate from each of the magistrates' clerks' seats and the two docks to the general office. Similar provision has also been made for communicating from the courts and general office with the officials in the basement, &c. Over the grand jury-room and adjoining the corridor are placed apartments for the resident porter. The ceiling of the basement story is raised 6 ft. above the footpath in the street, in order to effectually light and ventilate the various rooms and passages, especially those connected with the cells for prisoners. The story is 14 ft. in height. A corridor, 15 ft. wide, extending along the back of the building, and two shorter passages at right angles with the main corridor, give access to the cells, which are of various sizes. The windows in these corridors are large and numerous, glazed with obscured plate-glass, of great strength, and protected by strong wrought-iron bars. The warming and ventilation of the courts is a subject to which especial consideration has been given; and provision is made for passing heated air from the basement through a series of cavities or flues into the court-rooms and corridors. Air-ducts are arranged so as to convey a supply of fresh air to the courts, and secure a complete and constant change in the atmosphere. Heating-chambers and boiler-houses are placed in the basement, and large channels are constructed under the former to convey fresh outer air thereto, which, after being purified and warmed, passes into the courts at the time in use. The extraction of the vitiated air is effected by trunks and channels, which convey it to the ventilating shaft in the centre of the building, inside of which the smoke from the boilers and the various fires throughout the building is conducted by a wrought-iron flue.

The general contractors of the main building and the fittings of the courts have been Messrs. R. Neill & Sons; the ironwork is done by the Fairbairn Engineering Company; the heating and ventilating by Messrs. Hadon & Son; the carving, by Messrs. Earp & Hobbs; the gas-fittings, by Messrs. Thomson & Co.; the stained glass, by Messrs. Lavers, Barrand, & Westlake; the clock and bell, by Messrs. Cooke & Sons, of York; the grates and chimney-pieces, by Messrs. Wilson & Co. Mr. Samuel Taylor has acted as clerk of the works from their commencement; and the whole of the works have been executed under the direction and superintendence of the architect, Mr. Thomas Worthington, of Manchester.

A BIG GRANARY.

The only "grain-elevators" in the United Kingdom are those of the Mersey Dock Board, situated on the Liverpool and Birkenhead sides of the river; and of these we have recently received some particulars. The scene of operations is a huge pile of warehouses, or granaries, covering several acres of ground, and reaching upwards to the height of some six or eight floors. The grain-ships arrive alongside these warehouses, and the cargo, whether in bulk

or in bag, is emptied into what is called the "well" of the building, a depth of 22 ft. below the level of the quay. It falls into a "hopper" capable of holding six tons; and it need scarcely be stated that the object of thus lowering it is to dispense with the manual labour which would otherwise be necessary in filling the apparatus by which it is raised to the different floors. Corresponding with the "well" at the bottom of the building is a "tower" at the top, and the distance between the two is 145 ft. A hucket worked by a hydraulic ram travels between the two, and when a given quantity of grain has been emptied into the hopper the bucket descends, and by liberating a certain spring on its way to the bottom of the well, an arrangement is brought into play whereby the filling of the hopper is suspended, and the grain contained in the lower or sloping part empties itself into the bucket. The hopper is made to hold six tons, and the quantity discharged at each descent of the bucket is one ton—that being the quantity contained in the part of the hopper below which the filling process has been temporarily suspended by the action already described. A single stroke of the ram, and the hucket is raised from the bottom of the well to the top of the tower, the distance of 145 ft. with a ton of grain being accomplished in 45 seconds. On its upward journey, the bucket, which, it should have been stated, works on a sort of rails or guides, replaces the arrangement disturbed by its downward motion, and the process of filling the hopper is once more restored. Reaching the top, the bucket is acted upon by what is called the "tipping-wheel," and thus made to empty itself into the tower, where the contents are weighed, and got in readiness for distribution throughout the different floors and sections of the immense building. This subsequent process is even more novel and interesting than that just described. The upper floor of the warehouse is traversed in every direction by belts or bands revolving on pulleys, driven by small hydraulic engines. These bands, which are composed of india-rubber and canvas amalgamated, are from 15 in. to 18 in. in width, and about $\frac{1}{4}$ in. in thickness. A sort of "mouthpiece" is fitted on to the bottom of the hopper containing the particular kind of grain to be distributed; and by this means it is thrown on the band revolving underneath, in an even and continuous stream, and in sufficient quantity to keep the hucket going regularly between the well and tower, with its load of a ton every three-quarters of a minute. The grain is carried forward on the band at a very considerable speed; and by the introduction of what is called the discharging or throwing-off apparatus, which can be attached at pleasure, it can be deposited in any section of the top floor, or diverted down shafts, which carry it to any of the numerous floors underneath. These warehouses in Liverpool have been in operation about three years. The machinery, which is of a very simple but effective character, was supplied by the firm of Sir W. Armstrong, of the Elswick Works, Newcastle-on-Tyne; and the system is stated to be superior to that in operation at Chicago, where "grain-elevators" are quite an institution. The capacity of the Liverpool warehouse is something like 40,000 tons.

THE COST OF ASSOCIATED HOMES.

WITH reference to observations that have been made as to Associated Homes obtained by co-operation, Mr. W. Morrison, as a director of the Improved Industrial Dwellings Company, has addressed a communication to the *Co-operative News*, giving some useful information touching the cost of such buildings.

"I think [he says] that our operations have covered a sufficient extent, both of area and expenditure, to afford a trustworthy basis for calculation, as according to our last-balance-sheet our completed buildings are in eleven different localities, from Greenwich to Pimlico, and our expenditure on sites and buildings amounts to the sum of 212,175*l.* The accommodation provided suits the industrial classes in London; we have a very small proportion of unoccupied tenements, and in our last completed block in George-street, Grosvenor-square, where the rooms are not yet dry enough for immediate occupation, we have already received 180 applications for thirty-eight tenements. These blocks vary in height from three to eight stories, and consist of "tenements," each tenement having its own outer door opening into the street, or on

to a common staircase; the number of rooms in each tenement varying from two to five (counting as one room a kitchen with copper, dust-shoot, and water-closet)."

"I will first take our leasehold buildings, erected on building leases. In these cases the cost of the site takes the form of an annual rent, and does not appear in the following lines, which, however, include every other item of cost—legal charges, draining, laying on gas and water, paving and making or repairing roads. In the case of three blocks, containing 1,050 rooms, I find the cost was 43,066*l.* or about 41*l.* per room. In these cases the block contained dwelling-rooms alone, and no shops.

In the case of two blocks on freehold land, containing 216 rooms, all being dwelling-rooms, the cost was 11,120*l.*, or about 51*l.* per room. This includes all charges, as before, as well as the cost of the land.

The other buildings erected by the company are either built on a large estate, purchased in Bethnal Green, where it would be difficult to apportion exactly the share of the cost of site to each particular building, or have shops on the ground-floor, which will disturb the calculation of the cost per dwelling-room; but the figures given above are large enough to deduce a fair average.

In applying them to the employment of co-operative funds in the erection of blocks of a similar character, co-operators must recollect that, with the advancing cost of labour, building prices must advance also. On the other hand, building is cheaper in the provinces than in London, and the cost of freehold or leasehold land lower.

There seems to be no better mode of investing the surplus funds of a co-operative society than in the erection of dwellings for its members. It is an investment at home; the expenditure can be directed and controlled day by day by the committee of management; the proper cost in each locality can be easily ascertained, and a little care in supervision is a complete protection against gross fraud. The Act of last session has removed all legal impediments.

I confess that when I hear of large sums of money being invested in foreign bonds, or in the securities of companies at home, by committees of management, I do not feel quite comfortable. One has heard of so many shrewd men of the middle class being bamboozled by adroit rogues in companies, one knows so many cases of State repudiation of debts, that one cannot hope for immunity from similar misfortunes on the part of co-operators. I should like to see their spare funds kept at home within their own control, and employed in building or in pushing co-operative production at their own doors."

AID TO TECHNICAL EDUCATION.

IN a paper on the "Aspects and Prospects of Technical Education," read by Dr. John Yeats at the Social Science Association, on the 19th ultimo, the reader said,—It seems to me only just that when the State disburses money, the State should also undertake and be bound to see that the object for which the disbursement was made is fully attained; and this can be done in no way so effectually as by demanding of every pupil, male or female, frequenting a State-subsidized place of instruction, be it school, college, or university, a *minimum* of attainments, graduated according to circumstances, but insisted on before he or she commences an independent career.

Time will not permit, or I would gladly recount what a society akin to ours has accomplished in Holland. It has lately promoted a technical exhibition; it has long had night schools or technical schools in every principal town and village; it has elevated a race of depressed and dispirited *technici*, and made of them a contented thriving community. Cannot our own society accomplish something too?

What has been done or written, especially of late, to diffuse amongst our own artisans, in a popular form, the triumphs of mind over matter? Lord Brougham wrote, years ago, a celebrated essay on the "Pleasures and Advantages of Science," but a second is very much needed. It seems to me that amongst the most urgent literary wants of late have been accounts of the raw materials of industry; sketches of the development of skilled labour; the story of the growth of trade, &c. Having been at work in these matters during many years I can say no more of them myself, but recommend abler men

to take them up, and particularly on behalf of this great Class V., the *technici*, to prepare:—

(a.) An exposition of the successful applications of technical knowledge during the last half century.

(b.) Some account of the prizes still open to competition, such as the premiums of the Society of Arts, the Queen's prizes, &c.

(c.) An essay on the national danger of neglect of science, and the reasons for the asserted security and superiority existing on the Continent.

(d.) A fair statement of the advantages and disadvantages existing among foreign artists. The Gewerbeswesen.

(e.) A comparative view of ancient guilds and modern trade-unions, raising the question of apprenticeships.

(f.) An abstract of the best-known organisations of industry in our country, such as those of Messrs. Bliss & Son.

(g.) The same drawn from Continental sources: French, Dutch, German, the Handwerksloeh, and others.

(h.) Popular treatises on what is known in Germany as *Erlkünde*, *Waarenkunde*, *Werkzengkunde*, *Handwerkskunde*, and *Handelsswissenshaft*.

DAMP WALLS: GROUND DAMP.

"A. B." should drain the site of the house. Isolate the same from the adjoining land in the following manner:—All round the four sides of the building, and from 6 ft. to 10 ft. from the walls, construct an ordinary land-drain in the most careful manner, with sole-tile at bottom, filling up the trench with bushes, turf, and gravel. This drain should start at one corner, level with underside of footings, and be laid with a fall of 1 in 100, or more, to the opposite diagonal corner into a well. The writer has obtained a dry site in the wettest clays and a good supply of water by these means. The site may be left to take care of itself; but, to make doubly sure, sink a well 8 ft. deep in the centre of basement, and lead the drain-pipes spoken of into it, laid in gravel. In some cases this well will be found supplied with water; in others perfectly dry.

Valuable hints are readily given in the *Builder*. It is to be regretted that the recipients fail to communicate at a later period the success or failure of the remedies suggested, consequently much experience is lost. Twelve months hence let us hope "A. B." will profit by this hint, and favour us with the result.

A. Z.

THE BIRMINGHAM SEWERAGE BILL.

The Birmingham Sewerage Bill is important alike in the locality to which it relates, the objects it proposes to accomplish, and the means proposed to be adopted for the accomplishment of such objects. The framers of the Bill cannot be congratulated upon the breadth of view or vigour with which they grapple with this great work. The Bill is a bundle of pottering, paltering, huxtering expedients, rather than a fulcrum for the effectual uprooting and removal of an evil, and its conversion into good. The Bill contains fifty-two sections, and is to give extended powers to the corporation as the sewer authority for the borough, for making further provisions for its sanitary condition. The corporation propose that they should have powers to take lands, to agree for easements, to construct works, stop up roads, and exercise other important functions. They may collect, store, deposit, precipitate, filter, disinfect, deodorize, decalcate, and distribute for irrigation or fertilisation, the liquid sewage of the town. They may supply such sewerage to occupiers by agreement, and may recover penalties from persons using it without agreement. The manufacture of valuable saleable sewage, rather than the thorough cleansing of the town, seems the paramount object of the Bill. Unauthorised drains must not discharge into the sewers, and no matters may be passed into them that are injurious to vegetation. Manufacturing chemists, galvanizers, and wire-drawers, are specially indicated from using the sewers as a means of getting rid of their waste products. By passing into the sewers matters injurious to vegetation they will be liable to a penalty of 20*l.*, and a fine of 40*s.* per day for every day that the offence is continued after notice. Curiously enough, while thus careful to exclude from the sewers matters "injurious to vegetation," the occupiers of premises having water-closets are to be encouraged (?) by a fine

of 10*s.* per annum for each closet. The powers asked for in the Bill include provisions for borrowing 300,000*l.* by mortgage on sewerage, for raising money by annuities, and to order alterations as to the construction, cleansing, and removal of the contents of middens, cess-pools, privies, and water-closets; but how does the Bill provide for abolishing middens, cess-pools, or privies?

NEW CITY AND COUNTY ASYLUM, HEREFORD.

THIS establishment, of which we give a plan and view, was determined upon in 1868, when a limited competition took place, and the design of Mr. Robert Griffiths, the county surveyor of Stafford, was selected.

The building is now nearly completed. The main front is nearly due south, and the principal approach is arranged so that the several exercising yards will not be overlooked, or the patients disturbed or annoyed by persons frequenting the asylum. In the basement of the administration block, in the centre, are the boilers for the purpose of providing steam for cooking and hot water for heating the corridors of the several blocks and recreation-hall and chapel. Adjacent to the entrance the following accommodation is provided:—Porter's day and bed room, superintendent's room, waiting-room, clerk's office, with fireproof closet, stairs to committee-room, and steward's rooms, patients' visiting-rooms—one for each sex. Over this part, on the first floor are the committee-room and waiting-room, with w.c. attached, and the steward's bedrooms. The matron's and assistant surgeon's rooms, dispensary, &c., are to the right and left of the recreation-hall, with bedrooms for each on the first floor. The general store-room is of large dimensions, subdivided by partitions, for classifying the goods. It has a steward's office in the centre, and distribution-rooms at each end in connexion with the corridors to the male and female sides of the building, and with kitchen offices.

The administration block is central in position, between the store-room and dining-hall, and consists of kitchen, scullery, servants' hall, cooks' room, bread-room, larders, and dairy. A serving-room and scullery are provided between the dining-hall and kitchen. Over this portion are the servants' bedrooms, approached by separate stairs.

The dining and recreation hall, with the chapel over, are in the centre of the south front.

To the east and west of the dining-hall is the Asylum proper,—the males on one side, and the females on the other, but separated from the parts already described by fire-proof corridors and staircases, and two lofty water-towers. There are two blocks, with exercising galleries, 12 ft. wide, on each side of the hall, with day-rooms, single rooms, dormitories, lavatories, and store-rooms, the attendants' rooms being so placed as to give complete supervision. The baths and lavatories are in a separate block at the rear, concealed by a passage, with windows on both sides, so as to cut off any disagreeable or injurious effluvia from the main block.

The above description applies also to the npper floors.

To the north of the Asylum proper, and to the east of the principal entrance, are the various workshops, bakery, &c.; a shoe-room and lavatory for men returning from field labour; and a small day-room and dormitory for the working patients. Here also are the brewhouses, dirty clothes wash-house and drying closet, and dead-house.

A similar block to the west contains the laundry, wash-house, receiving and distribution rooms, and day-room, dormitory, and kitchen for the women engaged in this department.

The walls of the airing-courts are built in an

excavation, with sloping sides, so that the coping is only 3 ft. above the level of the courts, thus doing away with anything like a prison effect, and creating as little sense of confinement as possible.*

Ventilation is secured by means of flues and shafts in connexion with extraction towers, furnished with a gas apparatus, to secure an outward current of air.

The superintendent's house is to the west of the Asylum, near the entrance lodge, which is an obvious advantage. At the same time there is less disturbance of the patients than there would be if it were in the centre of the south front.

The general walling is of red bricks, made on the site, relieved with white bricks, in hands, strings, door, and window heads, with blue brick pilasters, and a sparing use of stone from the Grinshill and Bath quarries.

The ground-floor joists are of English oak, and all the other timber for carpentry of Baltic red fir. The floors of corridors, single rooms, day-rooms, and dormitories, are laid with English oak. The whole of the roofs are covered with Bangor slates, and the hips and ridges also with slate rolls.

The two towers shown in our view to east and west of the recreation-hall are each fitted with a cast-iron water-tank, and the water is pumped into them by a steam engine fixed in the basement under the brewhouse, and every portion of the building is supplied with water from these towers.

With regard to heating, all the day-rooms, galleries, and dormitories have open fireplaces, in addition to those portions heated by hot water.

Gasworks have been erected on the site, as the distance (three miles) was too far to bring the gas from Hereford.

The accommodation is as follows:—

Block No. 1, men's side, west of dining-hall...	109
Block No. 2, " " " " " "	89
Workshop Block	24
	218
Women's side the same.....	218
	436
Total	336

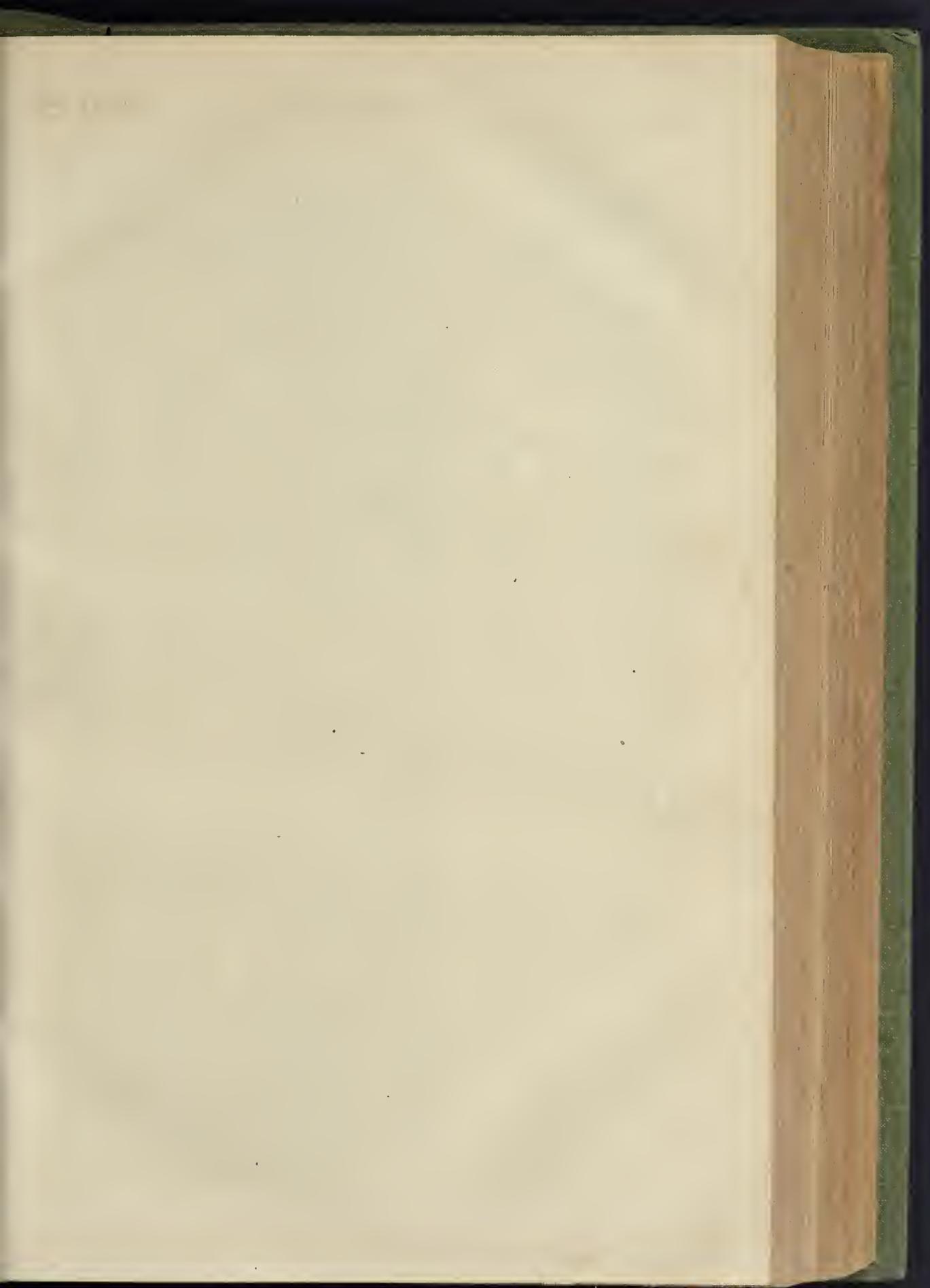
The contract was taken by Mr. James Clatter, buck of Gloucester, at somewhat over 41,000*l.*; but this did not include fittings, airing-court walls, forming of roads, yards, and approaches, engineering, or gasworks, which will bring the amount to about 55,000*l.*

Messrs. Goddard & Massing, of Nottingham, have carried out the heating and engineering works; and Mr. Bower, of St. Neots, the gasworks; Mr. Charles Smith was clerk of the works; and, as before stated, the architect is Mr. Robert Griffiths, of Stafford, who has recently erected the New Cheshire Asylum, near Macclesfield, and is about to commence one for the county of Northampton.

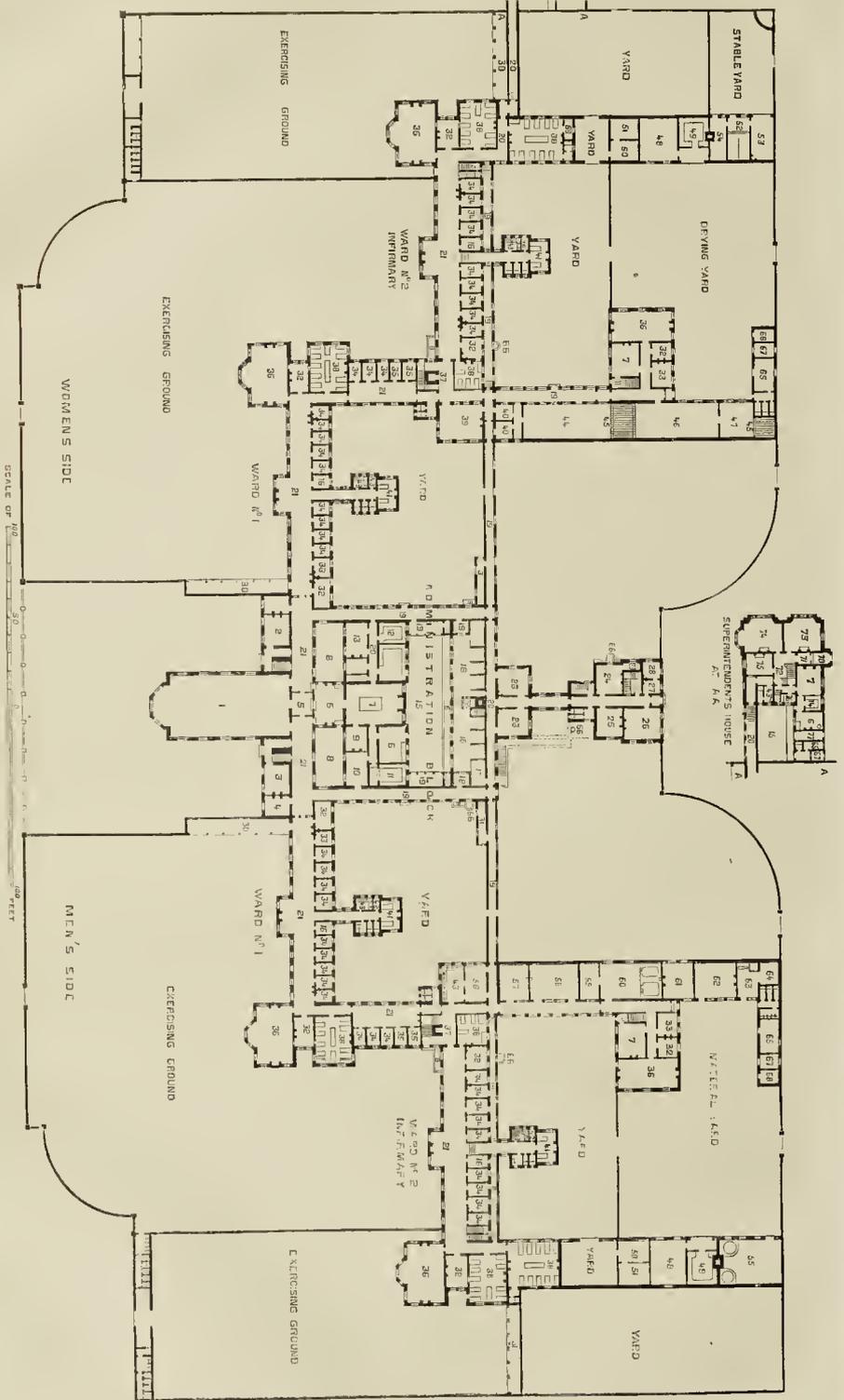
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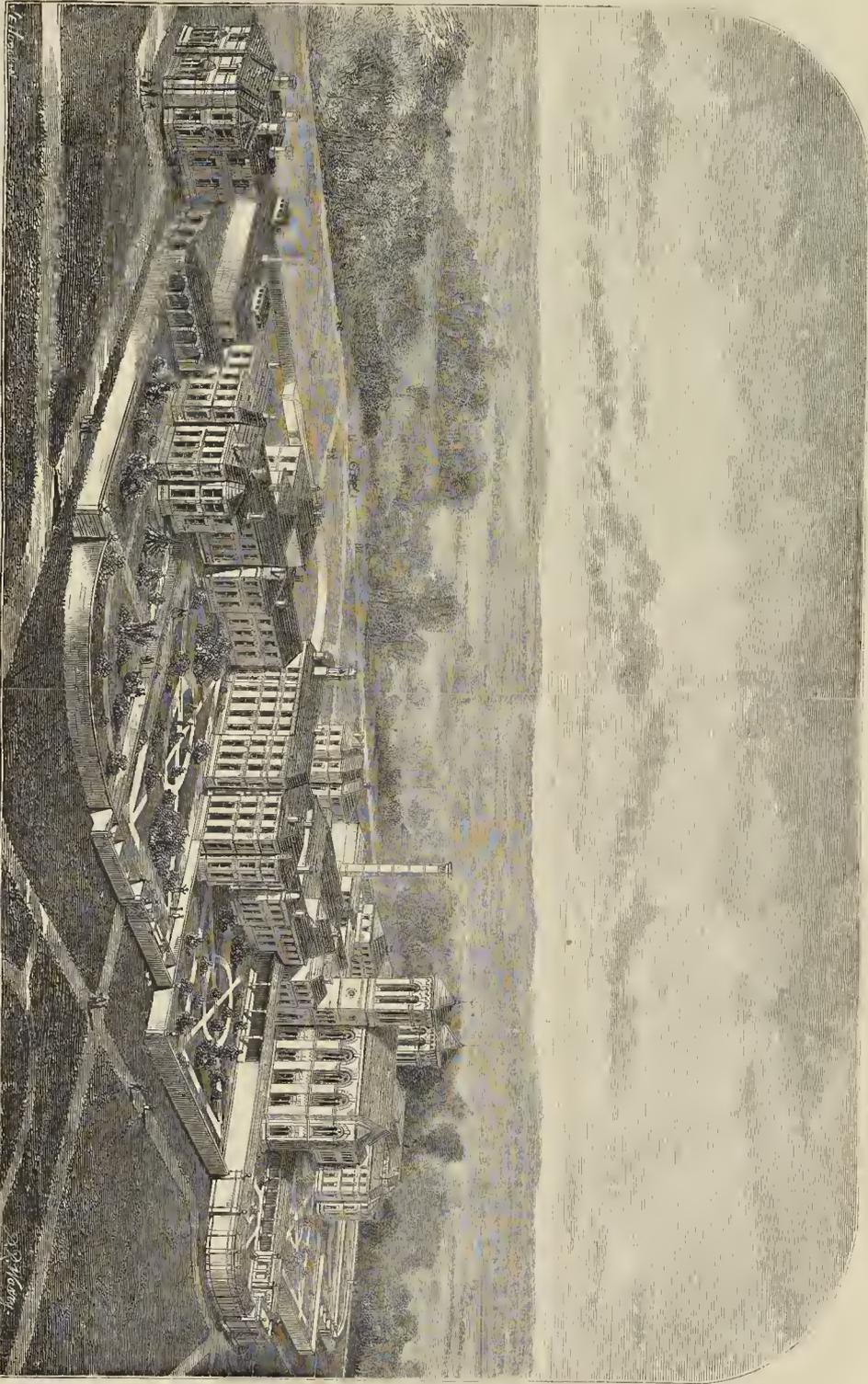
1. Dining and Recreation Hall.	40. Receiving room.
2. Matron.	41. Bath room.
3. Assistant Surgeon.	42. Dust.
4. Dispensary.	43. Lavatory.
5. Serving-room.	44. Wash-house.
6. Scullery.	45. Drying-house.
7. Kitchen.	46. Laundry.
8. Area.	47. Private Wash-house.
9. Cook's Room.	48. Dirty Clothes Wash-house.
10. Bread-room.	49. Drying stove.
11. Pantry.	50. Dead-house.
12. Dairy.	51. Post-mortem.
13. Servants' Hall.	52. Stall Stable.
14. Larder.	53. Coach-house and Harness.
15. Kitchen Court.	54. Hay.
16. Stores.	55. Brew-house.
17. Weighing-room.	56. Shoe-room.
18. Distributing-room.	57. Shoemaker's Shop.
19. Covered Way.	58. Tailor's Shop.
20. Passage.	59. Flour-store.
21. Corridor.	60. Bake-house.
22. Office.	61. Plumber's Shop.
23. Visitors.	62. Carpenter's Shop.
24. Clerk.	63. Smith's Shop.
25. Waiting room.	64. Iron-store.
26. Superintendent.	65. Coals.
27. Porter.	66. Coal-shoot.
28. Bed-room.	67. Ashes.
29. Safe.	68. Wood.
30. Sun-shade.	69. Closet.
31. Slope.	70. Vestibule.
32. Attendant.	71. Hall.
33. Attendant's Bed-room.	72. Principal Stairs.
34. Single Room.	73. Dining-room.
35. Padded Room.	74. Drawing-room.
36. Day-room.	75. Study.
37. Lift.	76. China-closet.
38. Dormitory.	77. Back Entrance.
39. Sewing-room.	

* The view and plan do not quite agree as to the position of the enclosing walls: the arrangement shown by plan is that adopted.

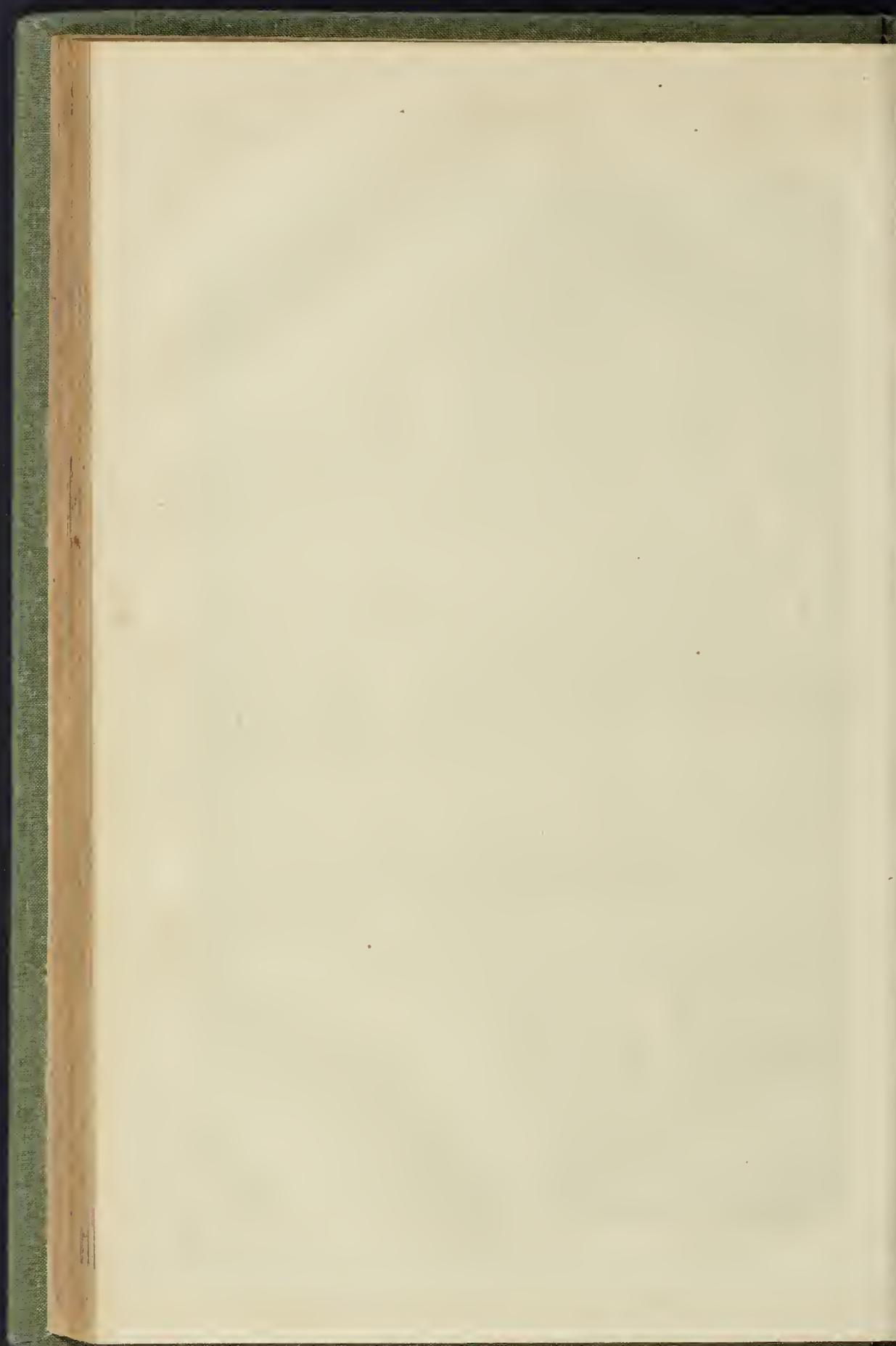


THE CITY AND COUNTY ASYLUM, HEREFORD. — Plan of Ground Floor.





THE CITY AND COUNTY ASYLUM, HEREFORD.—Mr. ROBERT GRIFTHS, ARCHITECT.



THE NEW LAW COURTS.

MR. C. BENTINCK, in the House of Commons, in prefacing a question that stood upon the paper in his name upon the subject of the new design for the Courts of Justice, said that on the 21st ult. he had asked the Chancellor of the Exchequer whether Her Majesty's Government approved the designs which were stated to have been accepted, and that the right hon. gentleman had stated that he did not approve those designs. He understood that during the vacation certain alterations had been made in these designs, and wished now to ask the right hon. gentleman whether that were the case; and, if so, whether he would consent to exhibit the altered plans in the library of the House of Commons, or elsewhere within the precincts of the Palace of Westminster, for the inspection of members of that House.

The Chancellor of the Exchequer replied that, although the plans had been exhibited in the library of the House for several weeks during last session, the House could not be brought to pronounce an opinion upon them. Under these circumstances he did not know what good purpose could be derived from exhibiting them again, especially as the works were now proceeding under them.

Mr. C. Bentinck gave notice that he should call attention to this subject on a future day, and move a resolution in reference to it.

THE REBUILDING OF GLOBE BRIDGE, AT PECKHAM.

The Vestry of the parish of St. Giles, Camberwell, have, within the last two or three weeks, been receiving fresh tenders for the intended new bridge at Peckham, to carry the Commercial-road, Peckham, over the Grand Surrey Canal; and at the meeting of the vestry, last week, the tenders, eight in number, were opened, when it appeared that they varied in amount from 3,350*l.* to 2,500*l.*, the lowest two being that of Mr. J. Brown, of Disan-road, New Cross, 2,610*l.*; and that of Messrs. Peach, Brothers, Loddon, Norfolk, 2,500*l.* The vestry decided to accept the tender of Messrs. Peach, Brothers, subject to the approval of the sureties, and in the event of their not being satisfactory, and that the tender of Mr. Brown be accepted, with a like proviso. The present bridge is only 12 ft. wide, and quite inadequate to accommodate the existing traffic. The new structure, which has been designed by Mr. James Dredge, of Buckingham-street, Adelphi, will be constructed of wrought-iron arched girders, resting on brick abutments. The span will be 27 ft. 4 in. and the width of the roadway the same as that of the approaches on the other side, namely, 40 ft.

IRRIGATION IN SOUTHERN INDIA.

INSTITUTION OF CIVIL ENGINEERS.

At a recent meeting, the paper read was "On the Value of Water, and its Storage and Distribution in Southern India," by Mr. George Gordon, giving an account of the ancient native and the modern systems, under the two heads of tank and channel irrigation. The value of water to the cultivator was shown, first, by contrasting the yield of dry crops with that of rice and sugar-cane, from actual experiments. From these it appeared that the net profit per acre on dry crops was 8*s.* 2*d.*; on rice, 4*l.* 16*s.* 10*d.*; and on sugar-cane, 1*l.* 6*s.* 6*d.* In the two last cases, a very low rate for the water was assumed, viz.: 12*s.* per acre for each crop of rice, and 24*s.* per acre for each crop of sugar-cane, as provisionally paid by Government. A comparison between dry crops and rice, and dry crops occasionally flooded, was then made, based on the average price of grain extending over five years, and deducting one-fourth from the gross value of the crop in the case of dry crops, and one-sixth in the case of wet crops, to cover loss in bad years. Without deducting the water-rate, the difference in the net value of the crops was as follows:—Between dry crops and rice, taking the most unfavourable comparison, 25*s.* 7*d.*; between dry crops and the same occasionally irrigated, 30*s.* 8*d.*; and between two dry crops and sugar-cane (which occupied ten months of the year), 8*l.* 2*s.* 8*d.* But if water was stored, so as to allow a second crop of rice to be grown, the advantages were nearly doubled. The author then showed that, provided a water-rate proportioned to the value of the water was fixed, irrigation would benefit the cultivator to

the extent of 8*s.* 6*d.*, or 50 per cent., and yield a gross return on the outlay of 14*s.* 9*d.* per acre; and if water were stored for a second crop, the gain to the cultivator would be 19*s.* 6*d.*, or more than 100 per cent., and the return to the agency supplying the water 37*s.* 3*d.* per acre, the cultivator not having to expend any capital in improvements. Of the 37*s.* 3*d.* per acre profit, 22*s.* 6*d.* was about the sum due to the storage of water, supposing such storage works to be added to distribution works already constructed. It was shown that the cost of large works of irrigation might be safely reckoned at 7*l.* per acre on an average, or 8*l.* 10*s.* if 5 per cent. on one-half the capital for ten years during construction were added. If the profits made by the application of the water were divided, in the proportion of one-third to the cultivator and two-thirds to the agency supplying the water, works of channel irrigation would benefit the cultivator, as above stated, to the extent of 50 per cent., and yield a net return of 7*l.* 4 per cent. on the capital expended. With respect to the cost of tanks, the author gave some figures to show that the construction of flat country tanks of the second class, or even of the third class, would offer a very doubtful return, although in some cases it might pay the cultivators to construct them. Great profits had been made by Government in several cases, by restoring or repairing tanks and also channels which had become ruined; such net profits amounting to from 10 per cent. to 45 per cent., and in one instance, which was cited, to 250 per cent. The construction of large storage reservoirs would, the author considered, return a very large percentage on the outlay.

WHERE DOES THE MUD COME FROM?

SIR,—Will you allow me to suggest through your columns that this is a question which may well engage the attention of those who have the charge of our thoroughfares; for if the following theory be correct, our tempers as well as our pockets are likely to be sorely tried, owing to the general road-repairs that will before long have to be undertaken throughout London?

I do not apply the question to macadamised roads, but to those that are covered with blocks of granite, as also to the footways. It does not seem to me so much a case of granite versus asphalt as that of bad workmanship in regard to the laying of the former; for a somewhat close attention to the matter has convinced me that by far the greater part of the mud that has been of late daily carted away consists of the very subsoil on which the granite blocks and pavement rest, and which, owing to the ill-laying of the stones and the badness in quality of the material used for binding them together, naturally, after a lengthened period of wet weather, becomes thoroughly saturated, and finds its way to the surface. If this be so, what can we otherwise expect than during a continuance of fine weather to find our streets sinking in all directions, owing to this displacement as well as contraction of the remaining soil? There can be no question that during the late had weather asphalt has fairly maintained its ground in public estimation, both as regards cleanliness and safety,—for footways especially,—and that bad workmanship will have to answer for all the miseries that have yet been endured and are still in store for us. The finest piece of granite road-laying in London is to be seen on the Holborn Viaduct and in the adjacent streets, and their extreme freedom from dirt during the late trying weather, as compared with other parts of the City also placed under the charge of street orderlies, is sufficient proof of what might be done, if only there were the will, to remove from London the reproach that attaches to it from the neglected state of its thoroughfares.

G. C. E.

THE NEW ST. JAMES'S HOTEL, DERBY.

THE new St. James's Hotel, erected by the St. James's Hotel Company (Limited), and situated in the Corn Market and St. James's-street, Derby, has been opened to the general public.

The hotel contains on the attic floor thirty-two bedrooms, and on the second floor about the same number, with two sitting-rooms, bath-rooms, and all requisite accommodation. On the first floor, facing the street, is a large room, which is proposed to be used as a ladies' coffee-room; there is a bath-room, &c., adjoining. A corridor leads to a good-sized dining-room, and

four other private sitting-rooms. On the landing are first-class private sitting and bed rooms. At the back, but leading from the principal staircase, is an assembly-room (to be called the St. James's Hall); attached is a serving-room, and on the same floor are stock or show rooms. On the ground-floor is a spacious entrance, leading from St. James's-street, with a coffee-room on the right-hand side, and on the other side is another large room for commercial gentlemen, with a luggage-room and offices adjoining. In front is the bar, with still-room and smoking-room. The principal entrances are provided from the Corn Market and St. James's-street, with access through an outer hall, covered with an ornamental iron and glass roof, which is to be fitted up and used as a lounge. The manager's room is central, and the bar commands a view of all the entrances. Speaking-tubes and bells communicate from the managing department to all parts of the premises. The inner halls are paved with encaustic tiles. The staircase is close to all the entrances, but not in the way of any, being in an inner hall. It is of stone to the first floor, and continued the same size to the attics, with iron scrollwork in the place of balusters, and mahogany handrail. On the first landing is a broad mirror, from the floor to the ceiling, facing the first flight of stairs. On the newel post at the bottom is a large figure in bronze supporting a clock. A hydraulic lift is placed between the kitchen and manager's room, and works from the basement to the attics. The kitchen, servants' hall, and working offices are spacious, and fitted up effectively. The hack or kitchen court is covered with a glass and wood roof. The basement is divided into cellars under all the hotel. Housemaids' closets, with hot and cold water and soft water, are provided on each floor. Attached to the hotel also is to be provided a luncheon-bar or restaurant, with lounge, smoking and billiard rooms, and necessary offices. Spirit vaults adjoin the gateway to the stables. The architects for this pile of buildings are Messrs. Giles & Brookhouse, Derby; and the builder is Mr. Dusautoy.

LEAKY SEWERS.

It is obvious that if the sewer inquired about by "B. A.," in the *Builder* for February 24th, although built in only 4½ inch brickwork, be laid in soil only "rather damp" no leakage ought to take place; but if the 2-feet barrel-drain be laid entirely, or even partially, below the water level in the land, and consequently always exposed to water, it is impossible to say what quantity of water might percolate through such a slight thickness of brickwork. A great deal would depend upon the description of bricks used and the length of the sewer. If there were any junctions prepared for future extensions, but not at present made effectually water-tight, a still larger quantity of water might enter than was due to the percolation through the brickwork of the sewer.

Q. E. D.

ECONOMY IN THE LEAMINGTON KITCHEN RANGE.

In recording my treatment of this range, it may be well to say a few words about its construction and usual action. With a very small fireplace, it has to heat water, a large oven, and a hot-plate for cooking; the bottom of the grate is double, reducing still more the apparent space for fuel. The upper (or real) bearing bars are framed together and stand separately about 1½ in. or 2 in. over the lower bars. When the half-door of the fire is shut, the draught is intense, and as I have heard it said "you can burn away any quantity of coal you please," it is very difficult to restrict your servant to the use of coals.

In practice, as may be supposed, the fire is very apt to go out suddenly; and not only so, but the false bottom soon wants renewing, and you also find that the range must be disused once a year or oftener, to replace a burnt-out burr.

Having had my full share of all these drawbacks in a grate, of which I admit the general excellence, it occurred to me that by putting a solid 2-inch burr in the place of the false bottom, I should check the excessive draught, and retain much general heat. This has completely answered, and during three years no burr has yet had to be renewed. The fire is much more enduring, and we can allow some

coal to be occasionally added to the coke without grumbling; there is no want of heat, for we have had to caution our servant against overheating the plate.

I have been told that in Birmingham it is not an uncommon practice to mould some tempered fire-clay into the bottom of ordinary fireplaces, and I would admit this to be an improvement upon the sheet-iron, and of course a step in the right direction. Allow me to add in reference to my former letter, that the poker should be made a little more pointed than is usual.

G.

THE TRADES MOVEMENT.

Ipswich.—A meeting of the master builders has been held to consider a circular received from the committee of workmen formed on the previous week, asking for the concession of the nine-hours system. After some discussion, it was unanimously resolved not to accede to the request of the men, as it was considered prejudicial both to the workmen and to the public.

Wolverhampton.—Nine years ago, after a series of ruinous strikes in the building trade at Wolverhampton, both masters and men resolved to refer their differences for the future to Mr. Rupert Kettle. An arbitration board was appointed, and has existed in the trade ever since. The last agreement between masters and men was come to after arbitration had endured for four years, and the men, thinking that the time had come for a change, in the direction of the nine-hours system, gave notice to arbitrate the point, and a meeting of the board of arbitration was fixed to be held for legislation upon the subject. Mr. Burkitt, the secretary of the board, gave the usual notices to the different branches embraced in the movement; and the arbitrator, Mr. Kettle, together with certain of the masters and men, were present in the Quarter Sessions Court of the Town-hall, the use of which had been lent for the purpose by the mayor of the borough. It was then found that Mr. Lovatt, one of the principal employers, could not attend; and it further transpired that the notice to the bricklayers, though it had been left at their club-house, had not been called for, and that, therefore, the bricklayers were unrepresented. These causes combined to make an adjournment of the conference necessary. Before, however, the adjournment took place, some conversation ensued, in which the very great benefits that had resulted from arbitration in the Wolverhampton building trades were admitted by masters and men alike; and Mr. Kettle said that, in all his experience of arbitration, he had never known a case in which the men had not abided by the rules in the utmost possible good faith.

Walsell.—At a meeting of the operative carpenters and joiners, it was unanimously resolved to request the employers to concede the nine hours system. It was also resolved that the wages for day-work should be 6½d. per hour, and that overtime should be paid time and a half; and that during the winter season the men employed on buildings should be paid the same as those employed in the workshop.

Deddington.—A meeting of more than thirty of the principal employes of Messrs. Franklin, builders, has been held, to discuss the bours of labour on a Saturday, which have hitherto been from six a.m. until five p.m., the employes' feeling somewhat aggrieved that their time for cessation of labour is not at one o'clock on a Saturday, similarly to most of the large firms in Oxford and Banbury. After considerable discussion it was unanimously agreed that a deputation wait upon Messrs. Franklin, and urge them to agree to close their establishment like their neighbours, and this without any deduction on account of wages. It has since been understood that Messrs. Franklin have proposed that their employes working out of the town may leave off work on Saturdays at one o'clock, and those in the town at three o'clock, to commence the first Saturday in May. Messrs. Franklin's employes had a meeting, and consented to Messrs. Franklin's proposal.

Wednesday.—Messrs. Stevenson & Son, painters, decorators, &c., have made an unsolicited offer to the workmen in their employ of an advance of 2s. per week in their rate of wages, and a reduction in the hours of labour, viz., to leave work at two o'clock on Saturday, instead of four, to commence on the 1st of April. The offer was accepted.

Gloucester.—The United Trades' Committee of Masons, Bricklayers, Carpenters, Plasterers,

and Labourers have addressed a circular to the master builders and contractors of Gloucester and its vicinity, requesting them to adopt the nine-hour day's work, receiving the same amount of wages now received for sixty hours; and that this concession come into force on the first Monday in April in the present year.

Edinburgh.—The plasterers' labourers of Edinburgh came out on strike, owing to the refusal of their employers to grant their demand of 2s. per week on their pay. The strike is general in the city so far as the labourers are concerned; and the master plasterers, who explain that only ten weeks ago they voluntarily advanced the labourers' wages 2s. weekly, and that now a similar advance is asked, are apparently determined not to give way. The late advance spoken of by the masters raised the rate of the labourers' wages, for thirty-nine hours' work, to 11. weekly—the skilled labour of the plasterers for the same time being paid at 11. 2s. 9d.

Glasgow.—A great strike lately appeared imminent in the ship-building and engineering trades on the Clyde. A mass meeting of the workmen, at which from 10,000 to 12,000 were present, had been held, to consider the terms of compromise offered by the masters, namely, a reduction of the working hours to fifty-four per week, and an increase of wages to the extent of 5 per cent. Delegates from the various establishments reported that, except in one case, the men had decided to reject the terms offered by the masters, and ultimately the meeting resolved, all but unanimously, to adhere to the original demand for a reduction of hours to fifty-one per week, with an increase in the rate of wages. The men employed at one of the shipbuilding establishments had already gone out on strike, when the masters came to an arrangement with the men, virtually agreeing to the nine-hours system.

Wantage.—The first really useful advantage of the nine-hour day's work seems to have been taken at Wantage. The adoption of the nine hours in this town by Messrs. Gibbons, and by Challoy by Messrs. Nalder, has given their numerous employes much spare time; hence the necessity of establishing classes by which improvement of the mind may be obtained, has been taken into consideration. The town-hall has been completely filled with a most attentive audience, composed for the most part of mechanics and artisans, to hear a lecture by Mr. Buckmaster, who insisted that scientific knowledge was indispensable to the artisan and mechanic in pursuit of their respective callings. The lecturer illustrated some of the more humorous conversations which he had had with those who considered themselves perfectly masters of their work. Classes will be formed as soon as the necessary arrangements can be made.

A NEAT INSCRIPTION.

The chancel of Whittingham Church, Northumberland, lately rebuilt from the designs of Mr. F. R. Wilson, is now adorned with the following inscription by Lord Ravensworth, incised upon a brass plate:—

Cancelum
Hujus veteris ecclesie
Fictate majorum extractum
Receptorum manu infeliciter reparatum
Hecarius Thomas Baro de Ravensworth
In honorem DEI
Sumptibus suis restitutum curavit
A.D. MDCCCLXXI.

SCHOOL PLANS: LONDON SCHOOL BOARD.

The sub-committee on school plans state in their report that the best number for a class is 30, and that the number ought in no case to exceed 40. The schools (except the infant school) should be arranged or graded according to the Government standards.

When a section in any school belonging to one standard numbers sixty children it may be conveniently divided into two classes, for each of which a class-room should be provided, but so that the two class-rooms may be thrown into one for the use of the whole section collectively when required, care being taken that the partition between the two rooms be such as to exclude or sufficiently to deaden in each room the sound from the other. In graded schools the area of the class-rooms should be calculated at nine square feet per scholar. The total area for general school and class-rooms together should be on the scale of ten square feet per scholar. The gallery in the general school-room should be constructed for two-thirds of the whole number of scholars in any group, or for fewer than 1,000 children, the senior schools for boys and girls separately would be too small. Therefore, in groups intended for less than 1,000, the departments should be three only,—infants', boys', and girls'. The majority of the com-

mittee suggest that in a group of schools intended for 1,000 or more there should be four departments—namely, infants, junior mixed, senior boys, and senior girls. After illustrating the principle of division recommended, the committee suggest plans for the arrangement of infant schools, adding that the area of the general school-room and of the class-rooms together in infant schools should contain in all cases not less than nine square feet per scholar. In all the graded schools of the Board, that is, in all besides the infant schools, there should be for each separate school department a general school-room, the area of which is calculated on the scale of four square feet for every scholar, and four class-rooms in two pairs, one pair for the use of each section or standard, and each pair capable of being thrown into one room—the area of each class-room to be calculated on the scale of nine square feet for every scholar in the class, and the number in each class to be 30, 35, or 40, according to the numerical unit adopted for the school department.

PROFESSIONAL CHARGES.

Sir.—The Conference Committee on Professional Charges has issued a proof schedule of charges, containing certain suggested modifications in the R.E.B.A. scale published in 1862.

As the object of the committee to avail themselves of the opinion of architects generally before preparing the schedule for presentation at the next Conference, will you allow me, through the medium of your journal, to inform those architects who are not members of the Institute, the Association, or other professional societies (who will receive copies through their own societies) that an application here a copy of the schedule will be sent to them.

J. DOUGLASS MATHEWS, Acting Secretary.
9, Conduit-street.

ST. PAUL'S.

The attempt at illuminating the dome of St. Paul's on Tuesday was a failure, as usual; and, in order to prevent failures on future occasions, it would be as well to try experiments at once, so as to be prepared for such occasions; and the experiment I would propose would be to place a powerful electric light in the topmost story of each of the west towers, and on the summit of the dome of St. Paul's School reflecting upon the dome. Additional lights, if necessary, and the effectual might be placed on the turrets of St. Austin's, Christ's Church, and St. Mary Magdalen's, Fish-street, all directed towards the same object.

W. S.

THE PUGIN TRAVELLING STUDENTSHIP.

From the six candidates who submitted drawings and testimonials in competition for the Pugin Travelling Studentship of 1872, the Council of the Institute have elected Mr. John Sulman, of Ashbarton-road, Addiscombe, subject to the usual conditions prescribed in the Pugin deed of trust.

The drawings of Mr. Edwin J. Munt were considered next in order of merit, and deserving of honourable mention.

LIGHTNING DISCHARGES.

Sir.—In an article, inserted in the *Builder* (No. 1512), read at a meeting of the Manchester Literary and Philosophical Society, on the above subject, in accounting for the occasionally destructive effect of lightning in buildings supposed to be protected by lightning-conductors, the following passage occurs:—"It is not surprising that atmospheric electricity, of a tension sufficient to strike through a stratum of several hundred yards thick, should find an easier path to the earth by leaping through a few feet of air or stone to a great system of gas and water mains, extending in large towns for miles, than by the short line of metal extended in the ground which forms the usual termination of a lightning-conductor." This statement is a plausible method of accounting for some of the disasters which have occurred from lightning discharges, when considered in conjunction with some of the accompanying circumstances, in observed cases. We cannot dispute facts. But it may be asked, How about the element of time? for electricity, quickly as it travels, takes time to do so. If the conductor has been of sufficient capacity in the upper part of its length to receive and convey the electric fluid, without injury to the building, why should we suppose that it should, for any reason whatever, leave the conductor, already conveying it, in order to strike through "a few feet of air or stone." Unless, indeed, the electric fluid be supposed, if we may so speak, to have a preconceived knowledge of the comparatively greater difficulty of its course, if it continue its passage along the conductor. The writer scarcely considers that any supposed previous electric condition, by induction or otherwise, of "the water and gas

mains" affords a sufficient reply to the objection here brought forward, so long as the conductor is, from its material and size, of sufficient capacity to convey the current.

The practical value of the suggestions made by the writer of the paper in question, I do not at all wish to dispute.

W. S.

SCHOOL BOARDS.

Bridgwater.—The School Board have received estimates for the proposed new schools at East-over from builders who had been invited to furnish them. The highest estimate amounted to 2,500l., the next figure was 1,700l., and the other estimates amounted to 1,580l., 1,350l., 1,320l., and 1,280l. respectively. The plans were examined in detail, but the consideration of them was adjourned.

Caterham, Surrey.—Mr. Richard Martin, of Caterham, has been appointed architect to the Caterham School Board.

CHURCH-BUILDING NEWS.

Leeds.—The Church of St. Luke, Beoston-hill, has been consecrated. This new structure has been erected from the designs of Messrs. Adams & Kelly, of Leeds. It is built of stone. The style adopted is the Gothic of the thirteenth century. There is a clearstoreyed nave, with north and south aisles, a chancel with aisle on the north side, and organ-chamber and vestry on the other side. The foundations have been laid for a tower and spire. The windows of the aisles are coupled, and have lancet heads; those in the clearstorey have tracery heads; the east window is a five-light one, with tracery, and is filled in with stained glass, the gift of Mrs. Bescock; and at the west end there are three-light windows, with a triple light surmounting. The roof of the nave is open to the apex. Interiorly, the total length of the church is 110 ft. 6 in., the width is 47 ft. 6 in., and the height from floor to ridge is 52 ft. The seats are free and unappropriated, and afford accommodation to 700. The total cost has been 3,150l. Messrs. Weatherley & Rymer, of York, were the contractors.

East Claydon.—The church at East Claydon, which has for years been in a state of dilapidation and ruin, has been restored, as a mark of respect to the rector of the parish. The church has undergone a transformation, both externally and internally; the only eyesore now being the tower, but this, it is hoped, the inhabitants themselves will, before long, place in a state of decent repair. A new carved oak porch replaces a very unpretending erection of brick and plaster, which comprised both the porch and vestry. The walls have been almost entirely restored, being copied as nearly as possible from the old. The parapet is new, and is of Dulton stone; all the old dressings have been restored, assimilating to the old. The earth has been lowered to the original foundation line, and an underdrain has been inserted to keep the foundation dry. The cost of restoring the body of the church has been borne by the subscriptions to the testimonial fund; and the chancel by Sir H. Verney, bart., M.P. One window on the north side of the chancel was perfect, and the others were copied from it. The east window is new; it is copied from the old one, and is the gift of the Rev. W. F. Fremantle; it is said this window will, at some future time, be fitted with stained glass. The roof has been raised 2 ft. 6 in., in order to place the windows in their former position, and has been restored with new oak panelling, and moulded and carved rails. The floor has been raised to its former level, and paved with Godwin's encaustic tiles. A sedilia has been formed in the south window of the sanctuary, and a credence in the north; the latter the architect has designed from two stones found embodied in the walls. The new prayer-desk is from a design by Mr. G. G. Scott. The doorway formerly existing in the west end of the north wall is re-used for the door leading to the vestry, which forms the eastern end of the north aisle. The roof is entirely of oak, of the Decorated period, with moulded beams, carved braces, and moulded rafters. The seats are entirely of wainscot. The roof of the nave has been raised 2 ft., to clear it from the windows. The arch has been restored in its own material. All the windows and internal dressings have been restored with stone to match the old. The original level of the floor, which is paved with black and red tiles, has been retained. The

whole of the interior of the tower, as far as the belfry floor, has been restored with new doors, new glazing, and new belfry floor on stone corbels. In the chapel there remains a portion of the church, evidently of a much earlier period than any other part of the building. The work has been under the superintendence of Mr. Hannaford; the builders were Messrs. Mansfield & Booth, Buckingham. The sum subscribed for the purpose of restoration is about 1,700l.

Sutton Coldfield.—Measures are now being taken for the restoration and enlargement of this church; plans for the purpose having been prepared by Mr. Thomason, architect, Birmingham. The church very much needs the proposed restoration. It consists of tower, nave, north and south aisles, and chancel, with two side chapels, built by Bishop Vesey, the great benefactor of Sutton. At present the tower (blocked off from the nave) is used as a vestry; heavy galleries disfigure the edifice; and the body of the church and the galleries are filled with high square pews—of the densest Georgian type,—so constructed as to occupy the largest possible space, and to afford the least possible room for the congregation. These pews ought to give accommodation to 700 persons; but, from their awkwardness of arrangement, they do not give sitting space for more than 450 persons. It is proposed to remodel the galleries, to add a second north aisle and vestry, to open the tower into the body of the church (so as to serve for an entrance and a baptistery), and to replace the pews throughout by open seats. In this way accommodation will be made for a total of about 1,000l. The cost of the intended improvements will be 2,500l., of which about 1,100l. are already offered.

Langport.—A public meeting has been held in furtherance of the restoration of St. Mary's Church, Huish Episcopi. The chair was taken by Capt. Stuckey. It was agreed to confine the renovation to the body of the church, the holders of the rectorial tithes being liable for the repairs of the chancel. A new roof will be required to the south transept, and that of the north, which is now of order, requires considerable repairs. A new vestry is also needed, the present room being almost useless, the fire which occurred a short time since having nearly destroyed it. To carry out this work of reparation, it was considered that 1,200l. would be required; and it was resolved that the landowners and inhabitants should be at once appealed to for assistance. The chairman announced that nearly 800l. had already been promised. A report on the state of the structure, and the work necessary to be done for its complete restoration, prepared some time ago by Mr. B. Ferrey, F.S.A., the diocesan architect, was read, and it was agreed that his assistance should be again sought, in order that specifications for the work might be immediately prepared.

Woodstock.—The church of St. Mary, Glympton, has been reopened, after considerable improvements, both in the church and chancel, under the superintendence of Mr. Street. The expense has been chiefly defrayed by Mr. H. Barnett, M.P., the patron of the living, and by the Rev. C. W. M. Bartholomew, the rector, aided by contributions. Four new windows, of Geometrical character, replace the very plain openings which had lighted the church, and a new roof has been placed on the chancel, and crosses on the east end both of the nave and of the chancel. A porch and vestry have also been built. A new altar has been presented. Plain stalls for the choir have been provided, and the chancel throughout has been laid with encaustic tiles. The east window, presented by the family in memory of the late George Henry Barnett, of Glympton Park, is of stained glass, by Clayton & Bell, representing the Crucifixion in the central light, and portions of our Lord's history, in connexion with the Virgin Mary, to whom the church is dedicated, in the side lights, with our Lord in glory in the apex.

Southampton.—The restoration of St. Michael's Church is now being pushed forward with all possible haste, the committee being in hopes that the work which they contemplate executing at present may be completed by Easter in order for the church to be then re-opened. The roofs of the aisles have been strengthened, and the whole of the pews and galleries removed; the aisles will be open from end to end, and not blocked up so much as formerly. The old roundabout staircase to the belfry and tower, which previously occupied so much room, has been done away with, and a circular one substituted, and placed in a much more advantageous position. The

flooring of the church will not be quite so high as formerly, the original level being taken, and the seats are to be open and, according to the plans, capitally arranged, while the alterations will give a better view from the interior of the east window and the altar. The work is being executed by Mr. H. I. Saunders, builder, of London.

Hanley Castle.—The chief stone of a new church has been laid here. The new edifice is to be a Chapel of Ease for the parish of Hanley, and has been in course of erection since the month of November last. The sole cost of the church has been undertaken by Mr. Samuel Martin, of Catterall, in the parish of Hanley Castle, and formerly of Liverpool, and the expense of the work is estimated at 5,000l. The site of the edifice is near to the Hanley-road, on land given by Sir E. A. H. Lechmere, bart. The old school church is situate at a distance of half a mile from the new church, and it has long been found to be quite inadequate to accommodate all who wished to attend the service. The new church is to be dedicated to St. Gabriel. The architect is Mr. George Gilbert Scott, and the builder is Mr. Wm. Porter, of Malvern Wells; Mr. Jas. Burlison is clerk of the works. The new edifice will be in the Pointed Gothic style of architecture, and will consist of body, tower, and spire, with nave and aisles. It is being built of Cradley stone, with Bath stone dressings, lined with brick. The walls are supported with stone buttresses. The tower is on the north-east side of the church. The entrances are on the west and north-west, and there is another entrance on the east side of the tower to the vestry and belfry, which will be constructed to accommodate a peal of six bells. The east window will have five lights, filled in with tracery. The windows in the aisles are double-lighted, with simple Gothic tracery in the head, and above them, in the clearstorey, there will be placed cinquefoil lights. The roof will be steep, and covered with slate. An ornamental cross will be fixed on the east and west points of the ridge. The spire and tower will consist of three stories, and the total height of tower and spire will be 124 ft. In the interior there will be an open roof composed of stained deal. The church is divided into nave, aisles, and chancels. The seats will be open, with sloping backs, and made of pitch pine. The memorial stone is in the base of the north-east pier of the chancel arch. The floor will be of deal, upon oak sleepers; but the aisles will be laid with encaustic tiles. The church will be heated with hot air. The building, it is expected, will be completed before the close of the present year. It is distant about two miles and a half from Malvern Wells. It is to accommodate 420 persons.

Penn.—The parish church of Penn, says the *Wolverhampton Chronicle*, has been re-opened, after being closed some months for restoration, enlargement, and beautification. In the way of enlargement there were difficulties, owing to the want of space, the site being hemmed in by roads, the only plan available being to build eastward. Even this was attended with difficulty, as well as expense, as the ground rose rapidly close behind the old chancel. A sufficient quantity of ground having, however, been cleared, the old chancel was removed, and the new work substituted consists of two new bays added to the nave, nearly doubling its length, and affording accommodation for about 150, and an entirely new chancel and chancel aisle, the dimensions of the chancel being 32 ft. long by 16 ft. wide. The material employed is Bromsgrove stone, and the interior walls of the chancel and chancel aisle are lined with stone from the same quarry. The roof is open timbered, and executed in pitch pine; and the floor of the chancel is laid with encaustic tiles, from Longwardine. The prayer-desks, and the seats for the choir (in the chancel) are new, carried out in oak, carved, and some seats for children, placed in the chancel aisle, are of pitch pine. The pulpit has been transposed from the north to the south side, where it has been fixed on a stone base. The chancel is separated from the chancel aisle by an arcade of three ornamented arches, and it is approached by four steps from the nave, the altar space being elevated four steps above the floor of the chancel. The east window of the old chancel, which was filled with stained glass, at the expense of the late Mr. W. H. Sparrow, has been erected in the chancel aisle, and in its place now appears a window of five lights, filled with painted glass, the gift of the same gentleman's daughters, as a memorial of their father. Mr. Preedy, of London, supplied the window.

One of the principal ornaments of the chancel is a reredos, the gift of Miss Sparrow, and executed in alabaster (partly found in the church in the course of the excavation) by Bell & Allmand, of London, according to designs by the architect. The reredos is inlaid with glass mosaic work, the centre tablet representing the cross, and the tablets on either side corn and the vine (typical of the bread and wine), and the emblems of the evangelists. Miss Sparrow has also presented a brass lectern (by Hardman, of Birmingham), and an iron screen, which separates the chancel from the chancel aisle. The altar-rail, also of ornamental ironwork, is the gift of Mrs. Mapleton, wife of a former curate of the parish. At the east end of the north aisle provision is made for a new organ, which is in course of building by Walker, of London. The church will in future be warmed by a new apparatus by Blakenore, of Wednesbury, introduced in substitution for stoves. In addition to the entirely new part of the work, the old portion of the church has been put in good repair. The whole has been re-floored, the roof has been boarded and felted, to correspond with the new roof, and re-tiled, and in a niche over the doorway of the south aisle a figure has been placed of St. Bartholomew, to whom the church is dedicated. Mr. Paley, of Lancaster, brother of the vicar, was the architect, and the contractors were Messrs. G. & P. Higham, of Wolverhampton. The outlay was about 3,000*l.*, of which 400*l.* were deficient on the day of the reopening.

Gelling.—The parish church has been reopened. This old freestone structure has been renovated and restored. The roof was dilapidated, the plaster and whitewash which had been daubed over the sedilia, piscina, and arches were water-stained, the walls were bulging in and out, the woodwork was grimy, and the whole interior was damp, dirty, and gloomy. The lofty steeple is among the very few in England which hugle out in the middle. The zig-zag walls which had for years been getting more and more out of the perpendicular, have been put into line, the stone scraped and made to bear some relation to the quarry from which it had been brought, the flooring has been restored, new modern seats have been supplied, and a light and cheerful look has been imparted where a gloomy and depressing aspect before existed. New open seats and chairs are substituted for the old ones, and one of Whitaker & Constantine's new convoluted stoves has been placed beneath the floor. In the chancel, Mr. Forester, the rector, has, at considerable expenditure, carried out his plans of restoration completely. The freestone, sedilia, and piscina, with their mouldings and arches, have been cleared of the repeated coatings of lime-wash, and restored to their original appearance; and the same may be said of the walls and windows. The floor within the altar-rails has been laid with tessellated tiles from Brossley, of a pattern which presents a quiet and sober combination of colours. An entirely new roof has replaced the old one at its original pitch, and the ceiling is an azure, or deep sky-blue, on which the sun, the moon, the planets, and various constellations are depicted in gold or some suitable colours.

DISSENTING CHURCH-BUILDING NEWS.

Tunbridge Wells.—The Congregational church has been reopened for divine worship, after having been closed about three months, during which alterations and improvements have been made. The architect was Mr. Pertwell, of Chelmsford, and the contractors Messrs. Strange & Sons, of Tunbridge Wells. The contract was taken for 875*l.*; but, in addition to what was originally contemplated, it has been found necessary to execute some repairs. The repewing (the benches being stained and varnished), the lighting, the ventilation, and the heating, together with a renovation of the whole of the interior, have been carried out. The old platform has given way to a new one. A new organ will be shortly erected by Messrs. Beddington, of Soho, at the cost of 240*l.*

Aboston.—The Wesleyan New Chapel, the building of which was commenced in August last year, has been opened for divine worship. The edifice has been erected on land belonging to the trustees in front of the old chapel, a portion of which was taken down to increase the size of the new building. The old chapel is now used as a Sunday-school. The new chapel is a Gothic building, 45 ft. long by 24 ft. wide on the exterior; the height from the ground level to

the apex of the gable being 27 ft. The external elevations of the chapel and porch are of pressed red bricks from Spondon, relieved with Coxbeech stone-dressings to the windows, doors, gables, and buttresses. The roof is covered with Bangor slates, with ornamental ridge tiles. The main timbers of the roof being exposed, are wrought, stained, and varnished, with white plaster ceiling, and the walls are stuccoed and lined in imitation of stonework. The chapel is heated by one of Johnson's patent Gill stoves fixed underground, with circulating air-flues, procured from the Derwent Foundry, Derby. The seats, which are stained and varnished, are all uniform in design, of the bench style, with reclining backs and stall-ends. The chapel is seated for about 160 persons. The pulpit is of pitch pine and deal. The space for the communion is raised above the level of the main floor, and has a moulded railing, supported by light cast-iron balusters, painted blue, picked out with gold, not a vermillion, and enclosing a marble communion-table.

Brighouse.—Baillife Bridge, situated about midway between Lightcliffe on the west, Wike on the east, and Brighouse on the south, has been left with scanty accommodation for religious service. The Methodist New Connexion proposed to put up a new chapel. The ground has been purchased at a cost of about 80*l.*, and the new building is from plans by Mr. J. W. Hellivell, of Brighouse, architect. The edifice is to seat about 400, and the estimated cost is about 800*l.* The building will include schools and other necessary accommodation.

Frodsham.—The foundation-stone of a new Wesleyan Chapel has been laid at Frodsham. Mr. Thomas Hazlehurst had offered to build a new chapel at his own expense. This offer was accepted by the Frodsham Wesleyans, and Mr. Charles Hazlehurst, a brother of the donor of the chapel, gave them a piece of land in Warrington-road for a site. According to the designs, furnished by Mr. C. O. Ellison, of Liverpool, the chapel will be Gothic, but treated after the French style of architecture, and built of the white stone of the district. In the front there will be a doorway in the centre, with polished granite shafts, and moulded and carved arch, with a five-light window above, nearly filling the front gable. At each side there will be five double windows, with tracered heads, and at one corner a tower and spire, 120 ft. high, with lights and projecting pinnacles, each of the latter having polished granite shafts. Inside, the roof and ceiling are to be entirely of pitch-pine, and iron columns will support the galleries and roof. These columns will have capitals of hammered iron. The principals are to be of moulded pitch-pine, with carvings at the intersections. There will be a gallery on three sides of the chapel, and at the pulpit end will be the orchestra, with pine and ornamental glass screen. The whole of the woodwork will be pitch-pine, and the ends of the open stalls will be carved. It is intended to fill the whole of the windows with stained glass. The chapel inside is 56 ft. long by 44 ft. wide, and will seat 600 persons. The height of the ceiling is 36 ft. above which there will be a ventilating chamber the full length of the chapel, with ornamental perforations in the ceiling. Heat will be supplied by means of hot air. In addition to the chapel there will be a lecture-room at one side of the chapel, 35 ft. by 24 ft., and four vestries. The estimated cost of the work is about 6,000*l.* The builders are Messrs. White & Son, of Runcorn. The approach to the chapel will be laid out with shrubs and trees. It is also the intention of the Wesleyans to build a house adjoining the chapel for the accommodation of their minister, at a cost of from 800*l.* to 1,000*l.*

Hull.—A new Primitive Methodist Chapel is immediately to be commenced in Williamson-street, Hedon-road, Hull. The ground-plan contains the chapel, 85 ft. by 55 ft.; main school-room, 50 ft. by 30 ft.; two infants' schools; and a kitchen, each 24 ft. by 14 ft. The plan of the first floor shows the gallery in the chapel, which takes the entire round of the building. At the back of the chapel and above the school buildings are shown thirteen large class-rooms. The seating in the chapel will all be carved and struck from one centre. The gallery fronts will be light and elegant in design, being white and gold, and supplied with ornamental cast-iron work, backed with crimson cloth. The whole of the buildings, with the exception of the kitchen, will be heated with hot water in lieu of fires. The style of architecture adopted is Italian; the estimated cost being 4,000*l.*, exclusive of heating apparatus. The

architect engaged is Mr. Frank N. Pettingell, of Hull and London.

Stainland.—The various works in connexion with the erection of the new Congregational chapel at Holywell-green, have been let by tender;—Masons' work, to Messrs. Benjamin Edwards & Son, Holywell-green; joiners' work, Mr. Joseph Hodgson, Holywell-green; slaters' Hill & Nelson, Batley; plaster work, Messrs. Bancroft & Son, Halifax; plumbers' work, Mr. Joseph Aspinall, Eland; glaziers' work, Mr. J. Boer, Leeds; painters' work, Messrs. E. & B. Briggs, Low Moor; ironwork and gasfitting, Mr. J. M. Dovey, Manchester; granite and marble, Messrs. G. & J. Fenning, London; carving, Messrs. Walker & Emloy, Gateshead; warming apparatus, Mr. J. W. Lewis, Newcastle-on-Tyne. The total amount of the tenders is about 6,000*l.* The foundations are already in. The total cost will be defrayed by Messrs. John Shaw & Sons, Brookroyd Mills, Holywell-green. The tower, with its spire, rising to the height of 120 ft., will be seen for miles round. The design comprises— nave, 74 ft. by 28 ft. 6 in.; aisles, 58 ft. 6 in. by 10 ft. 8 in.; choir, 18 ft. by 14 ft. 3 in.; two vestries in the rear, and two porches in front, formed by the tower on one side, and the staircase on the other. The present accommodation is designed for 600; but with the addition of transepts, for which the building is arranged, 400 more sittings can be provided. The pulpit will be of Caen stone. The windows will be glazed with cathedral tinted glass; the lobbies and margins will be paved with mosaic tiles.

Masbro'.—The corner-stone of a new Wesleyan Reform Chapel and School-room has been laid at Masbro'. The building, which will be in the plain Italian style of architecture, and calculated to seat about 400 persons, will be finished, it is expected, by the 1st of May next. The basement floor will be a school-room 11 ft. in height, above which will be the chapel. The whole building will be surrounded by walls and iron fencing. The chapel will be 20 ft. high in the interior, and instead of the usual pulpit a platform will be constructed. The whole of the works connected with the erection of the building will, it is estimated, entail an outlay of 800*l.* The architect is Mr. John Dodd, of Masbro'; the contractors for the joiners' and masons' work being Mr. Charles Ripley and Mr. Gardiner respectively.

SCHOOL-BUILDING NEWS.

Stoke-new-Guildford.—This school, which is situated at Bell-fields, and which has been in course of erection for the last six months, is opened. The structure consists of a school-room, 52 ft. by 20 ft., a class-room, 20 ft. by 16 ft., and a small open porch, from which the school and class rooms are entered. The materials employed are yellow stock bricks, relieved with hands and dressings of red and black bricks. The arches over the doors and windows are also in red and black. At the west end is a small gable with two openings in it, in one of which is hung the bell. The roof is covered with plain and ornamental tiles, in hands of red and dark tiles alternately. The schoolroom is lighted by a large three-light window at each end, and by seven two-light windows. Above the end windows are smaller ones, opening with lines and pulleys for ventilation, which is also secured by numerous gratings at the floor level. The school and class rooms are warmed by open fires, the stoves and chimney-pieces being hold, but plain. In the class-room is a gallery for the infants, and the school-room is fitted with desks, which by a mechanical arrangement may be converted into seats with backs for use at lectures, &c. The school will accommodate about 170 children. In the rear of the main building are the closets, fitted with Moule's patent carth apparatus. The works have been carried out by Messrs. Swayne & Sons, builders, of Guildford, Mr. Edward Ward Lower being the architect. The amount of contract, we understand, was about 630*l.*, which included fittings.

Nell Gwyn's House at Highgate an Hospital.—A medical dispensary reports that a convalescent hospital in connexion with St. Bartholomew's, is to be erected at Highgate, and that the old mansion in which Nell Gwyn lived, situated behind the St. Pancras Infirmary, and opposite to the Highgate branch of the hospital for sick children, has been presented to the hospital, and will be fitted up to accommodate forty or fifty patients.

VARIORUM.

THE *Leisure Hour* informs the learned Edinburgh Professor who objected to Addison's creation hymn, "The spacious firmament on high," because it taught errors in science, that a new set of nursery rhymes are prepared, of which we give two specimen stanzas:—

"Twinkle, twinkle, solar star,
Now we've found out what you are,
When into the noonday sky,
We the spectroscope apply;"

and,—

"Little Jack Horner, of Latin no scorners,
In the second declension did spy,
How of nouns there are some
That ending in 'um'
Do not form the plural in 'i,'"

These are as good as the couplet of Tennyson in its improved form:—

"Every moment dies a man,
Every moment one is born;"

which must be thus written in order to bring the language into strict consistency with statistical science:—

"Every moment dies a man,
And one, one-sixteenth is born."

The new number of the *British Workman* (with two remarkably good engravings) reprints an interesting and suggestive story from Holmes's "Kind Words to all Classes," called "Ben Starkie's Strike for Less Wage and More Time."

—The Nation's Wave of Suspense in 1871

(Houston) gives in a tabular form a record of the critical illness of the Prince of Wales, with a conspectus of the bulletins issued by the physicians in attendance, and notices of contemporary and connected events.—Lockwood & Co. are about to publish a new "Quarterly" under the title of "Naval Science,"—a magazine intended to promote the improvement of naval architecture, marine engineering, stean navigation, and seamanship. It will be edited by Mr. E. J. Reed, C.B., the late Chief Constructor of the Navy.—The *Garden* speaks thus of the "rockwork" at the eastern end of the Serpentine:—"Not long ago the site of this was an ordinary steep bank shaded by trees, with an objectionable and watery hollow at its base. It was resolved to improve it by covering it with an extensive 'rockwork.' It is difficult to give an idea of what this is like, but numbers of our readers may have an opportunity of seeing it for themselves. Suppose a cottager, in some part of the country where cottagers display grotesque taste in their usually pretty little gardens, to be owner of a few barrowfuls of the rubbish of burnt bricks, cinders, &c., and to make of these and a little mortar a flat shapeless mass on the ground, with a bole in the middle to act as a sort of vase. Suppose the whole surface of the large bank in the park to be covered with a gigantic and hideous plaster of this kind, and a roundish bole here and there left to be filled with earth for the reception of plants, and the reader who has not an opportunity of seeing this scene will have some idea of what it is. We should hesitate to describe it were it not under the eye of everybody, as people might naturally conceive it incredible that such a course should be pursued in a public park on which vast sums of money are spent."

—The *Daily Telegraph*, in a leading article devoted to Sir Christopher Wren, thus comments on the small amount of interest in him displayed by his countrymen:—

"The critics are still in a rage because there are not extant more Shakespearian autographs and more copies of the first folio, hundreds of which were probably burnt in the vaults under St. Paul's, used by the booksellers for war-rooms,—because it has not yet been discovered why the poet bequeathed to his wife only the second best bed in his house, and because it has not been made clear what he did when he first went to London, and whether he did or did not take refuge in the metropolis to escape a quarter-session prosecution for stealing Sir Thomas Lucy's deer. There is no such anxiety among the countrymen of Sir Christopher Wren to ascertain what manner of man he may have been, that was the habit in which he lived, what were his likings and dislikes. That he was the King's surveyor-general of works, a fellow of the Royal Society, a distinguished Freemason; that only a scandalously mean pittance was allowed him as architect and superintendent of buildings in St. Paul's Cathedral; that from the beginning to the end of his undertaking he was shamefully baffled, and bullied by Boards of Commissioners and Cathedral Chapters, and was at last turned out of his employment to make room for an incompetent plasterer, are circumstances of which most cultivated persons have a more or less vague idea, but only a few have had a personal acquaintance. As to Sir Christopher in the flesh, a casual acquaintance with the print-shop windows, or the pages of illustrated dictionaries and books of biography, may remind us that he was a portly old man with a high perwig. But there were many portly gentlemen in perwigs during the Caroline period; and, casually glancing at his effigy, the architect of St. Paul's might very fairly pass muster for Sir William John Deane, or Sir John Deane, for the French poet, Boileau, or for Villiers, Duke of Buckingham, Nollekens, the sculptor, used to tell a

story of an ingenious print-seller in Soho, who, during the 'No Popery' agitation preceding the riots of 1780, furnished up an old plate of Sir Christopher, had another name engraved at the base, and sold the copies as portraits of Titus Oates, there being a great demand for pictures of the 'Protestant Martyr' just then among the serious classes. Altogether, the great Constructor has been allowed to linger, so far as his individuality is concerned, in obscurity as complete as that which envelops the private life of the famous grammarian, Lindley Murray, of whom the most that is known is that he was a valetudinarian American gentleman, who lived for five-and-thirty years on the ground-floor of a cottage near York, subsisting entirely on boiled mutton and turnips, and delivering interminable discourses on philology to young ladies in training to become governesses."

Miscellaneous.

Collapse of the Australian Meat Preserving Companies.

—Just as the demand for Australian cooked meat is being established in this country among the workhouses and the poor, there is risk of a failure in the supply. The establishment four years ago of meat preserving in Australia proved most advantageous to the pastoral and agricultural interests. Not only has the price of stock been arrested in its downward tendency, but the value of fat sheep and cattle, notwithstanding the large increase in their numbers, has improved to the extent of at least 25 per cent., a 60 lb. sheep being worth 2s. and a fat bullock 2l. more than in 1867, when the Melbourne Company first commenced operations. The present partial collapse of this important interest, the prospective winding up of some companies, and the temporarily suspended operations of others, are matters therefore of national importance. The principal cause of this wide-spread failure appears to have been that too many companies have been started. There are at the present time, or at any rate there were lately, twenty-six meat-preserving establishments at work in the various Australian colonies; Victoria having ten, Queensland seven, New Zealand five, New South Wales two, and South Australia two. Prejudices are not overcome in a few months, and notwithstanding the efforts of energetic persons interested in extending the demand for Australian preserved meats, there is still a very wide-spread prepossession amongst Englishmen and Scotsmen in favour of seeing and knowing what it is they are eating. In the case of several companies the whole of their available means were swallowed up in the expense of building. Thus the Australian, with a paid-up capital of 1,015l., spent upon premises no less than 10,930l.; and the Victoria, with 10,830l., contrived, notwithstanding the protests of the manager, to sink upon bricks and mortar no less a sum than 9,544l. Half a dozen companies might have succeeded where a large number have broken down. Strenuous efforts should be made to combat the prejudices against preserved meat in England.

The *Metropolis Water Act*.—The new *Metropolis Water Act*, providing for a constant supply, has come into operation, and it is now to be the duty of the water companies to see that every house is properly provided with fittings, and to enforce the conditions which will be sanctioned by the Secretary of State. The penalties for defective fittings are decisive, for not only is the defaulter liable to a fine of 5l., but the companies have power to cease the supply of water, and to report him to the nuisance authorities. If the provisions of the Act are not complied with as regards fittings, misuse of water, and undue consumption of it, the company supplying the water, without prejudice to any remedy against the defaulter, may cut off the service and cease to supply water so long as the injury remains, or is not remedied; and in every case of so cutting off or ceasing to supply, the company shall within twenty-four hours thereafter give to the nuisance authority, as defined by the Sanitary Act, 1866, notice thereof; and if the fittings are not repaired within the prescribed time, the house shall be a nuisance within the meaning of the 11th section and sections 12 to 19 inclusive, of the Nuisance Removal Act, 1855, and shall be deemed as unfit for human habitation.

The *City Markets*.—At its last meeting the Court of Common Council resumed the discussion on the proposition to enlarge the Smithfield Market, by the erection of a new building on the vacant site at the western end of the present structure. It was resolved, after a long debate, to adopt the recommendation of the Markets Committee in favour of providing further accommodation.

Newspaper Press Fund.—At the annual general meeting of the Newspaper Press Fund on the 21th ult., the report referred to the adoption of a new rule of the society, under which they are empowered to make grants to deserving members of the press not members of the fund, to an extent not exceeding 10 per cent. of the average annual amount of the donations in the preceding years. The grants by way of relief within the year amounted to 403l. 1s. 6d., the number of cases being twenty-five, of which four were applications under the new rule. Fifty new members have been elected during the year, the roll now comprising 262 members, of whom 178 are resident in London, and 84 in the provinces. The invested capital of the fund now amounts to 6,200l. The alteration in the rules should be an additional incentive to the public to assist in maintaining the prosperity of the fund. The retiring members of the committee, Messrs. C. V. Boys, H. C. Corbet, H. Findon, J. M. Le Sage, and C. Shaw, were re-elected. Mr. M'Rea, Mr. Goring, and Mr. Mackenzie were added to the committee; and the treasurer, Mr. Hyde Clarke; and the auditors, Messrs. D. M. Evans, W. Gladding, and C. R. Saunders, were re-elected.

Adulteration of Food and Drink.—A Bill has been introduced into the House of Commons by Mr. Muntz for the suppression of adulteration. It provides for the appointment of analysts in London by the City Commissioners of Sewers and the vestries and district boards; in the country by the Courts of Quarter Sessions and town councils. Inspectors of nuisances and other officers appointed by the local authorities may procure articles suspected to be adulterated and submit them to the public analyst, and upon obtaining a certificate from him stating that the articles are adulterated, may obtain a summons against the seller or adulterator. The penalty for adulterating articles of food, or drink, or drugs is to be for the first offence not exceeding 50l. and costs, and for a second offence imprisonment with hard labour for not more than six months. The penalty for selling adulterated articles is 20l. with costs, and after a second offence the magistrates may cause the offender's name and address to be published at his own expense in such way as may seem to them desirable. The expenses of executing the Act are to be paid out of the local rates. It is to be hoped the new analysts will be of more use than those appointed under a previous Act of Parliament.

New Public Halls, Glasgow.—There being some apprehension that a scheme which is to give to Glasgow a new suite of halls would require to be abandoned, a number of the leading townsmen, headed by the Lord Provost, have come forward, and at a cost of 28,500l., purchased the ground. It is proposed to abandon the Tontine and Insurance principle, at first adopted, and to proceed at once with the westerly portion of the building, which will in itself be complete, consisting of a great assembly and banqueting room in connexion with suites of smaller apartments. This hall will be so arranged as to be available as a Chamber Concert-room, capable of accommodating an audience of about 1,000. The proprietors of the ground will retain for five years, in the interests of the Public Hall Company, now to be newly organised, the portion necessary for a great Philharmonic Hall, which may at any time within that period be erected. Meanwhile, the present shareholders will be asked to retain the shares already taken up, so as to enable the scheme to be at once proceeded with.

Sanitary Condition of Dover.—The Local Government Board sent down an inspector to inquire into the sewage of the town; but it now appears that, the Town Council having complained about the Government outfalls here, the military authorities in turn found fault with the sewers of the corporation, and the investigation was held in consequence. The result of the inquiry has been to show that both the town and the military outfalls are in not quite as good a state as could be wished, and doubtless those of the garrison are much worse than the others; but fortunately the evils complained of have not been sufficiently serious to affect the health of the soldiers or the people.

St. Bridget's Church, Wavertree, Liverpool.—This church, which was designed by Mr. C. A. Heffer, architect, was opened on Tuesday, the 27th ult. A full description of it, with illustrations, will be found in our volume for last year, p. 544.

A Hale Old Labourer.—The *Preston Herald* says,—“There is now living in Preston, and working hard every day, a man whose like is not to be met with every day, named Frank Bradley. He was born at Drumbeg, in Ireland, in 1776, and is consequently ninety-six years old! Notwithstanding his advanced age, Bradley, as intimated, still works hard, and during the present week he might have been seen at the mill of Messrs. Leese, of Fyde-road, mounting a long ladder, and going three or four stories high with a hodful of bricks on his shoulder! He was twenty-two years old when the Irish Rebellion of last century took place. After serving in the army for fifty-four years, he has earned his livelihood as a bricklayer's labourer. Bradley is hale and hearty, has nearly all his teeth, has lost none of the hair of his head, and looks likely to live for years.

Illegal Projections.—Dr. Appleton, in the St. George's, Hanover-square, Vestry, moved, “that a return be prepared of the several cases of illegal projections made since the passing of the Metropolis Local Management Act, in which this Vestry has taken proceedings for the purpose of giving effect to the law, and of the costs incurred by so doing; and that a copy of the same be forwarded to the Metropolitan Board of Works, and their special attention be called to the large amount of money which the Vestry has expended in these proceedings, and the very unsatisfactory results, in order, if possible, to obtain more energetic action in such cases from their officers, or an alteration of the law to enable the Metropolitan Board of Works themselves to prosecute for neglect or defiance of their authority.” The motion was carried unanimously.

This New Park at Stepney.—The contractors of the Metropolitan Board are now engaged in converting Stepney-green, which is situated in the heart of the most crowded quarters of the east of London, into a public recreation-ground. It had fallen into a neglected condition, and its inclosure and adornment having become the subject of discussion at the Local Board, the Mile-end Vestry, an appeal was made to the Metropolitan Board. After a brief delay, the Metropolitan Board consented to contribute the whole cost,—about 3,000*l.*—of converting the fields into flower-gardens and recreation-ground. The lord of the manor of Steubunthe has granted Stepney-green for the free and perpetual use of the people, and, except in regard to the expenditure for inclosure and culture, this open space has been secured to the public without cost.

The Workmen at the Law Courts.—Messrs. Dore, the contractors for the foundations of the new Law Courts, provided their workmen, over 200 in number, the best opportunity of remembering Thanksgiving Day, by supplying them with a good dinner,—a substantial mode of practical thanksgiving which we hope has had many imitators. A large tent had been erected on the ground, and at two o'clock an array of roast and boiled joints of the best quality, with vegetables and beer in abundance, followed by plum-pudding, jellies, and creams, were displayed before the British navy, to which he did ample justice. An announcement that the day's holiday would not involve the loss of the day's pay was, as might be expected, appreciated.

This Thames Embankment.—Mr. Gladstone having stated that the sum proposed to be paid to the Government by the tenants at Whitehall, in consideration of their giving up their claim to the piece of vacant ground reclaimed was wholly inadequate to its value, Mr. W. H. Smith gave notice, amid cheers from both sides of the House, that he would, on the earliest possible day, again bring the subject under the notice of the House and submit a resolution. The motion he proposed to submit on the subject would be in this form,—“That in the opinion of this House it is the duty of her Majesty's Government to take the necessary steps to give effect to the recommendations of the Thames Embankment Committee of 1871.”

American Cars for English Tramways. The Lohdell Car-wheel Company, of Wilmington, Delaware, has shipped for New York seventy-six car-wheels to George Starbuck & Co., a large manufacturer of cars in Birkenhead. They are to be placed on cars to run on London tramways. This is the second shipment by this company to England.

The New Railway and Station Works from Loughborough-road to the Crystal Palace.—A new branch railway, together with a special station, is about to be constructed from the Loughborough-road station of the London, Chatham, and Dover Line to the High Level Line of that company's line near Denmark-hill, for the purpose of reducing the distance between Ludgate-hill and the Crystal Palace, and avoiding the detour and change of carriages at Brixton. The new line involves the destruction of much valuable property in the neighbourhood. Within the last few days the works on the new line have been commenced, by taking down a considerable number of houses and shops in Flaxman-road, near Coldharbour-lane.

Fall of a Warehouse in Maidstone.—A large warehouse, situated in St. Faith-street, had been let to a maltster, for storing grain, of which a considerable quantity was delivered, a large proportion of it loose. The building, however, seems not to have been sufficiently substantial for the purpose, for the front wall bulged out, and fell across the street, the floorings gave way, and the contents of the warehouse, mixed with bricks, planks, and rubbish, were scattered over the roadway. The loss will be very considerable, not only to the owner of the building, but to the proprietor of the grain.

Brickdust in Mortar.—With reference to a paragraph in your last as to brickdust mixed with lime and sand being used in Cuba and the Spanish dominions, I would say that forty or fifty years ago it was extensively used in this part of the kingdom (Hull), and was called “simmon,” or, as I think, in one of your early volumes, by the French name “ciment.” It was mixed with mortar for fence-walls, &c., and with lime and hair for outside plastering, repairing roofs, and chimneys. Cement has superseded it for plastering and walling, and black (or furnace) sand or blacksmith's ashes for pointing and repairing.—A BRICKLAYER.

New Coal Depot at Wandsworth.—In addition to the large and extensive coal depot which the Midland Railway Company recently erected and opened at Walworth, adjoining the London, Chatham, and Dover Company, they are now about to construct a similar establishment, adjoining the Wandsworth-road Station of the last-named company, and for that purpose they have just purchased ten acres of land, on which the intended depot is to be erected. The establishment at Walworth is one of the largest in the metropolis; but that about to be built at Wandsworth will be on a still more extensive scale.

A New Monster Line of Steamships.—It appears from advices just received from America that a new company (the Randal Steamer Company) has just been formed in New York, with a capital of 12,000,000 dollars, to build six steamers on a large scale, to run between Liverpool and New York in a much shorter time than is at present occupied by the steamships of the Inman and Cunard companies, and it is stated that the new line will have a mail subsidy from the United States Government. The tonnage of each vessel will be 8,000 tons.

Liverpool New Southern Hospital.—An official statement appears to the effect that of the 45,000*l.* required for the new hospital 32,000*l.* have already been contributed, leaving a balance of 13,000*l.* yet required to complete the work. To realise this amount the committee propose, by permission of the Liverpool Town Council, to hold a grand fancy fair and flower show in Sefton Park, during Whit sun week. The foundation-stone of the new building was laid on October 23rd, 1867, by the late Earl of Derby, and the early completion of the work is only delayed by the want of the remaining funds.

A Speculation.—It seems that when the College Wynd at Edinburgh was recently demolished under the powers of the City Improvement Trust, all the oak found in the houses that were pulled down was bought by one person. His object was to manufacture the wood into souvenirs of Sir Walter Scott. This, it seems, has been done, and in many of the shops in the city card-trays, paper-knives, and other articles, have made their appearance, bearing to be made of “Wood from Birnplace of Sir Walter Scott, College Wynd, Edinburgh.” The *Scotsman* says they are tastefully made.

Tillage by Steam.—Spring is coming on and the companies who, in different districts throughout the country, undertake tillage by steam, are preparing for another season of activity. The existence of these companies, the large amount of capital which they represent, to say nothing of their dividends, are satisfactory evidence that mechanical appliances driven by steam can be used with profit in the cultivation of the land. Ploughs of the present day would amaze a farmer of the last generation, particularly that ingenious implement which makes four furrows at once, and that other which digs or grubs as may be required.

First Walk of the Oxford Architectural Society.—The first walk this term has taken place, when Magdalen College was visited. The members and their friends, upwards of 150 in number, and among whom were many ladies, met, shortly after two o'clock, in the Hall, where they were received by Mr. Henderson, the vice-president. The Rev. Dr. Millard, vicar of Basingstoke, who was formerly one of the secretaries of the Society, accompanied the party over the College, after addressing them in the Hall.

State-Room to Prevent Sea Sickness.—A target in luxurious fittings of the White Star Company's steamer *Baltic* is a revolving state-room, which is said to be effectual as a preventive against sea sickness. This room is situated almost midships, and close to the bottom of the chief companion way, and is fitted upon “points” in such a manner that, no matter how the vessel rolls or pitches, those in their berths are always on a level. We should, think, however, that it cannot prevent upward and downward movement.

The East London Tabernacle.—This large building for religious purposes in the East of London has been opened for the use of the Baptist congregation under the pastorate of the Rev. A. G. Brown. The new Tabernacle, which will provide sitting accommodation for 3,000 persons, has been erected in Burdett-road, Bow, at a cost of about 12,000*l.* The frontage is nearly 114 ft. in length; the height, 60 ft., with a turret at each end; and the depth, 83 ft. The basement contains a school, or lecture-hall, 92 ft. by 64 ft., with class-rooms.

Park-lane Sewer.—It has been unexpectedly discovered that there is a second sewer in Park-lane, 5 in. or 6 in. above the basement of Gloucester House. It is stated that, although the newly-discovered sewer had been stopped up at both ends as unfit for use, houses still drain into it, and the sewage oozes into the house in question.

Value of City Land.—Two freehold houses were sold by auction, at the Mart, Tokenhouse-yard, last week, part of the estate of the late Mr. Edward Loseby. They had a frontage of 53 ft. to Bush-lane, Cannon-street, and of 14 ft. to Cross-lane, embraced 2,900 square feet of land, and were sold for 10,250*l.*, to Alderman Truscott.

Engraving by Jets of Sand.—Mr. Morse, of the United States, now obtains fine effects, it is said, by simply allowing corundum or emery to fall through a tube of the length of 8 ft. on to the prepared surface. By this very singular means all the exposed parts of the glass or silver plate are etched in the most perfect manner.

Sweeping the Pavements.—The Chamberwell Vestry have considered a proposition in favour of sweeping the footpaths at the public cost. It was objected that the expense would be too great, and that the ratepayers would not be willing to pay. Ultimately the motion was rejected.

TENDERS

For additions to Sudbury Hall, near Harrow, to adapt it for a Girls' Industrial Home, for Mr. Williams, Messrs. Fishers & Brock, architects:—

Scrivener & White	23,183 0 0
Perry & Co.	3,160 0 0
Carter & Son	2,981 0 0
Wood	2,837 0 0
Newman & Mann	2,415 0 0
Manley & Rogers	2,757 0 0
Haynes	2,597 0 0

For building ten cottages, rear of Angel-road, Lower Edmonton, for Mr. Rayham, Mr. T. J. Hill, architect:—

Fairhead	22,195 0 0
Bayes & Ramage	1,907 0 0
.....	1,828 0 0
Childs	1,850 0 0
Lizell	1,423 0 0
Rust & Brown	1,490 0 0

For the erection of an oak palisade fencing, at the new cemetery, Charlton, for the Charlton Burial Board:—

Table with 2 columns: Item and Amount. Includes Wood (£318 15 3), Bays and Ranges (375 0 0), Bown (202 8 0), Langton (292 8 0), Fetham (257 5 6), Hill & Son (280 4 0), Woodcock (27 15 0), Tasker (268 9 2), Richardson (253 3 5), Marshall (accepted) (298 13 6), Pett (208 4 0).

For building two villa residences, at Enfield. Mr. T. J. Hill, architect:—

Table with 2 columns: Item and Amount. Includes Ward (£993 0 0), Bays and Ranges (375 0 0), Patman (849 0 0), Fairhead (805 0 0), Chads (812 0 0), Rist & Brown (575 0 0).

For additions and alterations to Brunswick Cottage, Upper Sydenham. Mr. C. F. Jones, architect:—

Table with 2 columns: Item and Amount. Includes Pawley (£457 0 0), Staines & Son (438 0 0), Bricker (347 0 0).

For bricklayers', tilers', plasterers', and other works, for proposed house at Caterham. Mr. R. Martin, architect. Quantities supplied by Mr. F. Sparrow:—

Table with 2 columns: Item and Amount. Includes Hunter (£842 0 0).

For carpenters' and joiners' work, at same house:—

Table with 2 columns: Item and Amount. Includes Baker (£429 0 0), Serveney (412 0 0), Bridgman, Nathal, & West (383 0 0), Simons (367 0 0).

For the sewing of Malpas:—

Table with 2 columns: Item and Amount. Includes Lee (£1,059 0 0), Carlisle (988 6 8), Coker, Jun. (850 2 9), Huxley (883 0 0), Walker (813 0 0), Bugbrin (789 0 0), Hoops (accepted) (720 17 5).

For part rebuilding and alterations, for Messrs. Dawson, Brothers, City-road. Mr. James Harrison, architect:—

Table with 2 columns: Item and Amount. Includes Emor (£1,130 0 0), Little (1,129 0 0), Houshal (1,120 0 0), Paak (1,085 0 0), Browne & Robinson (1,065 0 0).

For the erection of three six-room dwelling-houses, Crown-street, Brighton, for Mr. J. D. Bradley. Mr. W. W. Eldridge, architect. Quantities supplied:—

Table with 2 columns: Item and Amount. Includes Barnes (£865 0 0), Blackmore & Howard (675 0 0), Holloway & Son (620 0 0), Lockyer (550 0 0), Reynolds (455 0 0).

For redressing the fronts of Nos. 130 to 170 (even numbers only), Marylebone-road, including new party fence, and front fence walls, &c., to Nos. 174 to 204 (even numbers only), Marylebone-road, for Lord Portman:—

Table with 2 columns: Item and Amount. Includes Simpson & Son (£3,680 0 0), Browne & Robinson (3,650 0 0), Brown (3,300 0 0), Phillips & Son (3,295 0 0), Harris & Sons (3,118 0 0), Bird (2,981 0 0), Longmire & Burgo (2,870 0 0).

TO CORRESPONDENTS.

Subscriber (there are such tables in Transient's "Civil Engineer's Pocket Book," added recently in one page)—J. H.—F. M.—W. G.—J. T. R. G.—Practical Engineer.—B. H.—L. & N.—D. L.—A. F.—J. W.—T. J. H.—F. S.—B. F.—T. P. W.—A. W. M.—S. & Son.—R. W. H.—A. R.—J. H.—T. G.—Mr. F. M.—L.—D. & Son.—T. H.—D. R.—A Subscriber.—L.—G.—J. P.—W. G.—F. M.

We are compelled to decline pointing out books and giving addresses. All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication. Note.—The responsibility of signed articles, and papers read at public meetings, rests of course with the authors.

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NINTH BONUS MEETING, January 4th, 1872.

The following are Extracts from the Reports of the Directors:—

1.—Progress of the Society in the Bonus Period. AS TO INCOME: The NEW ASSURANCES were 2,159 in number, for an aggregate sum of £364,390, at premium amounting to 44,694, per annum, results which, viewed in relation to the depressed condition of Life Assurance during much of the period, cannot be regarded as other than satisfactory. THE YEARLY REVENUE was increased by over 21,000, per annum, and reached 234,568, on the 30th June, 1871. THE INTEREST yielded by the whole of the Funds, whether invested or uninvested, was 46 1/2 per cent. on the average of the entire period, being fully 3 1/2 per cent. more than that realized in the previous period. This increase was obtained not only without loss, but without the smallest impairment of security.

2.—Financial Position of the Society on June 30th, 1871. The Substantive Assurances on the 30th June were 6,670 in number, securing, with their Bonus additions, the sum of 5,445,628. The Assurance Fund at the date of Valuation was £1,828,438 10 9. And the total calculated Liability was £1,471,173 17 2. Leaving a Surplus of £357,278 13 6. Deducting therefrom the permanent Reserve Fund of 50,000, pursuant to Sec. 32 of the Society's special Act of Parliament, there remains to represent the profit of the 4 years the large sum of 2,997,268, or an amount equal to 26 per cent. of the total Revenue from all sources during the 4 years, and exceeding by 49,801, 6s. 6d. the surplus of any previous quinquennium.

3.—Results of the Division. The Cash Bonus, which is the present value of the Reversionary Bonus, and therefore the true measure of the allotment, will average 28 per cent. on the like payments, as against 25 per cent. at the last Division, and 28 per cent. in 1865, which was the highest previous percentage. No comment can illustrate better than this comparison the merits of the present Division.

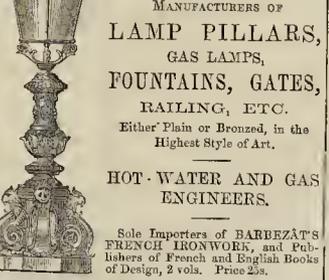
The next DIVISION OF PROFITS will take place in JANUARY, 1872, and Persons who effect New Policies before the end of June next will be entitled to that Division to one year's additional share of Profits over later Entrants.

The Report above mentioned, a detailed account of the proceedings of the Bonus Meeting, the returns made to the Board of Trade, and every information may be obtained of GEORGE CUTCLIFFE, Actuary and Secretary, No. 18, St. James's-square, London, S.W.

Turret Clocks.—Mr. Streeter, 37, Conduit-street, London, W., Manufacturer of Turret Clocks (with gravity or dead-beat escapement) for Churches and Public Buildings. Estimates and plans on application. Price:—Village clocks, from 15l.; church clocks, from 40l. The wheel-work throughout these clocks is of best hard brass or gun-metal. No iron wheels used. Timekeeping and durability guaranteed. Wholesale Entrance—Burlington Steam Works. [ADVT.]

Architects, before committing themselves to any system of Warming, should send to TRUSWELL BROTHERS, & HOLDEN, 100, Nottingham-street, Sheffield, for a prospectus of their Improved Patent Hot-Air Apparatus. [ADVT.]

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The Builder.

VOL. XXX.—No. 1518.

The Thanksgiving Illuminations and the Fine Art in them.



Old King Ludd, if ever such a personage had existence, and ever moved about in this world, could not have risen from his grave on the night of the Thanksgiving Day to see the crowd and witness the confusion in the place called after him, he would never have got over his surprise. No such crowd certainly was ever before seen on Ludgate-hill, and no such sight ever presented itself to the vision of men, from King Ludd to Christopher Wren, or from his day to the "Thanksgiving" day itself. We live in very practical and mechanical times; so much so indeed, that but for an accident we should never have had this imposing show of people and strange things on Ludgate-hill to talk about; and if therefore it be only for variety's sake we would say a few

words on what is to be got or learnt from it in an artistic point of view. But first a word or two on the character or generally of these kinds of display, so exceptional as they are. Unfortunately all that is done or even attempted would seem to be but little else than a matter of passing business merely; so no one, we can but conclude, ever properly and seriously considered what to do in the way of "illumination" or in the temporary house decoration of a day. No one, we may presume, ever thought of such a thing as producing an artistic work, or ever thought for a moment of calling in the aid of some artist "illuminator." We do not seem to have arrived in any way at that degree of "civilisation" which would impress on the world the startling fact that it is always necessary to employ some one to do a thing. Nothing comes into being of itself; there must always be an active personal agent in the work, whatever it be, whether merely temporary and for the passing hour, or so last for ever, or for as long as the material itself will hold together. This may seem but a mere truism to many, but it is a principle to be borne in mind and well worth remembering, for the fact really is, that no one in the late show knew what to do *himself*, and yet, stranger to say, no one seems to have thought it necessary to go out of his house to find the right man to do it for him. Do not let us be misunderstood. Of course there was, as there always is, the usual resource,—the *shop and counter* to go to. There were flag-shops, and red cloth warehouses, and gasfitters in abundance, and plenty of stock in hand for the work; but where, we may ask, was the man or men, the artists who were to mould all this material, abundant as it was, into shape? What, for example, was a man to do with a whole cartload of flags of all shapes and sizes, from one but little bigger than a pocket-handkerchief, to one

pretty nearly as large as the front of the house before which it hung? No man along the whole route from end to end knew what to do with his fine flags; and when the place did happen to be appropriate, it did not seem to occur to any one that when a number were used there would needs be room for some power of selection and choice, and that one device must be better and more appropriate than another, and that, so to speak, an *idea* might have been shadowed forth by the said flags. This was somewhat curiously exemplified in the flag display on the top of Montague House, Whitehall, on the tall French roofs of which there were no less than sixteen of these large fine-coloured flags, of all colours and patterns,—stripes, crosses, union-jacks, and all,—but the whole showy display was simply meaningless and without any significance, nor was it in any way related to the noble owner of the mansion. Surely there must be in such a place and surroundings "hannars" with a meaning enough, and the noble duke might have displayed to the wondering modern Londoner the armorial bearings of his house, and the successive additions to it, and, in short, the heraldic history of his family might have been shown; for to do such a work at all in such a place, and with means so ample, it was surely worth while to do it well and intelligently, if possible! It was possible to do it, but it was not done, for there was evidently no man to do it, or even to attempt it; for it came, as usual, from over the counter, and from nowhere else! In passing, we may notice a pretty flag arrangement at Gwydyr House, with stars and Prince of Wales feathers in crystal, as it is termed, which to see at its best it was necessary to stay out rather late, till the show was over, and to look at it in the dark, for these crystals look best and most gem-like by reflected light. It was a pretty enough display, and must have cost a little thought. We have said thus much about the banners and flags, because they are so effective in such national displays, and because they *might* be made so much more so, if but artistically treated and thought a little about, and harmonised with each other.

We might write a good deal on the show generally, and on the "stands" put up in so many places, and which effectively broke every now and then the dull house-frontages, some of them very handsome; and on the "Venetian" flag-staffs, the right forms and placing of which were, as we take it, so utterly missed; and a multitude of other little details to be observed by the eyes of the curious; but our main object is to say a word or two on the Ludgate-hill and St. Paul's part of the show. We do not mean the inside of St. Paul's, which may come in at another opportunity, but to the outside of it, and on the strange effect of the red and blue lights display. By a kind of accident, we must suppose, it was that some four or five enthusiastic scientific people took it into their heads to light up with fitful gleams the dense and packed crowd perfectly still and immovable sometimes, but coming down the famous hill at others in close streams somewhat in the way of a quickly-moving glacier, for nothing seemed able to stop it. There being so many of these intensely bright and moving lights, the strangest possible effect was produced; for the intensely bright and straight rays crossed and recrossed each other in every possible way, and produced an effect to be seen nowhere else on that eventful evening. We mention it for the sake of its singularity, for it does not seem to have been noticed elsewhere, and because it added not a little to the St. Paul's show. It was a pure and happy accident, like the packed crowd itself. Of course, too, there were flags in abundance, and illuminations of all sizes and kinds and degrees of costliness, and open windows, and, what to many might seem a kind of defect amidst so much glitter, the *dark* forms, shapeless enough, of the upper parts of the houses and roofs where visible, and there was

also the dark-coloured crowd by way of foreground. What old Rembrandt would have said, or thought, or done, with such a chance, who can venture to say? He certainly never could have seen such a novel sight without some permanent impression being made on his mind, and which impression he could not have kept to himself; the world *must* have seen it *through him* on canvas or on his magic paper. But this, good as it was,—we say again by happy accident,—was not all, for there was, of course, the huge front and dome of St. Paul's in the far background, with its circles of coloured ship-lamps round the lantern and dome,—hardly enough of them, by the way, and too wide apart, but still, good, so far as they went, for they did not obscure or put out the building, as the close and too brilliant gas-jets do; the "architecture" being lost, you seeing nothing but the bright lights. It is always possible to overdo a good thing, and to spoil a good idea by working it to death. There was, as all know, one thing yet which it was thought would give to the whole display a sort of finishing-stroke, and make of the "Thanksgiving illuminations" a something *per se*, to wit, the lighting up of St. Paul's with red and blue fires. Some disappointment seems to have been felt at this part of the show, as falling somewhat; and to those who were in expectation of volcanic effects it certainly was so; but to many who looked only for what was possible, it was not a little striking. It was necessary to use some little judgment and physical force in the finding a place to see it properly. Nothing could possibly be stranger or more weird-like than the sight of the fine building when lighted up with its red fires and smoke, the sources of the light being invisible from a low point of sight, the whole of the strange and novel sight culminating in the coloured fires and smoke (not a little important element in it) seen for a few seconds from the golden gallery surmounting the dome. Some may think this mode of lighting a building a little too theatrical; but in reality it was not so: it was *real*,—and but for a moment or two, and gave one almost the idea of a mighty conflagration—the burning of a city. It has been said that Turner, after relapsing into falsities and artificial nothingness, was recalled to truth and nature by the sight of the burning of the Houses of Parliament. What would he have thought of this sight; and how, at his best, would he have painted it on canvas, with all his wonderful skill and lightness of hand in the painting of smoke, and mist, and darkness, and coloured light? It was truly, though so transient, a subject well worthy of his powers. What a pity it is that he has no successor to record the magic scene.

AN HOUR AT THE BRITISH MUSEUM.

The recent remarks in our columns* on the study and restoration of the antique, have directed general attention to some of the noble marbles contained in the British Museum; and especially to that mutilated statue of Cupid, to which we more especially referred. In fact, something like a challenge was given for the careful examination of this exquisite relic. The challenge has been fairly met, in all honour and good feeling, and the results, as our readers will see, are in every way confirmatory of the justice of our remarks. With the frank concurrence and courteous aid of the officers of the Museum, it has been placed beyond doubt that this figure has been improperly restored.

The Cupid which is now in the Elgin room of the Museum, was found in fragments on the Acropolis of Athens, and was put together in the Museum itself. For a time it was called Icarus, being supposed to have formed part of a group of Dædalus and his son. The thongs or straps which cross on the chest, and which no doubt denote the slinging of the quiver of the boy god, led to this view. The figure has even been thought to have fallen from one of the pediments of the Parthenon.

* See p. 79, ante.

While the left foot, the authenticity, or rather the applicability, of which we questioned, is now attached to the figure, there is a piece of marble close by, which is actually separate, but which evidently formed a portion of the original plinth. On this fragment are to be seen the toes of the right foot. Careful comparison shows that they altogether differ both in workmanship and in size, from those of the foot which has been attached to the figure. They have the same indescribable *cachet* of the Athenian artist that belongs to the body and limbs, and are as unlike the straight, harsh, ill-modelled toes of the attached foot as can well be imagined. Further, as far as it is possible to speak with certitude, in the absence of a chemical analysis, the marble of the foot differs from that of the statue. It is not easy to demand a more complete demonstration of the truth of the charge brought by M. Ravaisson against the restorers of the antique.

It is perhaps hardly realised by the public of this country how rare and how costly are the treasures of ancient art contained in the British Museum. The younger establishment at South Kensington has been wisely kept so much more prominently before the public, that the elder museum, acting on an entirely different policy, has been somewhat eclipsed, so far as general attention is concerned. This is by no means as it should be. While South Kensington contains so much of the artistic wealth of the era of the *Renaissance* and the succeeding periods, Bloomsbury is alone in this country, and, to some extent, alone in the world, in respect of the stores of the antique. We do not at this moment speak of the extremely interesting series of Egyptian monumental sculptures; or of the more recently added contents of the ruined mounds of Assyria. But with regard to the age and the country in which sculpture attained its highest perfection, a very large proportion of all the known specimens of the work of the schools of Phidias and his contemporaries are actually within the walls of the British Museum. The Elgin collection was made by the Earl of Elgin, when ambassador at Constantinople in 1801-1803, under the powers of a firman from the Porte, and has probably been the means of rescuing the mutilated sculptures of the Parthenon from utter destruction. While antiquities, to tell their whole story, should always be studied *in situ*, and while the defacing of a monument for the purpose of ornamenting a museum is, in itself, an act of barbarism, the case is altogether altered when the alternative lies between deportation and destruction. The fire of the Venetian fleet, in the year 1687, caused the most fatal damage to the Parthenon. From drawings which were made in 1674 by Carrey, a French artist, of the sculptures of this temple, it is evident how much more damage has been done by war than by either time or earthquake,—the two fatal causes which have, by their combined operation, destroyed the greater part of the unrivalled sculpture of Greece. The Venetian general, Morosini, might have been an English rustic, or a landed proprietor in the vicinity of Avebury, and yet not a greater barbarian than he actually was.

The remains of the sculpture, from the hands of Phidias and his school, that filled the pediments of the Parthenon, as well as those of the metopes and the frieze of the same temple, form the basis of the Elgin Collection. With these magnificent ruins are placed some remains from the Erechtheum, from the Temple of Wingless Victory, and from the Choric monument of Thrasylus. Near them are casts from the Temple of Theseus, also at Athens, illustrating the art of about twenty years earlier than the era of Pericles. In the adjoining hall, called the Hellenic room, is a collection of marbles from the ruins of a Temple of Apollo, near Phigalea, in Arcadia, which was built by Ictinus, the architect of the Parthenon, in B.C. 430. There are here also casts from the metopes of a temple at Selinus, in Sicily, representing the archaic state of Greek art; and casts from the pediments of a Doric Temple of Minerva, in the island of Aegina, which is thought to have been erected about B.C. 500-478.

To this nucleus of Greek antiquity has been more recently added a group of relics from the Mausoleum at Halicarnassus, formerly one of the seven wonders of the world, which was rediscovered by Mr. Newton, in 1857. This celebrated monument was erected by the conjugal piety of Artemisia, the widow of Mausolus, Prince of Caria, to contain the remains of her deceased husband. Its date is about B.C. 352. It consisted of a lofty basement, on which stood an

oblong Ionic edifice surrounded by thirty-six Ionic columns, and surmounted by a pyramid of twenty-four steps. The structure rose to the height of 240 ft.; and it was crowned by a chariot and horses of white marble, in which it is supposed that a portrait statue of Mausolus was placed, as if in celebration of his apotheosis. Around the building ran a frieze, representing, in high relief, the battles of the Greeks and the Amazons. The four sides of the tomb were decorated by four celebrated sculptors of the late Athenian school, Scopos, Leochares, Bryasius, and Timotheus. The chariot group was the work of Pythos. The sculptures of the various friezes, reliefs, statues in the round, and colossal lions that surrounded the tomb, were all of Parian marble.

Of this magnificent monument, the remains which are now arranged in what used to be called the great Elgin room of the British Museum, consist of architectural marbles, such as capitals, mouldings, lions' heads, and floral enrichments; sculptures in relief, which formed portions of friezes or smaller panels; and sculptures in the round. Among the latter are the statue, it is supposed, of Mausolus himself, that of Artemisia, represented as the deified charioteer of his car; and fragments of male and female figures, horses, and lions. The interest of this noble collection, whether we regard the unrivalled fame of the monument itself, or the value which is given to the relics by the precise determination of the date of their execution, and the names of the sculptors, is extraordinary.

There are now on their way to the Museum relics of a scarcely less interesting character, from that famous Temple of Diana at Ephesus, of which we have recently spoken at some length. The great peculiarity in this case is the existence of sculptured columns, adorned with groups of figures in high relief; an unusual mode of enrichment, of which we find a later illustration in Raffaele's cartoon of the Beautiful Gate of the Temple, and the reproduction of which has been recently attempted in the terra-cotta columns at South Kensington. We shall have occasion, on the arrival of this precious consignment, to give further particulars; only now remarking that the workmanship of these columns is such as to furnish yet another proof of the manner in which true artistic feeling is strangled and stifled by the passion for over-ornamentation.

We thus find, within the halls of our great national Museum, an unrivalled series of illustrations of the progress of Greek art from its archaic period to the commencement of its decline. The history thus displayed presents, in many aspects, a striking parallel to the history of Gothic architecture throughout Europe, as well as of that special branch of the subject which may be studied in our own island. Again, a similar history may be traced in the development of the art of the glass-stainer. That antique sculpture, Medieval architecture, and a special art of decoration, which may be thought rather to have called upon the architect to afford scope for its display than to have waited upon any structural exigencies, should have all followed courses so strikingly parallel, is a matter of more than ordinary coincidence. It evinces the action of something like a law of organic growth. This law is to be sought, however, rather in the mental characteristics of the great Aryan race, of which Greek and Teuton alike form a part, than in the essential principles of art. That such is the case is proved by the contrast afforded by the long-maintained and unchangeable durability of Egyptian sculpture and painting. Again, in the art of a race of a totally different blood, which we are only commencing to study, namely, that of Japan, we find but little to recall the successive stages of European art. What we do find, in these widely-separated cases of Aryan progress, is this. First, the mind of the artist appears to have been possessed with a deeply religious feeling, a sense of awe, and a desire to devote to the embellishment of the temples of his worship the full power of an energetic but inexperienced workmanship. As year after year the hand became more exercised in its cunning, increased facility of execution reacted upon conception. The stone, becoming more obedient to the chisel, reflected yet higher and higher creations of the imagination. In each case the loftiest sublimity of conception appears to have been attained before the hand of the artist had been trained to its utmost cunning. The broad and grand style which characterises the work of Phidias and his school is justly regarded as the

acme of human art. Yet, on the ground of its plastic skill alone, it is not perhaps equal to that displayed in a somewhat later age, when the Homeric spirit seems to have evaporated from the marble, but when the latter had become as obedient to the hand of the sculptor as wax itself.

In the same manner we may compare the spirit and the execution of our own Early English and Decorated Gothic with the more elaborate details of enrichment by which perpendicular Gothic with us, and the Flamboyant style on the Continent, gradually became overlaid. Without discussing, at this moment, the cardinal periods of change, there can be no doubt that the course followed by Gothic art was, first to increase both the delicacy and the beauty of the structural lines, then to allow them to bud and bourgeon into lovely decorative foliage, and finally to confound and conceal them beneath a mass of endless ornament. If we compare the lancet windows of such a structure as the Lady Chapel of St. Saviour's, Southwark, or the arches of the reign of Henry III. or of Edward I. in Westminster or in St. Alban's, with the pendent stone ceilings of St. George's Chapel at Windsor, or of King's College Chapel at Cambridge, the development to which we refer will become manifest. Again, in the advance in brilliancy of execution in stained glass, which may be traced from the twelfth to the sixteenth century, the same order occurs. The solemn grandeur of the Early English stained-glass windows produces an effect on the mind altogether of a higher order than that due to the fairy-like sparkle of the cinquecento work. Yet, as matter of manufacture, and of all the manipulation of the artist in glass, there is no doubt that the latter is very much in advance of the former.

The materials for sculptural scholarship, in which the British Museum is so rich, do not close with the Carian fragments. But it is not so much to sculpture proper that we now have to look for the elements of an historic review, as to that portion of the sculptor's art that is executed by the medallist. In the age of Alexander, it is believed, it first became the custom to place the head of the reigning sovereign on the obverse of his coins,—a place previously given to some religious representation or symbol. We do not know of a contemporary coin of Alexander of any very striking beauty to which we can at the moment refer; but in the Gold ornament room at the Museum, in a case of Greek silver coins, may be seen a superb coin of Lysimachus, bearing the head of Alexander, and no doubt struck from the die prepared during the lifetime of that monarch. We are familiar with the features of the great Macedonian from the exquisite three-quarter face gem wrought by Pygmales. The profile on the coin is in no way inferior to the famous gem. The effigies of other sovereigns carry on the evidences of the state of art while passing from its religious stage to that in which it sank to little more than a costly mode of flattery; a flattery precious in its results, as it has given us a series of portraits of the highest physiognomic value. In the 1821 edition of the works of Professor Camper are to be found engravings of a copper coin of Bocchus, king of Mauritania (circ. B.C. 90), and of a silver coin of Pharnaces, king of Pontus, some half-century later, which contrast very favourably with the stiff head of Alexander, engraved on the same page. But to say nothing of any more or less idealised portraits, such for instance as those of Homer, of Sophocles, or of Pericles, there is, in the Museo Borbonico at Naples, a full-sized bronze portrait bust of Scipio Africanus, which must date late in the third, or early in the second century B.C., which even descends to the somewhat ignoble detail of showing the stumps of the hair over the whole of the closely-shaven head. Thus we come down with almost uninterrupted illustration to the portrait bust of Julius Caesar himself, in the gallery of the British Museum, and to the yet more wonderful intaglio called the Payne Knight Cassar, representing the same stern and lofty features, which come out under the glass in *altissimo* relief, and full face.

Greco-Roman art is also finely illustrated. A recent purchase has been the statue of a young man, undraped, represented in the act of holding a fillet round his head. This was discovered in the theatre at Vaison, the ancient Vasio, in France. There seems no reason to doubt that it is a copy of the famous Diadumenos of Polykleitos, the companion statue to that still more celebrated figure of the Doryphoros, or spear-bearer, which is referred to as the canon of Polykleitos. The Roman statue,

however, is a late and somewhat slovenly copy. The conception is thoroughly noble and antique, the execution is comparatively bald and poor. We should explain that, in forming an accurate and reliable judgment of style in sculpture, two special qualifications are requisite. One is, if not the habit, at all events the instinct, of the sculptor. No amount of observation will confer a true critical acumen on a person destitute of this artistic sense. The second requisite is, of course, knowledge of examples. The man who unites those two qualifications will be apt to say little as to style. He knows perfectly what it is. He can distinguish a Greek from a Roman bust or coin as readily as he can a horse from a donkey. But he no more thinks of boasting of this power than of his personal strength, beauty, keenness of vision, or any other natural and yet highly-cultured endowment. It is the man who knows little who prates much, and who tries to give weight to his opinions, for they are nothing but opinions, by reiterated assertion, and by the free use of technical slang.

We are therefore glad to be able to give other reasons for assigning a late date to the copy of the Diadumenes than the mere sentiment of style. When brought to the test of actual and minute admeasurement, this statue altogether fails in that exact proportion which characterises the Greek work of the best time. There were certain rules, into which we cannot for the moment enter, which were observed with such accuracy by the Greek sculptors, in proportioning the forms of different types, that they may be illustrated with equal precision from the symmetry of the grand Juno of Melos, an early Greek work, and from that of the delicate Venus de' Medici, a much later Rhodian work. The exactitude of reference to a certain modulus, in each case, is so minute that it amounts to absolute demonstration of this canon. But in the Diadumenes all is vague. The sculptor seems to have wrought by eye, and not by measure. In this very circumstance we may trace either a cause or a result,—at all events, a concomitant,—of the substitution of portrait sculpture for religious work. That fixity of rule which may be called conventional, but which was really but the reducing to system of the highest idealisation, is altogether inconsistent with the serenity of faithful portraiture. Italian sculpture at this very hour illustrates this view. At no period in the history of art has the power of cutting marble been greater or more delicate than at present. Some of the modern Italian statues to which we referred our readers in our account of the International Exhibition at South Kensington last year were in point of execution absolutely wonderful. In some of them, it is true, there was merit of a much higher order than this mechanical excellence; but in others, more especially in a pair of portrait statues exhibited at the Workmen's Exhibition at Islington, realism appeared in its very basest form; they were vulgar photographs of men, which looked very life-like, but very vulgar. We may refer to the City statue of Peabody, and to the figure on the Thames Embankment intended for Brunel, as further examples. We have not exhausted the subject, either as regards the transformations which art undergoes in passing from the solemn and decorous penury of its cradle, through the might of its religious fervour, to its decline into the staid of a mere pander to vulgar ostentation, or as regards the illustration of this progress to be drawn from the marbles, and even more from some of the unrivalled bronzes of the British Museum. But here we must pause for the nonce.

We ought, in justice to ourselves, to add, that this is the first notice of the Diadumenes which has appeared in print. The statue in question has not yet been placed in the public part of the Museum. There is, however, another type of the same subject, which was purchased from the Farnese Palace at Rome, and which has been for some time in the Sculpture Gallery, to which our remarks may be taken as applicable. This copy was dug up, we believe, on the site of the Baths of Caracalla.

St. James's Park.—In the Commons, Mr. W. H. Smith has given notice that he will ask the Chief Commissioner of Works whether it is the intention of the Government to proceed with a Bill, whereof the plans are deposited, for obtaining powers to take a certain space of ground off St. James's Park, 350 ft. in length, and from 60 ft. to 70 ft. in depth, for the erection of additional offices for the Admiralty.

MEMS. CONNECTED WITH THANKS. GIVING DAY.

It is stated that the number of passengers conveyed over the Metropolitan, Metropolitan and St. John's-wood, and Hammersmith and City Railways on Tuesday (Thanksgiving Day) was 243,863. This serves to give some idea of the enormous number of persons who were out on that occasion.—It is about to be proposed in the Court of Common Council:—"That in order to testify in an enduring form the deep sense of this court of the national importance of the recent general Thanksgiving, a memorial window of a suitable character be placed in the new library now in course of erection, and that it be referred to the New Library and Museum Committee to carry the same into effect at an estimated expense not exceeding 500 guineas."—The subscribers to the Fleet-street Decoration Fund have resolved:—"That 20l. from the surplus fund (amounting to 59l. 11s. 1d.), and the scarlet cloth on hand be presented to King's College Hospital; that 20l. be presented to the Harrington General Dispensary; and 10l. to the Police Orphanage, as an acknowledgment of the efficient services of the police on Thanksgiving Day."—Messrs. Sangor's Circus procession, which passed along nearly the whole line of route after the Queen had returned, was not the least striking incident of the day. It wanted harmonising and uniting by an artistic mind, but was, nevertheless, far superior to what is usually done in this way. The outlandish dresses were quite new, evidently, and were a mass of gold, silver, and colour, satins, velvets, and so forth. There were numbers of pretty horses; an immense gilt and painted erection (drawn by ten horses), with many smaller cars; a camel, or dromedary; an elephant, with his brilliant howdah; Cupids driving teams of half a dozen cream-coloured ponies; and a live lion crouched at the feet of a girl who represented Britannia, with helmet, shield, and spear. It was a risky thing to take such a cavalcade through the crowd, but we heard of no accident resulting.—As to the reported accident at Marlborough House, Colonel Hogg said, in the House of Commons, in reply to a question, it appeared from the report of the district surveyors that, after careful inquiry, they had not found that any structure which had been erected or was in course of erection in the neighbourhood of Marlborough House, up to the evening of the 26th of February, had fallen; but they stated that a standing-place, set up near the porter's lodge in Marlborough House-yard, and which consisted of loose planks, had been thrown down by the crowd, and was the cause of a serious accident. He desired to add, that the district surveyors performed their difficult task in a most careful way, and, after making inquiry, he had ascertained that no accident occurred to any structure they examined.—The expenses incurred by the Board in making arrangements for the accommodation of members of vestries and district Boards on the occasion of her Majesty's visit to St. Paul's, amount to 3,000l.—We understand that the proprietor of the *Central News*, through the courtesy of the cathedral dignitaries, introduced a wire into St. Paul's, and despatched a description of the ceremony to all parts of the kingdom as it progressed.—New locks and handles were made for the Temple Bar gates by Messrs. Hart & Co., the men working night and day to get them done in time, but they were, after all, not used.

COTTAGE BUILDING IN NORWAY AND SOME OF ITS TEACHINGS.

In the present state of things architectural, so confused, and with so much that indicates a fast-coming change, it must be not a little interesting to inquire into the work and methods of work of those who have not had, as we have, vast heaps of art "precedent" to go by and to copy. It is not a little singular to reflect on that it has been reserved for these modern days to be so entirely at the mercy of what has gone before. In no other age of the world has the architecture of the *then present* been at the mercy of that which preceded it. It never would seem to have copied,—always followed or seconded. Each age or generation took up the work as left by those who preceded it, improved on it or not, as the case might be, and so, in effect, left behind them practically a new style, a growth out of that which preceded it. It did not copy or make effort to reproduce what had gone

before, but simply went on with the work, and, by degrees, worked out a new style. Nothing can show this more convincingly than the primitive system of hut or cottage building in Norway,—*i.e.*, in those parts of it removed from the influence of modern and new systems of construction and new and patented materials. The subject is a curious one, and worth a little consideration and inquiring into, if only as a primitive system of doing things before style commenced, and before any one ever thought of copying. How to build architecturally and artistically, without any architectural precedent—in other words, to build up mere material constructively and ornamentally,—is an important question. It has been contended that this cannot be done,—that some definite architectural forms and ornament are absolutely necessary; and that these are the work of time and growth, and that no "architecture" in its full meaning, can come out of mere and simple construction; but it is a little wonderful to see, if you look a little below the surface, how much of architecture is to be found in the simply and rudely constructive. Before we go further, it is not a little to be regretted that no trustworthy system has as yet been invented of rendering wood *fireproof*; for the want of it, and the consequent disease of timber construction, have thrown woodwork into the background. No wooden houses, where any sort of building art prevails, are now possible, so that timber house construction and fine art are of the past. This is to be regretted. A complete history of wooden house-building and architecture with wood only for its material is to be gathered in Norway alone; indeed, this history may be said to go back beyond the historic era, for there are evidences of wooden buildings on piles of a date far beyond written records. Architecture grew up here and there, doubtless, out of materials and simple and necessary construction, each separated nationality or race having its own.

But the main practical interest of the subject lies of course in the strictly modern plan of hut or cottage building, as it exists, and as people now live in such buildings. Of course we are speaking only of the purely native system of building proper to the country, and not of that which is gradually superseding it, and which has been borrowed from foreign sources. These cottages are formed of pine logs, but roughly squared, with the sharp edges cut off so as to be nearly octagonal. These logs are laid one upon another, and with a layer of moss between them in lieu of mortar. The logs forming the side or end walls are notched, so as to receive the ends of the timbers forming the front and back walls. Each log is from 12 in. to 13 in. or more square, so that the walls are about a foot thick. The walls are about 10 ft. high. In the better sort of cottages the whole of the interior of the rooms are lined or panelled, so that it would be difficult to discover a better system of building, or one more entirely suited to the climate. A warmer kind of walling could not be devised, nor one more "comfortable" in appearance. The floors and ceilings are boarded, the former raised from the ground by stone sleepers, a foot or two high. We hardly know what will be said about the roof; but why should a clever thing be lost sight of? Improvement of course is introducing *state*, always neat, if not genteel, but the poor old Scandinavians looked to warmth and comfort, and perhaps to harmony and picturesqueness, if not to the "architecturesque;" and they covered their rough roofs with close boarding, then with birch bark peeled off in flakes; and then on this they laid earth about 3 in. in depth, retained by a fillet running along the eaves. A crop of moss of course soon covered this earth, so that a more picturesque or better coloured roof could not be, or a warmer or better heat-protector or keeper-out of cold. The joiners' work is but rough, like the walls and roof, but all harmonises, and may truly boast of one good quality,—it keeps out the wind and the weather! Surely such a system of building as this is as good as can be for the place it is in, and for the surroundings of rude forest, and rapid watercourses and lakes. Some might think this a better way of building a cottage than the thin-walled and meagre model cottage, which is, says a good authority, but "the skin of a house." The old Scandinavian and his not yet thoroughly civilised modern successor think nothing does but the solid timber logs between them and the cold. Nothing, indeed, can be more *comfortable* than the interior of one of these wood-walled and wood-lined rooms. With the prosperous

Scandinavian there is always a room for everything, for the material being so plentifully supplied by a bountiful nature, there remains but the trouble of building and putting together. Many of the houses are two-storied, and the stairs, from the ground to the upper story, are sometimes singularly quaint and architectural. Now, this is an old-fashioned way of work, and rough as may be; but we may ask, what workman is there that would not sooner live in such a tenement than in a patented, thin-walled, and corrugated iron roofed model-house of the most recent make and pattern, and choke-full of scientific inventions and improvements?

It will thus be seen,—at least, to some small extent,—that in this far northern and somewhat out-of-the-way country there now exist materials for forming some idea as to the origin if not creation of a style of architecture, the growth out of mere *constructive necessity*, and out of the materials afforded so abundantly by nature on the spot whereon it has grown up. We cannot in looking at it avoid the pressing thought of how much light is thrown analogically upon the origin and progress of Gothic architecture in these islands, for both are the results of Northern thinking out and requirements. We say "Northern," and use the word in place of a better, and as descriptive of the doings architecturally and architecturally of a people distinct from Southern and Eastern races. It leads us, too, to the much vexed question, now especially interesting, of how far is it possible to invent an entirely new style of architecture? Is it possible to create a new style of architecture to be founded on, and to grow out of, simple and necessary construction? and can it be accomplished in one age, or even so far carried on in one as to show itself as a something distinct in that age, and will the study of all other styles help or hinder it? No small amount of discussion might be raised on such a revolutionary project, and without something to go by,—"precedent" of some sort or other. There are some who might even go so far as to say the thing is impossible in the very nature of it. One thing, however, this Northern work undoubtedly shows, and it is this, that art and architecture may grow out of bare construction with "precedent," or a something to go by, entirely absent. This simple architecture harmonises perfectly with the scenery and surroundings of the place it fills. There is no jarring element in it. As to the modern transplanted villas and smart houses, you wonder where the latter came from, and who could possibly have imported them, so fearfully do they put out nature,—the nature which surrounds them,—a primeval forest growth, nature's own work, and which, as it would seem, man cannot without more capital and science destroy. What a pity it is that "improvement" has not stayed its hand here and there, and left us a town or even a small village from the old days,—some small collection or group of houses, whereon no disturbing artistic element would be found, with its quaint inn, irregular streets of houses, so truly "picturesque,"—its small church, and all these other little quaint things, once upon a time to be seen everywhere. A little of this, as all know, is to be found here and there, and the antiquary and the architect have ransacked England to find them out, and to transmit them to posterity on paper; but the things themselves are fast disappearing, and must soon be numbered with the things that were. But in Norway these strange things are yet to be seen, and a curious light indeed they throw on things architectural and artistic.

A FRENCH ARCHITECT ON THE ARCHITECTURE OF THE SECOND EMPIRE.

FRENCHMEN, naturally more emotional than ourselves, are more given to import their emotions into their business affairs. Since the downfall of the Napoleonic dynasty, and the crushing disasters which followed it, little has been publicly spoken or written in France on any subject whatever without an ultimate reference to the woes of the country and their supposed causes, or without an anathema hurled against the invader. The architects of France have, naturally enough, proved no exception to this rule. In graveside orations they have added a political lament to the expression of personal sorrow, and in written disquisitions they have endeavoured to cast odium of failure on the shoulders of the régime under which they recently flourished. One of the latest archi-

tectural opponents of the Second Empire is M. Daniel Ramée, and his strictures have been admitted, under reserve, into one of the Parisian professional journals. The charges which he brings forward are numerous, and expressed in no measured terms. Many of his *confères* differ from him; but many also agree with him; and in order that our readers may understand the views of those French architects who look on his darkest side, we translate a portion of his lengthy tirade. He says:—

During the eighteen years from 1852 to 1870, Paris and many other towns in France have completely changed their aspect. The venerable monuments which recall the national traditions and memories and glories of the past have been gravely marred and mutilated, cut down, and hacked about,—have even been thrown to the ground to make way for edifices of no intrinsic artistic merit. Moreover, a deplorable change has gradually taken place in the public taste, and particularly in architecture. There has, perhaps, never been an epoch which is richer in resources and materials of all kinds; and never in any epoch or among any people have public works absorbed a larger amount of the public moneys. Yet there has never been a people who with so vast means of execution, have produced such paltry results or results so sad and regrettable.

The degradation in which architecture lay under the feet of the Second Empire arose from two principal causes:—first, the equivocal and pernicious management of new architectural schemes; and second, the thoroughly bad and insufficient education given to students destined for the architectural profession. It is of the first alone that we shall speak. Under the Second Empire everything was sacrificed to the consolidation of the throne of Napoleon, and in pandering to the depraved tastes of those who helped to establish it. Under that Empire architecture, like the other arts, was abandoned to intrigue, and partially to baseness, to mastery, incapacity, to confusion, and to disorder. And architecture itself was without unity, without knowledge of its lofty purpose, without sincerity, without healthful fancy, and last of all without that elegance which is one of its chief attractions. All these faults arose from the absence of a capable, enlightened, independent, sagacious, and really national supervision. The ministry of Public Works was awarded by chance, by favouritism, or through the influence of those in Court favour, and was at the mercy of vain and inflated cliques, who utilised the power of office to carry out their own whimsical and fantastic caprices. Hence naturally emanated those servile and often burlesque conceptions in which oddity and frivolity predominate, and which are marked by degeneracy of taste and a want of suitability to the times,—in short, which, while seeking to derive inspiration from the masters of the art, only succeed in bringing forth hybrid works without character; which are displayed, too, with impertinent assurance and stupid satisfaction before the public, in whom they excite little interest and still less admiration. For the real non-official public looked with a cold and indifferent eye on those edifices which cost it so dear, which it saw surcharged with blunders and inconceivable artistic liberties, and which are but bad imitations of the styles of the past or their decadence. This public was, moreover, disgusted with the boastfulness which thought to impose on enlightened and independent spectators; it was astounded at the audacious presumption which outraged and violated it, which provoked and annoyed reflective people, and which excited the contempt of all true artists.

The more we regard the architecture of the eighteen years of the Second Empire the more does it appear insipid and inconsistent. The works produced during that time are only an eternal reproduction of academic types, which have been stereotyped for years, and which it is fatiguing to encounter without variation on every occasion.

To pile stones on stones, mouldings on mouldings, columns on columns, to fill deformed niches with second-rate statues, or to raise them on pedestals and establishments, to leave no blank space in the elevations, but to cover them over with debased profiles and sculptures of doubtful merit; to add ornaments which are of no conceivable use in the positions which they hold, except to mislead the eye, and detract it from the weakness and poverty of the architectural composition, has not resulted in the production

of a real work of art, and has only given satisfaction to the vulgar and the interested creatures of the Empire, but never to those animated with a love of what is suitable and beautiful and true. The First, like the Second Empire, suppressed liberty, and used its every energy to hasten the national decadence, so that it might establish its own absolutism. The intellectual tone has been lowered, and all creations of the imagination have been less bright and glorious. The Arts were stranded in the universal shipwreck in which our military glory flourished. With very rare exceptions, the buildings of the Second Empire, tricked out in the unintelligent gaudiness of the *parvenu*, and hurried up with so much precipitation, remind us of the structures of Augustus and of Constantine. To produce works quickly and abundantly, to prefer quantity to quality, seem to have been the device of these princes,—and notably of the former,—to consolidate their dynasties; and the Second Empire has not failed to pursue the same course with the same end in view.

EXHIBITION OF THE ROYAL SCOTTISH ACADEMY.

In our annual remarks upon this exhibition, we have made it our aim neither to praise inordinately nor to blame severely. Over-laudation is, we believe, more detrimental to the progress of art than the opposite; for by it many have been encouraged in the production of mere mechanical representations of nature when they might have been more happily employed as decorators, or in some useful handicraft. It is no pleasing task to speak unfavourably of works by which men gain a livelihood; but when these are exhibited to the public, criticism is courted, and it is unreasonable to chafe against unfavourable comment, when every scrap of praise is eagerly appreciated.

It is with satisfaction we remark that an unusual number of works have been rejected this year,—satisfaction not at the disappointment that will undoubtedly be experienced by many, but at the good effect it will have upon art, in stimulating the careless to greater exertion, and in causing some to consider whether it would not be to their own advantage to abandon a pursuit for which they are unfitted. Notwithstanding the smaller number of works exhibited, there are still some hardly worthy of consideration, as works of art; but the general effect of the exhibition is more satisfactory than that of the last. It must not be thought that we enter the picture-gallery with the expectation of finding there a galaxy of genius; we are more than satisfied if we discover one star shining over so dimly, and a few satellites giving forth a reflected light.

As is usually the case, this exhibition derives much of its attractiveness from works which have previously been exhibited elsewhere; these include Landseer's "Rent-day in the Wilderness," Orchardson's "Toilers of the Deep," Pettie's "Sally," and "Love Song," Halswell's "Pilgrims at Scala Santa," Baron Ley's "Marguerite, Duchess of Parma, giving Alms," Alma Tadema's "First Reproach," "Qual Fight in a Roman House at Herculaneum," by Raffaele Pozzi, and some others.

Many of the best-known local artists seem to have reserved their works for the Royal Academy. This practice is gaining ground year by year, and the Scottish Academy may be looked upon as a nursery for its more powerful rival. It is therefore a matter of interest to cast about with the view of finding out the men likely to fill up the gaps.

Works by Mr. Robert Gibbs may have appeared at former exhibitions, but they must have been unimportant, as we have no recollection of them. In the only picture he exhibits he aims high, and does not miss the mark. No. 561, "Last United Visit of William Lord Russell's Family the Day before his Execution," reminds us of the well-known "Release" of Millais. The jailer who opens the door of the prison has his back to the spectator, but the figure is very suggestive; Lady Russell bears evident marks of deep sorrow, but she is dignified and composed, and the little ones are worthy of their parents. The manipulation is bold and effective, and the colour subdued and harmonious.

We have no recollection of meeting the name of William F. Hole in former exhibitions; he contributes three works to the present collection, all characterised by a certain degree of quaint

ness. No. 115, "Chancer reading to Blanche, Wife of John of Gaunt," represents the poet, the duchess, and two attendants in a garden, shaded by trees where peacocks disport in the sunshine, and a fountain trickles refreshingly. No. 376, "The Canterbury Pilgrims," is a humorous representation of the "sundry folk that by adventure y-fell in fellowship," treated in a conventional manner, and displaying much humour; and in No. 547, "My Ward, Sir," we are presented to a lovely and loveable little maiden, gracefully attired in the costume of a period of which the present is an unhappy imitation.

No. 157, "Old Mortality and Sir Walter Scott," by Mr. James Drummond, represents the enthusiast at his self-appointed task, restoring a tombstone, while in the background the parish clergyman is conducting the great novelist into the churchyard. Sir Walter is represented as a young man got up in the fashion of the period, and old Paterson, in a patched blue over-coat and leather leggings. In composition and colour, the picture (which is carefully finished) is good, but we do not find in the "Old Mortality" of Mr. Drummond those strongly-marked characteristics of the original presented to us in the novel. Mr. Drummond's other two pictures, No. 332, "James VI. calling at the Shop of George Heriot," and No. 414, "An Edinburgh Armourer's Shop, temp. Charles I.," a Highland Chief selecting Weapons," exhibit the artist's accurate knowledge of antiquarian details.

Sir George Harvey has in his "View of Shandon House" (151), undertaken a subject few could grapple with satisfactorily. The mansion is a new one, and the grounds around it are newly laid out and planted, yet the artist has, without shirking details, by means of skillfully disposed light and shade, and by his treatment of the distant landscape, produced a satisfactory result. No. 342, "The Eagles' Nest, Loch Awe," is in the familiar style of the artist, and the scene is impressed with a weird solitariness which is enhanced by the introduction of a single figure.

Mr. Macfaggart, although producing no large picture this year, appears to great advantage; his seaside scenes are fresh and charming. No. 69, "The Fisherman's Noon," is worthy of Hook, and "The Children at Play" (180), and those "On the White Sands," are delightfully natural. The shore, sea, and sky are in each case rendered with truth and simplicity.

No. 113, "The Peacemaker," by Mr. James Archer, represents a lady endeavouring to reconcile a Cavalier and a Roundhead. The incident is plainly told, and the expression and posture of the actors appropriate, but the drawing is very defective. Such, too, is the case in No. 151, "A Bit of Romance; the Host takes his Guest Home for the Night," where we have a horse which appears to have been studied from a wooden model, and the rider from a lay figure, propped on its back. The subject (a knight escorting a monk) is, however, redeemed to a certain extent by a quaint and Medieval feeling which is attractive to some minds.

There are artists who paint a single figure well, but who avoid the greater test of depicting some worthy event requiring the delineation of action, expression, and emotion. Mr. G. Paul Chalmers must be reckoned amongst this class; he continues to exhibit single figures, all displaying much technical excellence, and, indeed, we have seldom seen finer *chiar'oscuro* and livelier dessein than appears in No. 348, "Sympathy." We are quite aware that the mere grouping of a number of figures in a picture is no test of its merit, and that a single figure may possess all the finest qualities of art, but he who cannot go beyond that can never occupy a very high position. In No. 455, "On the Tunnel," Mr. Chalmers has made his first essay at landscape painting, and in this branch of the art he promises to be successful.

Mr. Mouston paints his figures on so high a key as to make harmony almost an impossibility. No. 53, "Danger," and No. 278, "The Watch on the Moor," are not badly conceived, but the glare of colour on the costumes is such as to render it impossible to paint up the landscape to it, and in both instances the landscape is an essential part of the picture, and evidently not intended to be subordinate to the figures.

Mr. W. E. Lockhart is very vigorous in No. 1, "Andalusian Quack Doctor," vigorous to a fault, for the brush marks are in some parts so strongly pronounced as to produce a feeling of slovenliness and harshness. This is the more to be regretted as the composition is admirable, and the de-

lineation of character remarkable. The Quack, with spectacles on nose, seated upon his mule high above the surrounding crowd, is the very embodiment of a solemn humbug; but one's feelings are in sympathy with the young mother with her sick child, who carries away the highly-coloured drug as if it were an infallible remedy.

Mr. Robert Gavin appears to have visited the Southern States of America, and presents us with a number of subjects from Mulatto and Quadroon life, in which he contrives to give us an interest. No. 267, "Master and Slave" (a young master and a young and pretty slave), tells its own tale; she looks upon him as a god, he upon her as a chattel. No. 436, "The Planter looked upon the Slave's gold, and then upon the Maid," exhibits a still more painful episode in the same sad story.

Mr. Joseph Farquharson, who was gaining a good position as a landscape-painter, has directed his attention to figure subjects, and has achieved a decided success in No. 456, "On Grandma's Knee," a cottage interior, with an old woman and child. The leading lines have a fine bold sweep, and the painting is solid and genuine.

Mr. Otto Lyde also exhibits a cottage interior, "Sunday Morning" (160), simple and pleasing. The number of cottage interiors exhibited is remarkable, many of them well painted, but conveying no particular sentiment or idea. This want is not, however, felt in the exhibits of Mr. Joseph Israels, which are full of expression, and charm as in spite of fearful drawing. The arm of the woman in No. 273 is swollen out to preposterous dimensions, and the feet of the child upon her knee are ridiculously small in proportion to its body.

We have on former occasions referred to the originality of the Scottish School of Landscape Painters,—an originality the result of the study of nature having for subject the noble scenery of the North. But it would appear that foreign art is beginning to exercise an undue influence upon some of the younger men, and in place of originality we have imitation. The Scottish School was originally founded upon the Dutch, but it had gradually emancipated itself and formed a new and distinctive school, influenced doubtless, from time to time, by others, but never stooping to slavish imitation. Form,—the first thing which catches the eye in nature,—was never ignored for mere effect, and, above all, truthfulness was its mainstay. Landscapes by foreign artists have, for some years past, secured a ready sale, but we suspect home imitations of such are not so likely to be sought for; so that, even in a mercenary point of view, the probable result is failure.

This tendency is observable in No. 22, "The Silver Dee," by Mr. A. D. Reid, in which truth is sacrificed to produce a silvery effect. In No. 413, "Broadsea," there is a similar sacrifice to breadth.

Mr. John Smart's landscapes are vigorous and truthful. No. 165, "Mid-day," is bright and effective. Those of Mr. James Docherty are appreciative, and Mr. James Cassie's full of repose and beauty.

As to the older hands, Mr. Waller Paton is much as usual; Mr. Sam Bough not quite up to his usual mark. No. 114, "London from Shooter's-hill," is stazy, and too much of a panorama; and Mr. Beattie Brown more varied in his subjects, and sensible as ever. Of the architectural drawings we will speak separately.

ROUND CHURCHES.*

M. LUCAS has taken, as the basis of his work, a well-known article in Britton's "Architectural Antiquities," which groups together the rude stone circles at Stonehenge and Avebury, the circular temples of Greece and Rome, and the circular churches of the Middle Ages, with special reference to the origin of the churches dedicated to the Holy Sepulchre, at Cambridge, Northampton, Little Maplestead, Essex, and in the Temple, London, and with a view, apparently, of showing that all circular temples are but an expansion and fresh application of the original idea that expressed eternity and infinity by the figure of a circle, in the most remote ages of the world. M. Lucas has enriched it with notes relating to churches built in honour of the Holy Sepulchre, in Spain, Portugal, Italy, Prussia, and Paris; has added a letter from Mr. Wyatt Papworth, dotting down a list of English works on the four English churches mentioned; and,

* "Les Temples et Églises Circulaires d'Angleterre." Par Charles Lucas. Paris: Ernest Thorin. 1871.

evidently, in consideration of the services rendered him by Britton's labours, has entitled his volume a tribute to the memory of that industrious pioneer, in a dedication to two of his friends, Professor Donaldson and Mr. George Godwin.

In the essay no doubt is admitted as to the purpose of the numerous stone circles in Great Britain: they are circular temples, quite as unmistakably as though they were all on sites as secluded as that on the little rocky, sea-weedy islet in the St. Kilda group. There have always been nations that worshipped the sun, or the moon, or fire, or other visible object, who could not confine themselves within walls when engaged in their devotions; and these stone circles can be sought but the temples of those who could tolerate no other vault than that of heaven, and no limit to their prospect but that of the horizon. If Mr. Fergusson's theory that they represent victories in the battle-field, or other modern theories have met the eye of the French architect, they are not set forth to unsettle earlier convictions: the responsibility of these convictions, however, is left in words, with the author's translated.

The most ancient temples of which there are written descriptions are the tabernacle made in the desert by order of Moses, and the splendid Temple of Solomon. The essay passes from these and Egyptian temples to the six Greek circular temples mentioned by Pausanias; and thence to the more numerous examples in Rome and its environs, whereof the Pantheon is chief. After an enumeration of present remains, and transformations into Christian edifices, and the records of those that are now no longer seen, we are landed in England in company with the forty monks, under St. Augustine, sent by Gregory the Great to overthrow paganism and implant the doctrines of Christianity.

Our attention is particularly called to the pope's instructions not to destroy the Pagan temples, but to be content with displacing the idols, sprinkling the walls with holy water, erecting altars, and depositing relics; thus converting them into churches. They inform us that, in the instances where these directions were carried out, the form of the earliest churches must have been identical with that of the temples, whatever that may have been. And here Stukeley is brought in to suggest that the oldest churches were round. The Anglo-Saxon churches were also frequently finished with a hemicycle at the east end.

The tradition that the four round churches that we are thus gradually approaching were built by the Jews is next discussed and dismissed. M. Lucas adopts the view of Mr. Essex, and deems it unlikely that a form for which there is no Jewish precedent should have been chosen by the Jews, or that buildings should have been erected by them in quarters not belonging to them. In Cambridge, the synagogue would have been located in that part of the town still known as Jewry. On the other hand, the tradition that they were built by the Knights Templars is examined and accepted. All four of the edifices mentioned, together with the two sanctuaries at Temple-Bruer and Aslackby, are attributed to this body.

Turning now to the Knights Templars, we are reminded that their order originated with Helen, mother of Constantine the Great, and was organised in the immediate neighbourhood of the Church of the Holy Sepulchre in Jerusalem. Bede's account of this edifice, as being a large round church, is quoted; and a slight outline of its fortunes indicated. The enthusiastic veneration of the Templars for the Holy Sepulchre probably induced them, it is suggested, when dispersed over Europe, to reproduce its configuration in the churches of their commanderies.

Then follow, from the sources we have indicated, short accounts of the four churches in succession. That of Little Maplestead being probably less familiar to our readers than the more famous edifices of Cambridge and Northampton, or that of the Temple, we will follow M. Lucas as to it for a few lines. Little Maplestead adjoins Great Maplestead, and both are parishes in the county of Essex. In the reign of Stephen, Robert Dosselli, or Dorsnel, held Maplestead. His heiress, with the consent of her husband, gave the parish to the Knights Hospitallers of St. John, who established a preceptory in it, and, by means of gifts from many

* The round church in Abyssinia, described in the *Builder* at the time of the war, with the ark or altar in the centre of concentric circles, is interesting in this relationship.

benefactors, became very flourishing. After the Dissolution, their possessions, Temple Sultan and other estates, were given by Henry VIII. to Mr. Henry Harper, since when they have passed through the hands of various families. The church differs in plan from the other three, and is, indeed, *unique*. Its semicircular apse would suggest an early origin, but the style of the ornamentation does not confirm its evidence. The windows, arches, and columns, are all of thirteenth-century workmanship. Only the font, with its heavy and primitive ornamentation, suggests an earlier date; but this testimony is negatived by the small basin, in which the immersion required in the early ages of Christianity could not have been practised.

M. Lucas incidentally mentions the following churches as dedicated to the Holy Sepulchre in France.—The church of the *Saint-Sépulchre de Chauvigny* (Poitou); the churches of the Holy Sepulchre at Cambray, Abbeville, Mondidier, and St. Omar, in the North of France; those at Caen, Rouen, and Amnezy; the Holy Sepulchre of the Church of St. John at Joigny; and the chapel of the Holy Cross of Jerusalem at Clam-pigny. And he catalogues, with brief remarks, the church of La Vera Cruz, in Spain, which was built by the Templars upon the model of that at Jerusalem, and in honour of it; the great octagonal chapel of the convent of Christ at Thomar, Portugal, founded, it is believed, by the first grand-master of the Portuguese Templars; the round church of the Holy Sepulchre at Brindisi, quoted as resembling that at Cambridge; the church of San-Sépulcro at Bologna, which is also of a round form; and the Cathedral of Paderborn, in Prussia, founded by Charlemagne. M. Lucas concludes with a more precise account of the Church of the Holy Sepulchre in Paris, built in connexion with a hospital to receive pilgrims passing through that city on their way to or from the Holy Land, in the fourteenth century.

Our increased facilities for travel give architecture an international, or cosmopolitan, character that increases in intensity year by year. It is pleasant to see that the stream of pilgrims flows to our shores as well as from them; and we thank the accomplished architect whose essay is now before us for his painstaking indication of the fact.

PRACTICAL EXPERIENCES IN VENTILATION AND WARMING.*

WHEN, in January, 1868, this Society did me the honour to listen to my paper, entitled, "A few Remarks on some of the Sanitary Necessities of House Buildings," and my explanation of how these necessities had been provided for in the house built for me in Grove-street, an opinion was expressed by some of the members present that many of the ideas propounded and carried out were, at that time, new and merely theoretical, and a wish was expressed by Mr. Baul and others that I would go to the Society the results of the working of the plan, after twelve months' practical experience, by living in the house.

By your permission I will now lay before you my experience from living in the house, during four cold winters and four hot summers, both seasons being calculated to test severely the merits of both the warming and ventilation.

The points that it was thought required confirmation by experience were principally those connected with the warming and ventilation. It will, perhaps, be remembered that the plan recommended and adopted was to have a reservoir for fresh air in the centre of the house, with the rooms opening out of it on each side, and that this reservoir should be separated from the stairs lobby by swing doors, in order that the cold air, rushing in when the front door is opened, shall not pass into this reservoir; that the air shall be admitted into this reservoir specially, say, through gratings in the floor; so that it may be, at least, as pure as the air in the street, and that its quantity may be regulated according to requirements, and that it may be readily warmed when the air in the street is too cold to be admitted into the rooms without being warmed; that it shall be warmed either as it enters this reservoir or afterwards, but certainly before it is admitted into the rooms, and that this reservoir shall be repeated on each floor of the house, and with the same provisions; that

the air in this reservoir shall have free entrance into the rooms, even when the doors are shut, either through the skirting-board or through the cornice of the room; that I preferred the cornice; that the vitiated air shall have exit through the ceiling,—and that, not directly to the external air, but up an interior wall to a chamber in the roof over the central reservoir, and that it should not even then have a direct exit to out of doors, but be drawn out of this chamber by a syphon, provided with a means of being kept permanently heated, in order to produce motion from the rooms, and to prevent all possibility of back or down draught,—and that, for this purpose, I preferred the kitchen fire; that the exit-flue from each room shall proceed separately into this chamber, and each have a separate entrance into it, in order that the syphon may draw equally from each room; and that each flue shall be regulated by a valve in its course, to open when the full current of ventilation is required, or closed partially when few persons are in the room, so as to hasten or retard the current of air in the room, or to divert the fresh warmed air altogether to the bed-rooms at night.

Such, then, was the plan recommended and adopted. Originally I did not arrange for valves to close the primary inlet openings, but I was afterwards driven to their adoption, because when the wind came against the front of the house it rushed up the lobbies and through the rooms at a most uncomfortable rate. The air is warmed as it comes into the ground-floor lobby by five coils, in two layers of Perkins's inch bore hot-water pipes. These pipes are heated by a stove in the basement of the stairs lobby. By this means the air in this lobby can be kept permanently at 65°. Instead of confining all the hot-water pipes to the entrance, it would have been better to have taken them up from the stove directly to the attic floor, and carried a coil along each floor also, and ending with a few coils at the entrance. This I have since had done. I would here bear testimony to the perfection of Perkins's apparatus, as supplied by Mr. Gibbs: it is safe, efficient, economical, and almost all that could be desired. The greatest objection to it I have observed is that it has happened that in really cold weather it has required water, and, in this case, it has had to be let out to have some supplied.

Now, as to the central reservoir, corridor, or lobby, it appears to occupy much space, and may be thought by some to be a waste of space. What I have to say, after paying for the land and building and living in the house for four years, is that I am very thankful indeed that I appropriated the space for it; it is one of the greatest comforts and best provisions of the house; and I am sure that, after experiencing the comfort, no proprietor of a good house would regret such appropriation of space by his architect.

This lobby is lighted at night by Rickett's globes—these globes do not foul the air, and I wish I had adopted them throughout the house: this would have prevented all blackening of the ceilings. By having the central reservoir also as lobbies to the different floors, the heated air is checked on each floor, and prevented from rising at once to the attics, as it does when this heating takes place in the stairs lobby. By having the entrance of the air into the rooms independent of the door, it is continual, even when the door is shut; and by having it by numerous openings along the longest side of the room, it is nicely distributed, and perceptible current is prevented. And I still prefer that it should be through the cornice. There are advantages in having the inlet through the skirting, and there are advantages in having it through the cornice; but I am sure through the cornice has a preponderance of advantages. Though the skirting has the advantage of less easy travel of sound from the rooms, when the air in the lobby is warmer than the air of the room the ventilation is more perfect. But what does travel of sound matter when it is into a private lobby? So that this is really no advantage after all. And when is the air of the lobby warmer than the air of the rooms? Scarcely ever,—indeed, only when the heating apparatus is fully on, and the rooms are without fires; so that neither is this any real advantage. Nearly all the year round the air is colder in the lobby than in the rooms, and that also after having been artificially warmed; and there are about two autumn months and two spring months when, though it is scarcely necessary to have the heating apparatus at work, the air is too cold to be admitted directly into

the rooms, or, at least, through the skirting directly to the feet of the occupants; but it is not then too cold to be admitted through the cornice, because by slowly falling through the warmer air of the room it becomes tempered before reaching the occupants; practically, I have found this to be so. And, besides, there are now and then days, even in winter, when it is not necessary to have the heating apparatus working; and, now again, the advantage of the entrance through the cornice comes in. So, taking all points into consideration, the cornice is decidedly preferable to the skirting for the inlet.

Having control over the exit-flues with valves enables one to economise heat, and to direct the current of fresh or of heated air through any particular room at pleasure; for instance, on a very cold winter night by closing the valves of the ground-floor and first-floor rooms, where the heated air is not wanted during the night, we have the full benefit of the whole of the heated air through the bedrooms.

The question may be asked: Why have a foul-air chamber at all? Why not carry the outlets from the rooms directly into the upcast, and thus save both foul-air chambers and downcast? Because, in that case, some of the flues would have suction and others none. Having a foul-air chamber secures the suction from all the rooms equally. The other plan has been adopted by Mr. King, in the new gas offices,—all the offices having a flue into the shaft surrounding the furnace flue, which is of iron. I shall watch the working of this plan when in operation.

The fresh air being drawn through dry cool cellars, it settles the dust and blacks, and, in the summer, becomes cooled; and, in dusty weather, it can be passed through canvas screens. That the ventilating-lobby should be separate from the stairs-lobby is absolutely necessary in every good house; for in no other way can steady, sensible warmth and ventilation, combined with privacy, be secured. And this, of course, necessitates that the front door, or entrance into the house, shall be at one end of the house, and not in the centre of the front elevation. I grieve, whenever I see a good house built or being built with the entrance in the centre of the front; for I know that this is or will be necessarily a badly-warmed and ventilated house. By admitting the air specially into the central lobby, the quantity admitted can be regulated according to the number of persons in the house, and the way of the wind,—conditions absolutely necessary to the complete comfort of the house.

There are a few other innovations I wish to notice. For instance, the windows do not open,—they are fixed like church windows; four of the bedrooms have only two chimney-fues amongst them: the breakfast-room chimney-fue runs into the kitchen-fue; the principal chimney-breasts are in the outer wall of the front and back elevation, and the bells are electric.

Most persons object to the idea of windows not opening. My wife, in particular, protested that she should imagine herself in a prison, and go mad. I have, however, to say of the practical experience that I am confirmed in my own opinion of the wisdom of this arrangement in the town, when the house is properly ventilated; and my wife is not only reconciled to the idea, but says she is delighted that they do not open. It is a wonderful protection from dust and blacks, and from the necessity of dusting. The cleaning is done as in most good houses, by men,—and costs me 20s. to 30s. a year. This *fixed* condition of the windows is not at all essential to either the ventilation or warming,—it is not at all involved in the principles, and it was adopted merely to assist to obviate the ordinary draughty nature of window-places, and to keep out the dirt. I have been disappointed to find that it has, with some, been thought essentially involved in the principles followed out. An open window would, of course, increase the inlet, which might be an advantage on a very hot summer evening. It is generally thought that one flue will not answer for two fireplaces: practically, however, it does, and, indeed, these fires burn as well as any other when only one of them is lighted, and much better when both are burning. This, I think, results from the flues meeting at equal heights, and the common fue being equal to the two. The breakfast-room fue was, at first, a failure; as originally designed it was shown, the entrance flush with the inside of the kitchen fue; but it was found that when the common fue was occupied by the smoke from the kitchen fire the breakfast-room fue

* From a paper by Dr. John W. Hayward, read at a meeting of the Liverpool Architectural Society.

would not draw, so I got a shoulder put at the lower edge of the entrance into the kitchen fire. This remedied the difficulty at once, and now this is one of the best drawing-flues in the house. This making one smoke-flue serve two fireplaces is quite independent of the principles followed, and was adopted merely for economy's sake. As to the chimneys in the outer walls, here is still a difficulty, and the only difficulty that now requires remedying. These chimneys are subject to gushing down-draughts, when the wind blows in gusts against the walls in which the chimneys are; for instance, the west or front chimneys smoke in puffs in strong west winds, and the back or east chimneys smoke in puffs in strong east winds. This is contrary, I believe, to the general opinion, as it is usually thought that the wind comes over the roof and curls down the chimney. I have tried several kinds of chimney-tops, amongst them the swivel cowl and archimedean screw, a horseshoe cowl towards the roof, and the introduction lower down in the warm part of the chimney of an opening slanting upwards into the smoke-flue, but without success. I have now a straight long top, simply doubled at the termination; this has not yet met with the adverse wind. Of course it is not an essential part of the principles of warming and ventilating that the chimney-breasts shall be in the outer walls, and it was adopted merely to utilise the fire-draught to assist the ventilation. The electric bells also are a mistake; I do not recommend them for private houses. They are about the same cost originally; but they are a continual trouble and expense afterwards: mine have already cost me more in the absolute cost of sulphate of copper than the bells of my previous house cost me in repairs the six years I lived in the house, besides the annoyance of their not acting. Notwithstanding these imperfections, the working of the general arrangement fully answers the expectations originally formed: there are perfect ventilation and complete warmth throughout the house, so that persons may sit in any part of the room, and do not require to crouch over the fire; the smell of dinner is gone directly, and so is that of smoking in any room; the bedrooms in the morning do not smell like bedrooms; there is no offensive smell from the water-closets; and both the ventilation and warmth are easily regulatable, according to the requirements of the occupants, and the season of the year. Each room receives an ample supply of fresh air, so distributed that there is no perceptible current, and which in summer is cooled from 5° to 10°, and in winter is warmed from 10° to 30°; so that all the year round the atmosphere of the whole house can be kept from varying more than 8° to 10°; and in the coldest winter it can be kept up to or above 65°, and in the hottest summer it can be prevented from rising above 72°. Of the comfort and advantage of these conditions I have had practical experience, not only in health, but also in disease. For some weeks of the winter '69 and '70 I had staying with me a young lady in the early stage of consumption, and I had my wife laid up with bronchitis; both patients felt the advantage of being able to range through the lobbies and whole house at any time with a full supply of fresh air, and without fear of the irritating effects of cold air. Also in the spring of '70 and '71, I had two of my children down with putrid scarlet fever: and I then felt the immense advantage of plenty of fresh warmed air going from the lobbies into the bed-rooms, and thence out of doors without returning into the lobbies, and with the ability to load the incoming air with disinfectants. By using disinfectants in the first floor lobby, the air entering the house became impregnated, and then passing through the lobbies into the rooms to out of doors without returning into the house, left my professional part on the ground floor free from any risk of infection, much to my own and my patients' satisfaction. Finally, I am very well pleased with my bargain; and were I about to build another house, I would build it on the same principles, and in the same way, only that I would have a metal (cast iron) instead of an earthenware kitchen smoke-flue, in order to utilise more of the waste heat of the kitchen fire; it was a mistake to have an earthenware smoke-flue. It is, I am sure, the warmest house in winter, and the coolest in summer; and altogether the most comfortable and healthy house in this town. I speak now, not only from theory, but also from experience; and had I time to superintend the erection, I would have some houses built in the

same way as a speculation, for I am sure they would be sought after, and would pay a good percentage on the outlay. . . . The primary inlet has an area of 5 square feet, the total area of the flue running into the four-air chamber is 4 square feet, the area of the downcast shaft is 5½ square feet, and the area of the upcast, at the place of the anemometer, is 4 square feet; and the canvas across the primary inlet is 171 square feet. The air first passes through this canvas; this causes a loss of about 55 ft. per minute, i.e., 55 cubic feet more of air would pass through the house per minute (were the canvas removed); there is a further loss of about 8 ft. per minute when the doors of the rooms are shut over when they are open. The air passes up the upcast shaft at the rate of 220 ft. per minute. The area of the upcast is 4 square feet; 480 cubic feet, therefore, passed through the house every minute, independent of the suction of the fires,—enough to supply the standard quantity of 15 cubic feet of fresh air per minute to fifty-eight persons in the house at one time. But, supposing the ordinarily used fires were lighted, about 4,500 cubic feet of fresh air would pass through the house every minute, thus allowing each of the fifty-eight persons 77 cubic feet of fresh air per minute, or enough to supply 300 persons with the standard quantity of 15 cubic feet per minute; for, of course, the occupants would have the use of it as it passed to the fires. I have also ascertained that when the fires are burning there is no diminution of the quantity going up the upcast.

SHAM JEWELRY AND MORALS.

At the Society of Arts, on the 28th of February, Mr. W. G. Larkins (editor of the Society's *Journal*), read a paper "On Trinkets and their Manufacture." In concluding, Mr. Larkins said,—Let me give utterance to an idea that has come into my head with regard to the matter of personal adornment. I am not going to say that makers and sellers of sham jewelry are lowering the morals of the country. I will not say they aid and abet the actual lie of those who would have us believe their brass is gold; and I will not go so far as my friend, Dr. Dresser, who, in a paper read before us last year, asked if the destruction of Pompeii and the woes that have lately fallen upon our neighbours across the Channel, were not due to their false quantities in decorative art. But I do mind me of a sentence of that quaint divine, Dr. Andrew Fuller, who said that, in the time of Elizabeth, a "lady would as soon have patiently digested a lie as have worn a false pearl." I am afraid this high regard for truth is not characteristic of the present generation. There is, on the contrary, a good deal of show and lumbricity about even ladies and gentlemen, and "all is not gold that glitters;" and it is possible that mock jewelry, false hair, pretended jewels, and other shams may blurt that keen sense of truth and right which distinguished our Saxon progenitors. At the same time, I am bound to admit that, by the rapidity and cheapness of manufacture now-a-days, things of beauty are placed before those who would never otherwise enjoy them; and perhaps, after all, as Mr. Wright says, "There is no valid reason why the factory-girl should not display her gilt buckle and brooch of the same design as the golden one worn by the lady of the villa." Art may thus serve the community by cheapening the cost of the beautiful, and afford gratification to the humblest members of society, by superior designs reproduced in the cheapest possible form, and attainable by all.

Mr. George Wallis, opening the discussion, said,—They had all frequently heard it asserted that anything which came from Birmingham must be an imitation; but he would say, if it were made as an imitation, it was sold as an imitation; and, whatever might be done by the retailers afterwards, it went out of the hands of the manufacturers honestly for what it was. He had had the pleasure of living in Birmingham for seven years, as Head Master of the Birmingham School of Design, now called the School of Art. He had known Birmingham from his boyhood, and had kept up his connexion with it ever since he left, in 1858, and during the time he was there or since, he had never read in any police report in the newspapers of any workman purloining the goods of his master, although they were in the habit of dealing with precious materials amounting to the value of a million

and a quarter in the year. In 1855 he had the pleasure of reading a paper in that room, upon the "Recent Progress in Design," and he brought up from Birmingham a considerable display of the products of the town. Many of the objects were mounted upon cards, which were marked London so-and-so, and people thought they were made in London, but that was a mere myth; it answered the purpose of the manufacturers to cater for the whim of the retailer, and he mounted his goods accordingly. He should like to see this kind of thing done away with, as it would be more honourable and honest. In the Exhibition of 1851, Birmingham did not exhibit a single article of jewelry, but in 1862 they made a very excellent display, chiefly through representations made by him. Previously, the manufacturers said they did not care what the public thought about Birmingham jewelry; they sold it honestly for what it was, and did not care to betray the secrets of their customers. He was sorry to say that many persons, who ought to have known better, said they did not care to look at the Birmingham cases, because they did not consider there was anything worth looking at. There had been a deal of talk about French design, but he was satisfied that the French designers had led the English into some of the most outrageous absurdities, and it arose out of the incessant following of the mere whims and caprices of the French.

Sir Walter Stirling said he was much pleased at finding that Birmingham was in reality the temple of truth, for the general impression was quite the contrary. It was evident, however, from what Mr. Wallis said, that what was fictitious jewelry was honestly sold as such, and therefore there was no deception. He considered it a great public benefit that articles could be produced of the highest finish and beauty, without having intrinsically such a high value as to tempt housebreakers and thieves; and he hoped it would be more generally recognised that the beauty of trinkets should depend on the excellence and taste of their manufacture. The same principle applied in the highest circles of society, for he believed there was no such thing in use now, even at royal tables, as gold plate, except in rare instances. On one occasion, when dining with the Goldsmiths' Company, he inquired for the gold plate, but the only specimen shown him was a cup, which had been set before Queen Elizabeth. Even silver plate was now so closely imitated by electro-plate, that it was almost entirely superseded by it, and people might now sleep in safety, either in their town or country houses, without the fear of burglars breaking into their plate-closets and carrying off that which was not only precious as having been in the family, perhaps, for several generations, but also from its intrinsic value. It was very creditable to the artists to see such beautiful imitation jewelry, but, after all, there was nothing which could equal the beautiful appearance of pure gold. Indeed, having witnessed the Royal procession of the previous day, he was of opinion that even Temple-bar was vastly improved in appearance by the gilding bestowed upon it.

MASTER AND SERVANT BILL.

This Bill was issued to Members of Parliament and the public on Tuesday last. It provides that the Act shall come into operation on the 1st of January, 1873, and shall not extend to Ireland. Under the Act the whole of the wages of workmen shall be paid in coin of the realm, without any deduction, and without any condition as to the spending any part thereof. Every contract in contravention of the Act shall be illegal and void, and the workman may recover his wages as if the contract had been made in conformity with the Act, and as if any deduction had not been made, or as if such payment, so far as it is illegal, had not been made. Masters and masters' agents who make contracts imposing conditions, or using compulsion, as to the place or manner in which, or the person with whom any money paid on account of wages is to be expended, shall be guilty of an offence against the Act, as shall be also the person with whom such money is expended, unless he shall satisfy the court that he was in ignorance of such illegal contract. The Bill provides for the weekly payment of wages, or by special contract, and that a part only of wages may be paid, but such part to amount to not less than 90 per cent. No wages shall be paid on any premises licensed for the sale of intoxicating liquors, or at or within any office, yard, or place contiguous

to, or occupied with, such premises, or on any premises on which goods are ordinarily sold to such workman. Where any goods have been sold or supplied to a workman by his master or master's agent, as or on account of wages, at a shop or place kept by or belonging to such master or master's agent, or in the profits of which they may have an interest, an action shall not lie against the workman, and the master shall not be entitled to any set-off for such goods. The Act is not to refer to deductions for school fees for short-timers, or for contracts for the school fees of other children, or for board and lodging when the workman lives with his employer, or for fines mutually agreed to between master and workmen; nor shall the Act deprive a master of the right of distraining for rent. The Bill provides for an audit of deductions, for education, &c., by auditors appointed by the workmen, and for appeals to the Quarter Sessions. Offences against the Act will expose to a penalty of 10*l.* for the first and of 20*l.* for subsequent offences. If passed, it may not be doubted that this Bill will prove the death-blow of the Truck system.

THE WALWORTH COMMON ESTATE.

The sixtieth letting of the land on the Walworth Common Estate, which is vested in the Governors and Guardians of St. Mary Newington, and which has, during the last few years, been let on lease for building purposes, took place on Monday last, at the Elephant and Castle Inn, where there was a large attendance of builders and others interested in property. There were sixty-three lots offered, fifty-seven being sites for private houses, and six for shops. With the exception of sixteen lots, the whole of the sites offered are situated in a new street, called Faraday-street, which has been so designated in honour of the Professor whose name it bears, and who was born in the parish of St. Mary Newington. This new street, which is 15 yards in width, and about 400 yards in length, is now in course of formation. Messrs. Stuart & Son, who officiated as auctioneers, stated, in opening the proceedings, that the bulk of the estate had now been disposed of for building upon, and there was little more left to purchase. All the lots offered were readily sold, there being an active competition amongst builders present for the several sites. The sites for the private houses, which contain an average area of 17 ft. frontage by 60 ft. in depth, and which are all intended for a superior class of houses, realised an annual ground-rent of 4*l.* 15*s.* per annum, on a lease for the term of eighty years, whilst the sites for two shops, opposite each other, at the corner of Faraday-street and Thurlow-street, containing, respectively an area of 24 ft. and 23 ft. frontage and 60 ft. deep, realised 10*l.* 15*s.* and 9*l.* 10*s.* annual ground-rent. The lettings of the day realised, in the aggregate, an annual ground-rent of 331*l.* This estate, upon which several hundreds of houses and other premises have been built within the last few years, whilst whole streets of others are still in course of erection, is now yielding a large annual revenue in ground-rents to the Newington governors, the average amount paid for the leases representing about 3,000*l.* per acre, as freehold.

SHEPTON MALLET.

SINCE our reference to this town, the inhabitants have held a public meeting regarding the matter. It considered there was a necessity for reform in the existing sanitary arrangements, and a committee was formed to consult as to the best means of procedure. Immediate action was deprecated, in view of sanitary legislation this session, yet it was thought that the committee might pick up many good hints in the meanwhile in the towns in which sanitary knowledge and action were more advanced than in Shepton Mallet. We were not surprised to learn, that at this public meeting there were some who believed the sanitary arrangements of the town were well-nigh perfection, and who were prepared at all points, to prove Shepton Mallet "the healthiest town in England." There are now such a very large number of "healthiest towns in England," that we commend with delight to all Improvement Commissioners, and other opponents of sanitary measures, the phrase recently introduced by an Improvement Commissioner,—"the healthiest town in Great Britain." It is a decided pull upon phrases.

The Duchy of Cornwall possessing a large

amount of property in Shepton Mallet, the stream that runs through the town being part of it, it was asked to help in the work of purification; but for the second time the application has been refused, and with that peculiar air of grandiose snobishness that we hope and believe only Duchy of Cornwall officials exhibit in such perfection.

They would offer no impediment to the improvement of the Duchy property, but they had given an answer in the year 1868 (or thereabout), to which you are referred. On the Duchy stream from Kilver-street to the Factory at Draycott, there are forty-three privies emptying more or less directly into it, and forty-two sewers, nine of which are public, draining between them the whole of this town of 3,500 inhabitants; and on this stream, just before it reaches the town, there is a brewery, and then a large factory; some portions of the stream are arched over, of course making the uncovered portions all the more noxious and nauseating. Mr. Rawlinson, in his "Practical Suggestions," issued by the Commissioners in Lunacy, says,— "Natural streams should not be arched over to form main sewers;" to which one might add in this case,—so much ignorance, so much mischief; for ignorance is not idle any more than knowledge.

In an uncovered portion of the stream about twenty yards in length, close to Leg-square, at least three sewers and three privies empty; yet in this place we saw a man doing his weekly washing of entrails for sausage manufacturers in the town, whose names were given us. 10 ft. or 12 ft. back from the banks of this same part of the stream, and in such a position that God's sun can rarely if ever reach them,—cold, dank, dismal,—there are two houses; in one of them there has been a fatal case of typhoid fever, and the people who live there are constantly ill. An agent of the Local Government Board should see the convenience on these premises,—not the outside only, but the inside as well,—and then he should go across to another outside the flour-mills opposite: he would eat no dinner that day. Now, that the Prince has had such an awful experience of the very disease that may at any time visit some of the tenants of the Duchy of Cornwall property in Shepton Mallet, we believe that, if a proper representation were made to him, more directly than has hitherto been done, he would at once cause inquiries to be made as to the existence of these nuisances.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At a Special General Meeting of the Institute held on Monday, the 4th inst., the royal gold medal, annually bestowed (subject to Her Majesty's sanction) on some distinguished architect or archaeologist, was awarded to Professor Friedrich Schmidt, of Vienna, President of the Austrian Institute of Engineers and Architects, and holding the Government office of "Ober-Baurath," a title nearly equivalent to that of our First Commissioner of Works. Professor Schmidt designed the new Roman Catholic church at Vienna, the gymnasium in the same city, the Dominican church at Bisseldorf, and many other buildings of importance. He is also an honorary and corresponding member of the Institute. The meeting having next proceeded to consider the recommendation of the Council respecting the award of the Soane medallion and other Institute medals and prizes offered for designs, measured drawings of ancient buildings, &c., the following adjudication was made.

The Soane Medallion and 50*l.* (subject to the usual conditions as to Continental study), to Mr. Alfred Reading, of Hall-road, Handsworth, Birmingham, for his design of a town-hall.

The Institute Silver Medal and five guineas, to Mr. Fred. H. Reed, of London, for a series of elaborate and carefully measured drawings, illustrating Tattersall Castle, Lincolnshire.

A Medal of Merit, to Mr. Fred. C. Deason, of London, for a similar series of drawings, illustrating All Saints' Church, Edington, Wiltshire.

In the same competition, the drawings submitted by Mr. John Langham, of Leicester, and Mr. C. Bryan Oliver, of Bath, were "Honourably Mentioned."

The student's prize in books was given to Mr. William Scott, of London, for his design for a staircase in a domestic building.

The Council then announced their decision respecting the award of certain money prizes offered by Mr. H. W. Peck, M.P., for the

best series of drawings, illustrating the restoration of Eastbury Manor House, and the Convent Gateway, Barking, viz.:—the sum of 42*l.* to Mr. T. E. C. Strachan, for the best set of drawings of Eastbury Manor House; the sum of 20*l.* to Mr. Philip J. Marvin, for the second best set of drawings of the same subject; and the further sum of 10*l.* to Mr. Philip J. Marvin, for the best drawings of the old Convent Gateway, Barking.

It is understood that these prizes were offered by Mr. Peck with the sole object of encouraging architectural study, and with no view to the restoration of the building, which does not belong to him.

It is proposed that the formal presentation of the Royal Gold Medal and the Institute Prizes shall take place during the General Conference of Architects, which will be held later in the season at the Institute.

The next ordinary general meeting will take place on Monday, the 18th inst., when a paper will be read, by Mr. Wyatt Papworth, "On the Fall of a Church Dome, with Suggestions for its Construction on better Principles."

THE HOME AND THE MAN.

"As the home, so are the people."

WHAT is progress? Let us reason.

It is conquests great and great;

Honours, such as we enbazon

With the emblems of the State?

Is it arms bravely quelling

Civil strife, that drest ban;

Or the building of a dwelling

Where to mould the future man?

What is progress, Lords and Commons,

Ye who gnido the nation's will;

Can it be that man and women's

Nature courts but human ill?

Is it schools for prayer and spelling,

For the Arab class and clan;

Or a healthy human dwelling

For the family of man?

Progress, human, is the solemn

Home foundation undefiled,

Man the grand Corinthian column,

And the ornament the child:

This is progress, onward swelling,

In proportion and in plan.

As we make the human dwelling,

So we shape the future man.

Pro.

Let us build for health and morals;

Let us raise, in Heaven's name!

Homes to win us lasting laurels,

And to wipe away our shame.

Earthly triumphs these exelling

Are not in creation's span;

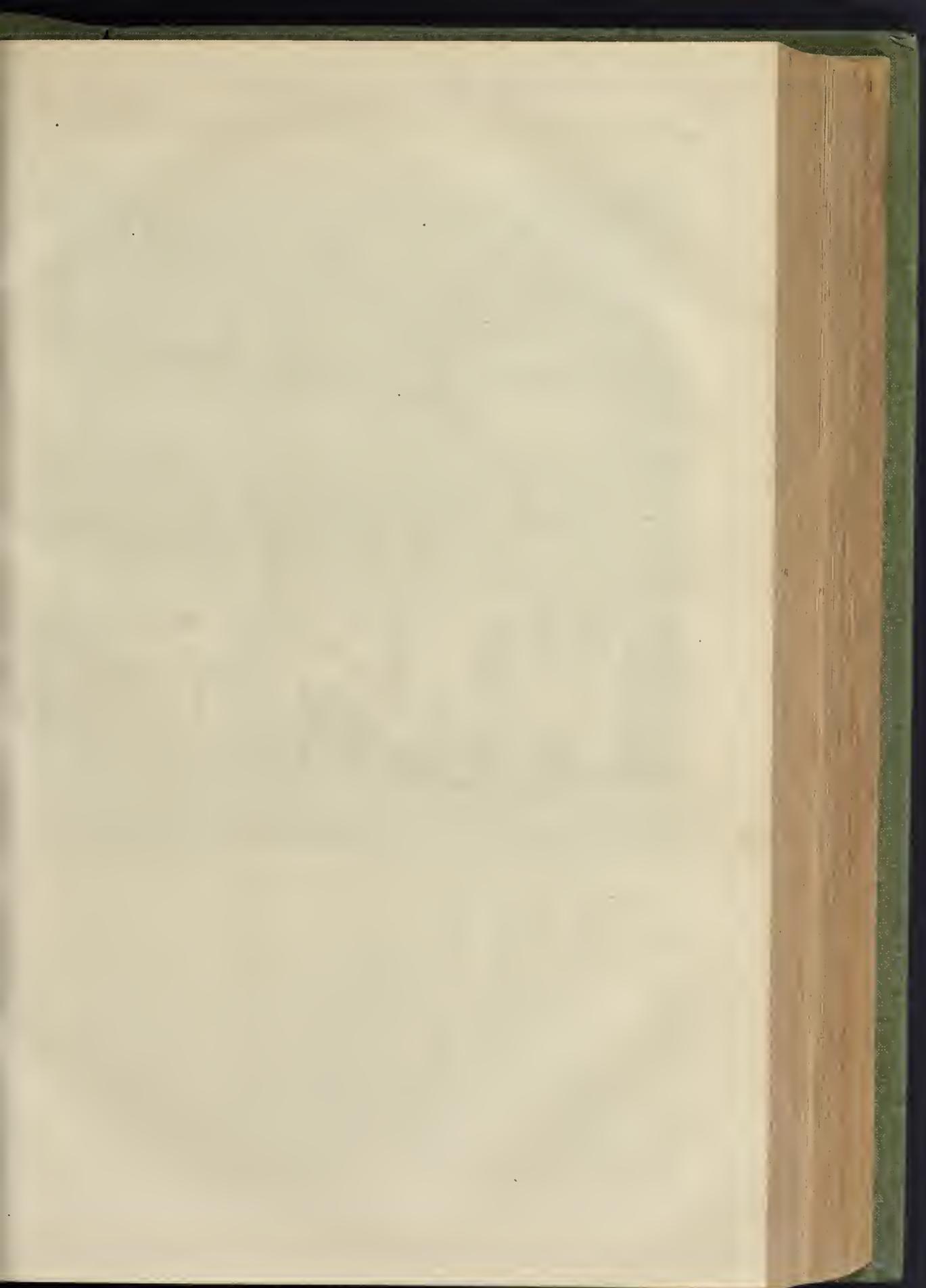
For improvement in the dwelling

Means improvement of the man.

C. C. H.

EARLY REMAINS NEAR GRACECHURCH-STREET.

IN Corbet-court, a turning out of the west side of Gracechurch-street not far down from Cornhill, a pile of offices with large cellars is about to be built, under the direction of Mr. Crockett. Considerable excavations and clearances of old works are being made in consequence, and in the course of these, at a depth of from 16 ft. to 18 ft. from the present street level, remains of a small Norman arcade and other early work have been exposed. One of the stone columns, with its capital, is pretty perfect. On other parts of the site there are vaultings of rubble and concrete. The bearing-wall of one of these is seen to have been underpinned with good masonry, probably soon after the Great Fire. St. Peter's, Cornhill, close by, is of very ancient foundation. Even if the tradition which makes it the first Christian church in London, and takes it back to the year of our Lord 179, be put aside, there is evidence to show there was a church here in the year 1230. It seems just possible that the remains now discovered formed part of some of the buildings connected with this or the neighbouring church of St. Michael. Chroniclers mention a subterranean passage-way from St. Peter's, the "London Tavern Apprentices," it is said, penetrated it to a considerable distance about sixty years ago, soon after which occurrence it was broken up.





ANCIENT TIMBER BUILDING AT LIMBURG.

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LIMBURG.

We add one more to our examples of ancient timber buildings. It is to be found in Limburg-on-the-Lahn, to the east of the cathedral, and forms the interior of the courtyard of an ancient building, which was originally the dwelling-place of the canons attached to that church. This is an early example of timber construction, and may date from the fourteenth century. As will be seen from our engraving, the beams are chamfered in a very elaborate manner, as are likewise the uprights and the ends of the joists, giving a contradiction to the assertion of some members of the profession, who are wont to persuade themselves, and try to persuade others, that chamfers are a "modern invention."

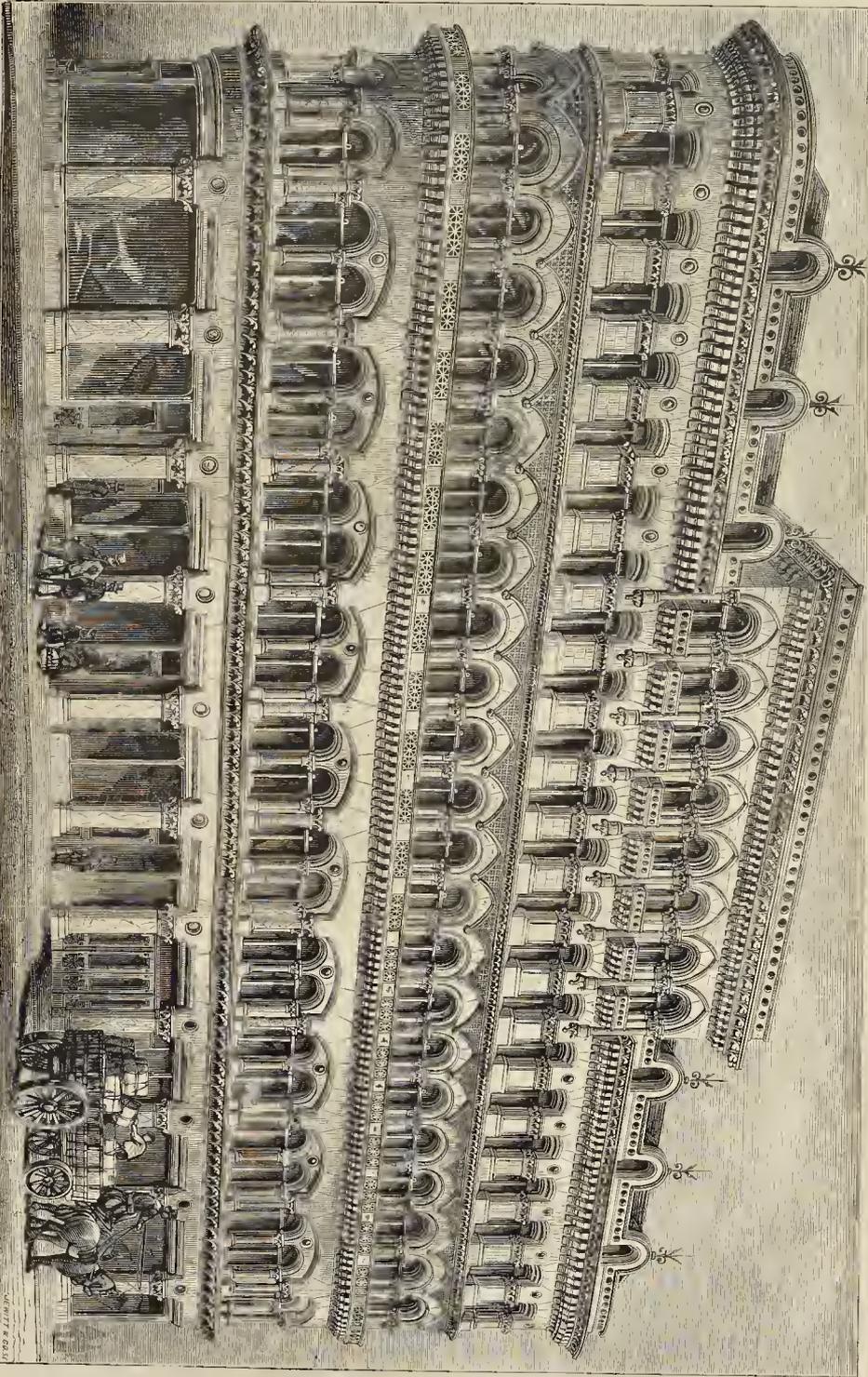
CHEAP GAS FOR RAILWAY COMPANIES.

It may be readily believed and easily understood that the expenditure for gas in lighting stations and booking offices constitutes a heavy

item in the accounts of the railway companies that have stations in, or near, London. The London and North Western Company paid, if we mistake not, over 40,000*l.* for gas consumed last year in London and the suburbs, at its stations, warehouses, and booking-offices. Reference was made to this subject at the last meeting of the Metropolitan Company, and to the hope that could now be entertained of an important reduction in this item of expenditure, through an arrangement with a new gas company, that was ready to engage to supply gas of sixteen-candle illuminating power, at 2*s.* 3*d.* per 1,000 cubic feet. It is understood that the company referred to has already arranged to supply the Metropolitan, the Metropolitan District, and the London Chatham and Dover Companies, with gas of the quality referred to, at the price stated. A condition of the supply will be that the gas company shall be allowed to lay pipes along the railway companies' lines, from the gasworks to the stations or places where the gas is to be consumed. This arrangement will obviate the necessity, and, of course, the heavy cost, of an

Act of Parliament, and will deprive the gas companies,—which are, as is well known, a rich and powerful confederation,—of a *locus standi* as opponents of the new company. Land for the new works has been taken at West Brompton and at Battersea, from which there is communication with all the railways having termini in London, north and south of the Thames, and all the stations in the extensive metropolitan railway district. It is stated that the gas rentals paid by the London railway companies amount to 175,000*l.* per annum, and that fully a third of that sum will be saved by their contracting with the new company. It will, of course, be seen that the arrangement between the railway companies and the gas company can be carried out without any interference with or breaking up of the roads or streets. It may be expected that other companies will speedily follow the example of those that have contracted for the supply of better light, at a rate so much lower than that they are now paying.

Mr. George Flintoff is the engineer of the new company.



LONDON STREET ARCHITECTURE: ALBERT BUILDINGS, QUEEN VICTORIA STREET.—MR. FREDERIC J. WARD, ARCHITECT.

—GUTHRIE & CO. L.

SECURITY AND SASH FASTENINGS.

SOMETHING has been lately said as to obtaining a safer method than the one in use for securing sash windows and reforming their fastenings.

Before making some suggestions to that end, I would point to the communications which appeared in the *Builder* on a cognate subject, from different correspondents, in the volume for 1870, "On Sashes and Sash Hangings." Most of our present sash-fasteners are useless for purposes of security, not alone from the fact that in the majority of instances they are "cheap and nasty," and of bad material, bad design, and worse workmanship, but because the sashes to which they are attached are not constructed in the right manner at the point where all the danger lies. The meeting-rails of the top and bottom sashes are seldom or never made of sufficient thickness or breadth. To allow for the thickness of the parting slip that separates both sashes, it is, of course, requisite to add to the breadth of the meeting-rails. Some sash-makers allow for the additional breadth on one rail alone; others equally divide it between the two. The first method is the worst, and the second method not much better, if what is technically called "hooking" or "spraying" both edges of the meeting-rails is not done. By this method both edges of top and bottom meeting-rails lap diagonally against each other. This meeting-rail is not so secure than a square meeting-rail, is still not proof against a thin blade of steel or a knife being inserted between; but it is far preferable to the square section, as the blade or instrument used will have to pass in at a great inclination. The fastener can be put on in this instance in such a manner as almost to counteract any successful insertion of a blade unless considerable force be employed.

Here is, however, in our opinion a much better method. Let the edges of the two meeting-rails of both sashes be rebated, the meeting-rail of the lower or inside sash to overlap the outer, so that their rising and lowering will not be interfered with. To go to the rudiments, let us suppose that the thickness of the sash-stiles is $2\frac{1}{2}$ in., and the parting-slip or bead in the sash-frame $\frac{1}{2}$ in. thick. Let us allow, then, in the breadth of the meeting-rails for what will give a $\frac{1}{2}$ in. or $\frac{3}{4}$ in. rebate: the last will be found sufficient if the sashes are closely fitted. No knife or thin blade of steel can be inserted in this instance, as the projecting section of the rebato of the meeting-rail of the inside sash stops it.

In making sashes, it is always aimed at to give the meeting-rails as light an appearance as possible, from the belief that they ought, if possible, to correspond with the bars,—a very erroneous notion.

There is no valid reason why the thickness of the meeting-rail of an ordinary sash should be reduced to $1\frac{1}{2}$ in. or $1\frac{1}{4}$ in., which is foolishly considered by many very gross for an ordinary sash meeting-rail. In fact, they should not be under 2 in. in thickness; but if men will aim at airy lightness, they must not anticipate security. In future, with a view of increasing the strength and security, and maintaining the lightness of appearance in the meeting-rails of ordinary sashes, I would recommend that the meeting-rails in every instance should be composed of either oak or ash. The rebato then would be more strong and durable, and would resist a much greater degree of real violence and open force. In respect to the suggestion of having the meeting-rails of sashes rebated, there will be some people who will pretend to see objections and eyesores at once; but before these are made we will anticipate them. As to a rebato being unsightly on a meeting-rail of a sash, it is no more unsightly than a rebato on a folding-door or a French casement window, which has to be so treated. One rebato only can be seen from the outside, and this only when the lower window is raised; and even in the window of the ground-story of a dwelling, no person, except those possibly bent on looking out for the sight, would take notice of the difference. As for the additional trouble in the preparation and fitting of the sashes, we see very little indeed. All sashes should be fitted to their frames before leaving the workshop or builder's yard and glazed. Fitting sashes after being glazed is an unworkmanlike fashion and leads to much loss of time and also loss of glass, as a great quantity of it is often broken when this slovenly method is adopted. The rebating of the meeting-rails will not interfere in the least with the space occupied by the sash-fastener, as there will be sufficient room for the screws and placement.

A word about sash-fastenings in general. They are, as a rule, flashy and bad, and instead of improving in quality they are growing worse, so far as good design and artistic design they have little claims to "honourable mention." The old screw and spring sash-fasteners of thirty or forty years since were far preferable and more secure than any of our present descriptions. The screw and spring were protected in the barrel or tube; and when the screw entered its corresponding socket, at each revolution both sashes were drawn tighter and tighter together. The opening and closing of sashes when required was a little more troublesome, or, rather, was not so expeditious as now, but increased security was obtained. The more we consider the adoption of the rebating process the more we are convinced of its security, and are prepared to meet the objection which may be urged against it.

If the meeting-rails are closely fitted they will keep close for years, and sand-bags may be dispensed with. Any objection that may be urged in the matter of paint clogging up the rebate in course of time may be urged against a rebate in other instances, but no such thicknesses of coats of paint may be anticipated, as they can always be avoided and prevented at each repainting.

After all, it may be said that the publication of each new improvement or invention connected with the security of house property is but giving so many useful hints to burglars. Swift, by his humorous "Advice to Servants" how to cheat their masters, opened the eyes of masters and mistresses a little also, and led them to be more particular in their manner of leading people into temptation.

If burglars as well as builders are assisted by our advice we cannot help it, but for the further information of the latter, who may be the owners of house property, we would advise them to provide shutters for all windows, and also we would advise the Commissioners of Police to give instructions to every policeman on his beat to insist that all shutters to windows, particularly those belonging to the two lower stories, should be closed to before midnight. Porches or porticos to dwellings offer great facilities to confederated burglars or housebreakers, who can make ladders of their backs in the interest and pursuance of their profession.

Finally, forcible entry can only be resisted by force, or counteracted by precautions,—household precautions, and those belonging to the public and local authorities,—or, otherwise translated, the due vigilance of "the man on the beat."

A clever burglar is not stopped or awed by trifles; give him but the coveted opportunity and his drills, jemmies, and centre-bits, and even with the shutters fastened he will make a stealthy and almost noiseless entry. A diamond and a leather sucker will lift a pane of glass, or a piece of it, with a refreshing smoothness into the tail of his coat or working apron, and after that *open sesame* we will let the imagination of our readers supply the rest.

A CRAFTSMAN.

CO-OPERATIVE BUILDING INVESTMENTS.

At a local conference of representatives from Lancashire Co-operative Societies recently held at Eccles, near Manchester, the employment of capital in buildings was very fully discussed. We condense a short notice of the conference from the *Co-operative News*:—The subject first considered was, "The Best Means for the Employment of Surplus Capital," and among many suggestions, that of cottage building seemed to find most general acceptance. If the buildings were adapted to the wants of the members, and suitably located, the investment yielded a good and safe return, and was advantageous to the members generally. It also conferred a political power which could be used in defence of industrial interests, when, as at the present time, an attack upon co-operative societies was expected on the part of the trading and mercantile classes.

In most cases the houses were built by the society, and either leased or purchased by its members. The Rochdale code of rules was commended, and their practice was to lend money for building purposes at 5 per cent. The working classes ought now to require good houses, and the co-operative societies might very profitably provide them. They frequently found private individuals do so to very good advantage. At Radcliffe they had built thirty-one cottages of a good class, most of which were let to their

members, and they had now formed a building committee, to whom they had granted 4,000l. for building purposes. Each member paid a tenth of the cost to start with, and the rest quarterly. Cottages were generally preferred as an investment to cotton. But it was urged that there should be somebody on each building committee who knew the trade, and they should carefully watch the extras.

The Baccup Society was referred to as a surprising instance of the supply and employment of capital. They had already more manufacturing companies than any other town in England. They had been building cottages very extensively, having just completed sixty-five, and having passed the plans for twenty-two more. They would probably keep on building for some time, as they could dispose of the cottages as rapidly as they were erected. Their society had 12,000l. or 13,000l. invested in different companies. They had found building a most practicable method for the employment of their capital, and distributed the repayment from purchasers over thirteen years.

Over Darwen was another instance given worth example. They had found the capital for a paper-mill which was nearly ready for work. They had about 8,000l. invested in cottages, of which they had built about as many as they required. They had next agreed to go into coal-mining, and were then in treaty for the purchase of an estate. Having provided for their colliery they were thinking of a spinning-mill.

A FATAL MISTAKE.

SIR,—I am much disappointed, in common with many of your readers who interest themselves in the great question of public health, to find that Mr. Stansfeld in his new Bill permits the appointment of inspectors and medical officers of health still to be left in the hands of the local authority. Unless this important provision be altered, I venture to predict that the Bill will never work. The reason is short and clear: the "local authority" themselves are for the most part the great perpetrators of sanitary sins; and how can I report against the interests of my employers? AN INSPECTOR.

ALBERT BUILDINGS, QUEEN VICTORIA STREET, CITY.

"ALBERT-BUILDINGS," now nearly completed have a frontage of 120 ft. to the new thoroughfare, Queen Victoria-street, with returns on Queen-street and Cannon-street of about 60 ft. each. The total height of the pile in the centre is 80 ft. The traffic to the upper portions of the premises is intended to be carried on by means of a hydraulic lift, in addition to the ordinary staircase. The material employed in the elevation is Portland stone, and very little ironwork is used in the construction. Mr. Frederic J. Ward, of Cannon-street, is the architect; the contractors are Messrs. Trosse & Co.; and Mr. Frampton is the carver.

THE PROPORTIONS OF CORNICES.

SIR,—I have always found great difficulty in designing cornices to rooms so that they be neither too large nor too small. After many failures, I have adopted the following rule, which will, I think, be found to give satisfactory results:—

Take half the width of the ceiling and the height of the wall from the top of the skirting to the ceiling, and, whatever they measure in feet, set out in inches for the cornice. Let as many inches as half of what the ceiling measures in feet be set off for the members on the ceiling, and as many inches as the wall measures in feet be for the members on the wall. Thus the cornice will measure on the flat (not girth) a twelfth of the height and of half the width of the room, which for public rooms might be increased perhaps to a tenth part if they were low in pitch. Of course, the space thus set out is to be filled in with members and ornaments designed in due proportion with each other,—a matter with which I have no immediate business.

It will be seen that by this rule, if the room is narrow in proportion to its height, we obtain more members on the wall than on the ceiling; and, on the other hand, if it is wide, we have more members (in proportion) on the ceiling

than on the wall; thus obtaining a flexible rule, which the necessarily infinite proportions of rooms require, and which will, I think, be found convenient, and at the same time satisfactory in its results, and as such will, I hope, be useful to some of your readers, from any of whom, however, I should be glad to hear of a better rule, if such exists.

E. F. HUTCHINS, Architect.

THE NEW PUBLIC OFFICES.

In reply to Lord Redesdale, the Marquis of Lansdowne said, in the House of Commons, that it was probable the public offices now building in Downing-street would be completed about the spring of the year after next. As to the second question, he could not say precisely when the houses between the new offices and Parliament-street would be pulled down. Rents were being got out of some of these houses, and the Government thought that it would be as well to have the advantage of those rents as long as possible. Besides, these had from view the work now going on at the back of the side of Parliament-street in question. With regard to the noble lord's third question, the Government had no intention of widening the side of Parliament-street near to the new public offices. He agreed with the noble lord that there would be a certain amount of unsightliness if the whole of Parliament-street was not opened up; but it would not do to throw the cost of such an improvement on the whole country. If the widening of the street was found to be necessary on account of an increase of traffic, it would be different. In that case, however, the proper body to deal with it would be the Metropolitan Board of Works.

THE PROPOSED METROPOLITAN AND ST. JOHN'S WOOD RAILWAY.

ALLEGED SERIOUS INJURY TO HOUSES AND OTHER PROPERTY.

It is stated that the proposed Metropolitan and St. John's Wood Railway, for which application is about to be made to Parliament, will very seriously interfere with the safety and value of property along the district which it intersects, and the consequence is that a determined opposition to it has for some time been resolved upon by the Marylebone Board of Works, which it appears is now to be followed up by the Metropolitan Board. It is alleged in opposition to the project that the company by their Bill are seeking for powers to interfere with houses and other buildings, without granting compensation, in a manner which has not hitherto been attempted by any public company. It is urged as one reason why the Bill should be resisted that it proposes to establish coal depots in some of the best parts of the metropolis, which it is contended will materially depreciate the value of property in the vicinity; also that the time for the completion of the line was three years, so that the West-end streets might be blocked up for that period.

SCHOOL BUILDING AND OTHER WORKS AT GREAT YARMOUTH.

The new Grammar School, in the Trafalgar-road, is now approaching completion. The buildings comprise master's house and offices, dormitories, dining-hall, and other accommodation for about forty boarders. School-room, 65 ft. by 26 ft., with class-rooms adjoining. Entrance porch, with bell-turret over, spacious lobbies, and the necessary offices. The buildings are of Gothic character; the walling material is red brick, with stone dressings. The expenditure has been about 4,500l.

St. Peter's National Schools.—These schools have recently been enlarged, additional accommodation having been provided for about 100 children.

St. James's National Schools.—The designs for these schools were prepared about four years since, at which time the Infant School was built. Contracts have now been entered into for the completion of the group by the addition of boys' and girls' school, with the necessary offices. Accommodation will be provided for about 500 children. The buildings are of Gothic character, walls of red brick, roof open timbered. The cost will be about 1,500l.

St. Nicholas (Priory) National Schools.—Considerable additions are about to be made to

these schools, by which accommodation will be provided for about 180 additional children.

St. Mary's Roman Catholic Schools.—New rooms have just been completed in connexion with these schools. Accommodation is provided for about 100 additional children.

St. George's Dens.—New school-rooms, class-rooms, and lecture-room have been erected, adjoining to, and in the area of the Baptist Chapel. The lecture-room is over the school and class-rooms, and is about 50 ft. by 30 ft., with open-timbered roof. Convenient and direct access is obtained from the lecture-room to the galleries, and from the school-rooms to the ground-floor of the chapel.

Dwellings for the Working Classes.—The Great Yarmouth charity trustees have instructed their architect to prepare plans for laying out a portion of their estate, near the Caistor road, for building purposes. The site contains about 7½ acres, and it is proposed to erect thereon about 200 small houses suitable for the various grades of the operative and working classes. The general plan and scheme for laying out the ground have been approved by the Charity Commissioners of England and Wales, and designs have now been prepared by the architect for the whole of the dwellings.

Mission Church.—It is proposed to erect a new Mission Church (Convent of Huntingdon) here, in a rapidly increasing part of the town. The building will be Gothic in style, with flint walling and stone dressings.

The architect in all these cases is Mr. J. L. Bottle, of London and Yarmouth.

THE CURACY HOUSE, PEWSEY, WILTS.

The Curacy House in the High-street has been pulled down. The new building recently finished is of a Domestic Gothic character, constructed of red bricks obtained from Devizes, relieved with hands and arches of coloured bricks, and having dressings of Bath stone. The roofs are covered with Staffordshire blue and brindle tiling, laid to patterns. The entrance porch forms a feature in the front elevation, having a bold open-timber roof, supported on brackets and stone corbels, rising between the two front gables. All the windows have been filled in with quarry lights and tinted cathedral glass, supplied by Messrs. Watson, of London. The ornamental ironwork was supplied by Mr. Shrivell, of Long-acre. The works have been carried out by Mr. Thomas Edwards, builder, from the designs and under the supervision of Mr. John Birch, architect.

OLD ST. PAUL'S CATHEDRAL.

Sir,—In the *Builder* for February 24th, I notice an article on Old St. Paul's Cathedral, by Mr. E. B. Ferrey, reference being made to an earlier church, which might have been afterwards "cased." Perhaps Mr. Ferrey may not have seen the following extract from Peppy's *Diary*, September, 1668:—

"It is pretty here to see how the late church was but a case wrought over the old church. You may see the very old pillars standing whole within the walls of this."

The above appears to have been entered by Peppy in his *Diary*, after paying a visit to Old St. Paul's Cathedral, then being pulled down.

J. HORDERN.

SCHOOL BOARDS.

Bradford.—At a meeting last week, Mr. Neill moved the adoption of the plans, specifications, and estimates submitted by Messrs. Lockwood & Mason for schools in Feversham-street. The cost of the schools, he said, would be 9,237l. of which 7,000l. were for the buildings, 1,300l. for the playgrounds, 250l. for fittings, 532l. 10s. for architect's commission and clerk of works, and 50l. for contingencies. A sum of 630l. for paving and draining of streets and 132l. for expenses of conveyance had been included in the former vote of 8,750l. for the land. He did not think they could ask the ratepayers to sanction the erection of a school that could be much plainer from an architectural point of view than the one shown in the plans. In Bradford hitherto, whenever a public building had been erected, the general feeling was, after a few years, that it ought to have been better done. In the matter of the street improvements, the men who had advocated the more ambitious plans had incurred a good deal of unpopularity at the time, but public opinion was year by year coming round

to their view. If they looked at schools built twenty years ago, the general feeling now-a-days was, that they were out of date, and that it was about time to rebuild them. He urged that if 50,000l. or even 100,000l. were spent on schools for Bradford, it would not be a great tax on the people. Mr. Coates said he was acquainted with the case of a school nearly as large as the one under consideration, the cost of which, including the land, would be about 6,000l. He might add that the cost of these proposed schools would be 23l. per head of the accommodation, against an average cost of school construction of 7l. per head. Mr. Neill said the actual cost of the schools would be 22l. 10s. per head. He did not know what school Mr. Coates was referring to, but he supposed it would be Bishop Ryan's school in Captain-street; he should be sorry to see those of the Board built in the same way. The resolution was carried by six to four.—Mr. Neill next moved that the Board adopt the plans, specifications, and estimates produced by Messrs. Milnes & France for schools in Bowling Back-lane. The estimates of this school by the architects amounted to 7,000l. The buildings were set down for 5,000l., the playground 1,071l., fittings 185s., architects' commission and clerk of works 482l., and contingencies 268s. The whole cost of the school, when complete, including land, would be 9,250l. The playgrounds would be laid with stone to a depth of 12 in., with asphalt over. The motion was carried, all except two voting in its favour.—Mr. Neill then moved the adoption of the plans, specifications, and estimates submitted by Messrs. Simpson & Langley for schools in Ryan-street. These schools would cost about 14l. 2s. 6d. per head of the accommodation, including the price of the land. The estimate for the buildings was 3,600l.; for the playgrounds, 1,500l.—a recreation park for Little Horton almost; 500l. for architects' commission and clerk of works. The total cost, including that of the land, would be 11,300l. The resolution was carried. Mr. Neill then moved that the clerk be instructed to write asking the Education Department to recommend the Public Loan Commissioners to advance 25,682l. for the erection of the schools of which the plans had been approved. The motion was carried, one only voting against it.

The Dimensions of Class-rooms.—At the last meeting of the London School Board a long discussion took place as to what the dimensions of the new class-rooms should be. It was agreed that nine square feet should be allowed to each child, and that no class-room should be of less than 360 superficial feet. It was understood that this decision referred only to the three or four schools about to be constructed, and that the general question will be discussed at some future period.

ARCHITECTS' ACTIONS.

THOMPSON v. ALLISON. ALLEGED BREACH OF CONTRACT.

This was an action (tried in Nisi Prius Court, Newcastle) brought by Mr. Matthew Thompson, of Newcastle, architect, to recover compensation for an alleged breach of contract entered into with Mr. W. H. Allison, a brewer, residing at Undercliffe, near Sunderland. Mr. Holker, Q.C. and Mr. Hugh Shield appeared on behalf of the plaintiff; while defendant was represented by Mr. Aspinwall, Q.C. and Mr. Crompton. According to the opening statement of Mr. Holker, it appeared that the plaintiff sought to recover damages from Mr. Allison for having failed to carry out an agreement concerning the erection of an hotel, and, as a consequence, for preventing him earning a considerable amount of remuneration. In the month of August, 1869, both parties to the suit met at the house of Mr. Charles Mark Palmer, Grinkle Hall, Yorkshire, and there got into conversation with respect to the erection of a large hotel on the Duke of Northumberland's property at Tynemouth. Mr. Allison said, "By the bye, have you not to do with the Duke of Tynemouth belonging to the Duke of Northumberland? I suppose there will in time be large building operations going on there?" Plaintiff replied that he was connected with the property, and expressed his belief that in a short time there would be a very considerable number of houses built. Mr. Allison next asked if there was a hotel site to be obtained on the estate, and, on being told that there was, said, "Well, you know if you could use your influence, and get me this site, of course I should employ you as architect." After plaintiff had promised to use his influence, and there had been something said as to the kind of building required, the conversation turned on the desirability of adding a ball room to the defendant's residence at Undercliffe, and Mr. Thompson was asked to go over, view the premises, and then tell him what it would cost. This was all that occurred at Mr. Palmer's residence; but when Mr. Thompson returned to Newcastle, he saw Mr. Snowball, the solicitor of Northumberland's commissioner, and obtained from that gentleman a site for the proposed hotel. The defendant was then communicated with, and, after several discussions, he was asked to be ordered to be prepared for a second-class hotel, and Mr. Thompson was asked to solicit tenders for the building from several of the local contractors. The residence was also examined at Undercliffe, and plans proposed for the ball-room; but as the work

of Osnaburgh-street, Regent's Park, and St. Paul's Churchyard, having waited upon the firm requesting them to give them the benefit of the nine-hours system, they have readily granted the same, viz., that for the future the working week shall consist of 54 hours, the wages to remain as before.

Northampton.—A meeting of carpenters and joiners has been held in this town for the purpose of taking steps to ask the masters to concede the nine-hours movement and to adopt a new code of rules for the governance of those trades. The meeting was well attended, and was presided over by Mr. Pickering. There were also present Mr. E. Brimley and Mr. C. Poll, delegates from the amalgamated carpenters and joiners' society, and Mr. Thompson and Mr. Green, delegates from the local society; the four forming delegates from the trades' council. The chairman denounced strikes as injurious to both employer and employed, and referred to the general concession of the nine-hours movement in all parts of the country. He advocated the principle of uniformity of labour, especially in the building trade, and requested the meeting to pass the rules which would be submitted to them. The rules were passed, and the 1st of April was fixed upon as the day on which it should be suggested that these rules come into operation.

York.—There has been a general strike made by the masons, joiners, and bricklayers connected with the York building trade, and as a consequence several hundreds of them are out of employment, besides a large number of labourers, who have nothing to do with the strike. The bricklayers have hitherto worked fifty-six hours per week for 29s. 2d. wages. They ask a reduction of hours to 50, and the same wages as before. The masters offer to reduce the hours to fifty-three, or one hour less than nine hours a day. The joiners gave notice of their present action three months since. From fifty-six hours they demand a reduction to fifty hours, and an increase of wages at the rate of 6d. per hour instead of 6d. The masters offer to reduce to fifty-three hours, and to give 6d. per hour. The masons have in the summer months worked fifty-six hours, at the rate of 6d. per hour. They seek for a reduction of time to fifty hours and a half, and an increase of pay to the rate of 7d. per hour. The employers here also offer to reduce the hours to fifty-three. In the latter branch one or two of the smaller masters have given way to the men. The labourers, who have been thrown out of employment, have also met. They have been paid at the rate of 19s. 3d. a week, and they have resolved to demand a guinea, but not to go out upon it until May next. The masters in the mean time offer 19s. 10d. per week, or an increase of 7d., and a decrease of the hours of labour to fifty-three.

Cockermouth.—The masons and wallers of Cockermouth have made application to their masters to adopt the nine-hours system, and have threatened to turn out if the application be refused.

Bishop Auckland.—A meeting of joiners and carpenters now on strike has been held at Bishop Auckland, to bring the strike there, if possible, to a final settlement. Five out of seven of the masters have acceded to the fifty-three hours and 1s. more wages for the present, and 1s. more advance within two months from this date. The men agreed to adopt the present settlement, and to appoint four men to meet four of the masters within the time stated to settle the fifty-hours question; and if they cannot agree, each party to appoint an independent arbitrator, and accept his decision. Two shops remained out.

PUNISHMENT OF ADULTERATORS.

A PROPOSAL of a remark made in our last number, as to Mr. Muntz's new Bill and the analysts under a past Act, a Dublin correspondent calls our attention to what can be done under the Act of 1860. The Dublin corporation have summoned three milk-vendors before the police magistrates, and had them fined, merely for adulterating their milk with water, on the evidence of the city analysts, in the respective sums of 5s., 3s., and 2s., besides being ordered to pay for public advertisements of their own names, addresses, and offences. Now if this can be done in Dublin, why can it not be done in London and elsewhere? Is not Dr. Letheby the City analyst for London? But was it not he who lately himself defended the adulteration of butter? In any new Act

there must be clauses compelling the proper authorities to act, and not merely wait for complaints; and analysts ought to be obliged to do something in return for holding such an office. Perhaps they want sufficient motive power under the Act. They ought to be active and detective officers, doing nothing else than perpetually testing food and drink, unawares to tradesmen and merchants, and holding over the whole class therefore the salutary terrors of the risk of exposure, fine, and imprisonment, as a preventive of the unmeasured rascality which now prevails amongst them.

AN AMBITIOUS RAILWAY COMPANY.

AMONGST the several projects for railway extensions which will come before Parliament in the course of the present session, one is a Bill promoted by the Mersey Railway Company at Liverpool. Last year this company obtained powers for the construction of a submarine railway under the Mersey between the Liverpool and Birkenhead shores, and they are now applying for additional powers, which include the extension of their line from the Mersey, underground, into the centre of Liverpool. In their Bill they seek Parliamentary sanction for the purchase of several properties in the neighbourhood of the Exchange, and amongst other buildings which they have scheduled with the intention of absorbing for the purposes of their undertaking is the town-hall, situated immediately adjacent to the new exchange, of which it is one side of a quadrangle and square formed by the two buildings. The corporation are unwilling that their municipal temple, under the roof of which royalty, ministers of state, and other distinguished magnates have been entertained, should be demolished, or converted into railway booking offices, and they have just decided to oppose the railway company's Bill before Parliament in consequence of the introduction of the obnoxious clause.

DRAINAGE OF WINDSOR.

THE Windsor Board of Health are still in difficulty in respect to the drainage question. A few years ago it was proposed to establish a sewage farm at Horton, but after some discussion the plan was considered too expensive, and it was not carried out. Then Mr. Dover's process was adopted, and negotiations were carried on between the Board and that gentleman for a considerable time, but to no purpose; and now the Board have turned their attention to the A B C scheme, but we understand it is not likely to meet with favour, and the site for the proposed works is not happily placed. It appears by a letter published in the *Windsor and Eton Express*, of the 17th ult., from Mr. Harkness, C.E., of Victoria-street, Westminster, that six years ago he proposed a plan for collecting all the drainage of Windsor, Eton, Slough, and Windsor Castle to a central point on the banks of the river Thames by gravitation and pumping it to Chobham, Finchley, or Bagshot, where suitable land could be purchased at a moderate price for a sewage farm. The cost of carrying out this plan amounted to 60,000l., to be apportioned among the three towns and the Castle.

THE SEWAGE QUESTION AT LEEDS.

At a recent meeting of the Leeds Town Council, the town clerk read a report on the utilization of sewage, which had been presented by a sub-committee of the Streets and Sewerage Committee. This document stated that the "A B C" system of works had been in operation since January 9th. The sub-committee had had the effluent water analysed, and, on the assumption that the "A B C" process would render the effluent water so pure that it might "flow into the river Aire without causing a nuisance, or becoming injurious to public health," called the attention of the committee to the immediate necessity of at once asking the Council for the requisite authority to proceed to the full completion of the scheme. 30,000l. had been expended on the land and in the erection of works for the purpose of experimenting on 2,000,000 gallons of sewage per day. Alderman Tatham proposed a resolution to that effect, and said he "hoped the Council would not go into the question as to what might be a better system of dealing with the sewage than that which they had taken up, because, if there were superior modes, they would not avail them now in meeting the

difficulty in which the riparian owners had placed them."

Mr. Mosley moved as an amendment,—

"That the Government Medical Board be requested to send an agent to Leeds, to test our sewage water after leaving the tank of the A B C system, in order to ascertain if it is so far purified as to be admissible into the river before the Council grants any sums of money to extend the sewage utilisation scheme."

Alderman Joy estimated that it would take 50,000l. per year to work the "A B C" system so as to deal with the whole of the sewage of Leeds, and said they were not justified in committing themselves to such an enormous expenditure on so doubtful a scheme. After some discussion, however, the amendments were defeated, and the original resolution was adopted.

It has been arranged before Vice-Chancellor Bacon that there shall be an extension of time for one year under the injunction against the Corporation of Leeds, restraining them from discharging the sewage of the borough into the river Aire, the Corporation undertaking to purchase fifteen acres of land, or obtain compulsory powers to purchase the same next session, for the erection of works for the disposal of the sewage.

EDINBURGH ARCHITECTURAL ASSOCIATION.

The usual fortnightly meeting of this Association was held on February 27th, in the hall, 5, St. Andrew's-square; Mr. Hippolyte J. Blanc, president, in the chair.

The second part of a paper on "House-drains and Plumber Work" was read by Mr. John Paterson, architect. To secure a perfect system of drains and appliances, Mr. Paterson urged it was necessary to trap all rain-water pipes, and have an air-vent in all house-drains. He pointed out where flaws in the arrangement were most likely to occur in consequence of defective construction or decay of the soil and waste pipes by corrosion. Although the necessity for air-pipes was well known, it was astonishing how seldom they were found where they ought to be. He recommended an independent stalk of air-pipes, to which a branch from every trap should be joined. This would not only prevent the trap being emptied by suction, but would ventilate the whole of the soil and waste pipes, and thereby render them less liable to be destroyed by the noxious air. He condemned the practice of fitting up cisterns beside water-closets, as was commonly done in flatted houses. Where this could not be avoided, water-tight covers should be provided for the cisterns.

OUR ENGINEER OFFICERS.

Str.—An extract from *Allen's Indian Mail*, quoted in the *Times* of the 29th ult., clearly shows that the recent surprising failures which have taken place in the Government buildings in India are really due "less to native rascality than to our own officers' ignorance." This is a notable discovery, after the great amount of "bouncing" we are accustomed to hear when allusion is made to the scientific education of engineer officers.

Some forty years ago Colonel Pasley made great and praiseworthy efforts to improve the education of our engineering cadets, especially as regards the arts of construction, with what results we now see.

Might I be permitted humbly to suggest to our young prince (whose restoration to health is causing delight from the palace to the cottage), that he might, with great advantage to the country, engage the first fruits of his convalescence in prosecuting a few stern, searching inquiries into the causes which are diverting the attention, and undermining the efficiency of our Engineers, both officers and men.

We know not how soon the enemy may be at our gates; let us not be, like Nero, caught fiddling. S. M. C. QUATE.

THE PROPOSED CHANNEL TUNNEL.

Strong endeavours are being made to raise subscriptions to the 30,000l. fund for cutting a drift-way under the Channel. We hear that about 16,000l. have already been subscribed; and amongst the most prominent contributors are the Duke of Sutherland, 200l.; Mr. Thomas Brassey, M.P., 1,000l.; Lord Richard Grosvenor M.P., 500l.; Marquis of Westminster, 200l.; Lord Delmeire, 200l.; Mr. E. Blount, C.B.

200l.; Mr. Albert Grant, 300l.; Mr. A. Joy, 400l.; Mr. Pender, 200l.; Sir R. Wallace, 200l.; Sir W. Jackson, 200l.; Sir Watkin Wynn, bart., M.P., 200l.; and Sir E. Buckley, bart.; Admiral George Elliot; Captain Beaumont, R.E., M.P.; Sir R. A. Cunliffe, bart.; &c.—A correspondent, commenting on Mr. Morant's letter, in our pages, urges that the tunnel may be made in the "Gault." The writer ridicules the notion of attempting it in the lower chalk.—Another correspondent insists upon Dungeness and Audrepelles being the proper termini for the tunnel. "For the furtherance of the tunnel scheme, I boldly say that at Dungeness may be found the following advantages over any other locality which has been suggested,—viz., a soil of clay, a splendid level approach to the shore, a beach superbly adapted for the construction of the necessary air-shaft, lighthouse, &c., called 'Le Colhart,' exactly half-way across, where at low spring tides there are only about two fathoms of water, and, what is, I believe, one of the greatest desiderata, a very excellent material on the spot for building of all kinds."

Sir.—A letter appeared in your journal recently signed by A. W. Morant, in which that gentleman gave as his opinion, that the construction of the above great scheme was next to an impossibility; and to bear out this assertion he mentioned some of the difficulties he encountered as engineer to the Norwich intercepting sewers. Now, sir, being not only a firm believer in the possibility, but likewise in the practicability, of the grand submarine work, I should, with your permission, like to ask Mr. Morant the following questions.

Did he employ sufficient power for pumping out the large bodies of water met with? Did he have duplicate engines and pumps in cases of breakdowns, which do and will occur where machinery is worked day and night without intermission? And, lastly, did he keep the brickwork well up to the face of the mining?

Unless these precautions were taken (from his own statement I imagine they were not), it must have proved fatal to the works. How is it possible, then, for Mr. Morant to argue from analogy on such a gigantic undertaking as the proposed tunnel at Dover from his experience at Norwich?

A PRACTICAL ENGINEER.

Sir.—Mr. Alfred W. Morant states in a letter in the *Builder* of the 24th ult., that the proposed tunnel is to be made "in the upper chalk," notwithstanding that I assured you, in reply to the article in the *Builder* of January 27th, printed in your issue of the 10th ult., that the proposed tunnel would be made in the lower chalk, and that it was because it could be made there in the lower chalk the proposed site for it had been selected. Will you allow me to reiterate this?

Permit me to add, that there are already some hundreds of miles of "tunnels" (colliery and lead-mine workings) under the sea, and that therefore the proposed tunnel is neither so novel nor so extraordinary or hazardous an undertaking as some would make the world believe. If there were coal or lead to be sought for in mid-channel, it would have been driven to long ago, without fuss or wonder.

THE SECRETARY OF THE COMPANY.

Miscellaneous.

The Artizans, Labourers', and General Dwellings Company, Limited.—The fifth annual meeting of the shareholders of this company was held on Saturday, at 1, Great College-street, Westminster, Mr. J. Baxter Langley, chairman of the company, presiding. There was a good attendance. This company possesses in various towns houses which are rented, and ultimately to be owned, by the working-class tenants. The report stated that the amount of share capital is now 18,580l., showing an increment during the year of 12,580l. The uncalled capital is 22,000l. The directors proposed a dividend of 6 per cent. on share capital, and 5 per cent. on deposits, leaving a balance of 281l. 8s. 11d. to be carried forward to the reserve fund. The shareholders who have recently joined include peers, members of Parliament, merchants, and others of the higher and middle classes of society, as well as many working men. One of the objects of the company is to direct operations more particularly to some of those large centres of populations where overcrowding is notorious, and where the laws of sanitary science, so far as they relate to the construction, ventilation, and improvement of workmen's dwellings, appear to be altogether ignored. The report was adopted, and the dividend declared.

The Polytechnic.—The directors of the Royal Polytechnic have purchased Messrs. Bryceson's Electric Organ, which has been for some considerable time on view in their theatre. Duplicate key-boards are to be placed in the Great Hall, with a cable connecting the organ in its original position, and in no way interfering with the key-boards in front of the stage in the theatre.

* Mr. Morant's letter was written before the appearance of the communication referred to.—Ed.

The Hallington Reservoir of the Newcastle Waterworks.—The directors of the Newcastle and Gateshead Water Company state in their twenty-seventh annual report, that the new reservoir at Hallington, which has been in progress since August, 1869, is now practically completed. The reservoir is estimated to contain about 600 millions of gallons; the contents, however, are found to exceed this by 85 millions, the true quantity being 685 millions. At the present moment there are in store 540 millions, and this quantity is daily increasing. The water at present in store, taking old and new reservoirs together, is 1,070 millions of gallons, which, when Hallington is full, will be further augmented to 1,200 millions. The directors express their satisfaction with the skill and attention displayed by Mr. Bateman, their engineer, and his staff. Credit is also due to Mr. J. B. McGuire, the contractor, for the manner in which he is said to have carried out the works, and managed the men employed thereon for the last three years. There has not been a single case of misconduct with the workmen; no strikes, riots, nor even a case of poaching. The workmen lived in huts or temporary dwellings.

Oxford Architectural and Historical Society.—On Tuesday evening before last, this Society held a meeting in the large room of the Ashmolean Museum, which was fairly attended. The Rev. the President of Trinity occupied the chair. The chairman called on Mr. J. P. Earwaker, of Merton, to speak on "the most important archaeological discoveries during the past year in the neighbourhood." After which Mr. James Parker gave an account of the Garford Barrow, near Abingdon, which had lately been opened under his supervision, illustrated with maps, plans, views, &c. Nothing was found in the barrow which did not appear anterior to the Roman occupation, but in a field near, a vast amount of Roman pottery was found, which all pointed to the third century. Professor Rolleston did not quite agree with Mr. Parker. The urn found in the barrow appeared to him clearly of the Saxon type, as whenever an urn of that shape had been found containing burnt bones it was always Saxon.

The Electric Light.—Writing to the *Standard*, Mrs. Mary Staitie, in reference to the inauguration of the electric light at the South Foreland Lighthouse recently, says that her husband, the late William Edward Staitie, was the originator and patentee of the application of electricity to lighting purposes, and that at the time of his death, in 1854, he had so improved upon it as to produce a powerful light, which was pronounced by scientific men perfect for all practical purposes. He held patents for this country, America, and several places on the Continent. Exhibitions were given from time to time in several of the chief towns of England, including London, Manchester, and Liverpool. Mr. Staitie also had the honour of exhibiting his light twice by command to her Majesty the Queen and the late Prince Consort. A tower was erected by the Liverpool Dock committee, where the light was tested for a considerable time, and there was reason to believe it would have been permanently adopted in Liverpool had not Mr. Staitie's death put a stop to all further proceedings at that time.

Not to Every One his Own.—Mr. W. Cave Thomas has before now seen his proposals taken up and carried out by others. It is happening to him now in respect of army organisation. Mr. Thomas's proposal, first roughly sketched in the *Pall Mall Gazette* of 1867, and further developed in a lecture at the Royal United Service Institution, before Sir William Codrington, March 12th, 1869, was to divide the country into military districts, and localise recruiting; also to establish the head-quarters of the depot battalion, military schools, exercising grounds and military workshops in one spot, and that a strategic one if possible. It was a scheme, in fact, as stated by its author, calculated to remedy the want of unity, to give more stability to our whole military system, and more organically to unite the army, militia, and volunteers. His lecture also detailed the organisation of his proposed district military schools, which, as he thought, would perfect the voluntary system of enlistment.

Architects' Benevolent Society.—The annual meeting of this excellent society will be held in the Rooms of the Royal Institute of Architects, 9, Conduit-street, on Wednesday next.

The Palestine Exploration Fund.—The annual meeting of the Dover Branch of this Society has been held in the hall of the Dover College, recently inaugurated by Earl Granville, which was filled with a company including the *élite* of the town and neighbourhood. Prince Arthur presided, and with several brief but appropriate and graceful speeches introduced Captain Wilson, Captain Warren, and Mr. Morison, one after another to the meeting. His Royal Highness also said:—"My duty is to draw your attention to the object of the meeting, and to ask you kindly to assist the funds for the exploration of Palestine. I believe that not more than 10,000l. are required adequately to complete this praiseworthy and admirable work; but surely such a sum ought easily to be collected in a wealthy country like our own—a country which ought to, and always does, take the lead in all matters connected with the Bible."

Cost of the Lambeth New Workhouse.—The new workhouse for the Lambeth Union, in Kennington-lane, which has now been some time in course of erection, has already cost a very large amount, although not yet finished, and the ratepayers have evinced much dissatisfaction at the expenditure which has up to the present time been incurred. In addition, however, to the sum already expended, a further contract, amounting to over 3,200l., has just been entered into, and the works commenced. These works are the erection of a laundry, kitchen, and bake-house machinery and fittings, in still further extension of the building. The contract includes all incidental builders' work which may be required in the additional premises. The contractors for the work are Messrs. Benham.

The Reclaimed Land on the Victoria Embankment.—A special meeting of the Metropolitan Board of Works has been held, to consider a letter from the Office of Woods and Forests as to the land reclaimed in connexion with the Victoria Embankment, and submitting the following proposition:—

"The Crown to sell the two acres of land to the Board for such a sum as shall represent the estimated loss which will be sustained by the Crown and the public at large if the proposition in the report of the Select Committee as to the dedication of the land in question as a public garden is adopted, in lieu of the proposed appropriation. The amount to be paid to be settled by arbitration."

Mr. Newton said the Board could not agree to this proposition; they were willing to negotiate on the basis of the report of the Select Committee (which proposed that the Board should rent the ground, 2½ acres, for a garden). After some discussion, it was decided that the proposal of Mr. Gore be not entertained.

Metropolitan Improvements and Houses for the Working Classes.—It is tolerably well understood that the constant improvements in the metropolis necessarily involve the destruction of large numbers of houses occupied by the working classes, and the Hampstead vestry appears to be of opinion that the Metropolitan Board, in carrying them out, should obtain Parliamentary powers for providing house accommodation for the working classes dispossessed by such improvements. A communication from the vestry to this effect was last week forwarded to the Metropolitan Board.

The Roads round St. Paul's.—A discussion took place at the meeting of the City Commissioners of Sewers, on Wednesday, as to the desirability of widening the western portion of St. Paul's Churchyard, by setting back the railings. A sum of 15,000l. had been offered for the land required, but no definite answer has been received. It was said that the Cathedral authorities positively decline to allow of the widening of the roadway on the north side; and ultimately the Improvement Committee were instructed to bring up a report detailing all the proceedings in the matter which have lately been taken.

Movement among Farm Labourers.—A class of very hard-worked, ill-paid, and ill-fed labourers,—the agricultural,—are now fairly on the move in the north of England, in an endeavour to obtain increased wages and shorter hours. Numerous meetings are being held at Morpeth, Newcastle, Prudhoe, Walton, Driffield, &c.

Institution of Surveyors.—The next meeting will be held on Monday evening, March 11th, when the discussion on Mr. Smith's paper, entitled "Land," will be resumed.

The late Frauds on the Birmingham Gas Company.—At an extraordinary meeting of the Birmingham Gas Company, held to receive the report of the Investigation Committee to inquire into the defalcations of the late secretary, the report disclosed an incredible amount of neglect on the part of the directors, by which the company had been exposed for years past to heavy losses, arising from want of management. The total amount of the defalcations of the officials is estimated at 40,000l.; the late secretary, Joseph Harrison, who has absconded, being responsible for nearly the whole of this amount.

Addition to Leith Hospital.—The directors of the Leith Hospital having just received 20,000l., as part of a legacy bequeathed to them by the late Mr. T. W. Ramsay, of London, lately a merchant in Leith, they have resolved to apply the funds in carrying out an important addition to the institution. A new hospital is to be wholly set apart for the administrative department and for casual cases of illness; and when it shall have been completed, the present building will be used exclusively for infectious diseases.

Metropolitan Street Improvements Bill. On the order for the second reading of this Bill, Mr. Pell moved (in the House of Commons) the postponement of the second reading for six months. The amendment, however, was withdrawn, and the Bill was read a second time. Mr. J. H. Palmer then moved that it should be referred to a Select Committee of ten members, of whom five should be nominated by the House, and five by the Committee of Selection; but the House decided by a majority of 170 against 122 against this motion.

The Metropolitan Water-Supply.—It has been resolved by the St. James's Vestry to instruct their medical officer of health (Dr. Lancaster) to call the attention of the different waterworks companies to the impure state of the water supplied by them. It has also been decided to petition the House of Commons to give the Metropolitan Board of Works powers to enforce on the various waterworks companies a pure and ample supply of water.

Architecture and the International Exhibition.—We would remind intending exhibitors that the date on which architectural drawings, designs, and models will be received at the International Exhibition (east goods entrance), is fixed for March 11th. Architectural drawings will be exhibited in the east quadrant, now in course of preparation; in order to obtain a favourable light they will be hung on screens, placed at right angles to the windows.

Vienna Palace of Industry.—Messrs. Clark & Co. have signed a contract at Vienna with the Imperial Commissioners to fix their patent steel shutters to all the entrances, &c., of the Palace of Industry, now rapidly approaching completion, in the ground of the Prater, in that city. There are upwards of 300 entrances and windows, measuring over 30,000 superficial feet.

New Town-hall, Sherborne.—We understand the committee recently appointed at a meeting of the inhabitants of Sherborne have seen Mr. Digby, who has expressed himself favourable to the movement, and plans in accordance with the object in view will shortly be laid before him by Mr. T. Farrall, architect.

Catholic Schools, Hatton Wall.—On Tuesday, the memorial stone of St. Peter's Schools, attached to the Italian Church, Hatton-wall, was laid by the Countess Tasker, who subscribed 500l. towards their construction. The cost of the structure is estimated at 1,250l. The architect is Mr. J. N. Tasker, and the builder is Mr. G. Leggett.

The Treatment of Stone.—Under this head a patent has been taken out by C. Douglas, Glasgow, and D. M. Watson, Dundee. The invention consists in first applying to the surface of the material as a wash a solution containing resin or colophony and an alkali, and then, before this first wash dries, applying a solution of alum.

"The Railway Interest."—The statistics we gave under this heading (p. 153) are from a lecture "On Railways," delivered by Mr. Crosbie Dawson, C.E., at the Nonceaton Institute.

New Railway Station, York.—We understand that the works in connexion with the formation of the new railway station at York will shortly be commenced.

The Thames Sewerage Commission.—The promoters have determined to withdraw the Bill for this session; but with the intention of making a renewed application to Parliament next session, by which time the views and wishes of each parish, and other interests affected, may be ascertained and provided for.

Buildings for Sound.—We understand that Messrs. Weigand & Co., of La Hogue, propose to show in the approaching International Exhibition a kiosk, described as "the music temple in its full power of propagating the undulation of sound," and which appears to possess many peculiar properties.

The Roadway in Cornhill.—The paved roadway in Cornhill, partly of stone, and more easterly, of wood, is miserably out of repair, and makes a journey along that important thoroughfare a dislocating misery. The whole is so singularly bad that we should like to know when it was done, and who did it.

TENDERS

For additions and alterations to Watford Union Workhouse, Herts. Mr. Arthur Allom, architect. Quantities by Mr. Bagg:—

Allen	£10,600 0 0
Wright, Brothers & Goodchild	9,375 0 0
Sharrington & Cole	8,225 0 0
Bentley	9,175 0 0
Jarrett	9,960 0 0
Coles	8,570 0 0
Brown	8,500 0 0
Sant	8,488 0 0
Blackmore & Morley	8,500 0 0
Holland	8,100 0 0
G. & J. Waterman	7,918 0 0
Chadwick*	6,638 0 0

* Error of 1,000; withdrawn.

For erecting eight villa residences in Leamington-road and Horn-lane, East Acton. Mr. John B. Badock, architect. Quantities applied:—

Tyler	£6,731 8 0
Cook	6,700 0 0
Gough	6,450 0 0
Sawyer	6,335 0 0
Stephens & Co.	6,225 0 0
Blackmore & Morley	6,222 0 0
Crook & Wall	5,500 0 0
Rankin	5,500 0 0
King & Co.	5,340 0 0
Johnson	5,279 0 0
Stegg & Long	4,850 0 0
Blick	4,850 0 0
Freedy & Son (accepted)	4,800 0 0

For erecting four villa residences in Leamington-road, East Acton. Mr. John B. Badock, architect. Quantities supplied:—

Sawyer	£3,353 0 0
Tyler	2,977 18 0
Stephens & Co.	2,803 0 0
Blackmore & Morley	2,800 0 0
Gough	2,840 0 0
Johnson	2,779 0 0
Rankin	2,750 0 0
Crook & Wall	2,750 0 0
Freedy & Son	2,750 0 0
Stegg & Long	2,600 0 0
Cook	2,500 0 0
Blick	2,325 0 0
King & Co.	2,217 0 0

For additions to the Hayes, near Stone, Stafford, for Mr. George Meakin. Messrs. R. Scrivenor & Son, architects:—

Turner	£2,850 0 0
Sutton & Meadon	2,701 0 0
Barlow	2,680 0 0
Ratcliffe	2,530 0 0
Whitome	2,527 0 0
Cook	2,516 0 0
Matthews	2,475 0 0
Bridley & Critchlow	2,400 0 0
Freakley	2,200 0 0
Inskip, Brothers (accepted)	2,156 0 0

For six cottages, in Crown-street, Brighton. Mr. W. Edridge, architect:—

Barnes	£1,470 0 0
Blackmore & Howard	1,350 0 0
Holloway & Son	1,240 0 0
Lockyer	1,100 0 0
Reynolds (accepted)	610 0 0

For the erection of a warehouse on Curtain-road, Shore-ditch, for Messrs. S. Moss & Sons. Mr. Lewis H. Isaacs, architect. Quantities by Mr. L. C. Riddett:—

Patman & Fotheringham	£1,260 0 0
Cheoman	1,200 0 0
King & Son	1,232 0 0
Ellington	1,205 0 0
Kilby (accepted)	1,150 0 0

For the laying of 5,588 feet run of stoneware pipe sewers, and other works, in the town of Uppingham, for the Uppingham sewer authority. Messrs. Whitaker & Ferret, engineers:—

Stevens	£1,105 0 0
East	1,030 0 0
Lee	900 0 0
Ridley	887 0 0
Streeton	828 0 0
Acok	809 0 0
Morris	777 0 0
Deane	756 0 0
Donahy	735 0 0
Chibb	706 0 0
Freeman	650 0 0
Walker (accepted)	556 0 0

For building a pianoforte manufactory, King-street, Camden-town, for Messrs. Monaghan & Weston. Mr. J. Pennington, architect. Quantities supplied:—

Walton	£1,050 0 0
Nutt & Co.	1,023 0 0
Kelly, Brothers	1,023 0 0
Mann	1,013 0 0
Scrivenor & White	997 0 0
Mildwater (accepted)	975 0 0

For curate's house, at Kenley. Mr. R. Martin, architect:—

Taylor & Son	£998 10 3
Simons	887 0 0
864 0 0	
836 0 0	
836 0 0	
785 0 0	
775 0 0	
748 0 0	

* Quantities supplied by Mr. F. Sparrow.

For alterations and additions to "Bedford Arms," Clapham, for Messrs. Whitbread & Co. Quantities not supplied:—

House and Fittings	£3,130 0 0
Stables	£230 0 0
Henshaw	£986 0 0
Axford	868 0 0
810 0 0	
519 0 0	
665 0 0	
603 0 0	
455 0 0	

For building vicarage-house for St. Michael's, Chesters-square, E. W. Mr. E. J. Withers, architect. Quantities by Mr. Poland:—

Rider & Son	£3,120 0 0
Brass	2,965 0 0
Higgs	2,943 0 0
Robinson & Cole	2,797 0 0
Perry & Co.	2,750 0 0
Henshaw & Co.	2,740 0 0
Adamson & Sons (accepted)	2,600 0 0

For the erection of new school at Stepley; and alterations to existing house, for the trustees of the Stepley Jewish School. Messrs. Davis & Emanuel, architects. Quantities supplied by Mr. Henry P. Foster:—

Myers & Son	£1,600 0 0
Williams & Son	1,635 0 0
Temple & Forsker	1,535 0 0
Lemon	1,520 0 0
Ennor	1,468 0 0
King & Son	1,440 0 0

For the erection of a warehouse in Victoria-street, Bristol, for Mr. Joseph Brivell, iron merchant and founder. Mr. H. Masters, architect:—

Kingstons	£1,590 0 0
Wilkins & Sons	1,375 6 0
Church & Phillips	1,350 0 0
Escott	1,325 9 8
Norris	1,248 0 0
Diment	1,225 0 0
Robertson	1,220 0 0
Ford & Summers (accepted)	1,031 16 6

For rebuilding drug-mill and stabling, at Redington-cum, recently destroyed by fire. Mrs. Mrs. Aiken. Mr. R. W. Price, architect. Quantities by Mr. W. H. Barber:—

Smith	£387 0 0
Black	355 0 0
Patman & Fotheringham	795 0 0
Jarratt	768 0 0
Tyerman	725 0 0
Coleman (accepted)	740 0 0

For additions to Crescent House, Brompton, for Col. Aikman. Messrs. Landsdown & Pollard, architects:—

Hird	£248 0 0
Howarth	218 0 0
Patman & Fotheringham	445 0 0
Stimpson & Co. (accepted)	404 0 0

For alterations and additions to Edmondton Union. Mr. T. E. Knightley, architect. Quantities by Messrs. Arding & Bond:—

Field & Sons	£3,450 0 0
Hivert	3,333 0 0
Callum	3,300 0 0
Easton & Chapman	3,287 0 0
Patman, Brothers	3,285 0 0
Robertson	3,160 0 0
Rose & Brown	3,047 0 0
Letherdale	2,983 0 0
Ponock	2,975 0 0
Callum	2,897 0 0
Nightingale	2,894 0 0
Linsell	2,838 0 0
Clark & Green	2,832 0 0
Bays & Co.	2,825 0 0
Vaughan	2,789 0 0
Burly	2,753 0 0

TO CORRESPONDENTS.

C. R. T.—G. A. R.—J. H.—L. H. I.—A. G.—E.—Dr. G.—C. B.—F. G.—W. E.—M. S.—J. B.—T. & C.—C. D.—R.—L.—E.—N. P.—F. S.—J. B.—T.—L. H.—B. A.—E.—F. H.—A. G.—W. B.—F. W.—D. H.—M.—F. W.—A. M.—S.—C.—M.—W.—H.—B.—F. W.—S.—E. G.—J. H.—Mrs. A. J.—F. G.—K.—S.—A.—S.—G.—E. S.—L. A.—E.—M.—B.—J. W.—W. H.—E.—B.—B.—W.—N.—M.—Mr. B.—A. H. (the word "require" in foot-note to "Readings for Contract" (p. 149, ante) is in the official document)—A. E. P. (a correspondence with the Commissioners of Inland Revenue as to Architects and the Stamp Act will be found in our volume for 1911 (part 1), p. 231).—J. G. T. (advertisement had been previously received).—K. & B. (next week).

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

Note.—The responsibility of signed articles, and papers read at public meetings, rests of course with the authors.

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MODEL HOUSES, by BANISTER.—We must compliment Mr. Fletcher upon progress in the right direction.—"Builder." These extracts must suffice for the present to show the very practical and common-sense nature of Mr. Fletcher's work, which we cordially recommend to the attentive study of our readers.—"Building News." It is the most practical contribution we have seen to the solution of the great difficulty how to provide the poor with houses which shall not be a direct incentive to disease, pauperism, and vice.—"Saturday Review." On Monday next, by same Author, price 5s.

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TO BUILDERS and CONTRACTORS.—TENDERS wanted for **CONSTRUCTING a PAIR of VILLAS**, at Colwyn-road, copy-hill, Newport. Specifications and particulars to be sent in, under a white, Old Kent-road. Tenders to be sent in on or before the 18th inst. The tender does not bind tenderer to accept the lowest or any Tender.

TO HOT-WATER ENGINEERS.—WANTED, ESTIMATES for HEATING with HOT WATER (various Suits of OFFICES, to Four Stories of a large Building and in Manchester).—Apply to Messrs. MANSFIELD & LITTLEWOOD, Architects, 3, Norfolk-street, Manchester, giving reference to number 1443 in London or elsewhere headed in a similar manner.

SOUTH-EASTERN RAILWAY COMPANY.—BRANCH RAILWAY from WESTENHANGER to FLYTHE and SHORNCLIFFE.—The Directors are prepared to receive TENDERS for the CONSTRUCTION of this BRANCH, about 2 1/2 miles in length. Plans and sections can be seen, on and after the 18th inst., at the Office of the Company's Engineer, Mr. FRANCIS BRADY, No. 5, St. Thomas-street, Southwark, S.E. For particulars and order of inspection from the undersigned. Tenders to be sent in not later than on THURSDAY, the 29th inst.—By JOHN SHAW, Secretary.

TO DUST CONTRACTORS.—PARISH Vestry hall, King's-road, on FRIDAY, the 16th day of MARCH, instant, at THREE o'clock in the afternoon, to consider TENDERS from persons willing to contract according to the terms and conditions of a specification printed copy of which may be had on application to the Vestry Clerk for COLLECTING and REMOVING the DUST, RUBBISH, FILTH, and RUBBISH from the streets and other places within this parish, during the period commencing the 20th day of March, 1872, and ending on the 1st day of March, 1873, by day and by night. The drafts of contract tenders to be entered into for any and all the terms of the specification must be inspected, and approved in writing, at the office of the Vestry. Parties intending must appear personally at the time the Tenders are opened, and not later than the 17th inst. at 10 o'clock in the morning. The acceptance of the Tender, and the remainder as provided in the said contract, shall be at the discretion of the Vestry, and shall be at the expense of the Vestry. The Tenders are to be upon printed forms, which, with further particulars, may be obtained at this Office. The Tenders are to be delivered, sealed, and addressed to the Vestry Clerk, at the Parish of Chelsea, and endorsed "Tender for Removal of Dust," &c. and to be delivered on or before THURSDAY, the 29th inst. Each copy of the specification and the printed copy of the specification must be brought with Tenders subsequently accepted will be retained until the contract is duly executed, or until the contracts are otherwise completed.—By order, CHARLES LABRE, Vestry Clerk.

TO BUILDERS and CONTRACTORS.—The Town Council of the Borough of Drottwich, in the County of Worcester, are desirous of receiving TENDERS for the CONSTRUCTION of BRICK and other FOOT PAVEMENTS, STONE MASON'S and FAVORITE WORK for the Parish of St. Peter, in the said Borough. Specifications and particulars may be obtained on application to the Clerk of the Council, at the Office of the Council, No. 1, St. Peter's Church, Worcester. Tenders to be sent in, on or before THURSDAY, the 14th day of MARCH next, before FOUR o'clock in the afternoon of MONDAY, the 26th of MARCH, 1872. The Directors do not bind themselves to accept the lowest or any Tender. A copy of the quantities will be supplied upon payment of the price of the same, which will be returned to each party on the receipt of a bond for the sum of 500l. such contract and bond respectively to be prepared by the Solicitors of the Council, at the expense of the contractor.

TO BUILDERS.—Mr. JAMES desires to be CONTRACTED FOR ADDITIONS and ALTERATIONS to his PREMISES, PENTON HALL, Pentonville, Finsbury, London, where the drawings and specification may be seen, between ELEVEN and FIVE any day except Friday and Saturday.

KESWICK, CUMBERLAND.—Builders desirous of TENDERING for the ERECTION of a MANSION, at Lingholm, Keswick, for Colonel Greenall, are requested to send their names and addresses to the undersigned, on or before 20, New Cavendish-street, London, W. WATERHOUSE, Architect.

CAMBRIDGE.—Builders desirous of TENDERING for the ERECTION of a new BLOCK of Undergraduate's Rooms, in connection with Trinity Hall, Cambridge, are requested to send their names and addresses to the undersigned, on or before MONDAY, 19th inst.—ALFRED WATERHOUSE, Architect, 20, New Cavendish-street, London, W. March 7, 1872.

TO CONTRACTORS.—Builders desirous of TENDERING for the ERECTION of NEW BUSINESS PREMISES in the Market-place, Reading, for Messrs. Sutton & Sons, are requested to send their names to us for approval before the 16th inst. Nonn but first-class firms need apply. Messrs. Sutton & Sons do not bind themselves to accept the lowest or any Tender. WM. & J. T. BROWN, Architects, Reading, March 5th, 1872.

RUBION WATER COMPANY.—CONTRACT No. 4.—The Directors are prepared to receive TENDERS for the CONSTRUCTION of a SERVICE RESERVOIR, Plans and specifications may be seen, and Forms of Tender obtained on application to Mr. HENRY DENNIS, Hillyer's-lane, Engineer to the Company, on and after THURSDAY, the 7th inst. Sealed Tenders, endorsed "Tender for Reservoir," to be sent to us on or before THURSDAY, the 14th inst. The Directors do not bind themselves to accept the lowest or any Tender. GEO. E. WOODFORD, Secretary, Rubion Water Company's Office, Rhio, Rubion, March 1st 1872.

TO BUILDERS.—Trinity House, London, E.C. March 7, 1872.—This Corporation being desirous of obtaining TENDERS for the CONSTRUCTION of a NEW TOWER, and ADDITIONS to DWELLINGS, at Lowestoft, High Light-house, hereby give notice, that the plans and specifications may be inspected, and specifications and forms of Tender obtained on application at this House, and at the Lowestoft High Light-house, on any day between the 10th and 15th inst. Sealed Tenders, marked "Tender for New Tower, &c. at Lowestoft High Light-house," to be sent to us on or before THURSDAY, the 14th inst. Sealed Tenders to be sent to us on or before THURSDAY, the 14th inst. The Directors do not bind themselves to accept the lowest or any Tender. (Signed) ROBIN ALLEN, Secretary.

ST. LUKE, MIDDLESEX.—To BUILDERS.—TENDERS are invited for the ERECTION of a BLOCK of ALMSHOUSES on a site in Bath-street, St. Luke's, for the Guardians of the Poor of the Parish of St. Luke, Middlesex. Plans and specifications may be seen on and after THURSDAY, the 14th inst. and a copy of the bills of quantities obtained on application to the Architect, Mr. T. J. HILL, 25, City Road, London, E.C. Tenders to be sent in to me at the Vestry-hall, City-road, on or before MONDAY, the 26th MARCH inst. at TWELVE o'clock in noon. The Guardians do not bind themselves to accept the lowest or any Tender. W. W. HAYNE, Vestry Clerk, Vestry Offices, City-road, 7th March, 1872.

TO BUILDERS and CONTRACTORS.—The Directors of the East London Cemetery Company, Limited, are prepared to receive TENDERS for ERECTING TWO NEW GRAVELS and ENTRANCE LODGE at the New Cemetery, Plaistow, Essex. The drawings, specification, and conditions of contract for these works can be seen at other particulars may be obtained on and after THURSDAY, the 14th day of MARCH next, of Mr. CHARLES DUNN, Board of Works Office, Wallingford-street, E.C., up to 9 o'clock in the afternoon of MONDAY, the 26th of MARCH, 1872. The Directors do not bind themselves to accept the lowest or any Tender. A copy of the quantities will be supplied upon payment of the price of the same, which will be returned to each party on the receipt of a bond for the sum of 500l. such contract and bond respectively to be prepared by the Solicitors of the Company, at the expense of the contractor.

TO BUILDERS and CONTRACTORS.—The Town Council of the Borough of Drottwich, in the County of Worcester, are desirous of receiving TENDERS for the CONSTRUCTION of BRICK and other FOOT PAVEMENTS, STONE MASON'S and FAVORITE WORK for the Parish of St. Peter, in the said Borough. Specifications and particulars may be obtained on application to the Clerk of the Council, at the Office of the Council, No. 1, St. Peter's Church, Worcester. Tenders to be sent in, on or before THURSDAY, the 14th day of MARCH next, before FOUR o'clock in the afternoon of MONDAY, the 26th of MARCH, 1872. The Directors do not bind themselves to accept the lowest or any Tender. A copy of the quantities will be supplied upon payment of the price of the same, which will be returned to each party on the receipt of a bond for the sum of 500l. such contract and bond respectively to be prepared by the Solicitors of the Council, at the expense of the contractor.

THE PROVINCIAL GOVERNMENT OF HUNGARY.—Notice is hereby given, that the Minister of Finance of the Province of Buenos Ayres is prepared to receive TENDERS for the CONSTRUCTION and SUPPLY of the IRON-WORK of a PIER and VIADUCT for the Port of San Pedro, Santa America. Printed specifications and plans of the Harbour Works and printed forms of Tender and Schedule, may be obtained on MONDAY, the 12th inst. and Following Days, at the Office of Messrs. G. de MURE, P. & CO. 7, Adams-court, Old Broad-street, London, of which a charge of three guineas will be made. Tenders, addressed to my self, and endorsed "Tender for Harbour Works of San Pedro," must be delivered at Messrs. G. de MURE & CO.'S Office, before FOUR o'clock in the afternoon on MONDAY, the 26th of this month. The Minister of Finance of the Province of Buenos Ayres is not bound to accept the lowest or any Tender. J. J. REYES, Engineer, London, March 7th, 1872.

GREAT WESTERN RAILWAY.—The Directors of this Company are prepared to receive TENDERS for the purchase of OLD MACHINERY, as undermentioned:—
Spring Steel about 250 tons
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Spiral Castings 10 " "
Ropes 8 " "
The said Tender upon which only one copy of the specification may be obtained on application to the Secretary, at Paddington; or to the Storekeeper, at the Swindon Station. Tenders addressed to the Secretary, and marked "Tender for Old Materials," and addressed to the undersigned, will be received up to TEN A.M. on MONDAY, the 26th inst. The Directors do not bind themselves to accept the lowest or any Tender. FRED. G. SAUNDERS, Secretary, Paddington Station, London, 4th March, 1872.

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PARTNERSHIP.—A GENTLEMAN, who had experience in the City, and who is prepared to apply himself assiduously to his profession, wishes to PURCHASE a SHARE in an old-established PRACTICE, or to obtain an ENGAGEMENT, with a prospect of future Profitable.—For particulars, apply by letter, to Messrs. JOHN MACRELL & CO., 21, Cannon-street, E.C.

WANTED, immediately, for a short time, a first-class GOTHIC ASSISTANT, to aid in completing the drawings for a church. It is requested that only those thoroughly competent will reply, stating terms. No. 471, Office of 'The Builder.'

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TO GRAINERS.— WANTED, a good WORKMAN.—Apply, stating wages, &c. to B. C. Victoria-road, Margate.

WANTED, a PLUMBERS ASSISTANT.—Address, stating age, references, wages expected, and length of time at trade, to 536, Office of 'The Builder.'

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WANTED, by a London Firm in the Iron Trade, a TOWN TRAVELLER, who would be required at times to Assist in the Drawing Office, and must therefore have some knowledge of drawing, taking out quantities, &c.—Apply, by post only, stating age, where last employed, salary expected, &c. to T. C. care of Messrs. Dewick & Son, 41, B.C. Victoria-road, Margate.

TO WRITERS and GRAINERS.— WANTED, a Young Man, who is a good WRITER and GRAINER, to fill a permanent SITUATION, in an old-established business. Must thoroughly understand his trade, and be able to execute orders for the drawing of work.—Address, stating wages, W. GARDNER, 37, Bunyate-gate, Dover.

WANTED, a good THREE-BRANCH HAND, to live on the premises and take charge of a jobbing business. Must be able to give good references as to ability, industry, &c. Must be married. Wages 3s. per week, with use of apartments. Address, in own handwriting, to 536, Office of 'The Builder.'

DISTRICT OF SOUTH HORNSLEY.— Mr. EDWARD BUCKLEY, Surveyor and INSPECTOR of NUISANCES WANTED.—The Local Board of this District, as depository of receiving APPLICATIONS from qualified persons to fill the office of ROAD SURVEYOR and INSPECTOR of NUISANCES. Salary, 100l. per annum, with residence at the Office of the Board. The person appointed must be a permanent resident in the district. Board 20th, 1872, or at such other time as may be agreed upon by the Board and the person to be elected. Applications, in candidates' own handwriting, stating age, present and previous occupations, and accompanied by recent testimonials not exceeding three, to be sent to me not later than the 10th MARCH, selected candidates will receive notice to attend on the day of election.—By Order of the Board, EDWARD BUCKLEY, Clerk, Offices of the Board, 15, Spenser-road, South Horsey, near Stoke Newington-green, N.

TO MASONS.— WANTED, a WORKING FOREMAN To Manage a small Bath Stone and Kentish Rag Job.—Apply to PARAMORE & SON, Builders, Margate.

WORKING FOREMAN OF CARPENTERS.—WANTED, a thoroughly practical Man. Must be a fair draughtsman and good at estimating. Accustomed to good jobbing work.—Apply by letter to F. S. & N. New-street, Dorset-square.

WANTED, by an Architect, a good ASSISTANT.—Address, stating antecedents and salary required, to 489, Office of 'The Builder.'

WANTED, a CLERK OF WORKS for an important Building in a Provincial town. He must be a man of mature age, good drawing, and able to manage a gang of workmen. Apply, by letter only, sending copies of testimonials (which the advertiser does not pledge himself to return), to W. F. C. Royal Inst. of British Architects, 9, Conduit-street, London.

WANTED, in an Architect and Surveyor's Office, a respectable YOUTH, who writes a good hand, and is able to copy and good drawing. The situation offers advantages to a young desirous of improvement in the general duties of a surveyor's office. A high and salary to be had.—Apply by letter to Messrs. WAYMOUTH & SON, 12, Moorgate-street, E.C.

WANTED, by the Commissioners for Public Works in England, a competent and experienced ENGINEER, of good character, competent to take charge of the Machinery, Furnaces, and other parts of the Works, and to superintend the Fire and Water Apparatus. Applications, with testimonials and recommendations, to be sent to the undersigned, on or before WEDNESDAY, the 14th MARCH, 1872, where the Committee will meet on the 15th MARCH following the 14th inst. at ELEVEN o'clock, when Candidates are expected to be in attendance. Particulars of duties and salary required, to be had from Mr. SEAWAY, the Superintendent, on the Premises.—By order, W. H. BANISTER, Clerk, 1st March, 1872.

CLERK OF WORKS.—WANTED, a CLERK OF WORKS, acquainted with drainage works. Must be able to draw and to estimate. Salary, 10s. per week.—Apply, with full particulars, salary, &c. to No. 471, Office of 'The Builder.'

AN ARCHITECT and SURVEYOR requires the SERVICES of TWO experienced ASSISTANTS in the drawing office, and a good draughtsman. Also an experienced ASSISTANT in the office, to be able to estimate, and to be able to write, stamp, and a good writer and correspondent.—Address, in writing, stating age, general qualifications, salary required, &c., to 'OLEN & BURNHAM, 4, Old-street, W.C.

A TIME CLERK WANTED.—Hours the same as the Man, but say two days per week assisting at the Office. Must be well up in making up time-books and booking time under his business.—Address, with salary expected and where last employed, 469, Office of 'The Builder.'

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The Builder.

VOL. XXX.—No. 1519.

Megaliths and Tumuli: their probable Eras, "Architects," and Purposes.



N this subject archaeologists are more or less divided into two classes,—the low-age and the high-age, according to their belief in the less or greater antiquity of the monuments in question. Mr. Fergusson is what we must really call a special pleader for their low-age; and he appears to regard a supposed proof that one or two, or a few, monuments of any one class must have been constructed since the Christian era commenced, to be sufficient to show the probability that all, or almost all, of that class belonged to much the same era. His work is a laborious and valuable one, as a collection of facts and illustrations, but it is on this ac-

count, and not on account of its theoretical or explanative value, we should think, that it will become, as it doubtless will, a standard authority. Historical proof of the extreme antiquity of pre-historical structures is, of course, an inconsistency and an impossibility; but it is incumbent on those who maintain the age of such structures as those we speak of to be within historical limits, to prove their case by historical evidence, and this we think no low-age advocate has yet done. On the supposition, however, that they really are, as a class, pre-historical, and of great antiquity, how are we to show the probability, at least, that they are so? Here is a difficulty not easily surmountable. Still we conceive that there is a way,—a new way; and we shall now proceed to indicate slightly rather than fully to show that way. Meantime we may remark that the fact that a few of the monuments in question,—if it be a fact,—have been proved to have been constructed since the beginning of the Christian era, is precisely what was to be expected by the high-age archaeologists. These monuments are admittedly Pagan in their origin. The Pagan era preceded the Christian, from pre-historic times; but overlapped it, and continued, even in partially Christianised countries, to exist down to comparatively recent ages. The Pagan era itself was undoubtedly and admittedly of pre-historical and extreme antiquity; and so, in all probability, are most of its more lasting monuments; but as Paganism continued to exist, and indeed still continues to exist, in the Christian era, there must be Pagan monuments erected during the Christian era; and that may be provable: it is what cannot but be. Some low-age advocates, however, would really almost seem to desire to establish the anachronism that the Pagan era and its monuments were not pre-Christian at all, as a rule. Such a line of argument may well suit the advocates of the literal interpretation of Scripture as to the age of the earth and of man, and the necessity or special advantage of crowding down as much of the Pagan era and its megalithic and other works into recent ages as possible. But since it has been proved, by the implements of the glacial drift, that man must have existed on the verge

of the glacial era at least, if not actually during or throughout that era; and since many thousands of years must have passed since that time,—however possible it may be, as we think it is, greatly to shorten the time of the glacial era itself, by showing reasons for vastly more rapid grinding action of the rocks, by ice and flood than than now, by the alternation of hot or tropical summers with Arctic winters, just as even now summers alternate, though in a minor and not tropical degree, with the winters, in the present restricted Arctic regions;—we have plenty of time, during all of which the Pagan era must have continued, for its monuments to last, if capable of outlasting severe and trying alternations such as even the immediately post-glacial era must have brought to bear upon them in now temperate latitudes like that of Britain. And were they not capable? What works of man were ever more fit for war with the elements than those tremendous rocks and artificial hills which Pagans reared? what works of ancient man were ever so suited for such an era?

The outlined history of man having been extended by the drift implements back to the glacial era, which materially affected the contours and the limits and sea levels of the habitable land in all countries,—the British Isles, at that time, for example, being a series of highland "isles," with tenfold significance; since the low-lying land in the glacial era lay hundreds of feet below the level of the ocean;—this state of matters, throughout, a great part of the hemisphere, but not the whole, necessarily affected, very materially, the distribution of mankind from their chief centre or centres, further south, or wherever those may have then existed.* The geological question, therefore, involves and rules the ethnological, as the ethnological does the "architectural" and mythological. Even on ethnological and architectural grounds, therefore, we must first of all say a few words on the geological phase of the questions at issue, which phase cannot now be any longer ignored in an inquiry such as this.

In a few words, the glacial era was simply an intensification and extension of the still existent and operative causes, productive, even now, of the present state of things in the Arctic circle and region, spreading it farther south into now temperate latitudes, though not over the whole of the hemisphere.† The winter cold was more extreme than now; and (as the existence of tropical and other animals in the glacial region indicates) so was the summer heat; and during this era of ice and flood the land, or rather the surface of the earth's crust, had already assumed the general outlines which

* Professor Phillips, in his "Treatise on Geology" (p. 78), thus describes the general features and the probable time of the glacial era in Britain and Ireland:—"There is reason to think that, during very late geological,—PROBABLY PERMISSIOVAL,—periods, the same northern zones of the earth which, in earlier times, had nourished plants and animals resembling those within the tropics [the summers being even then still tropical?], were chilled by a general reduction of temperature [in the winter, then Arctic], so that the mountainous [and at that time inland] regions of Great Britain and Ireland, were covered with perennial snow; their rugged valleys filled with gliding glaciers; the seas at their feet filled with Arctic life, and covered by floating icebergs, loaded with rocks."

† The land, as he remarks, was then, or during part of the glacial era, covered by the ocean to a depth of 1,500 ft. to 2,000 ft. more than now; but it appeared by degrees during that era, and continued to do so, till the close of the glacial and the opening of the "post-glacial and lacustrine" or lake era, after which "much the same general conditions of land and sea as those which now prevail" came at length to exist.

‡ We have on several occasions treated of this subject, both in its geological and its astronomical aspects, in the *Builder*.—*q. v.* on 10th of August, 1861; 4th of October, 1862; and 8th of September, 1866; if not previously also, and since that time; and we must refer to these occasions for a more particular account of this simple view of the ancient glacial era, and of the present Arctic region, as its residue or remnant and restricted glacial era of the present time; the key to which is, popularly speaking, the movement of the sun in the ecliptic, which is the cause of the alternation of winter and summer, according to the increase or diminution of the obliquity of the angle between the equator and the ecliptic, which angle, from time immemorial, has admittedly been on the decrease, as the extremes of winter and summer must therefore have also been, according to geological evidence, by which the astronomical, admittedly extremely defective, must now be instructed.

it still possesses, but was sunk in sea level, and existed partly beneath the ocean, so that what are now low level plains and countries had no existence then, as such, at all; and the British Isles, as we have said, were "islands" in tenfold intensity of meaning to what they now are. In fact, it was mainly the backbone, as it were, of the country, or the high lands, including Cornwall, most of Wales, Cumberland and Northumberland, and some other districts, with the highlands of Scotland, that were above water and constituted a collection of islands. So with Ireland, which was nearly a great ring of high land enclosing the sea; and so with other countries: the great plain of Europe was under water; but Scandinavia, like Britain and Ireland, was a series of islands. So was the high land of Europe, including parts of France and Spain, and so was the Caucasus. The nearest great continent, however, was the heart of Africa, including Upper Egypt, Abyssinia, and parts of Algeria and Morocco. The great desert of North Africa, though a vast level plain, was sooner uncovered than the great plain of Europe and Asia. A great part of the vast continent of Africa, moreover, like great districts of Asia, never came under actually glacial influences at all; or was not, even then, within the extended Arctic circle; but was tropical or temperate, and high and habitable land, while the glacial era in the isles of the great ocean lasted; as well as before and afterwards.

The continent next nearest, after Africa, to the European isles, was Upper Asia, including Thibet as the central land, the Himalayan and sub-Himalayan regions, Persia, and the higher districts of China adjoining Thibet. The great desert of Gobi, like the Sahara of Africa, was above water before the great plain of Europe. So was it with the Doocan aboriginal plateau of India, and with Asia Minor and Arabia; but Thibet and the Himalayas were the grand centre of the Asiatic continent, as they still are. Except through Persia and Asia Minor, Asia was then divided from Europe by a vast sea, which covered the low lands of Asia, and the great plain of Europe, as its remnants, the Caspian and Black Sea still do. The American continent was then also materially different from what it now is, but we need not here enter further into that subject; except to note that, as man existed in the glacial era, the frozen North Atlantic in the winters would form a way of communication for tribes, such as the Esquimaux, or the Laps and Fins, to traverse with freedom east and west as well as north and south. But although the men of the glacial drift itself were probably as little advanced as the men of the Arctic drift are at the present day, there is no reason, in the physical state of the earth at that time, why men of a far more advanced state—nay, as civilised at least as the Moors or Abyssinians of North Africa, or the Thibetans or Chinese of Upper Asia,—may not also, and simultaneously, have existed as comfortably as now, in the south; while the extended Arctic region of the glacial era covered the more northern, and now temperate, latitudes of the globe. Such is the case, both in Africa and Asia, as well as Europe, now, by comparison with the present glacial region, and such may have been the case then, as regards parts of Asia and Africa. And even had the more northern (but now temperate) latitudes not been at all habitable by man during the full extension of the Arctic circle to these latitudes, as the more restricted Arctic or glacial region and era now are; no sooner would the extended Arctic circle dwindle into less extended dimensions, so that the latitudes of Europe and the British Isles became less severe in climate, or more temperate, than migratory races from the more southern and gonal countries,—that is, from the north-west of Africa and the south-west of Asia,—would penetrate into these "Isles of the sea," and first of all from Africa, as the nearest continent, into Spain, France, and England; that is, from

Morocco and Algeria into the high land of Spain, into Aquitaine and Brittany, and thence into Cornwall, Wales, the Isle of Man, the high land encircling the sea in Ireland, and also, in fewer numbers, into Cumberland and Northumberland, as well as, in still fewer numbers, into the high lands of Scotland; and thence (let us say, in place of the contrary route) into Scandinavia.

In other words, these migrants from North Africa would necessarily and unavoidably take almost the exact route indicated by Mr. Ferguson's own most suggestive and valuable "Map, designed to illustrate the distribution of dolmens and probable lines of the migrations of the dolmen-builders;" avoiding, as they need must, the eastern and more lowland districts of England, the central lowlands of Ireland, and the eastern lowlands of Scotland, since these must have been beneath sea level when this great migration from Africa must have taken place, at the close of the glacial era, and before the land came to the level of less ancient ages. It might have been expected that in subsequent ages the dolmen-builders, if they then existed, might have erected them at lower levels; but they appear to have never been built, as a rule, in the lower districts of Britain, where tumuli and other forms took their place; and it was not till they had reached Scandinavia that the first great evidence of a descent to somewhat lower levels appears on the dolmen map in the region of Denmark and the northern corner of Germany adjoining it.

In long after times, when the great plain of Europe became dry land, other migrants would spread themselves westwards, across the Steppes of Asia and the low-levelled middle region of Europe to the Belgian district, and thence to England. And this route across Europe is precisely that which is strewn with *barrows or tumuli* in innumerable thousands.

Meantime, however, and long before these barrow men could have crossed Europe, the African aboriginal possessors of the isles of the great sea must have been already intruded on, south-westward, from Asia, through Asia Minor, along which route also so many tumuli are scattered; but by this route far higher and more civilising influences, architectural as well as others, were thrust upon the Western peoples than any they probably ever derived either from Africa or through the great plain of Europe: not that we necessarily entertain the idea that because the megaliths of the Africans were rough and rude, and mere glacial boulders (lifted, it may be, by great tides, into their high places in the then semi-insular or "sacred enclosures" or islands, spoken of, in far later times, by the bards or Taliesins; therefore these rough rocks were an undoubted proof and token of North African barbarism: on the contrary, it may only have been because the dolmens were unworked rocks, or stones, that they were devoted and used, untouched, unaltered, for sacred purposes. "If thou wilt make me an altar of stone, thou shalt not build it of hewn stone; for if thou lift up thy foot upon it, thou hast polluted it," said the Lord [in Exodus xx. 25] to Moses, the African, who was "learned in all the wisdom of the Magi," of the Africans, or at least of the Egyptians; and again [Deut. xxvii. 5],—"Thou shalt build the altar of the Lord thy God of whole stones;"—of boulders, in fact, whether great or small. And it is not curious, in this connexion, that as the sacred stones even of these early Jews of the later ages were probably glacial boulders, so their sacred or sacrificial knives were always flint implements, even while iron was used for other purposes? These ideas themselves look almost like vestigia of an extreme antiquity, far back beyond merely Jewish times; and, at all events, they go to show that the dolmens were sacred structures,—not that the Africans were then mere savages.

Now, the conclusions that have been or are being arrived at by ethnologists as to the aboriginal races who must have peopled this country in remotely ancient times are in singular accordance, as some of Mr. Ferguson's are, with these ethnological ideas. The apparently most ancient race, it is concluded by ethnologists, were a dark-haired, long-skulled, short, dark-eyed people, who have been traced to Spain and called Iberians and Milesians. These, we conceive, must have been of African blood, like the Moors in Spain. Another and less ancient race were light-haired, round-skulled, tall, and light-eyed. These must have been of Asiatic or Mongolian blood, whether by the southern or first route, including the Caucasus, or by the second or more northern and Scythian

route, across the Steppes of Tartary and the great plain of Europe. From the conjunction, probably, of these two,—the aboriginal dark race with the intrusive light race,—and chiefly, we should think, with the light race as warrior, and intrusive fathers, and the dark as aboriginal and receptive mothers,—another race, with dark hair and light eyes, as described by Professor Huxley, whom we are here following from memory, are recognisable. These we suppose to be the Celtic race. But the Teutonic element indicated here in the light-haired, round-skulled, tall, and light-eyed race must be distinguished, as Huxley remarked, from the Saxons and Danes of far less ancient times, though originally, doubtless, the same, essentially, in blood. There have been successive intrusions, but it is the more primitive intrusion of which we here speak.

Now it is remarkable that the flint arrow-heads, axe and chisel beads, and other implements of the men of the glacial drift of the British Isles, to use the words of Professor Ansted, in his lectures on Geology at the Royal Institution, in 1860, are "exactly like the flint celts and arrow-heads of the Ancient Britons." And we may here incidentally remark that these implements of the glacial or Arctic era men, as is well known, have been found in connexion with the bones of the elephant, hippopotamus, and other animals of warm climates, a fact which goes far to prove the truth of our simple view of the nature and cause of the glacial era, and to show that it was not an era of eternal and unmitigated fixed ice and snow, but of Arctic winters alternating with hot and something like tropical summers, clearly indicating, on the one hand, the departure of the sun further to the south than now in the winters, and, on the other, its removal farther to the north than now in the summers; so that Arctic life and tropical life co-existed, as a fact, side by side; only the tropical or sub-tropical animals were covered with hair, at least in the winters, if we may judge from the remains of a long extinct elephant actually found imbedded and preserved, it must have been for thousands of years, in the northern ice, and eaten by Siberian dogs, not many years ago.

Since the flint or stone implements of the men of the glacial era are exactly like those of the Britons of Druidical and historical times, it is probable that in their changeless barbarism (to use a phrase of Mr. Ferguson's), they were the same people essentially in the glacial and pre-historical era as in the time of the Romans; and that if they were dolmen-builders and tumuli-rearers in the Christian era, so were they for thousands of years before that era began; just as they were not only flint-implement makers during all that time; but, with the traditional fidelity of beavers to their dam-building, or birds to their nests, were makers, for all these thousands of years, of even the exact same patterns of such implements; and, while their flint implements of the glacial era still exist, side by side, and identical, with those of the Christian era, and undistinguishable from them, except by the localities in which they were found,—it is highly improbable that their supposed or admitted monuments of the Christian era, or end of the Pagan era, have no predecessors of far more ancient ages, during that same Pagan lasting nature of such rude monuments will fit them to endure for many thousands of years.

Since the people whose priesthood, in Roman and Christian ages, were Druids probably were one and the same people with that of glacial, or at least, post-glacial and lacustrine times, one would expect that, in the records of the later descendants of that pre-historical and pre-Christian priesthood, few as these records are, some traces may be found of the leading special physical features of the country in these more ancient times; and, above all, we would expect to find something notable about seas, and islands, and lakes, and boats. Now, this is precisely the case. The "bards" of Wales, who were one of three orders of the ancient British priesthood,—ovates, bards, and Druids,—in the Taliesin records, while speaking of "Deon or Hu," the great Druidical god,—round whose "narrow cell, beneath the tumulus," the priesthood, and it may be the people, danced in circles, "with frantic mirth,"—called this, their chief god, "the Emperor of the Seas," according to Davies's "Druids" (1809); and "the Ruler of the Deep." So numerous, indeed, are the allusions to seas, consecrated or holy islands, and sacred lakes, that one class of writers is well known to have held that it all related to rites connected with the Scriptural deluge and its retirement; and if that deluge could be sup-

posed to have referred, in some allegorical or figurative way, to the covering of the land by the ocean, during the whole of the glacial era, they might, in a certain sense, be right; but we have no intention to identify our own ideas with theirs. Still, we may make a few quotations from the passages collected by Davies, Brynau, and others, from the Taliesin records. Thus:—

"Existing of yore in the great sea, from the time when the shout was heard [whatever that cataclysmic noise may have been] we were put forth; whilst, smiling at the side of the rock, Ner remained in calm tranquility."

Ner, says Davies, was "the great Alysas, now retiring."

Taliesin (or one of the Taliesins; for Taliesin seems to have been an official title, and indicated the initiated) wrote a poem called "The Spoils of the Deep;" and in another poem, called "The Bardic Sanctuary," is the following:—

"O! thou proprietor of heaven and earth: [Hu, pronounced 'He' to whom great wisdom is attributed, a holy sanctuary there is on the surface of the ocean. May its chief be joyful in the splendid festivity, at the time when the sea rises, with expanding energy. Frequently does the surge assail the bards over their vessels of mead. And on the day when the billows are excited may this enclosure [this sacred list?] skim away through the billows. Come beyond the green spot from the region of the Fets . . . a holy sanctuary there is on the wide lake: a city not protected with walls: the sea surrounds it."

The precise meaning of all this, and of much more like it, matters little here: all we have to do is to show how much the minds of the Druids or bards were engaged with seas, islands, and lakes.

As to islands, we have such passages as these. The Taliesin says, in respect to his initiation:—

"I went the circuit. I slept in a hundred islands; through a hundred caers [chairs, kivaens, or dolmens?] in sacred enclosures. I tolled . . . a second time was I formed . . . I have died: I have revived: . . . I am now Taliesin."

"What are the names of the three insular sanctuaries [or caers] between the flowing and the ebbing tide." "In the quadrangular enclosure, in the island with the closed door, the twilight and the pitchy darkness [as of the Arctic winter and the early summer?] were mingled together."

It was not in Britain alone that islands were revered in this peculiar way. Bailly, the French astronomer, wonders "why islands have had so distinguished a hold of the superstitious feeling of the continentals." Now, we can better understand this than in Bailly's time.

And as to lakes, the Druidical allusions to these are no less frequent. Taliesin speaks of the "songs that were chanted by the Gwyllion, the children of the craving, in the bosoms of lakes." Gwyllion means fairy, night-wanderer, or witch. Gwyllion meant propheticesses who sang nightly songs, or songs in the night, as Hu, or Apollo, is said to have done, probably when "the God" was manifested in the entranced, who had "slept in the caers," or islands, and so became Gwyllion, or "became the God,"* as, in the kindred rites of Isis, Ceres, or Ceredwyn, the last being the Druidical name of the goddess Ceres, round whose central childron the Druids and Druidesses danced and circled till they were "inspired."

The supposed connexion of the Irish lakes with fairies (like that of the Irish tumuli with witches) has evident allusion to Druidical times and rites. The Welsh have a tradition very like that of Buddha stealing a flower from the Garden of Paradise. On a rock, near a lake, a door opened, every May morning, leading to an island, in the centre of the lake, where was an enchanted garden, inhabited by the Tylwyth Teg, or Fair family, a kind of fairies, who gave spirit-flowers and fruits to those whom they favoured. A sacrilegious wretch, however, once plucked a flower with his own hand, and lost his senses, in consequence, and the flower vanished as soon as he touched unhallowed ground. Thenceforth the door of the rock never opened more. The story reminds us a little of the golden branch which Æneas got from the Sibyl who lay (entranced) upon a rock, in her cell, which was the way to the Elysian Fields, or to the Shades.

Coracles or other boats, as well as lakes, islands, and seas, had much to do also with Druidical rites; and here we may incidentally remark that it is a curious and very interesting circumstance now explicable, that in the heart of Continental Asia, on the borders of Upper Asia, and very far now from any sea, a tribe of natives exists in whose language there are various words etymologically connected with the sea and seaports. A kindred fact of a different description may be here briefly adverted to. In the Asiatic

* See letters of J. E. Dore on Symbols, in the Builder of 16th October, 1853, &c.

Journal of Bengal for 1853, p. 2, Mr. Hodgson, while speaking of the vast influence of the Himalayans in the distribution of mankind, states the remarkable fact that between certain tribes of the Sub-Himalayas and the inhabitants of the Caucasus mountains, which are separated by low countries, there is a strong affinity in language. To many such facts, we have not the least doubt, the geological evidence of the gradual development of the land above sea-level, from the glacial era downwards, will now be found to constitute a key, which will open its relative dates, or epochs, in etiological time, that will shed a brilliant light upon the pre-historical era of man.

The route of the dolmen-builders into Britain, according to Mr. Fergusson's important map, as we have said, is really the route of the races who first, after the glacial era, probably migrated into Britain, when it must have first become habitable by a settled population; and this was especially the case with the southern districts of Cornwall and Wales, and the higher lands of Ireland, as the spread of the Silures and other dark races has shown; nevertheless, Mr. Fergusson urges, apropos of nothing but his undue desire to bring down the pre-historical and Pagan era of rude monuments within the limits of historical or quasi-historical record, that dolmen building was introduced into Britain, if not entirely originated, in comparatively recent ages. Whereas, since he himself has traced them from North Africa, through Spain and Franco to Cornwall and Wales, and to Ireland and Scotland, by the very route which must have been taken by the first settlers in Britain and Ireland after the glacial deluge, and before the lower lands appeared above sea level, it is much more probable that these first settlers brought their African dolmen-buildings, with their propensities with them, whatever were its purposes; than that, in long subsequent ages, of comparatively recent times, both Britons and Africans should have taken it into their heads, either simultaneously or in succession, either one way or the other, to commence the Pagan practice of dolmen-building at the fag-end of the Pagan era.

Mr. Fergusson thinks that "the key to most of our mysteries is hidden in the African deserts," and he is not far wrong; but that key he has just missed finding; and it is no other than it that we now produce. Africa is clearly a great centre whence not only dolmens but other monumental forms, and especially concentric circled ones, emanated; although, probably, it had many of them in common with those of the aboriginal Asiatic continent, before the lower countries came above sea level.

In North Africa, as instanced by Mr. Fergusson, dolmens and other stone monuments, occur in tens of thousands, many of them of prodigious dimensions; and not only dolmens simply, but dolmens centred in concentric stone circles, one, two, three, and fourfold; concentric stone circled tumuli crowned with dolmens; round towers in concentric circled series of walled masonry; cairns in "quadrangular enclosures" (to use words in the Druidical records); single stone circles; menhirs or single standing stones; even trilithons, exactly like those of Stonehenge; and various others. Mr. Fergusson may well say, therefore, that probably the key to many of our mysteries lies in the African deserts; and he himself points the way to the discovery of the extreme antiquity of these mysteries and these monuments, as a class, however many may have since come scattering down to less ancient times, and to lower levels of country.

In tracing so many of our crude Pagan monuments to the nearest continent, however, and to the earliest times, we must not overlook the fact

that there were those other great sources already referred to,—of equal antiquity in themselves, probably,—in the continental high lands of Asia and Asia Minor; but these were certainly not the source, or at least the chief source, of the dolmens, though they, perhaps, were of the chambered tumuli. But the chief source of the simpler harrows was more probably that which flowed from Upper Asia by the Scythian and Tentic route, through the great plain of Europe, where earth was more plentiful, and rocks were less so, than in the higher, earlier, and more mountains and rocky routes. These tumuli of the Steppes of Asia were usually surmounted by a human figure called a *baba*, one of which is represented in Mr. Fergusson's book, with carvings behind of something like the *V* and *A* symbols crossing each other; one, *V*, the masculine symbol above, and the other, *A*, the feminine below. A Russian barrow, on being levelled, was found to have, on the natural surface, a series of four concentric circles in stones (the genesis of our great circles, Mr. Fergusson thinks), with a central chair or kistvaen enclosed. There are stone circles at Caboul. Little seems to be known of the great Thibetan plateau, however, or even of the Himalayan and other mountain borders, especially the western, whence the barrow-rearers must have descended; but India is a great field for rude stone monuments, such as menhirs, trilithons, and dolmens, as in the hills inhabited by the Khassia tribes, and in the west of India, where there are also a variety of cairns, stone circles, and holo dolmens. Chambered tumuli and other forms of the Black Sea district, Lydia, &c., which probably emanated, originally, from Upper Asia, independently altogether, or nearly so, of glacial restrictions, through the plateaus of Persia and Asia Minor, came chiefly, it may be, by the southern or Aryan route, between the first or African descent and the third or North Asian ones; unless, indeed, they were a cross between the African dolmen and the Asiatic barrow, both in Britain and in Western Asia.

The fact (if it be a fact) that certain tumuli, kisteds or not kisteds or dolmened, stone circles, dolmens, or any other forms of gigantic Pagan monument were erected in the Christian era, or at the close of the Pagan era, either in Britain, or in Asia or Africa, and even were the proof clear and unquestionable in all such cases, is no evidence whatever that other monuments of a like order, or the main mass of such monuments, were not erected throughout the whole of the pre-historical and Pagan era, which is now clearly extended back to the glacial epoch,—probably 50,000 years ago. As regards one of the most ancient forms probably of all those introduced into the British Isles,—the dolmens,—these were too hard a nut to crack; and really Mr. Fergusson has scarcely attempted it, but has swallowed the nut whole without cracking it at all. He has not even tried to show when any British dolmen ever was erected, unless in a failure to identify one of them,—"Arthur's Quoit,"—with King Arthur as an historical personage. There is truly nothing for us to disprove in this respect therefore, because there is nothing but mere assertion to meet. As regards the chambered tumuli, stone circles, &c., we shall have some remarks to make, as well as in connexion with the dolmens and kistvaens, when we speak of the probable purposes of such monuments. Mr. Fergusson considers these rude structures in general, with certain exceptions, as being sepulchral and also simulative of sepulchral rites, and as works of ancestor-reverencing or departed-spirit-worshipping peoples. Our remarks, affirmative and otherwise, we must make in another article.

THE LATE MR. EDWARD WALTERS, ARCHITECT.

On the 22nd of January, 1872, there died at No. 11, Oriental-terrace, Brighton, of pleurisy, in the 64th year of his age, Mr. Edward Walters, an architect who during a professional practice of about thirty years in the city of Manchester and its neighbourhood produced a series of important and most original works, which have imparted a marked character of dignity and picturesque effect to what was before an uninteresting, although an important, provincial city, and have achieved a lasting reputation for the accomplished man who produced them.

Edward Walters was born in December, 1808, at No. 11, Fenchurch-buildings, in the City of London. His father, Mr. John Walters, was a

fellow pupil with James Savage, Joseph Woods (author of "Letters of an Architect from Italy," and the architect of the Commercial Sale Rooms, Mincing-lane), Whichcord the elder, J. Anson the elder, Ashpittel the elder (?), and Suter, in the office of Daniel Alexander. Mr. John Walters resided and carried on business at No. 11, Fenchurch-buildings, as was usual at that time. His principal work was the old Auction Mart, London, at the corner of Bartholomew-lane and Throgmorton-street, which was lately pulled down by the Estates Company, and the site is now occupied by the northern portion of the Alliance Bank. The Auction Mart was an imposing structure, but was very much disfigured by the subsequent addition of skylights in the roof. He also designed Shadwell Church, the tower of which is well proportioned, and St. Philip's Church, Stepney, built upon ground belonging to the London Hospital, of which institution he was surveyor. This latter building was one of the earliest attempts at the revival of Gothic architecture, and is a very creditable, although, of course, a very imperfect work viewed by the light of our present knowledge of Gothic art. Mr. John Walters died at a comparatively early age, leaving a widow, sister of Mr. J. Anson, senior, who survived him many years; a son, the subject of this notice; and a daughter, still living.

Edward Walters was educated chiefly at Brighton, and was a youth at school at the time of his father's death. He shortly afterwards came to London, and entered the office of Mr. Isaac Clarke, now of Lime-street-square, who had been a pupil of his father, and had then recently commenced business. He was not articled to Mr. Clarke, but remained with him for two or three years, and obtained the rudiments of an architectural education. His first professional employment after leaving Mr. Clarke was in the office of the late Mr. Thomas Cubitt, from whence he entered that of Mr. Lewis Vulliamy, where he was the contemporary of Mr. Owen Jones. He also for some time assisted the late Mr. John Wallen, and afterwards became assistant to Sir John Rennie, by whom he was sent to Constantinople in March, 1832, to superintend the building of a Small Arms Factory and some additions to the Arsenal for the Turkish Government.*

Mr. Walters remained at Constantinople until the completion of the works in 1837, when he returned to England, in company with his friend Mr. W. H. Barlow, the engineer to the Midland Railway Company, who had been sent out to superintend some works at the same place for Messrs. Maudslay. They left Constantinople in the month of August, 1837, visiting Smyrna, Malta, Sicily, and travelling through Calabria to Naples. Thence they went to Rome, Florence, and Pisa, and by Leghorn and Marseilles to Paris, arriving at Dover on the last day of January, 1838. The friendship which was thus early established between Mr. Walters and Mr. W. H. Barlow was continued with the greatest possible satisfaction to both, until Mr. Walters's decease. They frequently consulted each other upon points relating to their respective professional practice, and worked together with the most cordial feelings of amity. In 1860 they were associated in the laying out of a portion of the Midland Railway, between Ambergate and Manchester, of which Mr. W. H. Barlow was the engineer; and several of the stations on this line were built from Mr. Walters's designs.

It is evident, from a consideration of his works, that he must at some time have studied the proportions of some of the Italian palaces, particularly those of Genoa and Venice; but he does not seem to have made any measurements, the drawings which are preserved being coloured sketches, executed with considerable force, and the point of view selected with a just eye for effect. It is possible that if he ever made any drawings they may have been destroyed, as he was extremely jealous of his early drawings being made public, and frequently tore up his youthful designs when he came across them.

Whilst at Constantinople he made the acquaintance of the late Mr. Cobden, who, being at that time in ill-health, had undertaken a journey in the East for the purpose of recruiting his health, and at the same time to endeavour to obtain the secret of the method of producing the beautiful colour called Turkey Red, which is largely used in

* He made an elaborate design for a palace for the Sultan during his residence at Constantinople, a perspective of which was exhibited at the Institute. This design was never carried out, and this circumstance has, in all probability, led to the statement in a Manchester paper that he was appointed architect to the Sultan.

* It is an interesting circumstance that among a set of photographs from Abyssinia in the Kensington Museum (but removed to make way for the Duke of Edinburgh's collection) there was one, which we have seen, including a series of concentric circles amongst other symbols; and that an Abyssinian church was described in the *Builder* during the war, which was built or arranged in concentric circles, the most holy place being in the centre, with an altar or ark there placed. It is notable, in reference to the concentric circles carved on rocks in Northumberland too, was found in Wales a few years ago. Doubtless, however, they were, in subsequent ages, carved on rocks at lower levels, though their chief localities thus appear to have been on high land; and so long as that is the case, a few exceptions are of little or no force against the general principle, either as regards carvings or as regards megalithic references to African circles, with an slab from Carthage, with the circle and centre symbol on it, brought to the notice of the Society of Antiquaries by a member,—Mr. George Godwin,—and published in the "Archæologia," many years ago, is now more interesting and important than ever.

certain textile fabrics. With Mr. Cobden Edward Walters formed a warm friendship, and at that gentleman's suggestion he resolved to establish himself at Manchester, although at that time he had no friends in that city, but, on the contrary, all his relations and connexions were in the metropolis. He accordingly established himself, in 1839, on the ground-floor of No. 20 (now No. 24), Cooper-street, in which house he carried on business until his retirement, migrating only from the ground-floor to the first floor, and there his business is continued by his successors, Messrs. Barker & Ellis. His energy of character, his strict uprightness, and genial manners procured him friends, and he eventually acquired a considerable practice, after passing through an interval of doubt and difficulty.

At that period most works of any importance in Manchester were entrusted to Mr. Richard Lane, whose designs were in the prevailing style of the early part of this century, strictly Classic, and founded on Greek models, — a style which Sir Robert Smirke made popular. Lane's most successful work is the Manchester and Salford Savings Bank, at the corner of King-street and Pall Mall. He also built the Town-hall, Salford; St. John's Church, Higher Broughton; and several churches and chapels, one of which, the Pendleton Independent Chapel (built in 1849), has a front designed "after the manner of Whitby Abbey, delineated in Sharpe's Abbeys of Yorkshire," and a cast-iron roof. Sir Charles Barry, who designed the Royal Institution in Mosley-street, erected in 1823, had just completed the Atherton, Cheadam-hill Church was built by Mr. T. W. Atkinson, of London, in 1836-9, and the same architect designed the Manchester and Liverpool Bank, Spring-gardens.

The whole field of employment seemed barred to Mr. Walters; and, being a perfect stranger, his early life in Manchester was one of struggle and anxiety.

One of Mr. Walters's earliest commissions was a warehouse for Mr. Cobden at No. 16, Mosley-street. This is a plain, unpretending building, the ground-floor of stone, and the upper part of red brick, but although there is a certain refinement in the details which distinguishes it, it does not materially differ from other Manchester warehouses erected about the same time.

In the early part of his career he was chiefly employed in designing chapels and schools and residences in the suburbs of the ordinary villa type. In 1844, however, he built Oakwood Hall, a mansion of some extent of a Tudor character, upon the drawings of which he bestowed great care and study, most of them being drawn by himself.

It has been attributed to him by a contemporary that he designed some of the churches forming part of the scheme for building "ten churches" in Manchester proposed by the late Canon Stowell, but this does not appear to have been the case. Mr. Walters held aloof from the established clergy, but built several buildings for dissenting denominations, and had at one time a son of Dr. Halley's predecessor, Dr. McAll, for whom he built Cavendish-street Chapel, as a pupil. He did not ally himself, however, with any sect.

The same journal falls into the mistake of attributing the church in Grosvenor-square to Mr. Walters, which is not by him. He designed, however, the Free Church in Oxford-street, at the corner of Grosvenor-square, and this may have led to the error alluded to.

The first work that brought him into prominent notice, and developed his special talent, was a warehouse built, in 1851, for Messrs. Brown & Co., at the corner of Aytoun-street and Portland-street, and this was so pleasing in design, and so original in treatment, that the old-fashioned Manchester warehouse style was discarded, and Italian Renaissance buildings became the fashion. This warehouse was quickly followed by others in Portland-street, and may be named that for Messrs. Kershaw, Loose, Sidebottom, & Co., Messrs. Jackson's, one at the corner of Lower Mosley-street (Mr. C. P. Henderson's), and others in the central part of the city.

By reference to the list of Mr. Walters's works given at the end it will be seen that his progress in his profession was at first slow. In 1847 John Dalton and Corporation streets were opened, and considerable improvement became manifest in the architectural character of Manchester. The Branch Bank of England, designed by Mr. Cockerell, was opened in 1847. The Royal Exchange was enlarged by Alexander

Mills in the same year. In 1849 Sir Benjamin Heywood's Bank, at the corner of St. Ann's-square, by J. E. Gregan, was built, and other important buildings erected in the city. Mr. Walters soon obtained a considerable share of practice, and from about the year 1848 to 1860 was the leading architect in Manchester. He designed in succession a number of handsome warehouses, each in extent exceeding the majority of palaces, as well as numerous houses in the suburbs. In 1853 he obtained the Free Trade Hall in a limited competition. In 1860 he designed the Manchester and Salford Bank, in Mosley-street, a very charming composition, by some considered his *chef d'œuvre*, and in the same year the picturesque stations on the Midland Railway, among which may be specially mentioned those at Bakewell, and Miller's Dale, near Matlock, Bath. After 1860 his popularity to some extent declined in the face of the energy and determination of some of the younger members of the profession, and as he was of too proud and sensitive a nature to enter into what he considered a derogatory conflict with his brethren, he gradually withdrew from active practice.

With very few exceptions, the whole of Mr. Walters's works are founded on the style of the Italian Renaissance treated in the fullest, freest, and most intelligent manner. His earlier Gothic designs are poor and meagre, but the church in Cavendish-street is finely proportioned, and although the detail may not bear critical examination, it is a noble building, and will not suffer by comparison with any of the Gothic buildings of the same period. In all his compositions there is great breadth of design, a fine eye for proportion, a decided originality in combination, and a very careful study of detail. His work is throughout of the most conscientious character; it is the product of his own mind, and was carried out by his own hand. Of two years he was, however, greatly assisted by two gentlemen who became his partners, and ultimately succeeded him in his business on his retirement, whom he entirely reared and educated, sending them to study in Italy in order to qualify them for the position they were to occupy.

One of his last serious efforts in competition was a noble Classic design for the Manchester Assize Courts. This was not successful; and his want of success had a very painful effect upon his sensitive nature. He shortly afterwards retired from the active practice of his profession, resigning the business into the hands of his former pupils, Messrs. Barker and Ellis. He still, however, continued to take some interest in the practice of his successors, and only finally withdrew from a profession to which he was much attached, and in which he had so well and so intelligently practised in the year 1865. After this time he resided a good deal abroad, passing the winter generally in Italy, but making frequent visits to London.

Mr. Walters was singularly modest and unobtrusive in character, but his social qualities were of the highest order, and endeared him greatly to the many friends he found in Manchester, with whom he was on terms of the most cordial kind, as well as those who had known him in his youth. He was never married, and, although most courteous in his demeanour to women, he was not fond of female society.

He was most conscientious and laborious in his professional work, making a large number of his drawings himself, and altering and retouching frequently until the last moment. He was very particular as to the profile of his mouldings, upon which he bestowed great attention. Most of the warehouses in Manchester face to the northward, for the sake of the light, and on this account there is very little opportunity for obtaining any effects of light and shade upon those portions. For this reason the mouldings were, to some extent, exaggerated, and their proportions are slightly increased as they recede from the eye, in order to emphasise them, or, as Mr. Walters expressed it, to "make them read." This will account for, what may appear to those who are accustomed to the delicacy and refinement of the Italian prototypes of these buildings, an apparent coarseness of detail which is observable in his works. This peculiarity is more apparent than real, and is due to a careful study of the conditions under which the buildings were to be seen, and the dulness and opacity of the atmosphere at Manchester. There is in Mr. Walters's works in the city no attempt to obtain effect from the sky-line; the roofs of his city buildings are almost universally hidden, and

they derive all their value from the judicious proportions of their masses.

Mr. Walters's integrity and sense of honour were of the highest order, and it is to the credit of the people of Manchester that these qualities were appreciated by them as they deserved to be appreciated. To Mr. Walters is due the credit of having introduced into Manchester the system of taking out quantities as practised in London, and the abolition of the equivocal relation that formerly existed between architects and builders in the matter of quantities. Formerly it was the custom for the bills of quantities to be prepared in the architect's office, and the charges were paid by the whole of the builders tendering. If the quantities were prepared by a surveyor, the architect received a commission upon the amount charged for them. Mr. Walters, by the force of his example, did away with this unsatisfactory state of things, and promoted a more honourable, and at the same time a more cordial, relationship between architect and contractor. A contemporary organ of the building interest (the *Builders' Trade Circular*), in commenting on Mr. Walters's death, remarks on this subject:

"Mr. Walters was not popular among his brother architects and seldom associated with them; but he had the respect and confidence of the builders in a very marked degree. He was a strict man in having his work well done, but his criticism and his remarks were faithfully carried out, but a man of rare integrity. If a contractor gained his confidence it was not easily shaken. Sometimes a greedy client would try to get more work than was ordered. With weaker men this sort of thing too often succeeds; but in the hands of Mr. Walters the builder was safe. No fear of giving offence in any quarter prevented him doing justice to his tradesmen. He had a generous, warm heart, and his sympathies were strongly in favour of those who assisted him in carrying out his designs. He never failed to give his workmen with a word of consideration, and the builders of Manchester entertain a profound respect for his memory."

The *Manchester Critic* of the 16th of last December, in a series of papers on Manchester Architecture, past, present, and to come, reviewed Mr. Walters's works, and dwelt justly on the influence of his taste and common sense upon the buildings erected in Manchester during the last thirty years. We reprint a small portion of it, though our earlier volumes contain full reviews of his various works:—

"There can be no doubt that Manchester architecture may be criticised, and its quality estimated through the medium of its warehouses; those huge receptacles of manufactured goods, the buying and selling of which constitute what is commonly called the Manchester trade. In fact, Manchester is unmistakably a city of warehouses; the architectural character of the town is mainly derived from these buildings, inasmuch as the effect of whole streets depending upon their architectural treatment. The rebuilding of the old square-block warehouses inaugurated a new era in the history of architectural art, and opened out a wide field for the display of artistic powers, and an expenditure of money, the result of increased commerce and a livelier appreciation of the beautiful and of the refining influences of art.

The idea of inaugurating this new era in art devolved upon an architect whose name will always be held in esteem by his professional brethren, and whose genius will, we think, be acknowledged by succeeding generations as his fellow-countryman. Mr. Walters, indeed, Manchester owes a debt of gratitude for the wonderful change which he wrought in the appearance of the town, and for the respect which he won for the enterprise and spirit of Manchester merchant princes. The time was ripe for such a revolution in artistic thought, and Mr. Walters came upon the scene with an educated mind and a refined intellect, and the results soon became apparent as one after another, with astonishing rapidity, his stately piles reared themselves in our midst.

We well remember the surprise and wonder excited by, we think, his first great warehouse, the one built for Messrs. Brown & Co., at the corner of Aytoun-street and Portland-street; the style was new, there was a freshness and purity about it which quickly took hold of men's minds, and the building of Italian warehouses became almost a rage. This warehouse was quickly followed by others in Portland-street, including the one for Kershaw, Loose, & Sidebottom, one at the corner of Lower Mosley-street and Oxford-street; then followed the Free Trade Hall, the Manchester and Salford Bank, and many other buildings."

This article was written during Mr. Walters's lifetime, and the same paper, referring a few weeks afterwards to his demise, spoke in feeling terms of Mr. Walters's ability, and concluded with the observation:—

"It always engaged a cause for regret that Mr. Walters, when engaged in active practice, did not mingle more intimately with his professional brethren; but no doubt on account of the unfortunate relations and petty jealousies existing among members of the profession in this city this retirement is to be respected for. Mr. Walters has passed from among us respected by all, and with whom he came in contact, and leaving the mark of his genius in lasting monuments in the streets of Manchester."

The work upon which Mr. Walters's fame will chiefly rest is, the Free-trade Hall in Peter-street, the scene of the "Pterloo massacre" in 1819, and then called St. Peter's Fields, which was inaugurated on October 9th, 1856. It was built on the site of a hall of the same name, in which the Anti-Corn Law Meetings were held. It was erected by subscription among a very

limited number of residents in Manchester, and cost 25,000*l.* without fittings. The hall is 135 ft. long, and 78 ft. wide, and only 52 ft. in height. It was originally intended to be 61 ft. high, but acoustic considerations induced a curtailment of its proportions. In addition to the hall proper there is an assembly-room, 76 ft. by 37 ft., and 28 ft. high, approached by a separate staircase, with a summer-room over, a drawing-room, 40 ft. 6 in. by 24 ft., and other apartments. The principal front measures 153 ft. and the total height is 75 ft. The entire building covers an area of 2,300 square yards. The galleries will accommodate 754, and the floor of the hall will seat 3,156 persons, making a total of 3,910 persons, allowing 18 in. of seat to each individual.

There is a view of the principal front of this building in the *Builder* for 1856, vol. xiv., p. 526, and another view in the *Illustrated London News* for October 11th, 1856, which was taken from the drawing exhibited at the Architectural Exhibition in 1856 (No. 14).

Mr. T. Roger Smith, in his useful essay on the "Acoustics of Public Buildings," in "Weale's Series," founded on a paper read at the Institute of Architects, in 1860, refers to the Free Trade Hall as "one of the best examples that can be presented of a successful public room of the largest size." He proceeds to describe the means that have been taken to prevent echo at the end of the hall, and remarks:—

"This room, when empty, possesses a good deal of sonority, but when full is excellent in the extreme, either for music or public speaking. The amount of resonant material employed is not great, although there is a good deal about the orchestra, the part of the building where it will be of most service. The resonance is, however, produced by the large space above the ceiling, and by the fact that there is a hollow space under the floor. The included mass of air is probably also nearly as large as could be safely set in motion; so that, in all probability, the architect of this hall may be considered to have approached as closely as was either salutary or safe that limit of capacity or sonority, to have exceeded which would have spoiled the success of his undertaking."

The dimensions of the Free Trade Hall are, length, 135 ft.; width, 78 ft.; height, 52 ft. (originally intended to be 64 ft.); so that, as Mr. Smith observes, the height bears exactly to the width and approximately to the length the simple numerical relation of 2 to 3 and 2 to 5, the unit being 26 ft. The total cubic content may be roughly stated as about 500,000 ft.

The published illustrations of Mr. Walters's works are not numerous. Amongst them are illustrations of the Chapel in Cavendish-street, built for Dr. Halley, an Independent minister of some reputation in Manchester, given in the *Illustrated News* for 1849, vol. x., p. 181, and in a periodical which had but a brief existence, the *Architect*, 1849, vol. 1, p. 339. The Cavendish-street Schools are illustrated in the *Builder*, vol. vii., page 103.

In the notice accompanying the engraving in the *Illustrated London News* no mention is made of the architect, although it is evident from the accuracy of the description that the particulars must have been supplied by him.

There is a view of the Free Trade Hall in the *Illustrated London News*, October 11th, 1856, but it does not do justice to the building; the vigour and solidity of the original being quite lost.

There is no good view of the interior of the hall published. An attempt has been made to photograph it, but it has not been successful. There are a plan and section of the hall engraved in Mr. T. R. Smith's "Acoustics of Public Buildings."

An illustration of Messrs. Kershaw's Warehouse, Portland-street, is given in Knight's "Companion to the Almanack," 1854, p. 258.

Mr. Walters was a frequent contributor to the Architectural Exhibition. The first exhibition was held in 1849, but his name does not appear as an exhibitor. In 1850, when the exhibition was held at the Suffolk-street Gallery, he exhibited a garden elevation of a Mansion proposed to be built near Manchester (52); Oldham-road Chapel, Manchester, described as then building at Manchester (25); Entrance-gate and Lodge to Beechwood Hall, Cheshire (131).

In 1852 he exhibited a House for Mr. J. McLaren, at Manchester (28); a Warehouse erected at Manchester for Messrs. Callender, Sons, & Dodgson (72); a House at Rivington Pike, near Bolton, for Peter Martin, esq. (82); Messrs. Brown & Co.'s Warehouse, then building (153). In 1851-5 he did not exhibit. In 1855-6 he exhibited a group of Commercial Buildings lately erected in Manchester. In 1856-7 he exhibited a composition of buildings, lately erected at Manchester (1); the Free Trade Hall, Manchester (14); and Warehouses, Marsden-

street, Manchester (105). In 1857-8 and 1859, his name does not appear in the catalogue. In 1860 the Manchester Assize Court competition took place.

Mr. Walters does not appear to have contributed to the Architectural Exhibition after the year 1856-7. He had a strong dislike to exhibiting designs, and when urged to do so, generally refused, alleging that designs gave no idea of the appearance of a building when finished, and that when completed he would have the building photographed.

Mr. Walters was a Liberal in politics, and an ardent Free-trader. He was one of the promoters of the *Morning Star*, the organ of the Manchester School, which, although it did good service in familiarising the country with the doctrines of its party, was unsuccessful as a newspaper. Mr. Walters lost what money he had invested in the undertaking, but was proud of the sacrifice he had made for the sake of his principles. He was, however, as a rule, extremely reticent with regard to himself, and was averse to expressing his opinions openly, although he felt deeply upon public questions. Almost his only London work, which he obtained through this connexion, was the offices of the *Morning Star*, in Dorset-street, Fleet-street, erected about 1856, the date of the establishment of that paper.

The following is a list of Mr. Walters's principal works, for which we are indebted to Messrs. Barker & Ellis. The list is, however, incomplete, and does not include some of his early designs and alterations, nor buildings not strictly of an architectural character:—

- 1830.—Residence for Mr. E. Lloyd.
- 1841.—Union Chapel; Scotch Kirk, Manchester.
- 1842.—Grand-royal-starch; Queen's Hotel; Broughton-road Chapel and Schools.
- 1844.—Oakwood Hall, for Mr. Ormrod Heyworth; St. Andrew's Free Church, Oxford-street, corner of Grosvenor square.
- 1845.—Warehouse for Mr. S. Schwabe; Residence for Mr. T. Critchley; Darwen Chapel and Schools; Scotch Kirk, Bolton.
- 1846.—Residence for Mr. Whitlow.
- 1848.—Warehouse for Mr. Thos. Cooke; Residence for Mr. Thos. Ridgway; Residence for Mr. W. Morris; Blackpool Chapel.
- 1849.—Oldham-road Chapel; Stockport Chapel; Middleton Schools.
- 1850.—Residence for Mr. J. Leigh; Residence for Mr. J. McLaren, Whalley Range; Residence for Mr. Peter Martin, Rivington-Pike; Residence for Mr. W. Hadfield.
- 1851.—Warehouse, Portland-street, for Mr. Jas. Brown; Warehouse, Charlotte-street, for Messrs. W. R. Callender; Residence for Mr. Wm. Bellhouse; Residence for Sir Joseph Whitworth.
- 1852.—Warehouse, Portland-street, for Messrs. Kershaw, Leese, & Co.; Residence for Mr. Henry Hart; Residence for Mr. J. Leese; Residence for Mr. E. F. Langworthy; Billiard-room for Mr. T. B. Potter; Residence for Mr. W. J. Tate; Knott-mill Chapel.
- 1853.—Free Trade Hall (opened in 1856); Warehouse for Messrs. Gruner, Schmidt, & Co.; Residence for Mr. Jas. Brown.
- 1854.—Warehouse for Mr. C. P. Henderson.
- 1855.—Warehouse for Mr. Wm. Atkinson; Warehouse for Mr. J. C. Harter; Warehouse for Messrs. Jones, Brothers.
- 1856.—Warehouse for Messrs. Beaver, Higson, & Co.; Warehouse for Messrs. Williams, Scott, & Co.; Residence for Mr. Peter McLaren, Isalm.
- 1857.—Manchester and Salford District Bank, Warrington; Residence for Mr. J. Williams.
- 1858.—Warehouse, Portland-street, for Messrs. E. & J. Jackson.
- 1859.—St. Helen's Bank; Ashbury Carriage Company's Works; Residence for Mr. T. Ashton, Didsbury.
- 1860.—Liverpool, London, and Globe Insurance Office, King-street; Manchester and Salford Bank, Mosley-street; Residence for Mr. T. Wrigley; Burton Station, Bakewell Station, Longstone Station, Miller's Dale Station, Rowsley Station, and Hasop Station, on the Midland Railway; Manchester and Liverpool District Bank; Warehouse for Mr. E. R. Langworthy; Warehouse for Mr. Leo Schuster; Residence for Mr. B. Boden; Residence for Mr. G. Crossfield; Lynn Chapel.
- 1861.—Warrington Public Hall; Southport Chapel.
- 1865.—Warehouse for Mr. Dewhirst.

ARCHITECTURAL DRAWINGS, ROYAL SCOTTISH ACADEMY.

ARCHITECTS, here as elsewhere, meet with but scant justice at the hands of their fellow artists, the painters. If a small space at either side of the entrance to the galleries is allotted to architectural drawings, it is talked of as a good-natured concession to a kind of thing which is only by courtesy called art. The architect has more intractable materials to work with than the painter, but form and composition, light and shade, are as essential requisites to the successful performance of the one kind of work as the other. That a moderate degree of success is more easy of attainment with the brush and palette than with the square and compass, is shown by the fact that several exhibitors of paintings in these galleries began their career as architects, but we cannot point to a single example of the converse. The painter, too, is

indebted for much of his material to the architect, as is shown by the considerable number of views of purely architectural subjects exhibited; and although it may be pleaded that these are, in great measure, indebted to the mellowing hand of time for their artistic value, and that the new works lack that interest, it may also be safely predicted that the new work will, in the course of time, be as suitable and as eagerly appreciated by a new race of artists.

The sister arts should go hand in hand, each lending grace to the other, and then we shall find, as in the palmy days of old, the walls of our public halls covered with works of high art. Mr. Dick Peddie is the first architect in Scotland who has taken a step in this direction. "The Telling Room of the Royal Bank of Scotland," of one side of which we are presented with an elevation (768), is an elegant apartment, square on plan, and lighted by a dome supported upon four strongly pronounced arches. The details are simple, and effect is sought for by covering the broad wall surfaces with coloured decoration, and introducing four large paintings in the upper section of each arch, a much more artistic proceeding than loading the surface with plaster casts, as has been the practice hitherto in similar works. No. 779, "Interior of Inverness Cathedral, Alexander Ross." This edifice consists of a nave, with aisles, clearstory, transepts, and apsidal choir, covered by a wagon-roof. The pillars are of red granite, and the roof richly decorated in colour. The effect is pleasing, but exhibits no particular marks of originality. No. 812 is a view of the exterior, showing two spires at the west end, a flèche at the intersection of the cross, and an octagonal chapter-house. Nos. 781 and 822 are drawings of the exterior and interior of a new church, Woodgreen, Staffordshire, by Edward Francis Clark, who seems to have a thorough knowledge of Gothic details, and, by a skilful combination of such, produces a happy result.

No. 780, "Design for a proposed Free Church," John Honeyman. Why a Free Church should be made to appear outwardly as if it had a chancel is to us a mystery. We know of one example where such an anamorphosis has been perpetrated, and it produces no small shock to one's preconceived ideas, when, upon entering the building, the pulpit is seen at the opposite end to what appeared a chancel, and that that portion of the interior is fitted up with pews in the ordinary manner. An architectural work may be either the visible expression of the ideas of the designer, or it may be a composition produced by grouping together old forms. Mr. Honeyman seems an adept at the latter and more easy mode of procedure; for both as to detail and general effect the design is far from being unpleasing, like the poetry of those who,—

"Haunt Parnassus but to please the ear."

No two buildings could be more unlike than this and No. 787, "St. John's Free Church, Leith." There is no mistaking it for anything else than a Dissenting chapel. The fact that the interior is fitted up with galleries is apparent by a double tier of windows, and is emphasised by the stair leading thereto being indicated by a glazed arcade which follows its slope. A tower at the south-west angle is terminated by an open crown formed by eight flying buttresses meeting in a point; this feature has a poverty-stricken wooden character about it, the lower tier of windows are unpleasantly near to the ground, and the upper tier terminate in gables which are overwhelmed by an unnecessary parapet. The building is altogether too pretentious. No. 824, "St. Luke's, Dumfries," Robert Anderson, is quite another affair; it is an Episcopal church, and looks like one. Nothing is overdone, and a satisfactory feeling of appropriateness and repose pervades the interior. The only peculiarity about it is that the side aisles are without lights, and are kept narrower and lower than is usually the case, and a greater height is consequently given to the clearstory. This, we think, a satisfactory arrangement, the light coming from above producing a fine effect. Mr. Anderson has restored the parish church of St. Vigeans in a satisfactory manner; it is a Mediaeval church appropriated to Presbyterian worship; but instead of fitting up the chancel with pews, Mr. Anderson has set aside that space for the choir, and has placed the pulpit at one side, and not in the middle, as is usually done in similar circumstances.

No. 808 is a very grand "Design for a Scott Memorial Hall for the University of Edinburgh," by Adolph Emil Melander. It is after (a long

way after) the Ducal Palace at Venice, is spanned by a vast roof, out of which crop towers and pinnacles, turrets and canopies, producing a wonderful sky-line. How these features are to be supported is a mystery which a view of the interior could hardly solve. We doubt if the designer has made the attempt. No. 783, "Design for a Town-hall," William Nicholson, and No. 796, "Design for a Club-house," by the same, are common-places in the extreme, without a new feature in combination. No. 793, "Roschaugh House, Ross-shire," as designed by Mr. Alexander Ross, is a Renaissance mansion, with a large display of plate-glass, and would be as inappropriate in the North as No. 814, by Messrs. McGibbon & Ross, a turreted Scottish baronial mansion, would be out of place in the New Forest, Hants, where it is proposed to erect it. The Renaissance mansion has a tower with a heavy-looking roof, which crushes it into an appearance of humility towards the mountains of the north; but the Scottish intruder asserts his nationality by thrusting aloft a series of lanky turrets. "*Honi soit qui mal y pense.*" Cortachy Castle, Forfarshire, which is now in course of being restored by Mr. David Bryce, and of which a south-west view is given (831), is a very fine example of a Scottish baronial mansion. The main portion of the building is symmetrical, and not broken up into numerous small features, as is too often done in modern instances, such as No. 813, "Threave House, Kirkcudbrightshire," by Mr. C. G. H. Kinear. An outside stair, supported upon a semicircular arcade, is a happy feature, and so is the clock tower in the angle; but the sky-line to the right of the tower is hard and unsatisfactory, and appears to have been done at a later period than the rest of the buildings.

Mr. William Leiper has in "Colcarr, Perthshire" (825), given a new and appropriate expression to this style. It is difficult to point out wherein this design differs from many others lately produced; we can only say that it possesses a distinct individuality, and has that something about it which characterises the works of the new school of Gothicists. It is homely and comfortable-looking, and elegant without being pretentious.

No. 794, "Villa for Alex. McLaurin Monteith, esq., South-side, Edinburgh," Fred. Thos. Pilkington. This is the first instance we know of where Mr. Pilkington has stooped to use the vernacular villa architecture. Of its kind it is good, but that kind is very stale and uninteresting.

No. 821, "New Asylum, Lenzie," being erected for the Barony parish, Glasgow, by Messrs. Salmon, Som, & Ritchie, architects, is one of those widely scattered groups of buildings to which it is very difficult to impart artistic effect. No. 833, "Memorial Cross" to be erected by friends and pupils of the late Mr. John Charteris, Wamphray, is an appropriate Christian memorial. The sculpture represents the "Tree of Life and the Dragon bound," treated after the manner of the decoration on Runie crosses. Mr. J. B. Fife is a clever draughtsman, and presents us with "An Architectural Idea" (828), a church with deeply-recessed windows, and much carving, to produce which would necessitate a larger outlay than can usually be commanded. The composition around the base of the tower is too crowded for good effect.

ON JAPANESE ART.

The Japanese have, for thousands of years, worshipped at Nature's shrine, watching her every movement, and noting every change of mood and costume with a loving eye, until each detail of her marvellous handiwork and each expression of her changeable face are imprinted on their minds, to be transferred to every work they set their hands to do. These words may strike you as being too strong, but I can assure you that a careful study of Japanese art will convince you that the Japanese artist is, perhaps more than any other, a devoted worshipper of Nature, and delights in nothing so much as in depicting her works.

In the animal and vegetable worlds he is ever seeking for expressive action or lovely forms and combinations of colour; and when satisfied with his research, how boldly and truthfully he depicts what has pleased his fancy,—sometimes with his thumb and finger dipped in ink, sometimes with double brushes held in one hand, and used together with marvellous dexterity; or, sometimes, with a laboured delicacy which makes us attempt to calculate the time expended,

and, as is most frequently the case, break down in the calculation.

Another remarkable trait in the character of the Japanese artist is his keen appreciation, and indeed intense love, for the humorous and grotesque. This is evidenced in his drawings, and more particularly in his ivory carvings. This fancy leads him very often into broad caricature, and into the representation of positively indecent subjects.

Of all the objects adopted by the Japanese artist for ornamentation, the most beautiful are birds and flowers; and those over which he is least artistic are human figures. It appears that in depicting the human form the artist acknowledges some rules which restrict his fancy and neutralise his accurate observation. He submits to a conventionalised type, and goes on in one groove all his days. Notwithstanding this fact, great power and breadth of treatment are observable in his drawing of drapery; and in many instances one observes that action and *pose* have been well considered and carefully rendered.

In coloring, the Japanese are, generally speaking, very skilful, adopting a quiet and refined style, and using full low-toned colours in preference to excessively brilliant ones. In this they differ from their neighbours, the Chinese. Of course I do not wish you to understand that the Japanese artists do not use bright colours, for few men know their value better; but what I desire to convey is that they use them judiciously, and in comparatively small proportions, cleverly supporting and contrasting them with the secondaries and other compound colours they use in grounds in large masses generally.

Much as we may admire the marvellous skill and delicacy of manipulation the art-works of Japan display, as artists ourselves, we must feel that we are constrained to more fully admire the exquisite feeling set forth in the designs of their ornamentation; and it is rarely that one can detect any hardness imparted to the designs through their laboured execution. This clearly proves that the workman is in all senses the artist, and that he is not merely reproducing in his peculiar material the designs created by the fancy of others. In Japan, therefore, we find in every branch of art-manufacture what we so much want in our own land,—the artist workman. Combined with his artistic feeling, the artisan of Japan shows the greatest skill in manipulating the almost countless materials he presses into his service. We are informed that his tools are few, and of the simplest description; and personal inspection of the collection of native implements in Siebold's Museum, at Leyden, certainly corroborates this statement. It is a matter, therefore, of no small wonder how the Japanese workman can produce such absolute perfection of finish. The greatest possible dexterity of hand must be cultivated, along with accuracy of eye; and time, that bugbear of the West, must be held in small account in the production of his art-works.

The power of delineation displayed by Japanese artists is unquestionably great, and although they sometimes resort to careless and off-hand methods, they can display the greatest delicacy of touch, combined with the most perfect freedom. I have one example of this, a bird resting on a spray with leaves and flowers, executed in Indian ink. There is not a particle of outlining in this sketch, each feather, branch, leaf, and flower-petal being executed with a single application of the brush, a few dark lines on the bird and leaves, and a few dots completing the drawing. Notwithstanding this simple means and hasty manner adopted, the result is truly beautiful, and so expressive that nothing seems wanting to the eye.

It seems strange that so much could be told by half a dozen up and down brush-strokes as is plainly told in the simplest Japanese sketch; but let the artist have a clear idea to set forth, and he will never fail to do so, even in so humble a material as a grass blade. Nothing can exceed the grace infused into their representations of grasses, wild flowers, and creeping plants. Let any one who questions this, examine their ordinary illustrated books or the paintings often found on their beautiful *Satsuma Ware*.

With such materials as grasses and creepers they seek to display the graceful negligence of Nature. When they desire to show her strength and vigour they depict the stately iris with its erect sword-blades and curling plumes; when they wish to show her lavish richness they throw down showers of long drooping purple racemes,

or cover the picture with a profusion of giant *chrysanthemums*, or the beautiful *rose-like* flowers so much prized by the Japanese.

In addition to the flowers mentioned, the lily, the lotus, the carnation, the convolvulus, and numerous other creeping plants are very commonly represented.

Trees are also favourite subjects with Japanese artists, and those most frequently observed are the palm, the fir, a tree bearing dense masses of white flowers, and another of spiky character, bearing white flowers and pink buds. The native name for the last tree, I am told by a Japanese gentleman, is *Oumai*: it bears fruit somewhat similar to our greenage, but is evidently not prized on that account, the fruit never being depicted.

Perhaps of all the trees the fir is most often used, and the reason for this may be that it is held in considerable esteem on account of its constant verdure and the great age which it is supposed to attain before it dies. The superstitions amongst the Japanese believe that the fir-tree exercises some influence over the happy events of human life.

Equally with the fir, the bamboo is much used for decorative purposes, and indeed it appears to be held by the superstitious in similar veneration, and for similar reasons. The straight ascending habit of the bamboo, rendered unmonotonous by its frequent jointings, and its effective crown of foliage, have no doubt been the principal inducements for the artists to adopt it, and they certainly make good use of it, depicting its jointed stem, with an occasional leaf, on narrow upright spaces or such like, and its spreading foliage and graceful leaves on panels or other broad fields.

By all accounts the Japanese are passionately fond of dwarfed trees and shrubs, and their gardeners are remarkably skilful in the art of dwarfing. Such things as perfect trees, full of foliage and blossom, only a few inches high, are not uncommon. *Meylin* is stated to have seen in Japan, in the year 1826, a box 4 in. long, 1½ in. wide, and about 6 in. high, in which were growing and in healthy condition, a fir, a bamboo, and a plum-tree in full blossom.

In the miniature gardens which are commonly attached to the better-class houses in the towns, dwarf trees, a few feet high, are usual objects. This taste for dwarfing has led to the diametrically opposite taste for unnaturally increasing the size of trees and flowers. Firs are reported to be seen in the country, of gigantic proportions, and some fruit-bearing trees with blossoms as large as good-sized cabbages. Vegetables are likewise cultivated until they attain enormous size.

The Japanese also delight in bouquets of flowers and branches, with which they ornament the interior of their simply-ordered apartments on all festive occasions. I said bouquets of flowers and branches; but the latter ought to have been placed first; for branches, and wild-looking, distorted ones, too, figure largely in their composition. The Japanese construct their bouquets decidedly in a more artistic manner than does any other nation under the sun.

They frequently represent bouquets on works of porcelain and lacquer,—and what charming objects they always are! Dwarf trees and clusters of giant flowers are associated together without the least attempt at symmetrical arrangement; indeed, anything like uniformity or balance is studiously avoided in these groupings. A piece of bamboo sometimes rises vertically from amidst the flowers, with a stray leaf or two of its own, a delicate creeper trailing round it, or a slender branch of some choice plant, stuck through a hole in its side, and deriving moisture from water contained within; or, when the bamboo is of considerable size, with a perfect miniature fir or oak tree planted in soil contained in the top joint, and flourishing as luxuriantly in its way, as its friends of the mountain. So far, we have a picture of the mild type of Japanese bouquets; but there is another, which may be termed the wild type, and, to me, the most interesting and artistic. This consists of dwarf trees, gigantic flowers, bamboo, &c., as before, with the startling addition of the most outcorted and gnarled branches which badly brought-up trees might be expected to supply. These branches are sometimes devoid of foliage, or, at others, carry quaint tufts at their extremities, and, being so fantastically twisted, they wander about the bouquet in the most erratic manner; or, when of an independent turn, strike off, tufts and all, yards from the vase in which they are planted.

Before leaving the subject of vegetation and its use in ornament, I may mention that the Japanese adopt a great variety of conventionalised floral forms in the construction of vases, powderings, and such-like enrichments, where they cleverly combine them with purely geometrical patterns.

Next to vegetation, the artists of Japan are most skilled in the representation of birds; and they appear to have an equal love for depicting them. Here, again, we detect their painstaking and enthusiastic course of study, by the care and accuracy with which every action and favourite position of their birds is rendered.

It is principally in their porcelain, lacquer, illustrated books, and original drawings that we find the best specimens of their skill in this department; but I have frequently seen rare examples in their metal-work. Let the material, however, be what it may, wherever there is a bird there is food for our study and cause for our admiration.

A law existed in Japan, and, no doubt, does now, that no firearms should be used within a radius of thirty miles from the Imperial Palace; and this encouraged, to a great extent, the sport of falconry, and consequently the taste for depicting scenes from it. The screens which the Japanese use so commonly in their dwellings as temporary partitions, are very frequently painted with such sporting scenes; and many books are published entirely devoted to falconry. Both in these paintings and in illustrated books we find countless evidences of their skill in bird-drawing, and every conceivable position of the falcon and its quarry delineated. I possess two books on falconry, containing many woodcuts of great interest.

The birds most frequently represented by the Japanese artists are storks, tame and wild ducks, wild geese, pheasants, ravens, hawks, falcons, and cocks and hens.

The stork is held in a sort of semi-veneration by the Japanese, and adopted by them as the emblem of longevity. For these reasons, it is one of their most favourite objects, and is used as an ornament throughout the entire range of their arts. It is impossible to imagine any position which storks can assume that is not depicted by the Japanese artists, and it is likewise impossible to realise anything more artistic than their manner of treating them.

There are two birds, one a variety of the pheasant, and the other a species of tame duck, called *Kimodori*, which, from their extreme beauty, form favourite studies for Japanese artists.

The Japanese appear to have only one mythical bird, which, they believe, dwells in the high regions of the air, and descends, to bless the earth with its presence, only on the birth of a great emperor or some such extraordinary occasion. The name of this bird is *Foo*, and it is represented in art like a bird of paradise, with excessively rich plumage. This bird is not so generally introduced in art as the natural birds; and it appears to me that it is always in some way connected with royalty, and alludes to some remarkable event when it is introduced. Representations of this bird occur on several pieces of enamel in the possession of my friend Mr. James Lord Bows, and are almost in every case associated with insignia of royalty, the most usual being that of Taikosama, the first secular monarch of Japan, A.D. 1585-91. I have seen the *Foo* several times on porcelain, and in a few instances in lacquer-work,—one is on the top of a superb cabinet, also in the possession of Mr. Bows, and another on a cabinet in my brother's collection.

Kempfer remarks:—"Considering the largeness and extent of the Japanese empire, it is but sparingly supplied with four-footed beasts, wild or tame. The former find but few desert-places, where they could increase and multiply, and follow their usual shy way of life. The latter are bred up only for carriage and agriculture. Pythagoras's doctrine of the transmigration of the soul being received almost universally, the natives eat no flesh meat; and living, as they do, chiefly upon vegetables, they know how to improve the ground to much better advantage than by turning it into meadows and pastures for breeding of cattle." Such being the case, we cannot be surprised that natural animals are comparatively seldom depicted in their art-works. The horse is certainly often met with, sometimes alone, but more frequently with its rider, and always treated skilfully.

The elephant is represented in the Buddhist temples, no doubt in allusion to India, the birth-

place of that faith; and when it is used in other works of art, it is no doubt with some kindred idea.

I do not remember ever having met with a single representation of a natural lion in Japanese art, but have seen a few tigers, although indifferently well done. The Japanese frequently represent a mythical animal somewhat resembling a lion, commonly called by us the *Kylin*; but what their ideas are in connexion with this animal I have been unable to clearly ascertain.

The most important of the fabulous animals of Japan, and the one most frequently represented in art, is the dragon. Kempfer says:—"The chronicles and histories of their gods and heroes are full of fabulous stories of this animal. They believe that it dwells at the bottom of the sea, as in its proper element. They represent it in their books as a huge, long, four-footed snake, scaly all over the body, like a crocodile, with sharp prickles along the back, but the head is, beyond the rest, monstrous and terrible. Some of the Japanese emperor's cloth, his arms, scimitars, knives, and the like, as also the furniture and hangings of the Imperial Palace, are adorned with figures of this dragon, holding a round jewel or pearl in the right fore-claw. The Japanese dragon hath but three claws on each foot, whereby it is distinguished from the Chinese Imperial dragon, which is represented with five."

Foxes, monkeys, bears, dogs, cats, rats, rabbits, and frogs are amongst the animals most commonly met with in works of Japanese art; and although generally cleverly rendered, deserve no special remark.

A great variety of fishes are favourites with Japanese artists, and are invariably well drawn. Fish is one of the staple articles of food in Japan, and the fisherman's trade is held in considerable esteem by the people. Both these facts have operated largely in making representations of fish, and indeed all marine productions, very popular objects of art.

The different ways in which fish are introduced by the Japanese artists are positively countless, but there are four ways which are more common than others, namely:—As dead and lying singly, or in twos or threes, across each other; as alive and swimming amidst curling waves; as in the act of being caught by the expert fisherman by rod or net; and as in the act of ascending a waterfall.

The sea-tortoise or turtle in its natural form is occasionally depicted, but in art we more frequently meet with a fanciful modification of it. This consists of a tortoise, with a long and broad tail of hair issuing from the hinder half of its body. In this form it is called *Mooko* or *Mingano*, and is looked upon with considerable veneration as the emblem of long life and happiness. It is introduced in the ornamentation of screens and walls of the temples and palaces of the Japanese, and represented by their artists in every branch of their work.

Catfish and shell-fish of all sorts are adopted by the Japanese, and executed with great skill in metal-work, ivory carving, lacquer-work, and painting.

Insects are frequently represented, but generally in connexion with other and more important objects. Fruit and leaves, for instance, are sometimes shown partially eaten by insects; and we generally find a specimen of the deprecators, in the act of eating, shown along with them. It is also common to find insects and birds together; and a spider with its web stretched between the branches of a shrub, is also a favourite ornament; and should we find a fallen leaf supported by the web, we need not ask why the artist put it there,—it is only a way he has of telling us what a strong thing a spider's web is.

I have said as much as I dare say at the present time with regard to objects of animated nature. I shall therefore add a few words upon the most characteristic inanimate objects, utilised for art purposes by the Japanese, and pass on to the consideration of the several departments of art manufacture and their peculiarities.

The chief of all the inanimate objects utilised for art purposes by the Japanese, is the beautiful mountain, *Fusiyama*. This mountain is one of the most common illustrations in books, on porcelain, and on lacquer articles. It is nearly always represented as it appears from the suburbs of Yeddo, with its sharply-defined sloping sides and crown of snow. *Fusiyama* is an extinct volcano. The latest eruption on record was in 1767. It is considered sacred by the natives, and religious pilgrimages are made to it.

Rocks, with waterfalls, or waves of the sea breaking over them, are often represented by the Japanese in the charming little pictures they paint on their porcelain and lacquer-work. And driving rain, softly-falling snow, or a hoisterous gale, appear to give great scope for the graphic delineation of these cunning craftsmen. Their way of representing a mist at sea is very amusing, positively nothing being shown but a few straight and curved lines, shaping upper portions of masts and sails. Imagination supplies the mist which obscures all the rest of the vessel.

Sunset and moonlight are also very favourite representations, and are always cleverly rendered.

Clouds are almost invariably present in landscapes, or, indeed, almost every open-air scene, but are never well drawn. The attempt to flatten them to meet the requirements of decorative art is almost a universal failure.

There are countless other objects which are pressed into the service of the decorative artists of Japan, and I shall allude to many in the remaining portion of my paper: it is, however, impossible for me to describe them all, and, as I have mentioned the most prominent, it is not at all necessary.

G. A. AUDSLEY.

THE ENSUING IRISH EXHIBITION AND ITS PROSPECTS.

The first general Irish Exhibition, it may be remembered, was in the year 1853, following close upon the great English or polynational one of 1851. The one in the sister kingdom had its impulse and certainty in the princely liberality of one man, Mr. William Dargan, a well-known railway contractor, since deceased, who on the 24th of June, 1852, placed at the disposal of the Royal Dublin Society 20,000*l.*, which he subsequently increased by an additional 6,000*l.* towards defraying the expenses. It was opened in May by the Lord Lieutenant, and in the following August her Majesty, Prince Alhert, and the Prince of Wales visited it. During its continuance, which lasted within a few days of six months, it was fairly patronised; and, on the whole, considering that it was the first of its kind and defective in many of its arrangements, the receipts were large, but not large enough to make up losses through evident mismanagement and lack of proper organisation.

The second Exhibition, which was more of the nature of a local one, took place in 1865, a glass and iron structure having been designed for the purpose. It is in this building that the forthcoming Exhibition is about to take place. Though there was a considerable influx of English and foreign visitors on the occasion of the second Exhibition in Dublin, still it was financially a failure; and a good deal may be attributed in this case also to bad management, lack of foresight, and want of business scrutiny in several of the departments, and also as to the funds.

Both Exhibitions, however, had their useful ends, and gave an impulse to many dormant industries, which have since been successfully, in some instances, developed.

The Exhibition for this year begins under more favourable auspices, and it is hoped will be more successful than the preceding ones. The Messrs. Guinness, of the well-known Dublin brewery firm, are acting as the guarantee, on the condition that the business, control, and management will be left to their direction,—a condition that has been acceded to by the committee of noblemen and gentlemen formed, and others interested in seeing it properly carried out.

Already considerable progress is made in the arrangements, and a large quantity of goods of various kinds has arrived. The building, as we write, is undergoing re-decoration and painting, and the garden attached is being looked to with a view to have it as attractive as possible when the building opens, which it is thought will take place early in June, or perhaps sooner. The Exhibition will be of a permanent character, similar in conduct to that of South Kensington. Loans of articles of an art description have been freely granted by many Irish and English noblemen and gentlemen, as also by public bodies. The several corporations, having been applied to for loans of paintings and other historical works in connexion with their town-halls, have responded to some extent, and others are also willing to comply with guarantees as to the safety of the articles which they severally intrust.

Although the Irish Exhibition will be general

in its features, it will, at the same time, be more especially devoted to the illustrations of the arts, manufactures, and industries of Ireland; and for that end a separate portion of the building, called the Leinster Hall, will be allotted for the national department. To the latter will be annexed the "Loan Collection," comprising the whole circle as far as possible of objects historic, artistic, and *adscripti glæbe*, interesting in various ways to the Celt. A short enumeration will not be amiss of what the sections and classes embrace.

Section A.—Natural products, including minerals and animal products, chemical products, food, raw materials, and the immediate product of their manufacture.

Section B.—Works of art, including (Class 1), sculpture, plastic art, oil and water-colour paintings, &c., pencil, chalk, and crayon drawings, engravings ancient and modern, lithography, and chromo-lithography. Class 2.—Architectural and decorative designs, photography, models, porcelain painting, enamels, stained glass, and mosaics, and miscellaneous works of art.

Section C.—Class 1. Marble, porcelain, and pottery of all kinds. Class 2. Textile fabrics, lace and fancy work. Class 3. Printing, book-binding, leather work, wood carving, metal work and furniture. Class 4. Scientific inventions, musical and optical instruments, jewelry, carriage work, and manufactures not otherwise specified.

In looking over the several conditions and regulations laid down by the directorate, we might feel disposed to object in some instances if fault-finding were our only desire in recording them. As every possible care is promised to be taken of the exhibits, the promise must be relied upon. No insurance will be effected unless under special arrangements, and in the matter of providing stalls or fittings, glass cases for shows, show-boards, and other appurtenances, their security or appropriateness must be looked to by the exhibitors themselves, the committee reserving the power of objecting, in cases, we suppose, that may seem to outrage natural fitness.

In the matter of "sales," it is questionable whether the committee or directorate are on the right track. An agency office is to be established in the building to provide means for transmitting orders or negotiating sales, and for other cognate purposes, for which a nominal charge of 5 per cent. will be made on the amount realised by such sales. This is certainly the bazaar principle, and we shall be surprised if the committee will succeed in otherwise procuring open or covert sales, in view of their loose "regulations and restrictions as to exhibits," which say, "No exhibits can be received for a period less than six months, unless by special arrangements to the contrary, and goods will not be allowed to be removed or substituted except by a special permit from the superintendent."

Notwithstanding that two months' notice is to be given by an exhibitor before the removal of any of his goods, the above regulation is a very plastic one, and the special permit may be managed or relaxed, perhaps to cover a multitude of venial sins. The prohibitions as to admission of inflammable goods are unobjectionable. In the former Exhibitions in Dublin, a description of sales was allowed, and "touting," which we trust will not be witnessed in the present. We bear in mind of course that the ensuing Exhibition is intended to be a permanent one, yet we can hardly see that this alters the fact that it ought not to do anything that would detract from its merit, as a *bona fide* exposition of art, industries, and manufactures intended to elevate public taste, and encourage native talent to compete worthily with other talent outside the limit of the island.

We may expect to see a good many evidences of ancient skill; museum and cabinet articles; heirlooms in gold, silver, and other material belonging to Ireland of the past; but what we really desire to see is modern and present day evidence of the country's advancement in arts and manufactures. Appealing to the past, as in condemnation for the neglect of the present, will not do in these days of sober improvement. If Dublin, Cork, Limerick, Waterford, and Galway cannot show as fair an example in natural products and manufactures as the commercial town of Belfast, they will not deserve a very high commendation.

Belfast took several gold and silver medals at the late distribution of prizes belonging to the Workmen's International Exhibition,—first-class prizes; but we have failed to see that Dublin carried off any. In strict justice, however, to

her, it may be said that Dublin sent very few exhibits to London on the occasion.

As architecture has been lately looking up in Ireland, can we hope for anything in the way of a good show of architectural drawings, designs, models, and building appliances? Can the Institute of Irish Architects redeem the credit of their profession in Ireland, singly or conjointly? They ought to be able by this time to have gathered together the nucleus of a creditable museum. Of Irish works in marble, pottery, and porcelain we shall be anxious to see the results. In that ware known as Beleck pottery we are aware that some creditable progress has taken place of late years, as also in domestic marble ornamentation. We are unaware of whether anything has been done in the sister island in the projecting of native terra-cotta, glazed earthenware of an improved description, or encaustic tile manufacture. In the manufacture of the common building brick in Ireland there is vast room for improvement, and with every facility in many districts for brickmaking, the greater part of that article is rotten rubbish. The country has good brick-clay in many localities, and splendid marble-beds; and the county of Dublin alone is a perfect mine of building materials, from the hardest granite to the softest chalk, casting-sand, moulding-sand, building-sand, painting earths, minerals of various kinds, and a variety of other substances used in the arts, industries, and manufactures of other nations; and yet, with all these, the capital of Ireland is half a century behind the age in many ways.

We are scarcely called on to go into detail; yet we feel it is not out of place, in sight almost of these matters, with a view of leading men who ought to feel interested to consider the strange oversight that has characterised their action for a number of years.

Energy and enterprise are wanted in Ireland, more dependence on self, and less dependence upon others. A permanent Exhibition will or ought to do good, if it is kept from degenerating into a mere show-shop or building for effecting sales. To be successful, it must have the power to promote, foster, and elicit the true artistic and skilled spirit and embodiment of the country. This it can do only by keeping before the eyes of the people the best examples in everything, and, as far as lies in the power of its directorate, urging and encouraging to still further improvements.

ST. PAUL'S THANKSGIVING FUND.

A NUMEROUSLY-ATTENDED public meeting has been held in the Mansion House for the purpose of establishing the fund already on foot for the completion of St. Paul's as a thank-offering for the recovery of the Prince of Wales. The Lord Mayor occupied the chair, and was supported by the Earl of Feversham, the Bishop of London, Mr. Beresford Hope, M.P., Mr. Thomas Brassey, M.P., Canon Gregory, Lord R. Cavendish, Lord George Hamilton, M.P., Mr. W. H. Smith, M.P., Mr. Longman, Mr. Talbot, M.P., Mr. Wren Hoskyn, M.P., Archdeacon Bickersteth, the Dean of Westminster, Canon Liddon, and others.

The following resolutions were unanimously passed:—

"That the national thanksgiving for the happy recovery of His Royal Highness the Prince of Wales would be incomplete without some national thank-offering to mark the people's gratitude; and that, in the opinion of this meeting, the most suitable form which such thank-offering could take would be the completion of the cathedral in which that national thanksgiving was offered up to Almighty God."

"That inasmuch as Her Majesty the Queen and His Royal Highness the Prince of Wales have, after the example of their predecessors, affixed their signatures to the new subscription-book, with a memorandum of their offerings, those present be invited to follow the Royal example by now signing the subscription-book; and that the book be presented for subscription to other distinguished persons who may not be present on this occasion."

"That inasmuch as the greater part of the original revenues of the dean and chapter of St. Paul's Cathedral have been diverted from their original purpose and applied to the spiritual and ecclesiastical interests of the whole country, and the funds now remaining to St. Paul's suffice only for the maintenance of its fabric and services, the co-operation of the nation be invited to this essentially national work, and that the resolutions passed this day be communicated to the lords lieutenant and chief magistrates of the counties and boroughs of England and Wales, with the view of obtaining the requisite contributions for this object."

A letter from Mr. Wm. Gibbs, of Hyde Park-gardens, was read, promising, if nine others would subscribe a like amount, to give 1,000*l.*, and if 10,000*l.* were so raised, to give another 1,000*l.* upon the same terms.

The Bishop of London, in moving a vote of thanks to the Lord Mayor, said that no one could enter the cathedral without thinking that something should be done to make it more fit for such occasions as that of the Thanksgiving. The architect of St. Paul's had achieved a building in which the human voice could be heard by a larger number of people there assembled than in any other building in the world devoted to ecclesiastical purposes; and now, Sunday after Sunday, were assembled there between 6,000 and 7,000 worshippers, and he believed that the work which was done there was telling most powerfully upon the lower middle classes of London. On that ground alone he urged the importance of carrying on the work they had in hand.

DEAN STANLEY was not quite correct when, speaking of the propriety of commemorating the thanksgiving by the restoration of St. Paul's, he said,—"St. Paul's had this advantage, that there was not the slightest doubt whatever as to what should be done for it." Ten thousand schemes might be started in reference to other churches, such as that of Westminster Abbey; but what we had to do with St. Paul's was to make it more bright, more splendid, more gorgeous; to put it in the same category as the great basilica of St. Peter."

The fact is, there is the greatest doubt as to what should be done for it, and it is mainly because the public is by no means satisfied that the committee themselves know what should be done with it, that the matter has been allowed to drag on as it has done. Mr. Street's Papistical proposition to set up a high altar with a baldachino under the centre of the dome, has much damaged the scheme.

It is an unsatisfactory circumstance that not a single artist took part in the meeting in the Mansion House. Art is not to be had without artists.

ROUND CHURCHES IN EUROPE.

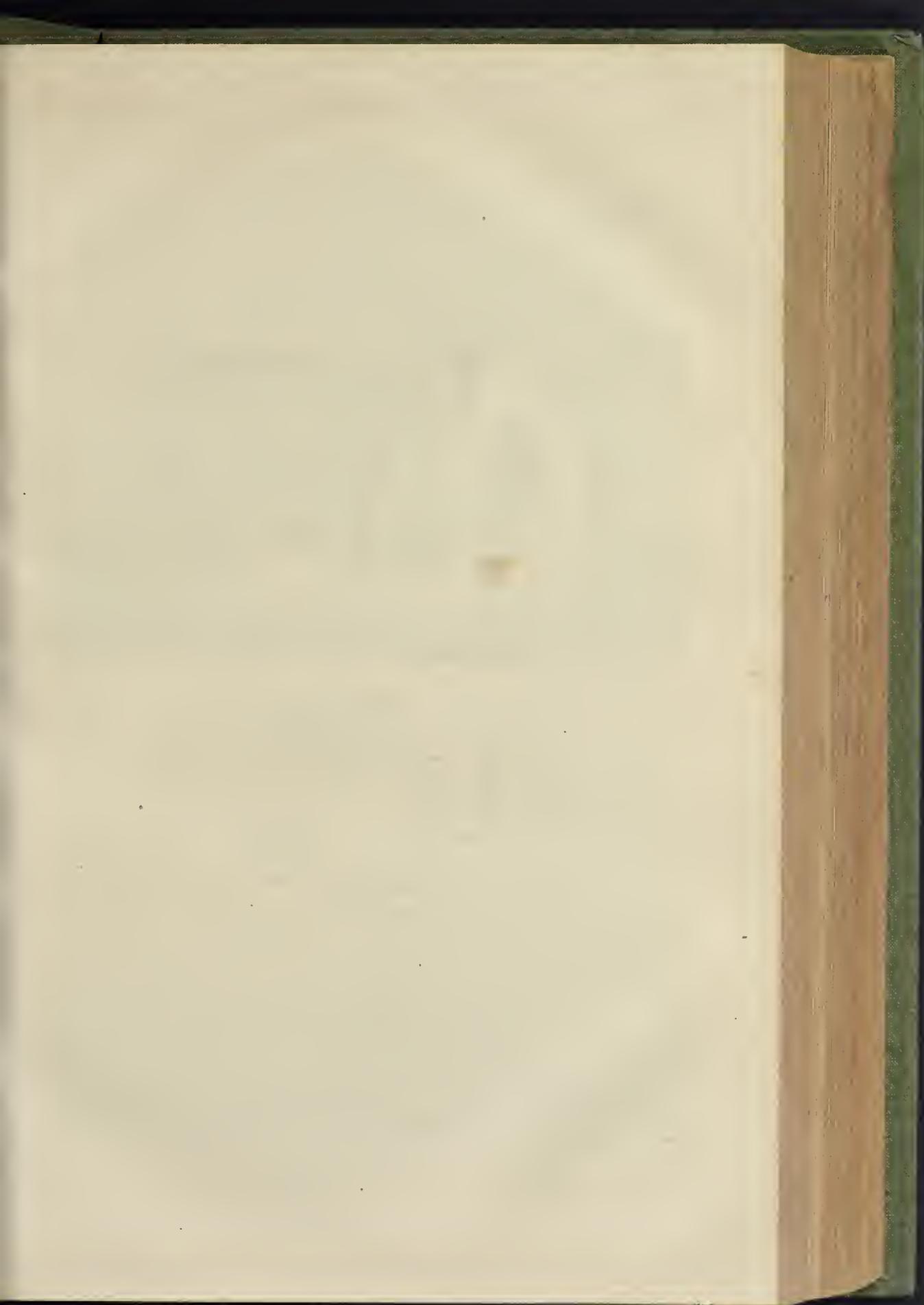
SIR,—M. Lucas, in the essay reviewed in your last number, conveys the inference that the Cathedral of Paderborn is a round church, and was founded by Charlemagne. Allow me to say Paderborn Cathedral is not round, and was not founded by Charlemagne. Possibly the writer has confused Paderborn and Aix La Chapelle.

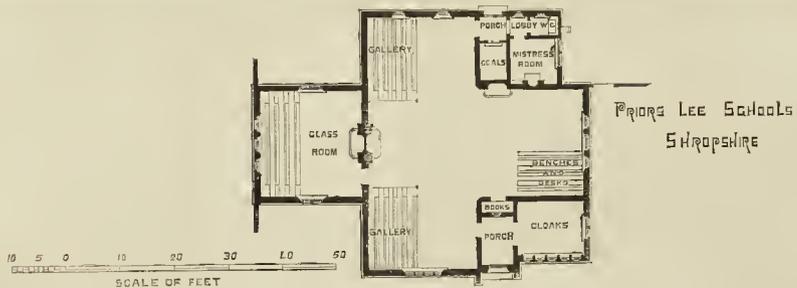
The following are the most remarkable round or polygonal churches in Germany:—Aix La Chapelle (octagon); Fulda; Wurzburg Castle Church; two small round churches at Prague (very early); church in the Wischerad (Prague, fourteenth century); Oberwittigshausen (octagon); Grunfeldshausen, nave and choir both octagon (thirteenth century, Romanesque); Weilburg; St. Geron, Cologne (twelve-sided); Koblenz (hexagon); and Standorf.

H. W. BREWER.

MARBLE STAIRCASE: GOLDSMITHS' HALL.

THE fine hall of the Goldsmiths' Company, close behind the General Post-office,—too, close behind it,—has recently received a further adornment: the stairs, staircase, and approaches have been re-formed in marble of various kinds, at the cost of something over 8,000*l.*, under the direction of Mr. Robert Hesketh, architect, by Messrs. Burke & Co., of Regent-street, who have done the work well. The steps and landings are of Sicilian marble, one of the landings remarkable for its size; the balusters are of Staffordshire alabaster; the columns which carry the dome are fine monoliths of Griotte de Plancres, each about 16*ft.* in height; and the walls are lined with Italian, Belgian, and Devonshire marbles of different hues, elegantly moulded and ably harmonised, including some remarkably beautiful panels of Pavanazzi from the Apennines. A niche on the first landing, whence the stairs go up right and left, and which contains Chantrey's bust of William IV., is cut from a single block of Devonshire marble, weighing originally, we are told, nearly 50 tons. We were surprised to hear that the whole of this successful work had been done in seven months. The Goldsmiths' Company need no longer dream that they dwell in marble halls,—it is with them a broad-day reality. By the way, the domical covering is now scarcely good enough for the substructure: it needs mosaic work, and a little high-class painting.





THE GRANVILLE SCHOOLS, PRIOR'S LEE, SHROPSHIRE.—MR. JOSEPH FOGERTY, ARCHITECT.

THE GRANVILLE SCHOOLS, PRIOR'S LEE, SHROPSHIRE.

The schools we illustrate have been recently erected from the designs of Mr. Joseph Fogerty, near Shiffnal, in Shropshire.

The external faces are of red brick, with white stone dressings to windows, tower, and doors. The roof is covered with brown and blue Broseley tiles, in bands. The internal faces of walls are of white glazed brick, with wood skirtings.

The internal woodwork throughout is of selected pitch pine, varnished. The ceiling is plastered, and divided into panels by wood ribs. The porches are tiled, and all the remaining floors are of wood.

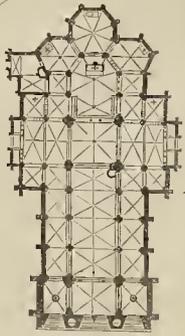
The room is heated by large open fireplaces, as shown on the plan. The requisite closets, &c., are erected in the playground for the children.

Accommodation is provided for 250 infants; and in the arrangement of the galleries and desks care has been taken to avoid, as far as possible, any confusion when more than one teacher is speaking. The cost was 1,296*l*. The builder is Mr. J. Cobb, of Newport.

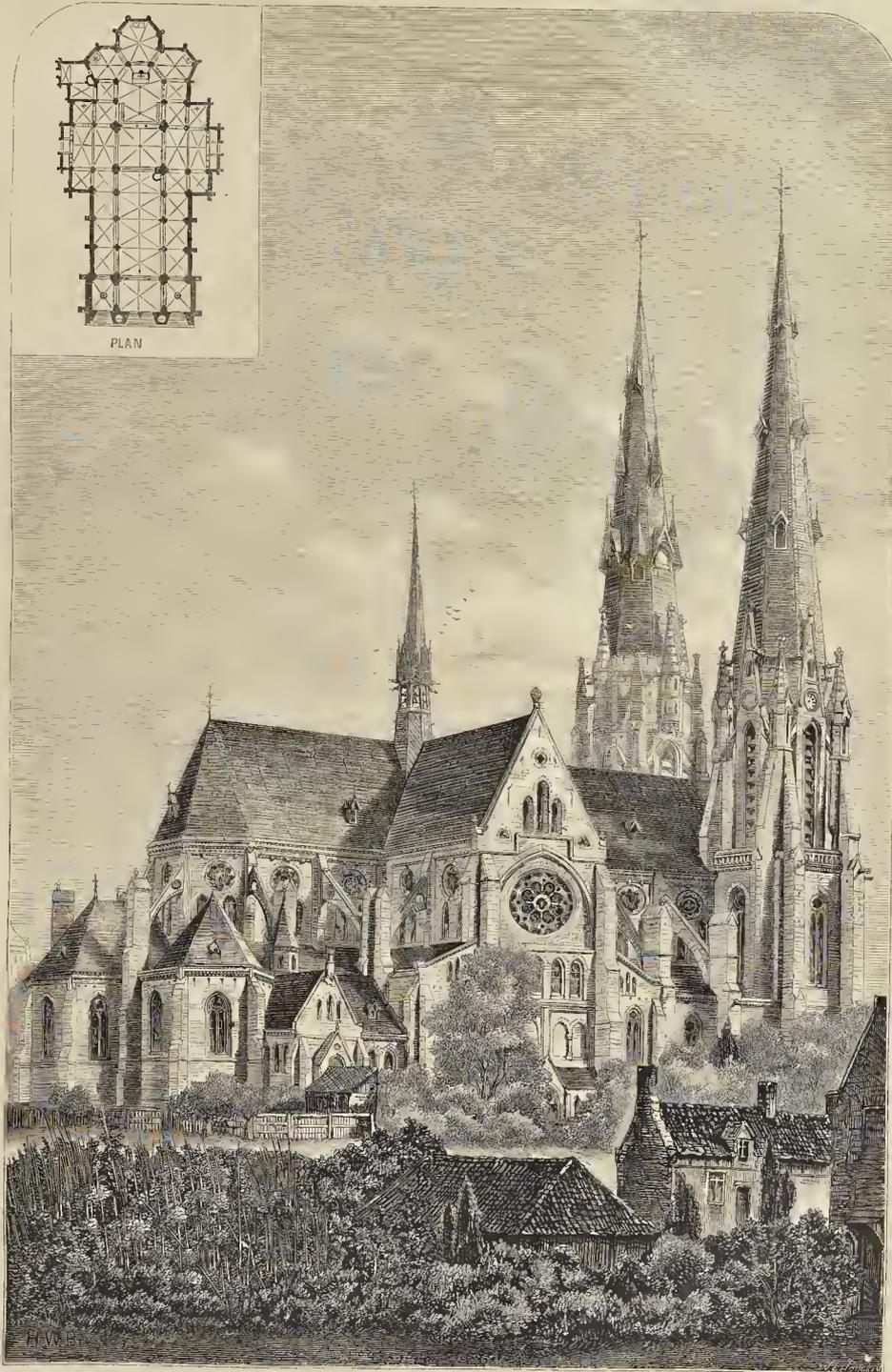
THE PUBLIC HEALTH BILL AND WATER SUPPLY.

In introducing his Public Health Bill, Mr. Stansfeld expressed his conviction that the existing enactments furnished sufficient powers for enabling local health authorities to provide sewerage and water supply for their districts; but with regard to the powers of local authorities to compel the use of wholesome water, the honourable gentleman is certainly in error. The Public Health Act of 1848 enables Local

Boards to compel any occupier to lay water on to his house, provided he can do so at a cost not exceeding 2*l*. per week; but practically this clause has been found to be inoperative, and a further provision appears in the Local Government Act of 1858, enabling Local Boards to enforce the use of wholesome water when the cost of doing so does not exceed the rates authorised by any *Local Act* in the district. Now the term *Local Act* is so ambiguous as to render the contemplated extension of power almost nugatory; and in districts where water is furnished by a private company, Local Boards have more than once been advised that the Public Health Acts do not confer the powers that they require to secure a supply of pure water for domestic purposes. Will it not be well to have so important a power conveyed in terms that admit of no ambiguity? A. J.



PLAN



ST. CATHERINE'S CHURCH, EINDHOVEN, HOLLAND.—Mr. CUYPERS, ARCHITECT.

ST. CATHERINE'S CHURCH, EINDHOVEN.
ARCHITECTURE IN HOLLAND.

WE have frequently had occasion in this journal to notice the remarkable "revival" of Gothic architecture which has taken place in the little kingdom of Holland during the last fifteen years, and we have more than once pointed out the fact that it is almost entirely due to one gentleman, Mr. P. J. Cuypers, of Amsterdam and Roommond. We have published illustrations of some of this gentleman's works, including St. Barbara's Church, Breda, and his design for a new museum at Amsterdam. We now give an additional example of his work in our illustration of his Church of St. Catherine at Eindhoven.

The new Church of St. Catherine in Eindhoven is certainly the best example of modern Gothic architecture which we have seen in Holland; it is also one of the most complete and perfect modern churches in that country. In addition to these advantages, it possesses another, that of being erected on a most excellent site.

The pretty little town of Eindhoven consists principally of one long wide street, with high brick gabled houses on either side. At each end of this street is a large square or "place" planted with trees, and paths bisect these at right angles to the principal or High street. Now the Church of St. Catherine is situated at the extreme end of the town, with its west end opening upon one of these large squares. It has a wide street on its southern side, while the east end and north side are surrounded by market-gardens and hop-grounds; and, as the church is upon the only rising ground in the whole town, it is seen to great advantage from all points of view.

It will be seen from our "sketch plan" that the church consists of a choir and aisles, a chevet, with three radiating apsidal chapels to the east, and a sacristy to the north; transepts, with eastern and western aisles; a nave and aisles, and two western towers. The dimensions of the building are as follows:—Total length, 237 ft.; width across transepts, 114 ft.; width of nave and aisles internally, 71 ft.; width of nave in the clear, 33 ft.; height of nave to the brick vaulting, 71 ft.; height of spire, 214 ft.

The most striking portion of the exterior of this fine church is perhaps the west front. It consists of three deeply-recessed doorways, the centre one of which is double, and has a noble statue of the Madonna and Child, considerably larger than life, upon its centre column, and a tympanum filled with sculpture, representing scenes from the life of St. Catherine. Above this is a large wheel-window, and over this, again, a gable pierced with long lancets, in front of which is an arcaded parapet, with angels standing upon it in front of the gable. The towers which flank this gable are similar as high as the parapet of the clear-story-walls, which is carried round them and returned across the west front. Above this line, however, they are wholly dissimilar. The northern one consists of an elongated lantern, pierced with lancet windows on its four cardinal sides; while long, sloping buttresses and octagonal pinnacles fill in the spaces between the square of the tower and its four oblique sides. The whole is crowned with a lofty spire of slate, pierced by three rows of louvre windows. The southern tower also becomes octagonal above the line of the clear-story parapet, but is quite differently treated from the one we have described; for, instead of having its cardinal sides gabled above the windows, four circular turrets are bracketed out from that front, and are united by an embattled parapet, from within which the spire commences. The spire also differs from its companion inasmuch as four large dormers are inserted into it for the clock-faces. We need scarcely observe that, in ancient churches it is much more common to find the western towers dissimilar than exactly alike, and this is even the case when both were erected at the same time. The rest of the exterior of this church can be better understood from our illustration than any description. We should mention that the whole building is in brick, with the exception of the doorways, window tracery, and strings. The brick is of a dark brown colour, and is laid in "English bond."

The interior of this church is far richer and more elaborate than the exterior. The whole building is vaulted in brick, with stone ribs and richly-carved bosses. The clear-story windows are shafted and moulded in stone, and below them is a very originally-treated triforium, consisting of three arches in each bay, the upper portions of which are filled with tracery, and the

lower portions, as high up as the springing of the arches, are filled in with a conventional representation of curtains similar to those on the west end of Rheims Cathedral. The arches of the main arcade are of brick in bands of colour, but with stone labels; all the capitals are carved in simple and conventional foliage of admirable design. The altars and screen-work, most of which is complete, are of stone, elaborately carved, especially the parcloches of the choir and the high altar, which are excellent examples of church furniture. The metal throne candlesticks and candelabra are all from the designs of Mr. Cuypers, and show that gentleman's thorough knowledge of that branch of his art. The arrangement of the altars in the transepts is one of the most pleasing features of the whole design. The only articles of church furniture which are not from the architect's designs are the pulpit, the font, the confessionals, the altars: these are all Italian, and were the only things saved from the church which stood where the present one now stands. It was a poor barn-like edifice, about 200 years old, and everything that was good for anything about it has been carefully preserved in the new building. The pulpit is a good example of Late Renaissance carving, as are also the confessionals: they are of oak. The font and altars, though bad in design, are of pure white statuary marble. Some people have found fault with Mr. Cuypers for keeping these features in his new church, but we think that he has acted wisely in preserving memorials which were in themselves good of the old building, however out of character they may be with the new one, and really the effect of these is anything but bad. They seem to give an interest to the church.

Before concluding this notice of this remarkable church, we must say a few words of the system of decoration which has here been carried out. The brickwork of the interior is in bands of buff and red, with a few lines of black; the buff, however, is in every case separated from the red by a broad band of whitewash, over which the markings of the brick are all picked out, and arabesques in blue and green painted over the whole. The stonework is also decorated in lines and spots of colour, and a considerable amount of gilding is introduced into the decoration of the roof. Below the aisle windows runs a series of wall pictures, painted in very flat colour, with strongly defined outlines. They are chiefly on a white ground. The records of the altars, and the altars themselves, are also decorated in colour; and every window is filled with stained glass, or patterns in "grisaille." Certainly a church with as much colour as is here described would, without great care was taken, appear gaudy; this has, however, been entirely avoided by the introduction of a quantity of pure white, which has a most brilliant effect, and yet seems to bring the whole into harmony and good keeping.

An altar carpet of most elaborate design, consisting of a mystical representation of the Garden of Eden, has been worked for this church. It is from the designs of the architect, and is, with the exception of the altar carpet for the Cathedral of Aix-la-Chapelle, the finest example of modern work of this description that we have seen, on such a large scale.

NEWS FROM ROME AND FLORENCE.

A HURRIED visit to Rome during the last weeks of the Carnival enabled me to take a cursory view of the state of the new capital under its Italian régime.

To the lovers of art, and the lovers of Rome as it was in the old Papal days, the change will not be altogether satisfactory. The welcome tranquillity, after visits to the bustling cities of the north of Italy, and the noisy Neapolitan capital, no longer exists. True, the crowd—the mob, I may say—of people this winter in Rome prefer the Corso and the Pincio; the places where, seeing, they can be seen, mostly attract them; luckily for the would-be student and lover of antiquity's remains, who are thus able to see some of Rome's treasures unmolested. But to our minds, in the words of the poetess (whose son, so deeply read in Rome's archaeological lore, is now delighting his hearers with his interesting *stances* in Rome), we may sing appropriately, "Rome! Rome! thou art no more, as thou hast been!" On the other hand, to the lover of progress the movement literally speaks volumes. The freedom of speech and

action, before so circumscribed, is now unchecked, but sudden and great changes like those in Rome must bring mixed consequences. In time, there is no doubt, the good will predominate. Education and enlightenment are the two great objects now prominently being battled for; but the reformer has to fight his way into Rome with hard, struggling steps. Old institutions,—the profitable begging trade, formerly sanctioned by the municipality,—have to be eradicated, and that at a time when rent and provisions have been raised and taxed to an unwanted degree. Begging produces a tangible supply, while education seems to the poor but the engrossing of the machinery for begging without producing visible returns; but work will soon be supplied in abundance, and the Roman workman should, if able to put forth sufficient energy, profit by it. The unemployed from the late capital are flocking down to be ready to work in the new buildings about to be erected. Count Beretta, the director of public constructions in Italy, has now the plans ready, and the approval of the Government for the commencement of the new grand quarter to be built on the site of the Pretorian Camp, near the Railway Station. Three streets of good large and imposing-looking houses are already planned, one leading from the railway station to the Corso already begun, and nearly a dozen houses being completed.

A handsome railway station is in course of erection, to replace the wooden sheds of many years' standing; the hitherto receptacles of all the accumulative confusion and ill-management to be found wherever railway termini exist.

To reach Rome is one thing,—to leave the station in possession of your luggage is a much more distant accomplishment. The coming of the Italians has produced the yellow washing of the exteriors of the houses in the principal streets of Rome, but the parts not in that category appear to be, perhaps from contrast, much more filthy than ever. The streets were indescribably filthy during the Carnival; the rain, mixing with the lime *confetti*, made matters still worse. An attempt at paving the Via Condotti, the street in which the most attractive shops exist,—where copies of the antique and the Roman jewelry are mostly displayed,—signally failed, the pavement being *lower* than the road, and, therefore, the receptacle of all the rain and mud from the latter, and the coachmen, unused to the modern innovation, drive over it indiscriminately. But the municipality promises, when the crowd of visitors has passed away, to pave Rome in an efficient manner.

All buildings to be erected are to be within the walls; large parcels of ground are to be found on which to raise the necessary buildings.

The *on dit* that the Campagna is to be drained by an English company requires confirmation. For agricultural supplies to the growing capital, it would prove of immense advantage.

Depending from without for all necessary supplies, provisions for the poor and the ill-paid employes who have flocked down to the capital have become exorbitant in price; increased by the enormous consumption by the unusual number of visitors to see Rome under its new auspices.

Taxes, increased twenty-fold, are groaned over by artists and artisans there; but after the first *furor* affairs will brighten for them. Enterprising North Italians have taken down their wares, and duplicate shops to those opened when Florence became the capital, and vying with those of Paris, may now be seen in the Corso.

The excavations of the Roman Forum are progressing most satisfactorily. A question might be mooted as to the legitimacy of Signor Rosa's supplying by brick erections the bases of the pillars in the Forum; the spots where they originally stood cannot be mistaken.

The hours and days of admission to the Vatican are limited, but to the real wisher to see its treasures, the ways and means are easily obtainable.

The prevalence of small-pox continues,—deaths therefrom range from 35 to 55 a week, but are almost entirely confined to the Italians; the visitors are not sufferers from it.

We must not omit to mention, among the projected improvements, the erection of two churches,—one for the English Episcopal congregation, one for the American: Mr. Street is the architect of both. Nothing is to be spared to produce a handsome and appropriate building for the English church. The site is within the walls, and nearly facing the Pincio.

The admission of all sects into Rome, now the capital of a free State, having a free Church,

causes a great demand for places of worship. Perhaps the chapels of the appropriate religious houses may be ceded, as has been done in Florence to the Waldensians.

The one great theme of conversation has been the discussion, permitted by the Pope and in Rome, on the subject whether St. Peter ever visited Rome. The arguments were carried on with great patience on both sides, three learned Roman Catholic divines being heard with three Italian "Evangelists," or Protestants, in opposition. Deodati's translation of the Bible being used by all by common consent. Learning only on tradition, and the assertion that the name "Babylon," used by St. Peter, whence, in his Epistles, he sent salutations, meant Rome,—as said an Italian discussionist, "We might have used the expression in reference to Paris during the reign of the Communists."—on these two arguments the Roman Catholic disputants founded all their answers to the addresses on the opposite side. The weak assumption of the chief of the orators that if St. Peter were but an hour in Rome it was sufficient to constitute him the head of the Roman Church, failed to give any weight to the question. The tale has been taken up, and discussions on the subject are being held all over Italy. The mode of crucifixion, which tradition and history attach to St. Peter's death, was found by Mr. Hemans to be Parthian, not Roman.

Many celebrities of the Roman Catholic Church of the anti-infallibility party are now in Rome. Père Hyacinthe, the famous ex-Germolite French declaimer against innovations, is there; the great friend of Dollinger, the *head*, as Père Hyacinthe is the *heart* of their cause.

Meanwhile Florence, the ex-capital, has suddenly resumed its provincial character. The old Italian families, whose huge palaces have been dim and closed for years, have opened their gates and let in floods of light and gaiety. Florence's attractions will be always the same,—the art treasures are its great stay,—the Pitti pictures are the city's property.

The natural surroundings are always beautiful; and it will not be the fault of its spirited sindaco, Signor Peruzzi, if Florence do not increase in beauty and attractiveness. The already-commenced improvements are to be terminated, those of which the plans are made, but not commenced, are to be ended; but there is a clause allowing a tetter of twenty-five years. But plenty of space has been left void by the removal to Rome for any new comers, and it is to be hoped that the willingness with which, for Italy's welfare, the ex-capital ceded its rights, may meet with the reward of greater prosperity in future years.

THE ROYAL SURREY GARDENS, WALWORTH.

THESE gardens and grounds are now undergoing extensive alterations and improvements, with the view of being shortly opened to the public, with a varied combination of attractions. The large building, which was formerly used as a music-hall, and which was also for some time the scene of Mr. Spurgeon's preaching previously to the erection of the edifice in Newington, is being converted into a spacious theatre, which is intended to be fitted up and decorated in a remarkable manner. The building will be devoted to dramatic entertainments of a good class, and also to concerts and general musical entertainments, which will be one of the principal attractions of the restored establishment. In addition to the theatrical and musical entertainments, the gardens will include the zoological element, and buildings for an extensive menagerie are now in progress simultaneously with the construction of the theatre. With the view of making this department of the establishment partake as much as possible of an educational and instructive character, the services of an experienced zoologist have been engaged, who is now collecting specimens for the menagerie, and several valuable and rare animals have already been purchased. Another feature of the design is the laying out a portion of the grounds as botanical gardens, which is now going forward under the superintendence of a landscape gardener. The gardens are to be rigidly closed not later than eleven o'clock at night, and on day in each week will be set apart as a reserved day for that class of visitors who may have objections to mixing with a miscellaneous crowd. Messrs. Jarvis & Son are the architects for the new buildings and alterations,

Mr. Shepherd being the contractor; and the estimated cost of this portion of the works is 3,400*l*. We understand that the buildings and laying out of the grounds are to be completed so as to admit of the establishment being opened in May. Mr. Strange is the new lessee and proprietor.

COMPETITION DODGES.

WE have received several letters, commenting indignantly on some invitations to compete now before the profession, such as the request, in our issue of February 24th, to send designs for two semi-detached villas, to cost 750*l*, and that for designs for the Western Counties Idiot Asylum. The terms are very objectionable in both cases. If architects choose to respond, they deserve what they will get.

ARCHITECTURAL ASSOCIATION.

WE reproduce elsewhere some portions of the paper read by Mr. G. A. Audley, of Liverpool, at the meeting on Friday evening last, the 8th instant, entitled "Notes on Japanese Art." The Saturday afternoon visit on the 2nd, was paid by a body of the members to the church of St. Augustine, Kilburn, the choir and transepts of which are nearly covered in. The nave is to be completed while the portion now in hand is in use, the western arch of the crossing being temporarily walled up. As a large church of somewhat unusual plan, with passage aisles in two stories, vaulted with stone ribs and brick filling in throughout, of red brick externally, with a very sparing use of stone, the building proved in many ways interesting to the students present, and thanks were very heartily voted to Mr. J. L. Pearson, the architect, for the permission and facilities afforded.

CHEAP BUILDING AT PORTSMOUTH.

IN the case, Alexander Dickson v. William Amlet Whillier (in Portsmouth County Court), claim for 49*l*. 10*s*., Mr. Burbidge appeared for the plaintiff, and Mr. G. H. King represented the defendant. Both parties are builders, and an agreement was entered into between them for the plaintiff to build three pairs of villas, at the rate of 36*l*. each, the plaintiff to find the labour, and the defendant the materials. After two villas and three-fourths of another pair had been erected by the plaintiff, a dispute occurred between them, the defendant alleging that the houses were not being built in a proper manner. After hearing part of the evidence in the action, the Judge remarked that it was impossible to do absolute justice in these cases. There were no specifications, and having entered into a blind agreement, out of which a dispute necessarily arose, the parties came to the court expecting him to settle it. His Honor also called attention to several receipts given by the defendant, some of which bore no receipt stamp, remarking such conduct was scandalous. The defendant said he should know better in future. After some fighting on both sides, the Judge finally gave judgment for 15*l*. and costs.

What about the happy tenants of such abodes?

SCHOOL BOARDS.

Derby.—At last meeting the minutes of the Building Committee were read, intimating that the plans and specifications for the new schools in Gerard-street had been laid before the committee by Mr. Coulthurst, the architect, and, having been sanctioned by them, had been forwarded to the Education Department for their approval. The minutes were confirmed.

Bolton.—At a meeting of this Board the tender of Mr. G. Martin for adapting the British School (which had been recently transferred) to the requirements of the Board, at an expense of upwards of 500*l*., was accepted. It was resolved to make application to the corporation for offices in the new Town-hall.

Southampton.—At the last meeting Mr. W. C. Westlake said, before the Board proceeded to the election of an architect and surveyor, as there was no fixed salary connected with the office, it struck him it would be better to propose that the appointment be made subject to such terms as may from time to time be made by the Board. The resolution was carried. The clerk then read applications for the office from Messrs. E. T. Howell, A. Burt, W. & J. Jurd, and J. G. Poole.

Mr. Westlake proposed the election of Mr. Howell, a gentleman who had acted for the Board upon several occasions already, both satisfactorily and reasonably. He was also connected with the town in various ways. The Rev. R. Mount alluded to Mr. Critchlow, who, he believed, had designed many edifices in the town, and amongst others his schools; but that gentleman's name not being sent in for the appointment, he supported the surveyor proposed by Mr. Westlake. He believed he was well versed in the duties of an architect and surveyor. Mr. W. Hickman said the name of the gentleman whom he intended to nominate was already before the meeting, and Mr. E. T. Howell was then unanimously elected.

THE ROYAL DUBLIN SOCIETY.

THIS body are making some commendable efforts to change their sphere of action in connexion with their schools of art and science. New buildings, and enlargements of existing ones, are projected. The Lord Lieutenant is interesting himself in the affair, and promises whatever assistance is compatible with his office in the country. The co-operation of other institutions in the carrying out of their views is sought under conditions, and more direct Government aid is required to place the schools of the Royal Dublin Society on a larger and more useful basis.

THE GALLERY OF ILLUSTRATION.

MRS. GERMAN REED and her little company achieved a genuine success on Wednesday evening last, in the production of an entertainment called "My Aunt's Secret," written by Mr. F. C. Burnand, with very agreeable music by Mr. Jas. L. Molloy. When we say that we regard it as the most complete little piece that has been done in the Gallery of Illustration, our readers will not need much more recommendation. The piece is exceedingly well written and admirably acted by Mrs. Reed, Miss Holland, Mr. Corney Grain, and Mr. Arthur Cecil. The latter gentleman, Mr. Cecil, had already established a reputation as a most accomplished comedian, but in the new piece he shows a power of pathos which could scarcely have been anticipated. His three personations,—the courtly valetudinarian, Sir Marmaduke Pender, Thomas Egerton, and the organ-grinder, Arniard,—viewed together and contrasted, demand for him the highest praise.

THE JEWS' HOUSE, LINCOLN.

WE hear with regret that the interesting Norman House at the foot of Steep Hill, Lincoln, is in so bad a state of repair that unless wise measures be adopted to restore the front to the perpendicular, and otherwise strengthen and maintain the fabric, one of the very few examples we have of a street house of the Norman period will become a ruin. This building dates from the beginning of the twelfth century. It appears to have gained its popular name, the Jews' House, from an incident in the reign of Edward I., when a Jewess residing near it was executed for clipping the coin of the realm. The city of Lincoln, for its own sake, should see that this interesting and valuable relic of past time, and tangible evidence in connexion with its early history, is safely preserved.

CONVENTIONALISM.

SIR,—I have been much interested with the articles which recently appeared in your journal on "Conventionalism in Art." May I be allowed to add an illustration not made use of in them, bearing on the subject, and showing how fine the line is which divides the ideal and conventional in artistic treatment from the actual and the vulgar? I refer to the introduction of the representation of the iris and pupil of the eye, in sculpture, which is sometimes tried, always, however, resulting in a parallel degradation of the ideal of the work which the introduction of colour occasions, as noticed in your articles. The more ideal the subject and treatment the greater the degradation by these means; and even in portrait sculpture a refined taste will not think that anything is gained, but the reverse. How correct and exquisite the instinct of the ancient Greeks in art matters was is seen in nothing more than in the absence of colour (though this is considered dubious by some), but

certainly in the uniform blankness of the eye, which to a lower taste is deemed a defect. It bears, however, I think a very interesting relation to the subject of "conventionalism," as treated in your pages. NEMO.

PETITIONS TO THE HOUSE OF COMMONS.

SIR,—Would some of your correspondents on the spot kindly enlighten a poor bewildered country coterie of your readers by giving us the following information?—

1. Where do all the petitions go to ultimately which are presented to the House of Commons?
2. Are they pigeon-holed (if so, where?) or stored (if so, how?) or thrown into a cellar under the House? (state whether it be fire-proof?) or are they preserved at all? (if so, in what building?)
3. How many cubic feet of space do they occupy per annum.
4. Are they considered as "national records"?
5. Finally, kindly inform us whether they do not constitute a waste-paper perpetuity of the Chancellor of the Exchequer, as some of us think? X. Y. Z.

WHAT MIGHT BE EXPECTED.

AMONG the replies transmitted, through their town clerk, to the council of the borough of Reigate, upon their inviting by advertisement applications for the appointment of an assistant surveyor, to give his whole time at a salary of 50*l.* per annum, was the following:—

"6, Hodge-alley, New-cut, 24 March, 1872.

Mister, I as fur this many yers carid a odd has a bricklayers laborer for a good master Bildee has wud I nose give me a cartiber.

My wages time about eums by working overtime and such like to a bit more in the yere nor you hoffers for silent surveyor, but I be gotten in yeres and fanas the work wud be easier in yure place, so if I sutes wud be glad to take it, remaining your servant mister,

SAMUEL SMITH.

I rites this has specimen, but my son has us ad sculing rites the dressin fur me."

Samuel's enliphraph partook rather more of a *fast than a hand*, but he enclosed a testimonial as to his fitness for the post from his employer, Mr. E. Eakins, of Eden-gardens, East Lambeth-road. P.

THE NEW PUBLIC OFFICES AND THE WIDENING OF PARLIAMENT-STREET.

In the *Builder* of last week is a report of the reply of the Government to Lord Redesdale on the subject of the widening of Parliament-street, the reply being that if such was found to be necessary, the proper persons to pay the expense would be the metropolitan ratepayers. Now, sir, the present Government have of late expressed most extraordinary opinions on such matters (notably in respect to the Thames Embankment), but I think this proposition beats all. You are aware that parallel to Parliament-street formerly ran King-street, one of the oldest streets in the metropolis, and (as its name implies) the king's highway to Westminster. The Government have stopped up this street and taken possession of the soil thereof, whereon they are building the New Public Offices. Having thus thrown the traffic of King-street into Parliament-street, and made the latter dangerous, the Government has the conscience to say that the ratepayers of the metropolis must pay the cost of remedying the inconvenience. I do not believe the Metropolitan Board are quite so soft as the Chancellor of the Exchequer seems to think them. T.

THE TRADES MOVEMENT IN LONDON.

THE Master Builders' Society met last week to consider, in a memorial from the carpenters and joiners, in support of one previously received from the operative masons, requesting an advance of one penny per hour on wages, and a reduction of the hours of labour to fifty-one per week. After considerable deliberation, the master builders unanimously came to the resolution that the present rate of wages,—viz., 8*d.* per hour,—was a fair and liberal rate, having regard to other like trades, both in the metropolis and in the country. As regards the hours of labour, they had reports from different quarters that in some places the men wished to work fifty-four hours, the same as the engineers have settled to work. In other places even longer hours are general; and so the society eventually

came to the conclusion that the present hours, as proposed by the operatives themselves last October,—viz., fifty-six hours and a half in summer, and fifty hours and a half in winter,—was a fair and not excessive rule. Although some little difference of opinion existed as to the exact number of hours desirable; on the main point,—viz., 8*d.* per hour,—it was unanimously agreed not to increase the rate; and if the men should strike against any employer for a rise, other employers would close their works.

THE EXHIBITION OAK.

SIR,—Walking in Hyde Park on Saturday, I was sorry to see that the old elm tree, which was so conspicuous in the north transept of the Exhibition of 1851, was prostrate on the green sward, hewn ready for the saw-pit, and marked or lotted as if for sale, or sold. I should have thought that South Kensington would have gladly claimed it as a relic, or at any rate it might have been converted into seats for the children of those who sat twenty years ago under its branches, and refreshed themselves. A JUNIOR of 1851.

THE SEWAGE QUESTION.

The Birmingham Bill.—In the course of the discussion on the Birmingham Sewage Bill in the House of Commons, Mr. Samuelson said that he could speak from personal experience as to the application of sewage to land, for that of Banbury passed within a quarter of a mile of his house, and was no nuisance. Lord Warwick, moreover, was having the sewage of Leamington brought into his park, being convinced that it was no nuisance if properly utilised. The opposition to the Bill was analogous to that offered to railways by landowners, to whom they subsequently proved a great benefit. There was a strong fight over the Bill, the second reading of which was, however, agreed to.

The Fleet.—A suggestion for relieving the Fleet Sewer, which has proved too small in wet weather to carry away the drainage of the district through which it passes, has been made by Mr. Scott, the surveyor of the St. Pancras vestry. He proposes that advantage be taken of the construction of the Euston, St. Pancras, and Charing-cross Railway, for making another sewer to carry off the storm-waters which now periodically overflow into the kitchens of the houses at King's-cross and its vicinity. Mr. Scott's proposition was warmly approved by the vestry, and recommended to the consideration of the Metropolitan Board of Works.

Ventilation of Drains.—A system of ventilating drains is now in operation at Victoria Mills, West Vale, Mr. Scott having patented the system, through Messrs. Tasker & Brierley, Halifax. The plan is simply that of connecting a pipe between the drain and the ashes place of the boiler furnace. The heat of the fire draws the bad air from the pipe, and it is thus consumed, no smell escaping from the pipe, and the drain for a considerable distance is in this way kept free from foul gases.

ACCIDENTS.

Fall of a Corn Mill at Manchester.—The front of a corn-mill, in Back-street, John-street, Manchester, has fallen to the ground. Happily no one was injured, the workmen on the premises having left for dinner shortly before the accident took place.

Fall of a Building at Stockport.—As some workmen were engaged clearing away old store-houses and offices, three stories high, and 60 ft. long by 30 ft. wide, in the Park Mill-yard, Stockport, previously to the erection of some new premises, about one-half of the length suddenly fell outwards, owing to some of the beams becoming rotted. Several persons were more or less hurt, and others had narrow escapes. Two of the labourers are not expected to recover.

Fatal Fall of a Scaffold at Strettonbury.—A shocking accident has occurred to Mr. Deaves, and to two other men who were with him on some scaffolding, at the bottom of Wylcop. Mr. Deaves, it appears, purchased, some months ago, a house in the locality named, and the building has since been pulled down and rebuilt. A man named George Heath, who had a youth working with him, was engaged in putting up some troughing at the back of the house, and Mr. Deaves ascended the ladder to see how the

work was progressing. While the three were standing on a plank, the "putlog" on which it was standing gave way, and they were precipitated a distance of from 35 ft. to 40 ft. Mr. Deaves, in falling, is supposed to have caught his foot in the ladder, but he came to the ground with a terrible crash, the young man falling upon him, while Heath fell upon his feet. Mr. Deaves has since died, and the others are seriously injured.

CONCRETE HOUSES.

SIR,—The conduct of your correspondent, Mr. G. P. Edwards, cannot be too highly praised in so kindly allowing your readers to inspect the house now building at Addlestone. It has three reception-rooms, kitchen, offices, &c., on ground-floor, about six bedrooms on the first-floor, with an attic story in the roof. There is also a cellar.

The walls, of concrete, have hoop-iron bond at intervals, and are covered with rough cast, with cement dressings to the angles, windows, copings, chimneys, &c. I was much disappointed to find a quantity of brickwork in various parts of the house, and on the question of cost, if 2,000*l.* be correct, and the price or hire of apparatus added, he might just as well have used bricks and mortar, unless the joiner's work and fittings are to be very costly. A concrete house costing from 600*l.* to 800*l.*, and letting for about 50*l.* per annum, would not only pay well, but be a great acquisition to middle-class dwellings, from the accommodation being greater than is now obtained at the same price in bricks and mortar. It would be interesting to hear of any now erecting.

BUSY BEZ.

VARNISH.

SIR,—Will one of your readers oblige with a recipe for varnishing a small article, made of beech? When varnished, I wish it to have a glossy and shining appearance. R. M.

THE ROYAL ENGINEERS.

SIR,—Your correspondent, "Summ Cutigue," makes the assertion that there are "causes which are diverting the attention and undermining the efficiency of our engineers—both officers and men."

As neither officers nor men can defend themselves from this attack in your columns, permit me to assure your numerous readers, as the result of some five weeks' close observation of both officers and men, during the last summer at Chatham, that the Royal Engineers are in no sense of the word "inefficient."

I am not acquainted with the state of efficiency of the other branches of her Majesty's service; but, if those branches are in the same state of discipline, training, and efficiency as the Royal Engineers, the country is in possession of an army that is fit for any duty to which it may be called, though the enemy stood at our gates to-morrow. FRANKLIN.

PROVINCIAL.

Workington.—The Carlisle City and Branch Bank is just about completed at Workington. An effect is produced in the north-east front by simply setting back the wall on the one-pair floor, thus forming a natural balcony, which forms a little tile-paved conservatory, outside the manager's drawing-room, should he see fit to utilise it in this manner. There is a limited amount of enrichment. The principal office walls will be lined to a height of 4 ft. with moulded panelling. The manager's house is amalgamated with and forms part of the bank building. The architect is Mr. John Hodgson, of Carlisle; and the contractors are, Messrs. James Wilkinson, builder and slater; Robert Harrison, carpenter and joiner; J. Ashbridge, plumber; Lea & Graham, iron-founders; Robert Ormerod, cementer and plasterer; and David Canning, painter and glazier.

Bradford.—A new infirmary for the accommodation of male patients of the Bradford Work-house, has been erected, at a total cost of about 4,000*l.* (exclusive of furnishings), and formally opened.

Books Received.

Laxton's Builder's Price-Book for 1872. Kelly & Co. London.
Atchley's Civil Engineer's and Contractor's Estimate and Price-Book. Lockwood & Co. London.

LAXTON'S new old-established Price-Book increases in bulk, and we may add in usefulness. Like all similar works, it requires to be used with intelligence, but evident pains have been taken to make it accord with recent changes in the labour market. The present edition includes the Building Act, the Bye-laws of the Board of Works, a list of distinguishing Brands on deals and boards, and much other information.

The Civil Engineer's and Contractor's Price-Book is edited by Mr. W. D. Haskell, and includes some forms of specifications, and a priced list of plant and tools. The editor properly remarks, that the varying cost of labour under

different circumstances, and in different places, "becomes of primary importance, and requires to be very closely examined into before it is possible to shape a reliable estimate."

Estimates and Diagrams of Railway Bridges.
By J. W. GROVER, C.E. Second Edition, enlarged. London: Spon.

THESE estimates and diagrams include railway bridges for turpiko, public, and occupation roads in the embankments of double and single lines and cuttings of double lines, with form for calculating quantities in skew structures, &c.; also culverts of various dimensions. The author, in this edition of a strictly professional and reliable work, has added some good examples of station works, as actually executed, with their costs, which will be found useful.

VARIORUM.

"EXAMPLES of Architectural Ornaments of Papier Mâché manufactured by the Papier Mâché Company." Part III., shows very attractively the ceiling-flowers and ventilators which they have on sale. The representations are got up in somewhat novel style.

The *Illustrated Book of Poultry* gives a hint as to economy in poultry-houses—"In erecting any range of buildings for poultry, it will save much, both in time and money, if all the details are so planned as to cut up the standard lengths of timber without waste. The most usual length is 12 ft., but 16 ft. is not uncommon, and occasionally 24 ft. may be had in quartering (2 in. by 3 in.) or scantling (4 in. by 3 in.). The latter will be the proper size for the main uprights, while quartering will do well for door-posts, and to support the partitions. But as short wood is generally cheaper than full lengths, if the width of a shed be 6 ft. for instance, it will save both money and the labour of sawing if all the boards for the cross partitions be ordered from the yard in 6 ft. lengths, when they are ready for nailing on without any preparation or loss of time. If the width of shed be 8 ft., a board will still cut out without waste, as the tongue will keep two 4 ft. lengths in place before the long ones. Much money is often literally thrown away for want of considering these simple matters."—The *Quiter* has a chapter on underground work. The writer says—"The work going on day and night in our 3,000 British coal-mines is difficult to realise. We hear not the sound of the 10,000 picks, borers, and sledges; we see not the subterranean towns where the grimy pitmen are manufacturing wealth and power for the British empire. But we may note some of the results directly following from the labours of these coal-black workers. The myriad spindles of our cotton-factories, the blazing furnaces of the iron districts, the ceaseless work of steam-engines, in towns, villages, and homesteads, and the fleets of steamships crowding the ocean highways, are all dependent on the mines, from which are drawn, day and night, the elements of an empire's strength. Such considerations may tend to quicken our sympathies for every class of these underground workers."

The *Art Journal*, treating of "Art-work for Women," says—"Hitherto, the most favourite branches of design for ladies have been lace, fans, and jewelry. If they could not decorate their dwellings, they might, at least, ornament themselves. But the same kind of talent might find a yet wider scope in the recent revival of the ancient homage to St. Valentine, and in the interchange of the Christmas and New Year's cards, which now make the postman's Christmas-hox a double pleasure as well as duty. The coloured lithographic 'scraps,' birds, fruit, and flowers, pretty heads, &c.,—used in the ornamentation of screens and fancy boxes, are also in the same class. The original design is bought by the lithographer, who then reproduces it by the thousand. But such designs are usually made by men: we hear of women employed in the manufacture of these things, but not in originating them. In the manufactory of Mr. Robert Canton, Aldersgate-street, for instance, a very pleasant sight may be seen of rooms filled with happy-looking young women, chatting and singing over their work, as with skilful fingers they put together the delicate flowers, and pretty or quaint devices, which are to bring delight to expectant eyes on February 14th. Mr. Canton is not only willing, but even desirous to give the preference to designs sent by women. But as yet he finds few applicants who can meet his wish."—Dr. Braithwaite, in *Hardwicke's Science Gossip*, affords some interest-

ing particulars of "Manna of the Desert," *Lichen esculentus*. It occurs thickly among stones in the very driest limestone hills of the Tartarian desert, and is scarcely distinguishable from small stones, except by the expert. Mr. Berkeley tells us that Dr. Arthand published a pamphlet to prove that this must have been the manna with which the Israelites were fed. Mr. Munby, who resided many years in Algeria, says that it covers the sand in some parts, and grows during the night like mushrooms, and also that the French soldiers during an expedition south of Constantine, subsisted on it for some days, cooking it in various ways, and making it into bread. "Presuming that the lichen is the same as that on which the children of Israel were fed, there is really little inconsistent with the Scriptural account; allowing that the manna was miraculously supplied, it might still be brought about by natural agency, for Mr. Berkeley further mentions that, lying loose on the ground, without any attachment, it is easily rolled along by the wind, and sometimes piled together in strata several inches in thickness. Nay, more, it is still, occasionally, rained from heaven, being carried up by whirlwinds, and after traversing the air for many miles, falls precisely as the showers of fish, frogs, and grubs' larvæ, which afford sensational paragraphs for our own newspapers. Such a shower of these lichens fell about twenty years ago at Zerzour, during a time of great scarcity: this bread from heaven affording opportune relief to the inhabitants."

—The March number of the *People's Magazine* furnishes, with several interesting papers, some account of the Granite Works of the Ancients. The writer, speaking of Indian work, says,—

"Compared with the monolith temples of granite at Mahabalipuram, which is likewise situated on the promontory coast, those in Egypt sink into insignificance. The rocks thereabout are composed of a hard grey granite, containing quartz, mica, and felspar, with a few crystals of hornblende interspersed. Many have been hollowed out by art, and sculptured into temples with spirited bas-reliefs,—representing episodes in Hindu history and mythology,—and supported by graceful columns; all carved from the solid rock. Detached masses have been cut into shapes of elephants, tigers, lions, bulls, cats, monkeys, and various nondescript monsters, and colossal statues of gods, one of which, namely that of Ganesh, being 30 ft. high. The southernmost of the temples is about 40 ft. in height, 27 ft. in breadth, and nearly the same in length; the exterior being covered with elaborate sculptures. The adjoining edifice is about 49 ft. in length, and in breadth, 25 ft. It is rent by natural causes from summit to base. According to the local Brahminical tradition, these wonderful sculptures were executed by 4,000 workmen, who had come from the north, and returned before their completion. From a careful examination, it is evident that almost all the enormous mass of sculpture and carving that adorns this city of monolith temples and colossi, must have been performed without the aid of fire,—with the hammer, chisel, lever, and wedge alone, and this is one of the hardest rocks in the world." Mention is made of festoons of granite chains in the interior of one of the principal structures, and in length about 518 ft. Each garland, consisting of twenty links, is made of one piece of granite, 60 ft. long. The links themselves are monstrous rings, 32 in. in circumference, and polished as smooth as glass.—The *Gardener's Magazine*, reviewing the City churchyards, speaks thus of that of the Metropolitan Cathedral:—

"The next open space I meet with is the churchyard of St. Paul's, and it pains me to say it is one of the very worst in the city. A more disgraceful scene I cannot imagine than that presented by what is called 'God's Acre' attached to the metropolitan cathedral. Some three or four years ago an avenue of poplars was planted on the northern side of the cathedral. The trees were set 5 ft. apart, so that if they should thrive, they would soon form a thick, but happily they did not thrive: some have lost their leaders and have been cut back, others are complete and are consumptive. I leave it to the architect to say what would be the effect of a nice thriving avenue of Lombardy poplars on the north side of the cathedral, and conjecture in advance their dictum, 'hideous.' As for the rest of the gardening here, it is too bad for respectable criticism, and I must say nothing because I dare not speak my whole mind plainly. I will simply ask every good citizen to pause for one moment at the point where the cabs congregate opposite the Cathedral Coffee-house, and therefrom survey the scene. Here there are a few good trees on the ground to save it from complete disgrace, but the 'gardening' that has been attempted is not only a disgrace to the ecclesiastical authorities, but to the City of London."

Miscellaneous.

Protection of the City from Fire.—A proposal, having for its object the better protection of the City from fire, was discussed at the last meeting of the Court of Common Council. It was brought forward by Mr. Isaacs, whose idea is to erect large reservoirs, to be supplied with water from the Thames, at such an elevation that it may be available by means of hydrants, without waiting for the arrival of the fire-engines. The cost, according to Mr. Isaacs, would be 100,000*l.*, and the proposal was negative.

The Infringement of a Registered Design.—An inquiry has taken place before the Stipendiary, at the Wolverhampton Police Court, into a charge against Messrs. Stokes & Hackett, ironfounders, Hall Green, near Bilston, of infringing a design for stove-grates of Mr. William Rice, iron merchant, of Birmingham. The complainant, Mr. Rice, being under an apprehension that the defendants were applying his identical pattern of stove-grates for their manufactures, for the purposes of sale, Mr. Rice had instigated the firm of Rigby & Co., of Birmingham, to purchase half a dozen grates from the defendants. For the prosecution, it was maintained that the grates thus supplied were *fac similes* of the ornamental design in question. For the defence, a moulder, who for twenty years had been employed by the defendants, testified that neither the grates nor the registered ornamental portion of them had been made at the works of Messrs. Stokes & Hackett during the time he had been in their employ. The firm only manufactured plain grates, and purchased all the ornamental ones that they sold. Corroborative evidence was given. Mr. Mallard Ingram, ironmonger, of Wolverhampton, swore that about twelve months ago he sold to the defendants the four ornamental grates, which he had purchased from Messrs. Barwell. A correspondence between the defendants and Messrs. Rigby, relating to the order for the grates, was then handed in. In one of these communications the defendants wrote that, in consequence of a breakage in their machinery they were not able to complete the order in the specified time. The Stipendiary decided that this was an admission of machinery being applied in the manufacture of these grates, and thereupon found the defendants guilty of the infringement: mitigated penalty, 5*l.*, and costs in one case: other charges were withdrawn.

Funeral of Mrs. Gilbert Scott.—Mrs. Scott, the wife of Mr. George Gilbert Scott, R.A., died (as we heard with great regret) at Mr. Scott's country seat, Rook's nest, Godstone Tandridge, Surrey, on the 24th ult., after a short illness, but after suffering from an affection of the heart for several years. The funeral took place at Tandridge (within which parish Rook's-nest House stands) on Thursday, the 29th ult. The procession consisted of a hearse drawn by four horses; three mourning-coaches, each drawn by two horses; and several private carriages. The mourners were Mr. George Gilbert Scott and Rev. John Oldrid, Mr. Gilbert Scott and Mr. Alwyn Scott, Mr. and Mrs. John Scott, Mr. Dufkinfield Scott, Rev. T. Scott, Rev. Canon Scott, Rev. William Scott, Rev. T. Scott, jun., Mr. Henry Scott, Rev. — Stevens, Rev. G. T. Hoare; the servants of the household, gardeners, ten clerks, &c., from Mr. Scott's office. The service was performed by the vicar, the Rev. R. H. Borradaile. The outer coffin was covered with violet velvet, and had gilt furniture. The handles were crosses, with circles; on the top was an illuminated brass plate. The brick grave was lined with enamelled encaustic tiles. At the bottom of the grave was a Latin cross of coloured tiles, with black border on red ground. The sides and ends were covered with tiles of various patterns. The deceased lady was the youngest daughter of the late Mr. John Oldrid, of Boston, Lincolnshire.

Buildings in St. James's Park.—Mr. W. H. Smith having asked the First Commissioner of Works if it was the intention of her Majesty's Government to proceed with a Bill for which plans had been deposited, under which it was proposed to obtain powers to take a plot of ground in St. James's Park upwards of 350 ft. in length and from 50 ft. to 70 ft. in depth, for the erection of additional offices for the Admiralty, Mr. Ayrton replied that the Bill was in course of preparation, and he hoped it would be introduced before Easter. It ought, he said, to be remembered that the land belonged to the Crown, and the Crown had the undoubted right to build upon it, if such buildings were for improving the carrying on of the business of the country. The real object of the Bill, however, was to acquire some land that belonged to private persons.

West Somerset, Norfolk.—Plans and estimates for the complete restoration of St. Mary's Church have been prepared. Some fine wall paintings have been discovered on the walls of this church, which should be carefully preserved. There is also a Perpendicular screen.

Society for the Encouragement of Fine Arts.—A lecture on "The Drama" has been delivered by Sir Charles H. Young, at the rooms of this Society, in Conduit-street, before a numerous audience, the chair being occupied by Mr. W. Bodham Donne, the examiner of Stage Plays. After referring to the magnitude of the subject he had undertaken, Sir Charles said that he must not be considered as coming before the audience as a theatrical critic, his experience of the stage being chiefly derived from a spectator's point of view. He considered that of all diversions that of the theatre was the most entertaining, and that in the drama we see the high art of the poet concentrating the various incidents of human life into a narrow space, and thus affording to observers a kind of retrospective view of life. But the drama should afford something more than a mere pastime to thinking men. The lecturer was in favour of a subsidy from Government in aid of the true interests of the drama, and he was confident that if a sum of money voted by Parliament were properly expended, the beneficial effect would be felt far and wide. Mr. Donne expressed his opinion that, until the stage was put upon its proper level as one of the great and fine arts, no real improvement could be expected in the drama.

The Proposed Metropolitan Improvements.—At the last meeting of the Metropolitan Board, a report was presented by the engineer (Mr. Bazalgette) in answer to the report of Mr. Haywood, on this subject. As to the new line from Oxford-street through Old-street to Shore-ditch and Bethnal-green, Mr. Bazalgette says:—"Opponents have sought to separate and review them as distinct local improvements, treating each portion upon its own local merits only in order to lower their value and importance, to divert attention from their real object, and reduce the whole from one large metropolitan to several small detached local improvements." The Board, he remarks, in this chief improvement has used up several existing lines of wide streets to complete the intended lines of communication, and so at a small expenditure convert them from their present undeveloped condition into arterial lines of thoroughfare. The report then goes ably into the subject *seriatim*. A copy of the report was ordered to be sent to the City Commissioners of Sewers, and other Boards and Vestries represented at the Metropolitan Board.

Bagshaw Hall, Tideswell, Sheffield.—The chief stone of this hall has been laid. The edifice, now in course of erection, is the gift of one of the oldest inhabitants, Mr. John Bagshaw, from whom it takes its name, to Tideswell Old Sick Club. It is intended to be used by this society, of which Mr. Bagshaw has for many years been a member, for the transaction of their business; it will also be let for public meetings. The site is in the Market-square, opposite to Mr. Bagshaw's house, and is the gift of the Duke of Devonshire. The building, which is to be of white stone, will be of the Elizabethan style of architecture, and will measure 78 ft. by 31 ft., with an elevation of 32 ft. This space will be divided into three rooms adapted for the purposes of committee or other small meetings, and a good-sized hall in which magisterial or other public meetings may be held. At the rear of these a small cottage is to be provided for the hall-keeper. The architect is Mr. Samuel Howard, jun., of Stockport, and Mr. Bullock, of Tideswell, is the clerk of the works. The total cost of the building is estimated at 2,000l.

Jersey Harbour Extension Works.—It was proposed, at the sitting of the Jersey States, to set aside its Act of March 31, 1871, ordering the construction of a landing-stage and break-water, at a cost of 250,000l., on the ground that the island's exchequer could not afford the outlay; and a motion, embodying those facts, was submitted, providing for the erection of three landing-stages, one in each of the three principal ports of Jersey. After a long debate, the motion was rejected by an overwhelming majority. Later in the sitting, it was unanimously decided to vote 3,000l., in addition to a grant of 1,000l. already made, for the construction of a break-water, 350 ft. in length, at Bonne Nuit Bay, in the northern coasts.

Freethorpe, Norfolk.—A number of almshouses in the Tudor style have recently been erected here for Mr. R. H. V. Walpole, lord of the manor of Freethorpe; Mr. J. T. Botle, architect. The cost has been about 1,000l.

Health of Liverpool.—The official report by Dr. Trench for last year has been circulated in a printed form. The death rate of the parish was equal to 39.0, and that of the out-townships to 31.4 per 1,000 of the population. The average age at death of the inhabitants of the borough was 22 years; in the parish, 24 years; and in the out-township, 20 years. The average age was lowest, in July, August, and September, when infantile diarrhoea was rife. The deaths of infants below five years old for the year, was 8,348, or 48.0 of the whole deaths. The death rates in the districts and wards, ranged from 23.4 in Everton and Kirkdale, and 27.2 in West Derby, to 44.0 in St. Paul's and Exchange, and 43.2 in Vauxhall. The mortuary chapel for Roman Catholics in Collingwood-street has at length been completed, and that curious remnant of a superstitious custom, the "waking" of the dead, it is to be hoped, will soon be put an end to.

The Marylebone Water Supply.—A report by the local medical officer of health on the quality of the water supplied to the parish by the West Middlesex Water Company, has been circulated in a printed form, in order to allay the uneasiness excited by what has been recently stated as to the water supply of Lambeth. Dr. Whitmore has examined the source of supply to Marylebone, the three reservoirs at Barnes, the process of filtration, and the water itself; and he says,—"I can have no hesitation in expressing my opinion that the directors of this company have availed themselves of the best practical means known to science, for delivering their water to the consumer in the best possible condition; that such water is excellent in quality and perfectly wholesome; and that so long as its present state of purity is maintained, it may be drunk, even during the prevalence of an epidemic of cholera, with the most perfect safety."

Black Beetles.—A correspondent complains of that never-ending pest the black beetles; that they exist in a new house of his in battalions, or rather in legions, invade his sitting-room, and attack his book-bindings. He has tried all sorts of traps and baits in vain. We cannot recollect all the "cures" suggested in the *Builder*, but of one or two, of which we have had a little personal experience, we have a grateful remembrance. Phosphoric paste, if spread upon very thin slices of bread, and carefully overtopped and covered by dripping or butter, will kill hosts of them; and many traps, made with bowls or jelly-dishes and sloping pieces of firewood, upon which they follow their noses to get at a mixture of treacle and beer, for they seem not only to be sweet-toothed but tippers, will do for them by hosts at a time. The phosphoric paste should be kept or put out of the way of children, cats, and dogs: mice or rats may share it with the beetles.

American Institute of Architects.—The first course of lectures for the winter of 1871-2, given under the auspices of the New York Chapter of the American Institute of Architects has closed, and the second course commenced on the first Monday in February. The course so far has comprised weekly lectures by Mr. E. G. Hatfield on "Constructive Architecture," and by Mr. Russell Sturgis, jun., on its "Aesthetics." Also a series on "Hospitals," by Mr. Carl Pfeiffer, and another series by the secretary, Mr. A. J. Bloor, on "Landscape Architecture." Mr. Bloor has also lectured on "Common Sense in Future American Architecture." Mr. L. W. Robinson has held, during the week, for the benefit of the junior members, a weekly class in mathematics, as preparatory to the lecture on "Construction."

Public Offices, Reading.—The town council have finally resolved to adopt Mr. Waterhouse's revised plans in pencil of the proposed buildings for public offices, comprising a new council chamber and other improvements of the town-hall buildings, which he estimated could be carried out at a cost not exceeding 7,000l.; that Mr. Waterhouse be requested to finish the plans submitted, and to prepare a perspective view of the exterior, with an explanatory report and estimate, in order that the same may be submitted to the council for consideration. Mr. Parry, the borough surveyor, has also been instructed to prepare a ground-plan of the vacant site adjoining the town-hall buildings, and to show thereon the line of the proposed new street, as delineated in the plan attached to the agreement between the Board and Mr. John Henry Blagrove.

Sanitary Legislation in Ireland.—Mr. Nelson Hancock, in his returns, just issued, with reference to local taxation in Ireland, says,—"In sanitary legislation, Ireland had been allowed to fall behind the favourable position of almost complete assimilation, secured by fourteen clauses of the Sanitary Act, 1866, extending nearly the whole sanitary law of England to Ireland. The defect noticed in the last introductory report of the statutes since 1866 not having been extended to Ireland has been remedied by the Local Government (Ireland) Act, 1871, and assimilation has again been secured. The risk, however, of Ireland being again left behind in sanitary legislation is shown by the entire omission of Ireland from the Bill introduced by Sir Charles Adderley, to carry out the codification of sanitary law recommended by the Sanitary Commission."

Chicago Post Office and Custom House.—The *Chicago Builders' Journal* says,—"The plans for our new Government buildings are nearly completed. The edifice will have a frontage on both Clark and Dearborn streets of 336 ft. On Adams as well as Jackson street the frontage will be 210 ft. The style of architecture will be of the Romanesque-Inglo-Jonesian order, which is peculiarly Mullettonian. The adoption of this order of architecture by the treasury architect, Mr. Mullett, will give to Chicago an architectural display rarely seen except in London, where Inigo Jones was regarded in his time, which was in the sixteenth century, as the greatest architect of his day."

An Historical Building.—The *Edinburgh Courant* states that a considerable part of the more ancient portion of Invercauld House is at present in course of being pulled down in order to make room for the erection of a new wing. The plan of the projected extension is intended to be in better harmony with the other architectural features of the mansion than the old portions in course of demolition. Among these are the apartments which were occupied by the Earl of Mar, and from which he issued his famous letters in 1715, relative to the Jacobite rebellion, a few days prior to the unflinching of the royal standard at Culloden or Bannanur.

Application to Build between the Victoria Embankment and Cannon-row.—At a recent meeting of the Metropolitan Board of Works, a report was presented from the Works and General Purposes Committee, stating, with reference to the letter from the Statistical Society of London, inquiring whether the Board will lease to them the plot of ground lying between the Victoria Embankment and Cannon-row for the erection of a building thereon, for the purposes of the society, that, in the opinion of the committee, it is not desirable to let the ground in question at the present time, and recommending that the society be so informed. The report was unanimously adopted.

The Proposed Wet Dock at Whitehaven.—At a meeting of the Whitehaven town and harbour trustees, the secretary read a letter from Mr. Phillips, who submitted a revised tender at 76,997l. 16s. 9d., in the place of his original one at 75,869l. Mr. Brunles, C.E., the consulting engineer to the Board, wrote an explanatory letter that Mr. Phillips had added about 2l. a ton to the price of ironwork, seeing that the price has risen considerably since the tenders were sent in. After some discussion the secretary was instructed to write to Mr. Phillips and inform him that his amended tender could not be entertained.

Re-building of Warwick Castle.—The rebuilding of that portion of the castle which was destroyed by fire in December last is about to be commenced. Within the past few days workmen have been engaged in erecting scaffolding around the walls at the east wing. As a consequence the public are no longer admitted by order to see the ruins. The work has been undertaken by Mr. Bromage, builder, of Rugby, under the supervision of Mr. Salvin, Lord Warwick's London architect.

Collective Assurance against Injury from Personal Accidents.—A novel feature in assurance is presented by the "Royale Belge" Life and Accident Assurance Company, who have established an English branch for the assurance *en masse* of the employes of railway companies and other large industrial establishments against accident to life and limb, as practised in Belgium. The terms seem worth looking into.

Remains of Lake Dwellings.—On the borders of Lake Leman, almost opposite Nyon, there has recently been discovered a lacustrine station, which appears to be very rich in curiosities of the pre-historic times. This station is situated in the gulf of Condre, near Thonon; the piles cover a considerable space, and the importance of this lake settlement seems to have equalled that of Morges, which faces it on the Vaudois shore. In the course of one morning's investigation there have been collected seven hatchets, two knives, two sickles, one lance, five bracelets, and a large number of pins, all in bronze.

Model Lodging-house, Bradford.—A new model lodging-house has been erected near St. Thomas's Church, Bradford. It is for the accommodation of male lodgers only, and will provide 184 beds, 110 of which are for lodgers paying 4d. per night, and the remainder for those who pay 6d. Reading and sitting rooms are provided, and there will be a small library of standard works. At each end of the building are lavatories and bath-rooms, where hot and cold water can be obtained.

Royal Albert Hall, Kensington Gore.—A series of People's Subscription Concerts is to be given, in order to enable all classes to enjoy music in the Royal Albert Hall. There will be twelve concerts on Tuesday evenings, beginning on the 12th, just past. The prices are, to the picture-gallery, for twelve concerts, 1s., or to a single concert, 3d.; to the orchestra, 2s. for twelve, or 6d. for one; to the balcony seats, 3s. for twelve, or 9d. for one; and so on.

St. Andries.—On Saturday, the 24th ult., the workmen employed at St. Andries in enlarging the mansion for Sir A. Acland Rind, bart., sat down to a supper at Mossman's West Somerset Hotel, in Watchet, provided for them at the expense of Mr. Davis, of Taunton, the contractor for the works. Many pleasant things were said with reference to master and men.

An Engineer Knight.—Her Majesty has been pleased to signify her intention of conferring the honour of knighthood upon Mr. John Condie, C.E., in recognition of his professional services rendered to the Government, and extending over a period of about twenty-five years, during the construction of the national harbour at Portland, which has recently been completed.

Framlingham.—A new bank is about to be erected at Framlingham, Suffolk, for Messrs. Curmey & Co. The architect is Mr. Bottle.

TENDERS

For alterations and additions to factory, Southwark-bridge-road, for Messrs. Welch, Margeson, & Co. Mr. R. M. Shaw, architect.—

Patrick	21,369 0 0
Avis & Co.	1,274 0 0
Brown & Robinson	1,173 0 0
Colls & Son	1,097 0 0
Newman & Mann	1,488 0 0
Nightingale	1,062 0 0
Hobson	950 0 0

For stables and coachhouse at Westcroft, Carshalton, for Mr. J. Welch. Mr. R. M. Shaw, architect.—

Cowley	21,118 0 0
Clark	1,091 0 0
Hipwell	1,029 0 0
Nye	998 0 0
Mason	899 0 0
Jarred	813 0 0
Nightingale (accepted)	868 0 0

For new residence, for Mr. Thompson, at Marlborough, Wilts. Mr. S. Overton, architect.—

Pope	21,835 0 0
Roberts	959 0 0
Hoskings	875 0 0
Nightingale	855 0 0
Dyer	840 0 0

For the erection of a villa, at West Malvern, Mr. Fletcher, architect.—

If Cradley stone quoins and dressings, in lieu of red brick.

Bridgman & Nuthall	21,485	21,485
Porter	1,080	1,134
Wood & Sons	1,022	1,087

For erection of villa, No. 2, Mr. Fletcher, architect.—

Wood & Sons	2,913 13 0
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For reinstating the "Crown" public-house, Hatting-garden, Mr. Fletcher, architect.—

Fairhall & Weeks	2,162 0 0
Hilberd	451 19 0
Bridgman, Nuthall, & Co.	383 0 0

For the erection of a warehouse at the rear of No. 33, Eastcheap. Mr. E. Woodthorpe, architect. Quantities supplied by Messrs. Welch & Atkinson.—

Chamberlen, Brothers	23,233 0 0
Ashby & Sons	3,140 0 0
Perry, Brothers	3,137 0 0
Turner & Sons	2,960 0 0
Dove, Brothers	2,805 0 0
Conder	2,799 0 0
Browne & Robinson	2,710 0 0
Brace	2,393 0 0
Pritchard (accepted)	2,353 0 0

For Fire Brigade Station, Mile-end-road, for the Metropolitan Board of Works. Quantities supplied by Mr. T. Nixon.—

Simpson	23,660 0 0
High	3,300 0 0
Colls & Co.	3,240 0 0
Servinier & White	3,068 0 0
Sharnur	2,998 0 0
Wood	2,947 0 0

For cemetery chapel, lodges, and gates, Littlehampton, Sussex. Mr. G. B. Nichols, architect.—

Whitehead	21,775 0 0
Stevens	1,619 0 0
Knight & Co.	1,480 0 0
Seaman	1,470 0 0
Cockle	1,137 0 0
Barnes	1,100 0 0

For the erection of new brewery, chimney-shaft, &c., for the Liebfeld Brewery Company, Limited, Mr. G. Seaman, architect. Quantities supplied by Messrs. Curtis & Son.—

Buildings.

Clark	25,120 0 0
Marriott	4,450 0 0
Spencer	4,362 12 10
Burkert	4,743 0 0
Lovatt	4,333 0 0
Whitcomb	4,115 0 0
Dakin (accepted)	4,139 0 0

Ironwork.

Cochrane	22,183 0 0
Burkert	2,070 0 0
Jukes	1,960 7 0
Dawley	1,819 0 0
Hensley	1,733 0 0
Hornley Iron Company	1,418 0 0
Smith & Wood	1,309 0 0
Croucher	1,305 0 0
Darlington Iron Company	1,297 2 6
Thorncill & Warham	1,220 0 0
Head	1,055 0 0
Gillard	1,050 2 0
Orr & McLean	1,569 0 0
Croskey (accepted)	1,350 0 0

For rebuilding six houses in Hare-street, Bethnal-green, for Mr. W. A. Thorp. Mr. W. Reddall, architect.—

Eaton & Chapman	22,000 0 0
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TO CORRESPONDENTS.

W. H. (there should be no comma at all in such a case).—Ch. L. (the committee will doubtless be glad to have opinion of our correspondent's colleagues).—P. T. D. (next week).—F. C. (did not arrive till Friday).—Justin (the circumstances would seem to justify what is shown, but in that case the full charge could certainly not be covered).—B. E. I. (consult a solicitor).—W. L. H. B.—Nemo.—W. S. C.—Messrs. L. A. J. L. H.—Capt. H.—C. M.—Mr. P.—E. A.—P. B. W.—F. H.—H. N. T.—Gardiner.—S. H. P.—H. G.—W. D.—B. R. H. S.—T. O.—T. J. H.—B. R.—M. P.

We are compelled to decline pointing out books and giving addresses. All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication. N.B.—The responsibility of signed articles, and papers read at public meetings, rests of course with the authors.

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NINTH BONUS MEETING, January 4th, 1872.

The following are Extracts from the Reports of the Directors:—

1.—Progress of the Society in the Bonus Period.

"AS TO INCOME: THE NEW ASSURANCES were 2150 in number, for an aggregate sum of £38,000, at premiums amounting to 54,654 per annum, —results which, viewed in relation to the depressed condition of Life Assurance during much of the period, cannot be regarded as other than satisfactory. THE YEARLY REVENUE was increased by over £2,000 per annum, and reached 226,508 on the 30th June, 1871. THE INTEREST yielded by the whole of the Funds, whether invested or uninvested, was 41.66 per cent. on the average of the entire period, being fully 38 per cent. more than that realized in the previous period. This increase was obtained not only without loss, but without the smallest impairment of security.

"AS TO OUTGOINGS: 877 Policies, amounting to 648,811. The claims which accrued by the death of 786 persons, assured by the Society, amounted to 648,811. The mortality was very favourable to the Society, the payments having been below those estimated by fully 80,000, and the interest which occurred then fewer by 92 than the number expected. THE EXPENSES incurred in conducting the business, always moderate and well within the provision made for them in the Premiums, were fractionally less than in the previous period, and fell below 71 per cent. on the Revenue. It is thus seen that side by side with uniform success in the transactions of the Quinquennium, there was continuous growth in the resources and assets of the Society, which consequently stood, at the closing of the books, on a broader basis than at any former time."

2.—Financial Position of the Society on June 30th, 1871.

"The subsisting Assurances on the 30th June were 8,670 in number, assuring, with their Bonus additions, the sum of 3,445,028. The Assurances Fund at the date of Valuation was £1,826,458 10 9 and the total calculated Liability £1,477,179 17 3 Leaving a Surplus of £349,278 13 6

This Surplus is matter for hearty and unmitigated congratulation, and justifies the preference shown by the Board for a well-selected business tending to profit. It must, however, be remembered that although owing in the main to ordinary recurring causes, and to sources of profit having every prospect of permanence, it is, nevertheless certain that its unprecedented enlargement is due to a condition of mortality favourable beyond previous experience, to be probably ascribed under the law of averages by an increase of deaths hereafter, beyond those allowed for in the calculations. The Cash Bonus, which is the present value of the Reversionary Bonus, and therefore the true measure of the allowance, will average 29 per cent. on the like payments as against 20 per cent. at the last Division, and 28 per cent. in 1866, which was the highest previous percentage. No comment can illustrate better than this comparison the merits of the present Division."

3.—Results of the Division.

"Of the sum now to be divided, five-sixths, or 225,000, will fall to the Assured, and will produce a reversionary addition to the Policies. This Reversionary Bonus will average 49 per cent. or vary according to age from 34 to 82 per cent. on the Premiums received in the Quinquennium, all at the Policee amongst which it will be distributed.

Dealing it prudent to provide for each a contingency, the Directors have, under the advice of their Actuary, set aside the sum of 20,000 for this purpose. Of the remaining 274,278 13s. 6d. they now recommend the division of 270,000, a sum greater by 30,000 than any previously divided, and sufficient to give to the Shareholders 2s. a share, and to the assured the largest bonus ever allotted to them."

The next DIVISION OF PROFITS will take place in JANUARY, 1872, and Persons who effect New Policies before the end of June next will be entitled at that Division to one year's additional share of Profits over later Entrants.

The Report above mentioned, a detailed account of the proceedings of the Bonus Meeting, the returns made to the Board of Trade, and every information may be obtained of GEORGE CUTCLIFFE, Actuary and Secretary, No. 13, 81, James's-square, London, S.W.

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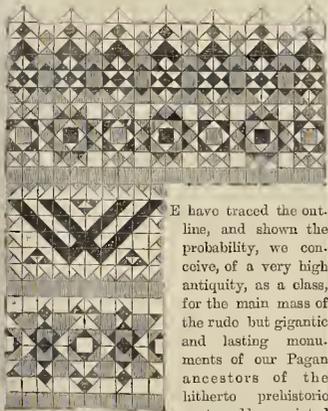
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The Builder.

VOL. XXX.—No. 1520.

Megaliths and Tumuli: their probable Eras, "Architects," and Purposes.



We have traced the outline, and shown the probability, we conceive, of a very high antiquity, as a class, for the main mass of the rude but gigantic and lasting monuments of our Pagan ancestors of the hitherto prehistoric past; and have pointed

to the probable "architects" of these monuments; whatever evidence there may be in favour of a slight sprinkling of a few special examples, reared by their successive descendants, down into ages more or less approximating towards the historic close of the long existing prehistoric Pagan era; which is now fully proved and recognised as having extended back at least to the drift-impliment men of glacial times,—probably 50,000 years ago.* And, above all, the dolmens appear to have preceded most of the other forms; although, among their African precursors, there would seem to have not only been dolmens, but stone circles single and concentric, trilithons, tumuli, and many other forms of such monuments, in vast, central, and, as it were, metropolitan and dispersive abundance. Even Mr. Fergusson cannot help inadvertently indicating the probably extreme antiquity of the dolmens, as a class,—or, at least, of the dolmen builders,—notwithstanding his sweeping general conclusion, without any legitimate or adequate premises, that we can see, to the contrary. At page 329 he says:—"In the present state of our knowledge, the cave men [of the glacial or Arctic era] and the dolmens seem not only contemporaneous, but their frequency seems generally to be coincident." And as to the era of the cave-men themselves and their stone implements (p. 509), he speaks of "the question of the antiquity of the cave men, or the palæolithic stone implements, the age of which we must, for the present at least, leave wrapped in the mists of the long prehistoric past"; these men, as he fully admits, having existed under Arctic or glacial influences, in their caves, contemporaneous with dolmen localities, in "a climate nearly similar to that of Arctic North America," and "the inhabitants of these caves had all the habits of people now dwelling in the Arctic regions." Yet in Mr. Fergusson's arguments for the comparatively recent origin of the dolmens themselves all this appears to be forgotten. Into the apparent inconsistency, however, we have no space here to enter. Still, we may remark that his idea that the dark-hued (ex-African) dolmen-builders of this country originally inhabited the low-lands, and built there no dolmens; but were at last driven, by Bryts (or other comparatively recent races), up into

the mountainous fastnesses of Wales and Cumberland; and only there and then began to build their dolmens, appears to us to be just as clear a perversion and reversal of the probabilities of the case as that the rude stone monument builders of Europe got their ideas from the Romans; or that the Greeks,—those mere children of antiquity, as Herodotus tells us the Egyptian priests regarded them, by comparison with the hoar antiquity of the Thebans of Upper Egypt,—instructed the Indian, Aryan, or other ancients of the East;—opinions which Mr. Fergusson almost seems himself to entertain. That the ex-African and Arctic dolmen builders of the high lands of this country, in Wales, Cumberland,* Northumberland, &c., the Isle of Man, and the high lands of Scotland and Ireland were aboriginally residents of these high lands, though of African descent; that their Arctic caves and dolmens were contemporaneous; and that they erected these dolmens there, as they did in Africa, Spain, and France, even before the low level lands of Britain had reached up to sea level after the drift impliment era, we think, is much more probable than Mr. Fergusson's hypothesis. That they afterwards spread downwards from higher to lower lands is more likely.

But the chief object which we have now in view is to consider, as far as our limited space will allow, the probable purposes of the rude monuments of the Pagan era. And as we desire to agree with Mr. Fergusson, as far as we possibly and reasonably can, we shall first of all note what he says of these, or of certain of these, probable purposes; with which, to some extent, we agree, so far as they go.

The summary and result of the whole of his elaborate and interesting inquiry is, "that honour to the dead, and propitiation of the spirits of the departed, seem to have been the two leading ideas that, both in the East and West gave rise to the erection of these hitherto mysterious structures, which are found so numerously scattered over the face of the Old World." Again he says (on same page): "With the fewest possible exceptions, and these of the most insignificant character, their connexion with the relics of the dead can be proved, from all having become places for ancestral worship; and having, under various forms, been used for commemorating or honouring departed spirits." They were reared, he conceives, "by dead-reverencing, ancestor-worshipping people" (379), who made "offerings to the dead," and were "kindred races of mankind, with whom respect for the spirits of deceased ancestors was a leading characteristic." Stone circles of theirs, in North Africa (311), were "evidently connected with the religious rites of the ancient inhabitants of these regions." The great stone circle of Drumbo, in Ireland,—580 ft. in diameter, and second only to Avebury itself, with "one of the most interesting of the Irish dolmens" in the centre, called the Giant's Grave,—or "bedd,"—and probably "the grave of a chief,"—Mr. Fergusson suggests (p. 229), may have been used "for celebrating funereal games or ceremonies round the tomb."

Well, surely all this goes to show that these circles, tumuli, and other earthworks and ramparts, dolmens, kists, chambers, and so-called altar-stones were something more than mere places of burial, even according to Mr. Fergusson's own ideas, since they were "places of worship," where "religious rites" and "ceremonies" of the dead, in "departed spirit worship" were conducted? And a very curious sort of hero-worship is that of the "dear spirits." How is it, too, then, that only Christians are said by Mr. Fergusson to have associated "their places of worship"

* It is a curious fact that the supposed great range of high mountain land in the heart of Africa is called by natives "Jebel el Kimmzi." It is so named in Hughes's Physical Map of Africa. The word, however, seems still more closely akin to "Cymry" than to "Cumberland."

with their burial-places; and that it is "applying a Christian precedent to a Pagan people" to say that the barrows of Stonehenge were "gathered round the sacred precincts" of that assuredly "sacred enclosure" (Druidically speaking) as a place of worship;—we shall not call it a "temple"? we hear little, if anything, from the Welsh hards themselves, as to "temples," but much about "sacred enclosures," "circles," "fenced enclosures," "ramparts," "sanctuaries," "dales where the courses surround the circles," the "sacred corso," where—

"rapidly moving, in the course of the sky, in circles, and uneven numbers, druids and bards unite to celebrate the [central] Leader,"

"round the sanctuary of the uneven number."

"Whilst the circular revolution was performed . . . the assembled train were dancing . . . and singing in cadence, with garlands on their brows, loud was the clattering of shields round the ancient cauldron [or cup, of inspiration from Ceredwyn] in frantic mirth."

For jovial cantrips such as these why might not the area of the great circle enclosing the two inner and lesser circles of Avebury (or the circuit of Stonehenge either) be five times that of St. Peter's at Rome? We need not imagine that such places were ever intended for congregations either sitting or standing in, as Mr. Fergusson supposes; for either witnessing spectacles or hearing harangues or sermons. But what arena could be better fitted for assemblies of people, singing, dancing, and circling round "the sacred course in a serene morning," in frantic mirth, with inspiration (of a kind) in their hearts, and garlands on their brows; till, like dancing whirling dervishes at their devotions, some one or other fell out of his ranks, "stirred up" or "awakened," in this "revival," into a fit of entrancement, sacred ecstacy, or God-possession, and was "chained" as an Oracle, or as Deon,—thus to "celebrate the Leader"?

But what of the oaks and groves of the Druids? In hunting out these and other passages and expressions quoted from the Welsh hards, we did not happen to come upon even one about either trees or oaks any more than temples, far less serpents, sun-worship, or astrology. Yet no doubt such were just the sort of people against whom the early Christian priesthood fulminated mandates against "the worshippers of trees and stones." Must not both stones and trees, then, have been venerated, and used, in their "sacred enclosures"? In the Sub-Himalayas there are Druids who chant or sing and dance in circles of trees, with a stone at each tree.

But all this has nothing obviously to do with "departed spirits," after all. The one central druidical "Leader" was their God, Deon, or Hu, Apollo, or whatever we may call him, as manifesting Himself in a taliesin, or initiated and inspired bard or druid, in the car, or chair or figurative womb, kist vaen, dolmen, or "simulative tomb" of "the Goddess of Death," Ceredwyn. "I have died: I have revived: I am now Taliesin," said the bard. His death was the simulativo death of entranced inspiration, in the simulativo tomb, kist, sarcophagus, or coffin, whence he was "born again," into the new and divine awakened life of trance,—"the life of the Gods." "I require men to be born again," said Deon, as the true purpose of the druidical religion; and the Taliesin or God-possessed says, "twice have I been born," and "complete is my chair in Caer Sidi: neither disorder nor old age will oppress him who is within it": he was now one of "the deathless brotherhood," of "the twice-born,"—"first, born in the egg [an ovate]: next, born out of the egg [a hard]."

Far other than mere "departed spirit worship," as this was, the druidical like other doctrines may have been apt to degenerate into it, with its trance and other mediums and spirit-circles; and, in a sort of saint worship, the sacred enclosures may have become surrounded and embued with the dead, just as every second or third Christian

* See p. 197, ante.

Church is by its churchyard and its tombs,—its God's Acre, and its Paradise, or city of the dead; but so far from this implying that "application of a Christian precedent to the Pagan people," it is the Christians who must have adopted the Pagan practice of associating their places of burial with their places of worship, even on Mr. Ferguson's own principles. There are churches in the Scottish Highlands which to this day are called "The Stanes," or Stones, as if even the name of some Pagan Stonechairs had been adopted by the Christians, as well as the Pagan sites and practices too.

The fact that the Romans made no allusion to Stonehenge, we may here note, is of little force, considering that the French occupied Algeria for many years without taking the slightest notice of all the tens of thousands of dolmens, stone circles, &c., there and elsewhere in North Africa.

While pointing out the general association of the actual tombs of the dead with simulative tombs, devoted to religious rites, it must be noted that according to Mr. Ferguson himself a host of instances occur in which dolmens or kistvans have all the appearance of being nothing more than what he calls "simulated tombs." But of the precise uses or purposes of these simulated tombs he hardly gives any definite idea. He thus speaks of these "Bedds," as the Irish call them, in connexion with the real and generally underground tombs, kist-vans, or dolmens, with special reference to a singularly typical tumulus, with three concentric circles of stones, rising circle above as well as within circle, round and up to a central dolmen at the top, in Aveyron, and called "the dolmen de Bousquet."

"So far as I know, none of these dolmen-crowned tumuli have been dug into, which is to be regretted, as it would be curious to know whether the external dolmen is the real or only a simulated tomb. My own impression would be in favour of the latter hypothesis, inasmuch as a *trou-à-fauteuil* are characteristic of all similar monuments. In the Pyramids of Egypt they consisted, in every Buddhist tomb, without exception, there is a tee, A still more apposite illustration, however, is found in the tombs around Agra and Delhi. In all those of any pretension the body is buried in the earth, in a vault below the floor of the tomb, and a gravestone laid over it; but on the floor of the chamber, under the dome, there is always a simulated *trou-à-fauteuil*, which is the only one seen by visitors. This is carried even farther in the tomb of the great Akbar (1556, 1605). Over the vault is raised a pyramid, surrounded, not like this tumulus, by three rows of stones, but by three rows of pavilions; and on the top, exposed to the air, is a simulated tomb (or kist), placed exactly as this dolmen is. No two buildings could well seem more different, at first; but their common parentage and purpose (?) can hardly be mistaken; and it must be curious to know whether the likeness extends to the double tomb also."

Of course, Mr. Ferguson means it to be inferred that the encircled or enclosed and dolmened tumulus, being so like in principle and arrangement to Akbar's monument, must be of much the same age, although the evidence for that is just about as slender as it would be to urge that the stone implements of Britons (if we may so call them) of the glacial drift must be of much the same age as the stone implements of Britons of the Roman era (near 50,000 years, at least, later, probably), because the one sort is "exactly like" the other.

The chief races who honoured their dead by the peculiarity of tomb-rearing are thus specified, although the great North African dolmen and circle builders, and High Asiatic tumulus rearers, are not so explicitly named as they might be.

"The peculiarity is most characteristic of the EARLIER CIVILIZED RACES, whom we have generally been in the habit of designating as the Pagan races of mankind. But if that term is objected to, the tomb-building races may be specified,—from the East,—as the Chinese; the Mongols in Tartary, or Mogols, as they were called, in India; the Persians, in their own country, or in Persia; the Ancient Pelasgi, in Greece; the Etruscans, in Italy; and the races (North African and Upper Asian, we shall call them), wherever they were, who preceded (and probably preceded) the Celts in Europe. But the tomb-building people, *par excellence*, in the old world, were the Egyptians (African, of course). Not only were the funeral rites the most important element in the religious life of the people; but they began at an age earlier than the history or tradition of any other nation carries us back to. The great pyramid of Gizeh was erected certainly as early as 3,000 years before Christ; yet it must be the *actual* descent of a *radi-chambered tumulus* or cairn, with external access to the chambers [just such a one as that of New Grange,

or the 'Sorcery Hall' (or simulative tomb?) at Maeshowe], and it is almost difficult to calculate how many thousands of years it must have required before such rude sepulchres as those our ancestors, erected,—may (?) probably after the Christian era,—could have elaborated into the most perfect and most gigantic specimens of masonry which the world has yet seen."

If we rightly understand this, surely it means that the chambered tumuli, such as those of our ancestors, are of a much more ancient type, at least, than that of the Pyramid of some 5,000 years of age, and just such as the North African predecessors of the Pyramid builders, must have given origin to, both in Africa and Ireland. Nevertheless, the tumuli builders of the East may have combined with the chamber or dolmen builders of the South in the enterable chambered or kistled tumuli, which are said to be more peculiar to the West than either to the South or to the East, alone.

Anyhow, *simulative tombs* are regarded by Mr. Ferguson as a very general feature connected with megaliths and tumuli. But not only so; the dolmens, as a class, are simulative tombs, the connexion of which with actual tombs at all has not been established, even when associated with tumuli, as we have just seen. And the *simulative tomb*, whether with or without a real one, is a mystery which requires a different line of research altogether than a merely archaeological or antiquarian one, to enable us to divine or reach its purpose. The author of "The Buddhist Emblem of Architecture,"* we do believe, was not far off that purpose in the brief generalisation, from various ancient sources, here quoted; and which, we may at once say, manifestly relates, whether he knew it or not, to the *simulative death* of entrenchment, often in *simulative tombs*, and kists, dolmens, or hedds, coffins, "elegant couches," as in Egypt and at Babylon, or on altars of self-sacrifice," divine self-annihilation, or God-possession, as in modern Tibet, which simulative death has been already shown, in the *Duiller*, to be a key to ancient religious mysteries,† both magical, as were the Pagan religions in general, and especially those of a higher order, as were the Buddhist and Brahmical, the Egyptian and the Druidical; no less than the Jewish and the Christian, or the Free-Masonic mysteries.

"In all those mysteries which were held in such high veneration by the ancients, and the types of which have descended as a chain of unbroken succession even to our own days, the attainment of the crowning point of the craft was typical of death. It was alone by passing through the vale of its shadow that perfect light [the well-known 'lucidity' of entrenchment] could be obtained. Apuleius, in the eleventh book of his 'Metamorphosis,' or 'Fable of the Golden Ass,' describes minutely this completion of initiation: 'the night-like darkness; the approach to the confines of death; and then, in the very midst of this darkness, the Light revealed to him (and in him). In some of the various versions of these mysteries it is said that the candidate was shrouded in the shroud of death; was placed in that narrow lane to which we all must go, was buried again, and went forth the new-born and perfect craftsman.' Others it was represented by the candidate passing through an oval, symbolising that as he entered this scene of woe so must he go forth again. Thus was it that we find that styled, in ancient writ, the *portal of life*."

There is an allusion here to "the narrow home" which reminds us of this passage in the Taliesin records of the Druids:—

"In the dale, where the courses surround the circle (or cairn) Ho [Ho] arouses who is partly covered and partly bright. [He is now, says Davies, in the mystic coil (or kist or chamber), giving direction to his attendants.] . . . Let the renowned, the enterprising (Eidol) or Ambrosius, whose actions are recorded in the Gododin] be lulled to sleep. But let Hu mildly warm him with his divine presence. The man who rushes forth, when the fies lies in ambush, is the *red-fellow* of him who rests in the narrow house beneath the tumulus."

The allusion to a chambered tumulus like those encircled "sorcery-halls" at Maeshowe in Orkney, and New Grange in Ireland, seems here to be evident; but we need not wait to consider the special meaning of the context, which relates to Him—Hm,—of whom it is said that he "lived and died alternately." We merely wished to show that the *simulative tombs* were associated with *simulative death*, as indeed has already been done, in the *Duiller*, while treating of the Great Pyramid of Egypt and elsewhere. The Druidical and various other Pagan doctrines have also been treated of on this principle in our journal, in a series of Letters, to which we may here refer.‡

* Captain T. Latter, B.N.T., Assistant Commissioner, Agra.

† See Letters referred to below.

‡ See articles on the Great Pyramid, in *Builder* of 24th September, 1864, and 19th September, 1868. See also letters in *Builder*, by J. E. Dove, on "Wing and other Symbols," October 16th, 1858, and January 15th, 1859; on "Geometrical and other Symbols," April 4th and 18th, June 6th, and July 11th, 1859; on "Wing and other Symbols," July 2nd, October 22nd, and December 17th, 1864; and various others.

But merely to indicate all that this subject involves would require an inquiry and a volume at least as extensive as Mr. Ferguson's; and all we can do here is merely to offer a few disjointed remarks on so vast a subject.

That the *worship* of "departed spirits," real or imaginary, has been one form of error in religion which was very prevalent in ancient times appears to be undoubted; and we may just hint that this Pagan form of error, as a *positive and intentional "religion,"* seems to be on the high way to a full-fledged revival in modern times.

There are two great divisions into which all so-called religion may be said to have ranged itself in practice, both in old and in recent times,—Monothemism and Polytheism. That the veneration of the dead, or the worship of "departed spirits," belongs to the order of polytheism there really cannot be a rational doubt. The object of worship becomes "a God," whatever it be; and even were it an image or idol,—a God of silver and gold,—or even a stone, far less a real or supposed human being, "departed or not departed." "These be thy Gods!" a phrase applied to those who "served" the "golden calf," may quite as legitimately be addressed to "the servants of the spirits," as one class of modern Spiritists actually call themselves. The witch of Endor called her own "familiar spirits" Gods; and Samuel the Seer was venerated by her as one of those Gods. Of such as she, no doubt [in Isaiah lxx. 3], was that "people who . . . sacrifice in gardens and burneth incense [for enchantments] upon altars of brick; which remain (and sleep, as Herodotus says) among the graves, and lodge in the monuments," kist-vans, dolmens, chambers, tumuli, or other "simulative tombs."

The monothemistic principle has also been, to a certain extent, mixed up with the polytheistic; but in many cases the priesthood upheld the polytheistic for exotic purposes, while they were well enough acquainted, covertly, with the monothemistic; and, indeed, the multitude of Gods in Pagan mythology, apart from "departed spirits," was little else than a multitude of names given to one ruling principle, "one and the selfsame Spirit" of Nature, God, or Goddess, in whom all live, move, and have their being, or by whom all subsist. Thus Ceres was called the "many-named God," and according to Lucius, at his initiation, Isis declared herself to be Nature, and "the uniform manifestation of Gods and Goddesses." After this multitude of Gods had consecrated a variety of her names, such as Juno, Venus, Proserpine, Ceres, and Minerva, she said, "Under all those names, and with many different ceremonies, I am the only Deity whom the universe invokes!" And whatever Isis was, as an oracle manifested in her "servants," she was no more "departed spirit," far less any endless variety of departed spirits, such as the 333 millions of Hindu Gods may have been to those who were instructed to dwell in the tombs (like Chaldeans in cities of the dead), and wear grave-clothes, even though Brahma was always one God, or Brahma, Vishnu, and Shiva, three in one. It is very curious, however, that Isis did call herself "The Queen of departed spirits," and an unruly set of subjects to Queen Isis, or Cereswynn, they occasionally seem to be in their modern manifestations; and much they stand in need of a ruler and a pater-down. It is no less curious, too, that this self-announced title is not quite unprecedented, as a title, even in sacred writ. In Numbers xvi. 22, God himself is called "the God of the spirits of all flesh." Either of these, if they be not "one and the selfsame Spirit" of the Universe, is a God of Gods, and not such a mere rabble of minor Gods, unruly and unrulied, as are those who actually rule or govern "the servants of the spirits."

The Universal Spirit, as the oracular monothemistic principle, whether as God or Goddess, has a close relationship to "the flesh." The body of man is the temple of God,—the temple of the Holy Spirit, or Holy Ghost; "the body is for the Lord, and the Lord for the body." And in truth *God-possession*, which means to be "not in the flesh but in the Spirit" of ecstatic and sacred entrenchment, is, as has been heretofore remarked, the leading idea of all monothemistic religion; as *departed-spirit-possession* is the leading idea of all really polytheistic religion. It is to "one and the self same (divine) Spirit" that monothemism exhorts

* See in *Builder* of 17th December, 1864, on "Rock and Sorcery-hall Symbols."

man kind to present and give up possession of their bodies, as temples, and as living sacrifices, at sitting and appointed times, in which to manifest "the Spirit of Truth," or to constitute "the Oracles of God." It is to an endless succession of different and merely human spirits, illusory or real, that polytheism calls upon them to give up possession of their bodies as "servants of the spirits,"—not as "servants of God,"—and to constitute questionable oracles of these their "Gods," with their seers and prophets, or trances and other "mediums," and their tables or altars, spirit circles, "services," prayers, hymns, and other mockeries of "religion." A few of the "trance mediums," moreover, among the modern veneration of departed spirits, do devote themselves mainly to the "service" of some few, or one even, among the hosts of "spirits"; and the proper place for such a "medium," who gives up the possession of his body to another, who has lost his own, to be talked through, or written through, or oracled through, while "in the trance," or simulative death, should be in a Pagan dolmen, or other "simulative tomb," on the top of the grave of the defunct interlocutor, to those quasi-oracular utterances he is so devoted, as "a servant of the spirits," in these their second-hand inspirations. Where else so appropriately as among the tombs, and the dead, or in church-yards, could "departed spirit-worshippers" practice their "religion," as in ancient Pagan times.

These remarks, however, only apply to a certain fanatical class of the modern spiritists, and not to those who are scientifically engaged, or merely as a pastime, in "trying the spirits";—the "psychic forces," magical forces, or whatever they be,—an inquiry of a very curious and interesting order; and it would be well the chaff were winnowed from the wheat as soon as possible, in this more than threatened modern revival of hero-worship and polytheistic Paganism.

The ancient Pagan worship of departed spirits must thus be distinctly contradistinguished from any one of the various more or less pure or impure forms of ancient monotheism, although they were, doubtless, more or less mixed up with it as they sank into more and more degraded and superstitious forms of "worship." These more or less pure monotheistic forms of religion included the Buddhist and Brahminical, the hierophantino of Egypt, and even the Druidical, no less than the Judaic and the Christian; as cannot be appear from evidence already given in the *Builder*. Here, however, we cannot dwell on this subject. There is even a lower depth into which the ancient religions probably sank than into the worship of "departed spirits," whether with mediums entranced or not entranced, and that is into the region of mere dreaming and unentranced sleep, as their only source of inspiration, or dictation; and Sir John Lubbock was probably not very far wrong when he said, in a lecture at Liverpool on the social and religious condition of the lower races of men, that—

"The ideas of religion among the lower races were intimately associated with, if indeed they had not originated from, the condition of man during sleep, and especially from dreams. Sleep and death [he continued, though this is much more the case with *france and death*] had always been regarded as nearly related to one another. The savage would naturally look on death as a kind of sleep. . . . the events in his dreams as real as those which happened when he was awake," &c.

We can now, from all that has been said, see pretty clearly the meaning of the passage from Herodotus, as to a North African people, the Nasamonites, thus referred to by Mr. Fergusson (p. 407):—

"From Herodotus we learn that this people buried their dead sitting, with their knees doubled up to their chins [which is the sleeping posture of the Tibetan peasantry, we may here remark; and a posture of the ancient dead which has been noticed in this country as well as in America], and were so particular about this that when a man was dying, they propped him up that he might die in that attitude (iv. 190). We also learn from him that they had such reverence for the tombs of their ancestors that it was their practice, in their solemn form of oath, to lay their hands on these tombs, and so invoke their sanction; and, in their mode of DIVINATION, they used to SLEEP in or on these sepulchres (iv. 172)." That is, probably, he remembered, "in or on" the dolmens, which Mr. Fergusson thinks the Nasamonites may probably claim, as one form of [simulative] tomb in ancient use by them and their forefathers, although he cannot think that all the thousands of North African dolmens, even

in Algeria alone, were theirs. Were not these Pagans also like those in Judea already alluded to, of whom Isaiah spoke (lxv. 3-4), as those who "remain among the graves, and lodge in the monuments,"—that is, probably, sleep in them, too, by night? "I slept in 100 caers," kist-vacns, or dolmens, or at least sacred enclosures, islands, or whatever they were, said the Taliesin, and "have died and revived," or been "horn again." And as such people also "sacrificed in gardens, and burned incense upon altars of brick"; so the Druids sacrificed in groves, although much less is said as to that, as we have remarked, in the Taliesin records, than about caers, and narrow houses, sanctuaries, sacred islands, lakes, circles, revolutions, inclosures, and boundaries.

The sleep alluded to by Herodotus may have been, even in his time, the same as the "sacred sleep" or "temple sleep" of the Egyptians, which, in truth, was entrancement, high or low, and regeneration into a new life, in theoretical principle at least, and however degraded or false,—however dissimulative no less than simulative of death, it may then have become in practice. It was the same state that Herodotus indicated, in his account of the concentric circle, or rather voluted, pyramidal tumulus, or tower, of Belus, at Babylon, with a shrine, or actual tomb below, and a chapel, or simulative tomb, at the top, in which a "chosen priestess" lay, on "an elegant bed" at a golden table, and was nightly visited by Belus, or entranced by the God; when, probably, the oracles uttered were written down at the table. Here is a type of the probable uses of the ruder kist-vacns, dolmens, beds, cells, chapels or oratories, caves, and crypts of various ages.*

Such then appears to us to have been the chief purposes of simulative tombs, such as dolmens, kists, beds, chairs, chambers of tumuli, and also many altars. They were probably used, whether by "departed spirit worshippers" or not, in the production of simulative death, or entrancement, real or false,—or in "waking" the mystically "dead"; and whether among the actual tombs or tumuli of the really dead or not; and Mr. Fergusson's discovery of so extensive an association of "simulative tombs" with real ones, and also apart from them, is a most significant and important one; and whether the object of worship, or service, by human beings in "God-possession," were the one divine monotheistic Spirit of the Universe; an endless polytheistic host of "departed spirits"; or a mere dreaming delusion of the insane, "possessed, by devils, coming out of the tombs."†

In concluding this very imperfect outline of a new argument in favour of the probably great antiquity in general of the mass of gigantic monuments throughout the old world, we must acknowledge how materially indebted we have been to Mr. Fergusson's own labours and suggestive pages, and map, for being able at all, now for the first time, to put into something like definite form, this outline of an idea which we have long entertained, as to the probable uses, architects, and purposes, of these rude megaliths and tumuli; and, without the aid of this very interesting and important volume itself, in which confusion is reduced to something like order, we do not see how this could have been done with the least chance of a favourable reception by archaeologists.

THE PUBLIC HEALTH BILL.

A BILL to amend the law relating to public health, prepared and brought in to the House of Commons by Mr. Stansfeld, Mr. Secretary Bruce, and Mr. Hibbert, and ordered by the House of Commons, on 10th February, 1872, to be printed, has just been issued.

The Bill has no preamble. Those who are attached to time-honoured associations may be shocked. For our own parts we are disposed heartily to welcome any well-considered attempt to escape from that barbarous verbiage of legal meshwork with which our statute-book afflicts and disgraces the age and the country. An approach to either the incisive lucidity of the French publicists, or the elegant perspicuity of the Italian legists, would be hailed by all plain-dealing, honest men. That the case which exists for legislation, in any instance, should be explained and admitted, before a Bill is pro-

* In the Kensington Museum, amongst the interesting and curious photographs of Indian temples and tombs, one, called "the Muddan Mahal," at Jubulpore, appears to be in the form of a chapel, erected on the top of a dolmen, with access to it by outside stairs.

† Matt. viii. 28.

ceeded with, is, of course, proper. But it is not necessary to commence with WHEREAS in large letters. Not only are we struck with this novelty in the mode of commencement, but still more with the care and skill that have been evidently devoted to mastering and explaining the subjects dealt with by the Bill. Its draughting forms an exception to the cumbersome and slovenly dictation which we have learned to expect, as matter of course, in any new Act of Parliament.

The Public Health Bill contains ninety clauses, and occupies forty pages of letter-press. Commencing with the usual preliminaries, defining the title, the application, and the date of the commencement of the proposed operation, of the Act, it devotes the seventeen following clauses to the establishment of sanitary authorities. It goes on to deal with the alteration of areas, the union of districts, and the repeal of local Acts; which subjects occupy, altogether, eleven clauses. Clauses 32 to 50 deal with the subject of nuisances; 51 to 53 with that of water supply; and 54 with gas supply. Seven clauses follow, treating of hospitals and provisions for the sick; three deal with the subject of analysing water; and the remainder of the Bill consists of miscellaneous, and saving clauses, directions as to legal proceedings, and definitions. Under the miscellaneous clauses is to be found an important power granted to any "sanitary authority to buy up any water-mill, dam, or weir which interferes with the proper drainage of the district," which we regret to see nullified by the condition that Parliamentary sanction must still be sought, in order to give compulsory power of purchase to the Local Government Board.

England is divided by the Act into sanitary districts of three descriptions, namely, urban, rural, and port (including riparian) sanitary districts. Urban sanitary districts are either boroughs, in which the sanitary authority is the council; Elective Improvement Act districts, under the direction of the Improvement Commissioners; or Local Government districts, in which the authority is that of the Local Board. A rural sanitary district is commensurate with the area of a rural union; and the guardians of the union are to form, with certain exceptions, the rural sanitary authority.

From the first meeting of the sanitary authorities constituted by this Act all other sanitary authority shall devolve on the newly-constituted Boards. No less than six sets of Acts of Parliament, in addition to the Local Government Acts, are mentioned as forming the basis of the powers of the new authorities. These are the Sewage Utilisation Acts, the Nuisances Removal Acts, the Common Lodging-house Acts, the Diseases Prevention Acts, the Artizans and Labourers' Dwellings Act, and the Bakersons Regulation Act. It would be desirable, if it be felt unadvisable to attempt during the present session a consolidation of all the legislation, the enforcement of which is thus committed to the new authorities, that a schedule should be attached to the new Act containing the enacting clauses of the earlier laws, so that the new authorities should not be compelled to provide themselves with an extensive legal library.

A medical officer of health is to be appointed by every urban sanitary authority from and after the expiration of three months from the commencement of this Act, in the manner provided by the 40th section of the Public Health Act of 1848. Here, again, we ask to have the section in question appended to the new Bill. Clerks and treasurers, inspectors of nuisances, and any other necessary officers and servants may be appointed by the new authorities.

Inspectors of the Local Government Board are to have, for the purpose of the Sanitary Acts, similar powers to those which the Poor-law inspectors have under the Acts relating to the Poor Law, for the purposes of those Acts. Here, again, a clear and compendious summary of actual legislative enactments is absolutely necessary for the guidance of the inspectors as much as for that of the Board.

All expenses incurred by urban sanitary authorities are to be defrayed as provided for by the Local Government Act, if in force in their district. If the Act is not in force at the commencement of the new law, the council of a borough are to have recourse to the borough rates, and the Improvement Commissioners, to any rate leviable on their district.

The expenses incurred by any rural sanitary authority will be either general or special; the former including the expenses of the establish-

ment and officers, the expenses in regard to disinfection, the providing conveyance for infected persons, the providing of hospitals, and all other expenses not defined as special. The latter comprise the expense of construction of sewers within the district, the providing of water supply, and any other expenses legally incurred, and determined by the Local Board to be special. The general expenses are to be defrayed out of a common fund, to be raised out of the poor-rates of the parishes forming the district. Special expenses are to be separately charged on each contributory place; the sanitary authority issuing its precept to the overseers of each such contributory place for the payment of the same.

Power is given to Local Government Boards to make over their authority to the conservators or commissioners of any port of England for the jurisdiction over such port and its waters; and riparian sanitary authorities may be empowered to act in like manner; the expenses being regulated on the same principle as in the case of the contributory districts.

Consolidation of areas, and of local authorities at present constituted, is facilitated by the new Act. In the case of a borough comprising, with its area, the whole of an Improvement Act District, the authority may be transferred to the borough council. Where a special drainage district has been formed, but no works, involving the raising of a loan, have been commenced, the district is to be dissolved, and will merge in the parishes. When works have been executed, in such circumstances, the confirmation of Parliament to the provisional order of the Local Government Board is necessary. No simple mode of obtaining such Parliamentary assent is, however, contemplated by this clause of the Bill; which, to this extent, must be regarded as a convenient seed-bed for numerous future Acts of Parliament. The assent of some central authority might, with extreme advantage, be substituted for this cumbersome process, or the provision, which occurs later in the Bill, of allowing a regulation that, after being laid on the table of the House of Commons for forty days, has met no opposition, to be taken as definitive, might apply to the whole measure.

Where it appears to the Local Government Board, on the application of the sanitary authorities of any sanitary districts, to be desirable to form the same into a united district, power is given to do so by what is rather enigmatically termed a "provisional order." The term is explained by reference to the Local Government Act of 1858. The objects of such unions are stated to be the prevention of the pollution, or of the obstruction, of streams; the procuring a common supply of water; or the making of a main sewer, or combination of a system of sewerage, for the districts to be united. It is, however, added, "or for any other purpose of the Sanitary Acts." The mode of forming such united districts, the description of the governing body, the regulations as to constitution of joint boards, and the mode of charging expenses and of raising funds, are then severally detailed; and power is given to the Local Government Board to repeal, alter, or amend any local Acts which are inconsistent with or relate to the same subject matters as the Sanitary Acts.

We now come to the very important part of the Bill that stands under the simple title of "Nuisances."

Every person who throws into any stream rubbish, cinders, refuse of manufacturers, or other solid matter, in such quantities as to interfere with the due flow of, or to pollute, the water is to incur the penalty of 5*l.* for the first offence, 10*l.* for the second, and from 1*l.* to 2*l.* for every day during which the offence is continued. On a third or subsequent conviction, the penalty is increased to 20*l.*, with a daily fine of from 2*l.* to 5*l.* Every person who turns into any stream any sewage matter, solid or liquid, or any other polluting liquid, is to incur similar penalties. Two years' grace is allowed for the continuance of any existing nuisance, so far as the operation of this Act is concerned. The question of the liquids which shall be considered as polluting is removed from the ground of conflicting opinion, and placed upon that of scientific analysis,—a bold and wise step. The tests specified are these:—

The presence, in 100,000 units of water, taken by weight, of either three units of dry mineral matter; one unit of dry organic matter; two units of organic carbon; '03 of organic nitrogen; two units of any metal except potassium, sodium,

calcium, or magnesium; '05 of metallic arsenic; one unit of free chlorine; or one unit of sulphur, in the condition either of sulphuretted hydrogen or of a soluble sulphuret; shall be held to constitute a polluting liquid. Further, any liquid of an acidity greater than that which is produced by adding two parts by weight of real muriatic acid to 1,000 parts of distilled water; any liquid of an alkalinity greater than that produced by adding one part of dry caustic soda to 1,000 parts of distilled water; and any liquid which exhibits by daylight a distinct colour, when a stratum of it 1 in. deep is placed in a white earthenware vessel; is to be held polluting. There should, we think, be some explanatory clause added to prevent any drainage or irrigation works in mountain districts from being hereafter impeded by the foregoing provisions. A spate in the Highlands, for instance, would bring down a peat-coloured torrent that would, no doubt, show a golden stain in the test-tube of white porcelain. The intention of the provisions is clear; but a word of explanation would not be here out of place.

The Local Government Board may alter the foregoing conditions by order. In case of rendering the stringency less, they may do so absolutely. In case of increasing the stringency, the alterations are only to come into force when they have lain for forty days before Parliament. This mode of counting Parliamentary challenge appears to avoid the objection which we mentioned as lying against clause 65. The mode of obtaining Parliamentary sanction to the acts of the sanitary authorities ought, however, to be the same in all cases. A special enactment, applying to the whole Bill, would simplify and improve this part of the arrangement. The sanitary authorities are empowered, by clause 34, to take any proceeding they may think fit, at law or in Chancery, for the protection of streams; and no plea that other nuisances exist is to be available in extenuation of any individual nuisance.

A penalty not exceeding forty shillings is imposed on any person having charge of a fire, the smoke of which is found to be a nuisance. The Nuisances Removal Acts and the 19th section of the Sanitary Act of 1866 are referred to in this clause, and should be appended to the Bill.

The 37th clause is so important as to require citation in full. All sewers and drains, whether public or private, shall be constructed, provided with means of ventilation, and kept so as to effectually prevent such sewers and drains from being dangerous to health, and any sewer or drain not so constructed, ventilated, or kept, shall be deemed a nuisance under the Nuisances Removal Acts, and, whether it be on public or private premises, may be dealt with under the said Nuisances Removal Acts as if it were on private premises. This very comprehensive clause will, no doubt, provoke full discussion. The force of the word "kept" is absolute.

A long-voiced controversy is to be closed, and a long-standing scandal to our civilisation removed, by the six lines which form clause 38, making it the duty of the urban sanitary authorities to provide for the proper cleansing of streets (pavements ought to be distinctly specified), as well as for the removal of all refuse or unclean matter from all closets and cesspools. Here, too, is a clear proof of the earnest determination of the framers of the Bill that it shall not remain a dead letter. If the sanitary authorities, after due notice, omit for two days any such cleansing they shall pay to the owner of the house so neglected a penalty not exceeding ten shillings a day. We take it that this provision is not only novel, but likely to be extremely effective. The only weak point that strikes us is, that it is not stated from which funds the penalty is to be defrayed. If it comes out of the rates, it only brings a moral pressure to bear on the neglectful authorities. But even that is much. Power is given to the officer of the sanitary authority to inspect premises; and a penalty not exceeding forty shillings is imposed for throwing rubbish into any sewer or drain.

The 49th section of the Public Health Act of 1848, providing that houses are to be drained into any sewer that runs within 100 ft. of their site, is so far modified as to allow of the construction of a new sewer, instead of making communications with an old one, where desirable.

Clauses 44-46 relate undoubtedly to the protection of the public health; but, although admirable in their enactments, would hardly have

been looked for under the head of nuisances. They provide that the milk of any animal suffering from any tubercular, contagious, or infectious disease shall be deemed unfit for human food; and that milk and tea shall come under the provisions of the Nuisances Removal Act of 1863. A penalty not exceeding twenty pounds is attached to the sale of any unwholesome food, and a warrant may be granted by a justice, on application from a sanitary authority, to search for unsound food. These are admirable clauses.

Foul pumps or wells are to be closed, by the order of two justices, on the application of any sanitary authority; and the inhalation of any building unfit for human abode may be prohibited in the same manner.

Power is given to sanitary authorities to carry water mains, when requisite, without their own district, as well as to purchase water rights. All water supplied either by the sanitary authority itself, or by any waterworks company or person, shall be filtered when necessary, and shall be free from all impurities; and a penalty not exceeding 50*l.* is imposed for the supply of impure water; without relieving the offenders from liability to any further proceedings, and without removing the obligation resting on the sanitary authorities to enforce the provisions of the section. This is root and branch work, and, if carried out, will be a most important safeguard to human life.

Power is given to any urban sanitary authority to light their district with gas, or to buy up, with the assent of three-fifths of the shareholders, the property of any gas company.

Clauses 55 to 61 lay on the sanitary authorities the duty of establishing hospitals and dispensaries, of supplying medicines during epidemics, of providing a mortuary, and of obtaining returns of sickness. The water supplied for domestic purposes is to be analysed from time to time, as well as all matters polluting streams. To the power to buy up water-mills, given by clause 65, we have referred. The Local Government Board have further powers entrusted to them with reference to section 35 of the Sanitary Act of 1866, and further explanation is given as to section 69 of the Public Health Act of 1848, and section 28 of the Local Government Act of 1858. These sections ought to be appended to the present Bill.

Clause 69 imposes a penalty not exceeding 20*l.*, or one month's imprisonment, on persons making false representations with respect to infectious disease, which may have existed, within three months, in any house or rooms let for hire. A great howl will probably ascend from many a watering-place at this most righteous and enlightened check on our favourite "Eherty of the subject." The liberty of any one to spread disease is thus boldly denied by the Bill.

The remaining clauses give directions of detail, which those whom they concern will best study in the Bill; a set of definitions, or sort of glossary of some of the legal terms employed, occupying the two pages which constitute the 90th clause.

The Public Health Bill may be, and has been, criticised on two grounds. First, that it does not consolidate the existing legislation; secondly, that it is permissive, and not compulsive. It may be fairly urged, however, that, important as consolidation is, the Government are in a better position to know whether the time has arrived for effecting it, than any one else can be,—not, as Prince Bismarck pithily remarked, because they are more clever than any one else, but because they must know more on the subject than any one else. An attempt to do more at this moment might, in case of opposition, have resulted in the embarrassment of the whole question. We suggest that the several clauses of other Acts which are specially referred to in the present measure, should be printed as an appendix to the same. As to the second point, we can only say that, although we believe more is needed, the bill has been taken by the horns; and an amount of compulsory cleanliness must result from the passing of this Bill in its integrity, that will greatly astonish and confound the friends and patrons of filth.

The Bill is, for the most part, clearly and well arrayed. Further progress in that direction we hold to be both possible and desirable. By the insertion of one or two preliminary clauses, as in French legislative and legal documents, a large amount of repetition may be avoided, and an Act of Parliament much reduced in length and equally increased in perspicuity. By comparing the two or three lines in which we have above described the liquids that shall be held

to be polluting, with the page devoted to the same object in the Bill, it will become clear that verbiage may be yet diminished. We shall return to some objections to the Bill as it stands, but meanwhile we thank the framers of the measure, Mr. Stansfeld, Mr. Secretary Bruce, and Mr. Hibbert, for the stride which they have made towards a legislation that shall be intelligible to plain men, without the interpretations of a lawyer.

The provisions of the Bill have been taken, almost entirely, from the Second Report of the Royal Sanitary Commission appointed in 1869. It will be seen that the Public Health Bill is, in the main, a great engineering measure. While the medical element must always retain great importance, the works of all kinds that will be necessitated by the provisions of the Bill can only be successful if carried out by competent engineering skill, and if duly designed as a portion of that great reform in the water supply, irrigation, drainage, and agricultural engineering of the kingdom which, as we have often pointed out, might in so short a time trouble the products of the soil, and occupy all available labour.

ON JAPANESE ART.*

Enamels.

Of all the arts of the Japanese the one which is to my mind the most interesting is that of enamelling. In this they excel beyond any other nation with whose works we are acquainted.

It is only within the last few years that examples of Japanese enamelling have reached this country, and I am led to believe that it is only very recently that they have been allowed to be exported from Japan. Neither the large collection of Japanese curiosities preserved at the Hague, nor Siebold's Museum at Leyden, contains a single specimen of this art.

The few statements I have been able to obtain from those who have resided in the country, or who are living there at the present time, as well as from Japanese gentlemen themselves, are so vague and conflicting that, put together, the result is nil. My own idea is that none are now made, and that the art has always been dedicated to the production of articles of use and ornament for the palaces of the Mikado and the princes of the land.

The recent alterations in connexion with the Government of Japan, and the breaking up of a large proportion of the Daimios' establishments, consequent upon the decrease of their power and revenues, may account for the sudden exportation of so many valuable works of art from this country. Be this as it may, we have become the lucky possessors of works of great beauty and value, as well as of lasting interest to all true art-lovers.

A careful examination of the Japanese enamels almost bewilders the mind, and confuses the eye; on the one hand by the almost superhuman skill displayed in their manipulation, and on the other by the marvellous diversity, intricacy, and beauty of their designs.

The ancient examples of the art of Cloisonné which have come down to our time from the Middle Ages are almost entirely in the form of small plaques, which were used for the ornamentation of ecclesiastical vessels, book-covers, altar-frontals, and the like. In the interesting work by the monk Theophilus, on the "Arts of the Middle Ages," we find an elaborate description of the manner of constructing small plaques of this enamel for the enrichment of church vessels; but no hint is given as to its adoption for the complete surfaces of the vessels themselves. Theophilus appears only to have been acquainted with pieces which could be held between the thumb and finger, and polished like the natural gems with which they were usually associated on the golden vessels. What would he have said if he had seen the works of the Japanese in vases nearly 3 ft. high, and dishes 2 ft. in diameter, entirely enamelled (on both sides in the case of the dishes), with designs more minute and accurate than any he ever saw in the church plate of his day,—the culminating epoch of the arts of the Middle Ages?

Japanese enamels are characterised by great sobriety of colouring, bright colours being sparingly used. In this respect they differ from the Chinese, in which the brightest possible colours are introduced throughout. The principal colour in Japanese enamels is a dark green,

and is adopted generally as the ground tint. Other colours, such as lilac, drab, and dark blue, are frequently employed for the grounds of the variously-shaped medallions introduced in the designs.

In almost all instances which have come under my notice, the green ground is ornamented with a delicate spray and leaf work, with small flowers studded throughout it; the leaves are in various colours, including drab, light green, and white. Medallions of different sizes, formed when small of various geometrical designs, and when large of devices derived from animal and vegetable life, occur at intervals, sometimes symmetrically placed and sometimes erratically disposed. Along with these medallions, pieces of diaper work, of both regular and irregular shapes, are introduced with the most happy result. Sometimes a wonderful degree of care and skill is observable in their manipulation, especially when the design is of a small repeating geometrical figure; for instance, in a diaper most difficult to put together, I counted no less than 103 separate squares of wire in the quarter of a medallion of only $\frac{1}{4}$ in. radius. You must remember that each of these squares had to be shaped out of the fine ribbon-wire, and soldered one by one to the ground of the article.

Of the designs of the conventional flowers, rosettes, and scroll-work, found on every piece of enamel, it is impossible to speak too highly, and their colouring is invariably harmonious and effective.

On large specimens of the art, the dragon is perhaps more frequently depicted than any other object, and it is invariably handled in a most masterly manner. The Foo is another favourite representation, and is commonly shown in the act of descending from its lofty home towards earth, with its numerous long and richly-coloured tail feathers floating around it in graceful curves. In this shape, the sacred bird is certainly one of the most artistic conceptions of the Japanese artist.

The material, which for its proper display requires to be cut up by the metal files into minute divisions and distinct forms, is highly favourable for depicting birds, fish, foliage, flowers, and all descriptions of purely ornamental figures; but is, on the other hand, incapable of rendering landscapes or any scenes requiring perspective. It is simply impossible to convey any idea of distance in the material. I have seen a landscape attempted on a Japanese dish, but the result was of the most archaic character, and a total failure.

Lacquer Work.

I am truly at a loss where to begin my remarks on the lacquer-work of the Japanese, and I am afraid I shall experience considerable difficulty in knowing where to end.

The styles and modes of manufacturing and ornamenting it are apparently countless. I have endeavoured to classify the several descriptions which show some signs of resemblance, but have been compelled to give up the task as hopeless. There is no art-manufacture, I believe, which displays such a diversity of treatment as this.

In a single cabinet, which formed one of the gems of the Japanese Court in the Paris Exhibition of 1867, and which now ornaments the collection of Mr. James L. Bowes, there are no less than nine distinct species of lacquer, and twenty-four different modes of artistic treatment represented on the main divisions, such as drawers, doors, and the like. On a more minute inspection, we find on one drawer sixteen different modes of applying and decorating gold-work, and on another seven ways of treating various metals; all the remaining drawers, along with the doors, present numerous interesting methods of handling the coloured and aventurine lacs, and the metal, shell, and other inlays. This work, taken altogether, is certainly an extreme illustration; it was made, I understand, for the purpose of showing, in a single article, the most important modes of lacquer-working followed by the Japanese of the present day; and, notwithstanding the great variety it displays, its general effect is superb. It is richly mounted with silver; and the key-drawer is faced with an engraved plate of that metal, edged with gold, and barred with a broad line of some black metal.

It is rarely that one meets with more than two kinds of lacquer on one article, but the artistic treatment of any one kind may vary considerably.

It is a well-known fact that Japanese artists

avoid, if not positively dislike, diametrical division. This you will see most satisfactorily illustrated on the sides, ends, and top of a cabinet before you. On all these surfaces a piece of fret diaper is introduced, but nowhere dividing them diametrically or into regular forms. The diaper is not constructed, as we should certainly do it, at the angle of 45° ; and, what may strike us as more peculiar, its margin lines are not at the same angles as the pattern, or even similar to each other, one being straight and the other zig-zag. Here, then, we have all our ideas of propriety in ornamentation broken through, yet who can deny that the result is satisfactory?

The Japanese frequently use diapers to cover surfaces entirely, in the manner common with us, but they never consider it necessary to border them round, but let them crop out just as they may.

So much for ornamentation by means of diapering; I shall now draw your attention to the Japanese method of introducing medallions in their art-works. When two or more medallions are introduced, containing any kind of enrichment, they are almost always of different outlines, the love for variety preventing the artist repeating his forms. Referring to the cabinet, we find twelve medallions and six different outlines used; and out of the total number eight are complete, and four are broken medallions, the latter being cut into by the panels of the doors and main drawer.

The back ends, and top have two medallions each, of different forms, one being placed on the black ground, and the other breaking into the fret diaper-work, in the most free-and-easy manner imaginable. The artist bore contrived, by comping differently-shaped medallions, by disposing them in different positions, and by cutting the ground in a different way with the fret diaper, to make every surface of the cabinet a distinct and independent design; yet combined they produce a most consistent whole.

I have been led to enlarge on this subject because it involves art-principles which we should do well to carefully consider; and, because, on the other hand, it supplies a key to much that may appear strange to the observer who examines works of Japanese art for the first time.

Nothing can surpass the delicacy and beauty of finish observable in the old lacquer-work, now unfortunately rarely to be met with, and one cannot but wonder at the loving care and marvellous skill displayed in it. Some of the small articles, such as medicine-boxes, come as near perfection, to my mind, as anything done by the hand of man; and larger works, though not demanding so much delicacy, are still remarkable for their manipulation.

Of the mode of manufacturing lacquer-work very little appears to be known in this part of the world, but what little is known I shall briefly detail to you.

The lacquer or varnish in its original state is the produce of a shrub called by the natives *oerosino-ki*, that is, varnish-plant. The product of the shrub requires to be prepared with great care, and the colouring materials have to be incorporated with it by a tedious process of grinding. The colours most commonly used are black, scarlet, dark green, crimson-red, and brown. Black is more generally adopted for the ground-work of lacquered articles than any other colour; scarlet is principally used for the interior of boxes, and sometimes as the ground-work of trays and similar things. Perhaps the most beautiful of all the lacquers used for grounds are those called by us aventurine, from their likeness to aventurine glass made in Venice; there are several kinds of this, some closely resembling the glass, and others of a more dispersed nature, with flakes more like coloured mother-of-pearl than metal.

In laying on the varnish, five or six coats are applied, one after another, each coat having been allowed to dry before the next is laid on. When a sufficient time has passed to secure the perfect drying of the whole, the surface is ground down and polished. In many instances squares of gold and silver, pieces of pearl, ivory, coral, and such like are inlaid, as it were, into the lac surface; this is done by fixing them with the first coat of varnish, and then filling up to their thickness with many successive layers, and ultimately grinding the whole to an even surface.

The process, so far as I have described it, is used in the preparation of grounds only; when the beautiful relief ornamentation is to be applied, much more complicated and tedious

* By Mr. George A. Audsley. See p. 202, ante.

manipulation has to be gone through. I have been told, by those who have resided in Japan, that many months, and even years, are required to produce a highly-raised piece of lac. Lacquer-work is prized, in the first place, in proportion to its delicate finish, and in the second, in proportion to the degree of relief given to its ornamentation. In the writing-case before you, which was exhibited at Paris in 1867, you will observe how very beautifully the designs, both outside and inside, are rendered in relief, with the lights put in with squares of polished metal, and the red berries, growing on the rock plants, represented by raised beads of coral.

There can be no question that the process of raised lac working is one of the most tedious nature, and it is evident that careful cutting and grinding are required, to bring the rough masses of varnish into their proper forms before the final gilding is attempted. As regards the gilding, I know nothing, and can get no correct information. It is on the surface of the lac; but whether it is laid on in leaf, or powder dusted on a wet coat of varnish, I am unable to decide. When of good quality, it stands rough usage, washing, and polishing.

The practice of enriching lacquer by applying other materials, such as the various coloured metals, tortoise-shell, mother-of-pearl, coral, and precious stones, is very usually followed in good work. The small vase brought for your inspection is a most characteristic example of this practice. The general body is raised gold lac; the flowers of the iris are in white and purple pearl; the chrysanthemum flowers are in white pearl, with yellow centres and green calyxes; and the *Oumai* blossoms and buds are in white and red coral. All these flowers and buds are exquisitely carved and engraved.

As another instance of this class of work, I may describe a picture on the top of a modern Japanese box, which I had the pleasure of examining the other day. It comprised two figures of men, one of which was on horseback. The faces and hands of both were in ivory, carved in high relief; their sword-handles and guards were in ivory and purple pearl; and the silk tassels of the horse's trappings were in white pearl. The remainder of the picture was in various-coloured lacquer, and the whole beautifully rendered.

Porcelain.

To my mind, the most beautiful and artistic of all the fictile wares of Japan is the Satsuma; and I consider it superior, in an art point of view, to anything produced by other countries. This is made in the province of Satsuma, situated in the south-west of the island of Kiusiu. The body of the ware is of a delicate cream or vellum tint, and is covered with a thick transparent glaze, which is in nearly all cases cracked. On this softly-toned ground, figures, birds, flowers, and conventional designs are painted in the most exquisite manner imaginable. The freedom and grace infused into every line of the flower and bird subjects are astonishing; while the colouring is soft and refined to a degree.

In my remarks on lacquer-work I drew your attention to the fact that the Japanese artists dislike diametrical division. I have here a piece of Satsuma ware which is a still better illustration. It is a small basin, on which are painted two medallions, one filled with flowers, and the other with ornamental patterns. Looking at the basin, on the outside, neither of the medallions is seen to be complete: the one with flowers, placed on the lower part, is almost, one-third cut away by the stand of the bottom; and the other, placed on the upper part, is cut in half by the rim. On the outside of the basin, therefore, we find no trace of the symmetrical arrangement or balance of any sort; and on the inside we find the same love for irregularity displayed, for all we discover there is the remaining portion of the upper medallion cleverly doubled over the rim. How quaint all this is; and, on careful examination, how lovely,—as free as Nature herself, yet satisfying all the requirements of decorative art.

Another beautiful ware, richly ornamented with red and gold, is made in Japan, I am informed, in the district belonging to the Prince of Kanga; but of this I am not at all certain. The ornamentation of this ware is infinitely more minute and laboured than that of Satsuma, but is far inferior to it in artistic excellence. Kanga ware appears to be held in great estimation in Japan, no doubt on account of its fine colour and intricate ornamentation.

The Japanese frequently lacquer articles of porcelain, sometimes entirely and sometimes

partially. When entirely covered, they are treated, as regards their decoration, in a similar manner to ordinary lacquer-work; when only partially covered, two methods are adopted. The first method consists in grounding in with lac all portions of the object excepting those which have been already decorated, and intended to remain in their original state; and the second method consists in taking the porcelain itself as the ground, and ornamenting it with raised designs in gold and coloured lacs.

Metal Work.

The Japanese are very skilful in all that relates to the artistic treatment of the metals, and produce works in this branch of art as commendable as they are varied. They are expert in casting, carving, damascening, engraving, inlaying, weaving, and tempering; and in many of these departments, produce specimens comparable to anything done in Europe.

Perhaps the most characteristic of all their metallurgic works is that called by them *syakifo*. In this, numerous metals and alloys are associated, the designs being produced in colours, through the agency of the various coloured metals,—white being represented by silver, yellow by gold, black by platinum, all shades of dull red by copper and its alloys, brown by bronze, and blue by steel. Gold, silver, and polished steel, of course, represent themselves in designs as well as abstract colours. A red garment, embroidered with gold, and clasped with silver, would be executed in red-coloured copper, inlaid with gold, and furnished with a silver brooch. The sword in the hand of a warrior would be in polished steel, and, if bloody, would have red copper inlaid on it. These instances will suffice to illustrate the general mode of producing coloured designs by the exclusive use of metals. I have seen many beautiful specimens of *syakifo*, and can bear witness to their faultless execution.

The Japanese have brought bronze-casting to great perfection, as is proved by the superb incense-burner which was presented to his Royal Highness the Duke of Edinburgh by the Mikado, and is now exhibited in the South Kensington Museum. They also produce a highly-finished and polished bronze-work, on which the relief ornamentation is produced by cutting the surrounding metal away. The relieved objects are then engraved, and richly damascened with gold and silver. Bell-founding is carried on to a considerable extent, and art is never neglected in the designs.

Reposist-work is well known to the Japanese metallurgists, but is not so largely adopted by them as it is by Western artists.

Flat silver wire, woven into diaper patterns, is a favourite material for covering uniform surfaces, and is frequently applied by the Japanese artists in an effective manner.

Lastly, I desire to draw your attention to a group of stones, executed in gold, silver, bronze, and other metals. You will agree with me, that the Japanese have been more successful than our silversmiths in appreciating the nature of their materials, and realising the correct modes of working them. Compare this group,—where every feather is a thin plate of metal, carefully engraved; where the legs, tails, necks, and heads of the birds are in their natural colours; where the rock they stand upon is modelled with accuracy, and its stunted vegetation truthfully rendered,—with the best efforts of our silversmiths, as displayed in presentation plate, of which the best that can be said is that they contain many pounds of "solid silver." Compare them, and I am satisfied that you will give the award in favour of the Japanese.

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Carved Works.

It is a somewhat remarkable fact that in all the varieties of ornamentation applied to such materials as porcelain, textile fabrics, paper, and in pictorial illustrations generally, the Japanese never resort to shadows for the purpose of giving the effect of relief. It is a remarkable fact, because, as a race, their artists are passionately fond of relief in everything, and adopt it everywhere it can be properly used. My last words explain all, they acknowledge the great law in decorative art that flat surfaces should not appear to be relieved, but be treated as flat surfaces, and admit relief only where it can be properly used.

When relief is wanted, the Japanese artist has countless expedients for securing it: in porcelain, he moulds it from the clay, or applies it by lac; in metal-work, he casts it, sculps it, or

bents it up; in ivory and wood, he carves it; in lacquer-work, he brings it up by coat after coat of varnish; and in embroidery, he plies thread over thread with patient care until the relief is gained.

Of all the carved work of the Japanese, the most wonderful and interesting are their ivories, called *netskes*. These consist of groups of figures and animals, grotesque figures, and representations; in short, of nearly every natural object in Japan, most truthfully rendered. It is quite impossible to give any idea in words of the quaint humour, the broad caricature, the intense power of expression, and the general artistic excellence, which stamps every *netske*, in which the human form appears with an individuality distinct from all kinds of a kindred nature produced in other lands. A first-rate Japanese *netske* has positively no rival. The carving of these ivories is carried to the highest degree of perfection; and its effect is frequently enhanced by the partial application of colour and gilding.

The Japanese are likewise skilful in wood-carving, and they frequently substitute it for ivory in their small works.

Of the larger and most important labours of the wood-carvers,—such as those applied in the temple and domestic architecture of the country,—I am at present unable to speak. My visit to Japan will, no doubt, put me in a position to tell you something about the native architecture, and the modes adopted for its decoration; and on a future occasion I shall be pleased to give you the result of my observations.

THE BOARD OF PUBLIC WORKS IN IRELAND.

An alteration in the constitution of this Board, which is in contemplation, if not already actually decided on, is exciting a strong feeling of dissatisfaction in the sister kingdom, and involves questions equally important in England as there. For the proper understanding of the matter, some little information is necessary.

The range of business coming within the Architect's Department in Ireland is enormous. The department is presided over by three commissioners, the chairman being an officer of Engineers, Colonel McKerlie, whose interference in the details of the architect's administration leads at times, it is asserted, to some miscarriage of business.

The architectural department consists of:—architect (800*l.* per annum), assistant ditto (450*l.*), with a moderate staff of draughtsmen, clerks, three surveyors (at about 300*l.* per annum), one clerk specially attached to the architect and surveyor (120*l.*).

The department has to administer in all matters of building, maintaining, furnishing all buildings of a public nature (except the military ones) in Ireland, and to transact the business appertaining to Government loans under existing Acts of Parliament for farm buildings, labourers' cottages, globe-houses, &c. The Board of Works is now identical with, or has absorbed into itself, the functions of the Board of Control of *Lunatic Asylums*; also the architect's department of the *Board of National Education*. Under this head, the department has the entire work of negotiating for sites, building, maintaining, inspecting, and keeping in repair all model schools, model farms, and national school-houses over the whole country. So with regard to the *Constabulary Department*: it has a like duty with regard to the constabulary barracks, which are spread throughout Ireland; *coast-guard stations*, officers' and "coast-guard's" houses, the same; a vast number of miscellaneous public buildings, their maintenance and furnishing, to the minutest details,—the Castle of Dublin; the Vice-regal, Chief Secretary's and Under Secretary's lodges, Phoenix Park, with all the lodges and rangers' and keepers' houses, &c. (the park is under the control of the Board of Works); the Law Courts, comprising some eight or nine courts, record buildings, solicitors' buildings, &c.; the Queen's Colleges, at Galway, Belfast, and Cork, and College of Maynooth; the post-offices, Custom-houses, stamp-offices, Income-tax offices in the larger towns, and a host of public departments,—the Dublin Metropolitan Police-offices, and other buildings which we cannot at present call to mind. The above will be sufficient to show the extent of the work ent on for the architect's department, and the nature of it being such that even a pair of bellows or a poker is not applied to the Lord Lieutenant's kitchen without the matter passes under the architect's hand, it

may be fairly conceded the staff is not an immoderately extensive one.

As respects the present head of the department, Mr. Jas. H. Owen, the president of the Irish Institute of Architects, we believe we are correct in saying that he bears a high reputation for administrative ability, and is popular in the greatest degree with both the public and his subordinates.

Touching the surveyors, who divide Ireland into three districts among them, the peculiar character of their duties should be remembered when estimating the proposed Government scheme. In inspections of the many buildings under their charge, the limited amount of railway communication in Ireland is to be borne in mind. It is still possible, in going from Dublin to inspect some remote coastguard station, to expend *six days* of hard travelling in going and returning. There is no parallel in any English architect's practice for the extraordinary conditions of laborious posting over long distances of fifty, sixty, and seventy miles per day, which fall to the lot of an Irish architect in wide practice.

And now let us see what is proposed. A commission was sent over on the part of the Treasury last autumn, consisting of the Marquis of Lansdowne, Mr. Herbert Murray, and Captain Crossman, of the Royal Engineers; three gentlemen at that time admittedly, we believe, unacquainted with Ireland or Irish affairs.

It is stated that the first and most essential provision laid down for them,—no matter what they should ascertain the work of the department to be,—was that on no account was the annual cost of the department to be increased. A confidential report has been made by these gentlemen, but the nature of the recommendations have leaked out, and are well known. First, they propose to appoint an assistant-commissioner, or director of works, whose sole duty shall be to direct and control the architect's department, and that this functionary shall be a *captain of Royal Engineers*, at a salary of 1,000*l.* per annum! To provide the means and ways for this 1,000*l.*, the lower officials are to be doctored off. The entire of the surveyors' work is to be done by two persons, one of whom shall have the city of Dublin; the other, the whole of Ireland; (the assistant architect, we presume, is to be abolished altogether). These two surveyors are to do all inspecting, negotiating as to sites and buildings, write specifications for new works, and are to have one clerk allotted to them at home, to copy their said specifications and documents. As neither of these gentlemen in the discharge of his duties would often find time to enter his office, and as the surveyor in charge of all Ireland would be obliged to live, eat, drink, and sleep in railway-carriages and jaunting cars, the nature and description of his office-work, and how it is to be done, are puzzling. It is unnecessary to go into further details as to the injustice to the subordinate employes. The object would really seem to be to provide a berth for a captain of Royal Engineers, and at the expense of the salaries of the working officials doctored off. We look in vain for a reason for humiliating the able architect who is at the head of the department, and knows his business, and does it thoroughly, by placing an officer of Engineers as his superior; and it seems to us that we are justified, as well on the part of the public as of the profession, in asking to be furnished with a statement of the grounds on which this determination has been arrived at. The question might very properly be asked in the House of Commons, and we trust this will be done.

THE METROPOLITAN EXTENSION OF THE GREAT EASTERN RAILWAY.

On Saturday last the members of the Civil and Mechanical Engineers' Society visited the works of the Metropolitan Extension of the Great Eastern Railway, by permission of Mr. Edward Wilson, the engineer to the company.

The object of these extensions is to shorten the route from the main line at the outskirts of London into the City, by cutting across, under Hackney Downs, and near London-fields into Broad-street, instead of going round as at present; and also at the same time open up a district at present unserved by any line, running from North to South. The members first met at the site of the new station in Liverpool-street, adjoining the existing Broad-street Station of the North London Railway.

The new station will be below the level of the ground, and large quantities of earth have been removed by the contractors, Messrs. Lucas & Co. These excavations show a great depth of made soil, the accumulations of centuries, cesspools and sewers being in great abundance. On the west side of the site a heavy retaining wall, somewhat after the style of those at the metropolitan stations, but more ornate, is being erected. In the foundation and backing of this wall such of the old bricks as are sound and whole, from the houses that were taken down, are being re-used, and for hardness they compare favourably with new bricks. The North London Railway being on a viaduct immediately alongside, and, as before mentioned, the new work being below the level of the ground, it has been necessary to underpin the piers of the viaduct, as well as the neighbouring houses, on the east side of the course of the line.

This work, although not presenting a great show, takes a good deal of time and requires great care on the part of the contractors. The heavy traffic running on the viaduct, and the tenderness of some of the concrete underneath the piers, increasing the care necessary in securing a proper foundation. Between Sun-street and Brick-lane, the various bridges and other works were carefully examined. At this point, near Brick-lane, the extension line crosses under the main line of the Great Eastern Railway at an angle of about 30°. The old line is carried on a viaduct, the arches of which are elliptical; these had to be cut away and replaced by girders carried on three massive walls: this work created a good deal of interest amongst the members of the society, the mode in which it was carried out being described by a representative of the contractors, who conducted the members over the works. After passing under the Great Eastern main line, the extension rises by a stiff gradient from under the surface of the ground to Winchester-street, which it crosses over, and the line continues on a viaduct to Hackney Downs, where it runs into a cutting. Beyond the Mile-end Station the works are in a forward condition, and will shortly be opened for traffic.

MANAGEMENT OF THE NEWSPAPER PRESS FUND.

A WRITER in the *Pall Mall Gazette*, signing himself "A Humiliated Journalist," has given so erroneous and injurious an account of the operations of the Newspaper Press Fund, that any one who feels interested, as we do, in the maintenance of an important charity, will desire to aid in setting the matter right. He professes to speak in no spirit of hostility; but the public have not now to be told that mischief is done by want of head as well as want of heart. The writer in this case has either wilfully mis-stated the case or is altogether ignorant of its real facts. Referring to the balance-sheet for the year 1870, he says,—

"I learnt that the total amount in the way of grants was only 152*l.* Yet, on reference to the other side of the sheet, it appears that the donations and subscriptions alone amounted in the twelve months to 81*l.* 1*s.* 9*d.*, while the interest from investments is set down at 17*s.* 12*s.* 8*d.* Of these sums, however, the association has, I see, invested 421*l.* 7*s.* in Eastern Bengal Railway Stock. But there remains the striking fact that the committee in this one year consumed 551*l.* 6*s.* 2*d.*, and that out of this expenditure only the above-mentioned sum of 152*l.* reached the unfortunate persons whose distress this society was intended to alleviate. Nor does the balance-sheet leave us in any doubt as to the causes of this extraordinary state of things. It appears that the annual dinner of the association cost 17*s.* 18*s.* 6*d.*, although the tickets only brought in 96*l.* 1*s.* Thus the philanthropic diners were apparently provided with a banquet at very little more than one-third of cost price."

Now, what is the truth? In the first place, the committee "consumed" *nothing*, being an unpaid body; but if by this expression the "Humiliated Journalist" means to refer to the amount they allowed to be expended in the management of the Society, the sum should be not 551*l.* 6*s.* 2*d.*, but 291*l.*, including the secretary's salary and a gratuity, 112*l.*, rent of office 42*l.*, stationary, postage, and so on. He shows that only 152*l.* were given away, and goes on to explain the cause of "this extraordinary state of things" by pointing out that, while the dinner cost 17*s.*, "the tickets only brought in 66*l.*" Objectors of this class, even when honest, forget the fact that in the infancy of a society the chief aim and cause of expense are the collection of money and the establishment of a fund to assure the permanence of the Institution. A dinner is in our days, whether rightly or wrongly, the means adopted: men of eminence are invited,

and they, in lieu of paying for it, ordinarily present donations far exceeding the cost of the dinner. The correct statement as to the precise dinner in question would stand thus:—

By cost of annual dinner, and postages in relation thereto	417 <i>l.</i> 0	0
Received—Donations at the dinner 4217	0	0
" For dinner-tickets	66	0
Gain by the dinner	683	0
	2509	0

Of this and other receipts 400*l.* were invested, 152*l.* were voted to distressed members, and 100*l.* remained at the banker's. The assertion of the writer that the philanthropic diners were provided with a banquet at little more than one-third of the cost price shows entire ignorance, or something much worse.

The sum voted to applicants seems small; but it may have been all that was necessary during that year, at which time only members of the fund could obtain relief. Since then, the Society, recognising the great assistance they were receiving from the outside public, have altered the rule, so as to allow the committee to relieve extreme cases of destitution on the part of deserving members of the press not contributors to the fund, their widows and orphans. The grants last year, partly in consequence of that change, amounted to 403*l.*

We repeat that the expenditure in the office of such a society must be viewed, not alone with reference to the sum distributed, but the sum collected; and in the case of the Newspaper Press Fund, it must not be forgotten that a permanent fund, amounting to 6,200*l.*, has been created available for the purposes of the charity. We shall by and by be glad to see its doors opened still wider, and have little doubt that this will gradually take place. We will only add that, after a careful examination, we feel tolerably well assured that, so far as the Newspaper Press Fund is concerned, the "journalist" who wrote in the *Pall Mall Gazette* has no occasion to feel "humiliated," except on the reflection that he has done very great injustice to what promises to be a valuable and important institution.

SCHOOL BOARDS.

Liverpool.—At a recent meeting of the Liverpool School Board, Mr. Stitt said that the school organisation and management committee had given serious consideration to the question as to the kind of schools to be erected by the Board. The same matter had occupied the attention of the London School Board, who had issued an elaborate report pointing out what they thought should be the character of the buildings. Mr. Robinson, the architect of the London School Board, had had the report under consideration, and was preparing instructions upon it to architects. The organisation and management committee had asked for a copy of those instructions, and it had arrived that morning, so that no time would be lost in the matter.

Covestry.—The first premiums for school plans having been awarded to Messrs. Parsons & Ellwood (motto, "Modus Operandi"); and the second to Messrs. C. Henman & W. Harrison, of Newcastle-upon-Tyne (motto, "System"), Messrs. Parsons & Ellwood wrote to the clerk stating that with reference to the terms upon which they should be disposed to carry out their design, they would be prepared to make the necessary working drawings, draw out the specifications, and procure the estimate, at a commission of 1½ per cent., and to superintend the erection of the buildings at a like percentage, making in all 3 per cent. upon the accepted tender. Messrs. Henman & Harrison said:—

"We hope that, should you decide to build schools from our designs, we may be entrusted with the preparation of the necessary working drawings and specifications for carrying the same into execution. We beg to point out (and we feel sure that you will agree with us) that the premium will not adequately remunerate us for preparing the drawings which you have chosen. It was in the hope of getting the superintendence of the buildings which induced us to prepare and submit them."

It was resolved, after some consideration, that Messrs. Parsons & Ellwood's offer be accepted, and that one of those gentlemen be requested to call upon the Board.

Ipswich.—At a recent meeting of this Board, some conversation took place on the subject of inviting competition for plans, and the chairman drew up an advertisement, which it was agreed should be inserted in the *Suffolk Chronicle* and *Ipswich Journal*, and that a copy of the advertisement should be sent to all the architects resident in the town within the knowledge of the Board. The Sites Committee for St. Margaret's

and St. Helen's District reported that, acting under the instructions of the Board, they had agreed to purchase nine allotments in the Argyll Estate, Woodbridge-road, covering an area of 49 rods 85 ft., for 425l. It was then mentioned that it was proposed that the schools built here should accommodate 250 boys, 200 girls, and 200 infants. It was agreed that the report should be received and adopted, and referred to the committee to complete the purchase. Some conversation took place as to whether the Board should wait till they had received plans for the Stoko Schools before they invited plans for these, but it was decided to advertise at once for plans. Mr. Fraser raised the point, as he had done with reference to the Stoko schools, of lighting the school buildings from the north; and after some conversation, in which Dr. Chevallier and Mr. Grimwade expressed their disapproval of a room which the sunshine never entered, it was decided that a suggestion should be made in the advertisement that architects should give their attention to the expediency of lighting from the roof facing the north.

Bridgewater.—The School Board have received tenders for the proposed new schools at East-over from builders who had been invited to furnish them. The highest estimate amounted to 2,500l., the next figure was 1,700l., and the other estimates amounted to 1,580l., 1,350l., 1,320l., and 1,290l. respectively. The plans were examined in detail, but the consideration of them was adjourned.

THE CONSTRUCTION OF BANKS FOR CANALS OR TANKS.

THE INSTITUTION OF CIVIL ENGINEERS.

ON March 12th, the paper read was "On the Sookkasa Canal of the Madras Irrigation and Canal Company," by Mr. J. H. Latham.

The object of this communication was to give a general description of the canal between Sookkasa and Cuddapah, recently constructed for irrigation and navigation by the Madras Irrigation and Canal Company; and to direct particular attention to the mode of safely constructing high banks for canals or tanks, illustrated by that work.

It was remarked that the countries possessing the greatest powers of production were those in which the yearly rainfall was concentrated into a few months. Settled warm weather was the safest for crops at every stage of their sprouting growth, and ripening; and, not only in England but in India, it was found that crops grown during uncertain weather, as all unripened crops must be, were nearly as often and as severely injured by rain or floods as by drought. To fully develop the productive powers of land three things were needed.—1st, settled weather, which art could not give nor control; 2nd, irrigation, which must be controlled by art; and, lastly, manure.

Of the native engineering works in the Madras Presidency those for the application of water to irrigate fields and gardens ranked the first, both in magnitude and importance. Of these there were three kinds, viz.—wells, tanks or reservoirs, and river channels. Of the latter full details were given, and it was remarked that, while the rebuilding of the Nellore anicut, since it was last carried away, was making progress, the Toombudra project, of which the Sookkasa canal was a portion, was adopted by the Government. This was designed to serve two purposes; first, the continuous irrigation throughout the year of three large areas, of which the principal lay in the Bellary district, the next in the Kooder Valley, and the other in the Nellore district. The second purpose, apparently necessary to the success of the first, was a means of communication by canals, by which the produce of those areas could be sent to a market more cheaply than by cart or railway, more expeditiously than by cart, and more securely than by railway.

The canal began at Sookkasa, with a weir across the river Toombudra, 1,500 yards in total length of clear overfall, which was broken into two lengths by an intervening island. The weir stood upon the rocky river-bed, and was formed of three patterns, viz.—(1st) of solid rubble masonry of gneiss, trap, and quartzite boulders; (2nd) of gravel concrete, with gneiss rubble facing in front and rear; (3rd) all recent portions were of solid gneiss rubble masonry, with a facing on the lower side of Kurnool limestone ashlar, which averaged ½ yard thick

where exposed to concussion. Patterns Nos. 1 and 2 had a front and rear batter of 1 in 8; while No. 3 had an upper batter of 1 in 4, and rear face vertical. All were 8 ft. broad at the top, and coped with dressed limestones 1 ft. thick. The mortar throughout was of Kurnool kunkur, except the joints of the coping, which were of Portland cement. The coping was joggled wherever the anicut (which was not straight, but followed the line of highest solid rock) was concave in plan on the upstream side. No part of the anicut formed on any of the above patterns, either with or without the coping, had ever failed. The height varied from 6 ft. to 26 ft., and averaged about 15 ft.; and the highest registered flood rose 7½ ft. over the crest.

Though the masonry works, and especially the weirs, contained a great variety of work, the chief interest and novelty in the construction of the canal was undoubtedly the mode of forming the banks. These ranged up to a height of 50 ft. from the ground surface of their site to the water-line. In all cases single banks were revetted or shingled on the inner slopes. The formation of the banks was various, comprising lengths of simple filling, of masonry wall, of masonry face-wall, of masonry revetment, of puddled bank, and of puddle-core bank, in different sections of the canal. The masonry wall, masonry revetment, and puddle-core bank came into the author's hands in 1865, as finished works; but had since been strengthened or raised. The strongest and best sections were the masonry face wall and the puddled bank, adopted after the experience of two seasons in the working of all kinds. The author estimated the efficiency of these as equal, that the choice between them might be a question of cost. The only objection to the face-wall was, that it could not be easily raised when once built. No portion of this face-wall had cracked, or shown any signs of weakness; nor, though unprotected in front by either plaster or puddle, was the leakage more than just sensible. The puddled slopes were even tighter than the face-wall, and had proved efficient even when the bank was of the worst kind of white and grey clay, mixed with salts of lime and soda, and such as to absorb water readily.

Some remarks were then offered as to the probable stability of a bank, composed of any soil thrown up without either selection or puddling, when first exposed to water; and the mode of meeting the two dangers, of slips and leaks, to which a bank was exposed, was described. The consideration of the problem, how to construct earthen dams, of a great height, which could neither slip nor be cut up by leaks, was discussed at some length; and it was remarked that, in practice, the best position for the puddle was on the flattest slope in front of the bank, where it should be protected by rubble, the larger and smoother the better, laid on sharp loose gravel impervious to vermin. The thickness of this protection must be so great, that it could not be wholly removed as the bank settled. Rubble packed, or very rough stone, as kunkur, was best avoided, as it would not follow the bank during settlement. The puddle would be the most dense part of the banks. Where used by the author, the surface of puddle under construction was always kept flooded, like a rice-field; and gangs of men, with their arms linked together, walked backwards and forwards on short lengths of it all day, treading it stiff, as layer after layer was added by the contractor's workmen. In order to insure the puddle remaining water-tight under all circumstances of original settlement, and of alternate wet and drought, it was desirable that it should rest on a substance rather more compressible than itself. To lay it to an ordinary rammed filling would be too violent a change, and it had always been laid by the author on a cushion of earth, moistened and rammed; each layer, of 6 in. or so, being well wetted, and then sprinkled with enough dry earth to prevent it sticking to the rammer, when punned with a rammer of 40 lb. weight. The rest of the front slope, if not already existing, had been made of earth rammed dry in the usual way; since it was found safest, indeed almost necessary, to establish the broad rule, that nothing but earth should be brought to the front of the centre line of the bank. The bank was then completed of any gravel or hard soil available, the gravel being kept at the bottom as much as possible, and the finest soil to the centre. Though such banks were not theoretically perfect, they had never failed, nor given trouble upon letting the water against

them. The lengths entirely constructed on these rules were insignificant, but about five miles of old bank had been faced with puddle laid on earth rammed moist.

HIGHBURY STATION.

A CONSIDERABLE amount of terra-cotta has been used at the new station of the North London Railway Co. at Highbury, now nearly completed from the designs of Mr. Horne. It was supplied by the Watcombe Terra Cotta Co., and is in the shape of medallions, small columns, and an elaborate frieze round the whole of the building, very well executed. The colour, red, contrasts at present somewhat strongly with the stonework of the rest of the façades, but a short time will bring these more into accord. The building includes the well-known "Cock" tavern, and will cost, we learn, about 17,000l. The looking-office, which is of considerable size, has a panelled wood ceiling. Messrs. Wicks, Bangs, & Co. are the contractors, and the stone carving has been well executed by Messrs. Farmer & Brindley.

CANDELABRA FOR KING'S COLLEGE CHAPEL, CAMBRIDGE.

UNDER the direction of Mr. G. G. Scott, jun., M.A., architect, Mr. Barkentin, goldsmith, has just now completed two brass candelabra for King's College Chapel, of unusual size. They are 13 ft. in height, are supported on lions and stand upon plinths of black marble. Each standard carries in the centre one great taper, 3 ft. in height, and six smaller ones round, on (vine) branches. A small shield on each standard admits some work in enamel. The style adopted is that of the period of the chapel, but it is, to a certain extent, German in feeling rather than English. The work has been executed, with praiseworthy care, at the cost of 550l.

ST. HELEN'S TOWN HALL COMPETITION.

SIX competitors have sent in seven designs, respectively marked "Truth 1," "Truth 2," "Respice Finem," "Justice," "Tenuanda Via Est," "Utility," and with a device of three circles. A local correspondent points to the last-named as much superior in internal arrangement to the others. The majority have ill-lighted corridors, and are deficient in the means of entrance and departure.

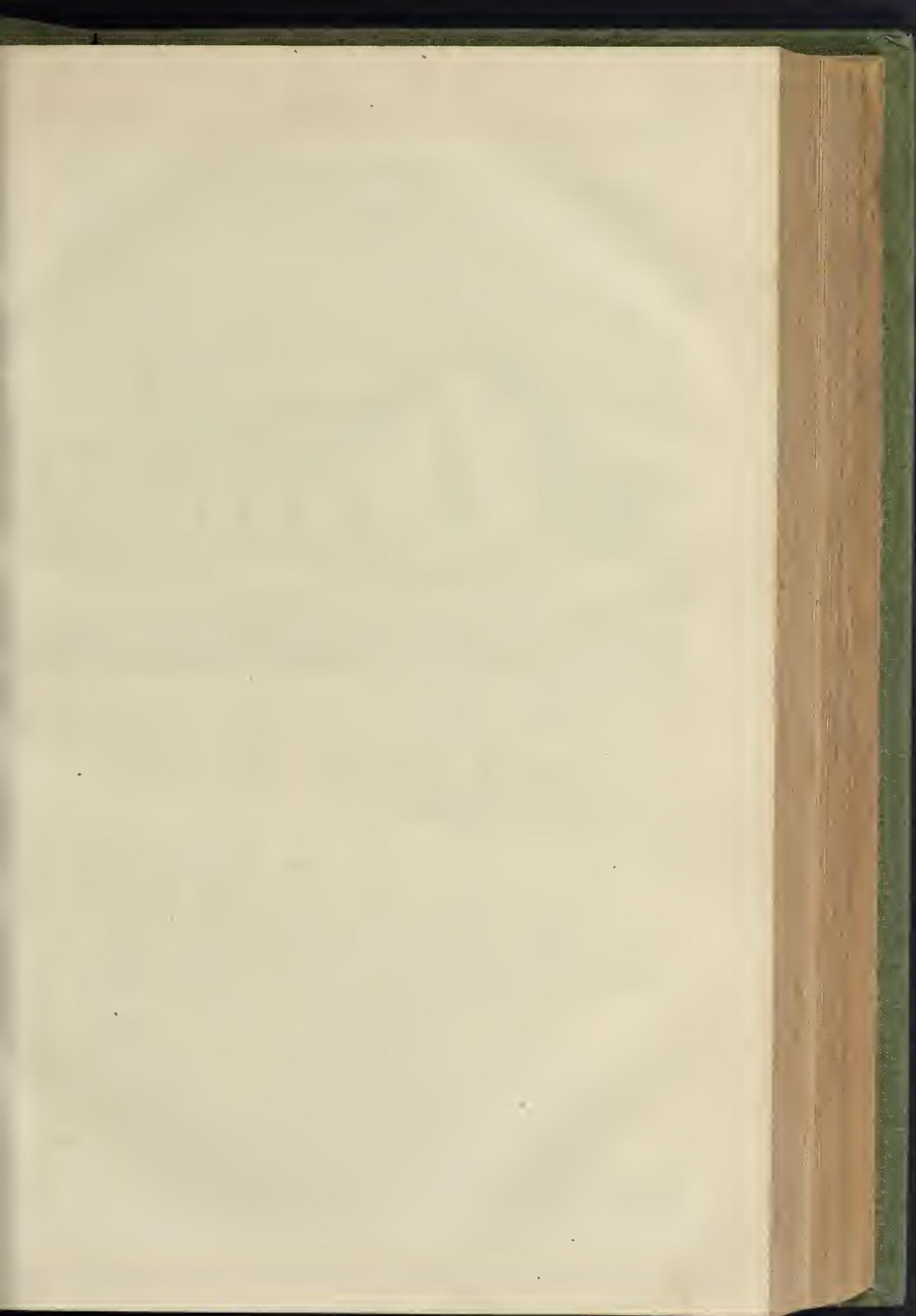
PAINT IN LONDON.

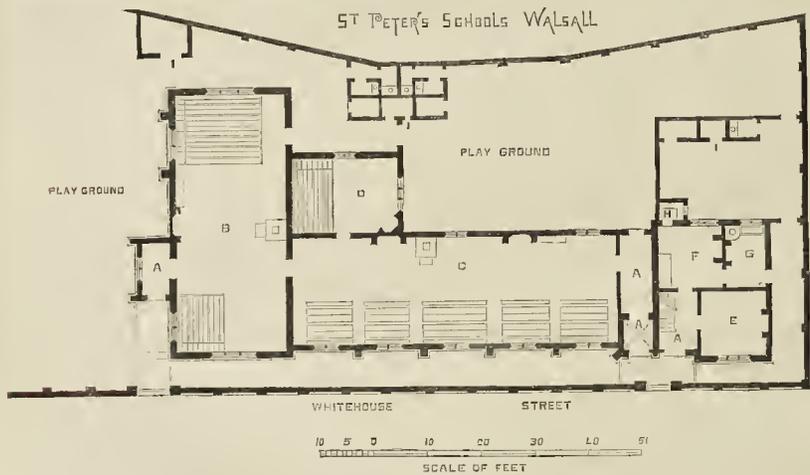
Sir,—Will some of your correspondents explain the cause of the light-coloured paint work in London during the past few years after two years' wear, turning in places dark grey, with a metallic appearance? My own opinion favours the belief that it arises from inferior white lead.

GASSETTER.

THE WORKS AT PUTNEY-BRIDGE.

THE Thames Conservancy Commissioners having called the attention of the proprietors to the obstruction caused to the navigation of the river by this bridge, it was arranged that application should be made to Parliament for powers to alter and amend the structure so as to afford increased width and height to the waterway. These powers were obtained in 1870, and designs were at once prepared; the work has since been carried out, and is now, with unimportant exceptions, completed. The alteration comprises the removal of several of the old piers, and sinking in lieu of them two pairs of cast-iron cylinders, 5 ft. 6 in. diameter, with granite caps supporting wrought-iron truss girders, with a clear span of 70 ft., and two side openings, giving a total waterway in the middle of 138 ft., and an additional height in the centre of 3 ft. 6 in. The roadway is formed with a concrete of broken granite bedded in asphalt, supported on buckled plates riveted to the cross girders. The traffic over the bridge was never suspended, a temporary roadway having been formed while the cross girders were being fixed. This has now been removed, and the permanent roadway is open for carriages and foot passengers. The works have been ably carried out by Mr. Walter Scott, of Newcastle, aided by Mr. John Nichol, under the superintendence of Messrs. Wadmore & Baker, of Great St. Helen's in conjunction with Mr. John Mair, C.E., of Newcastle.





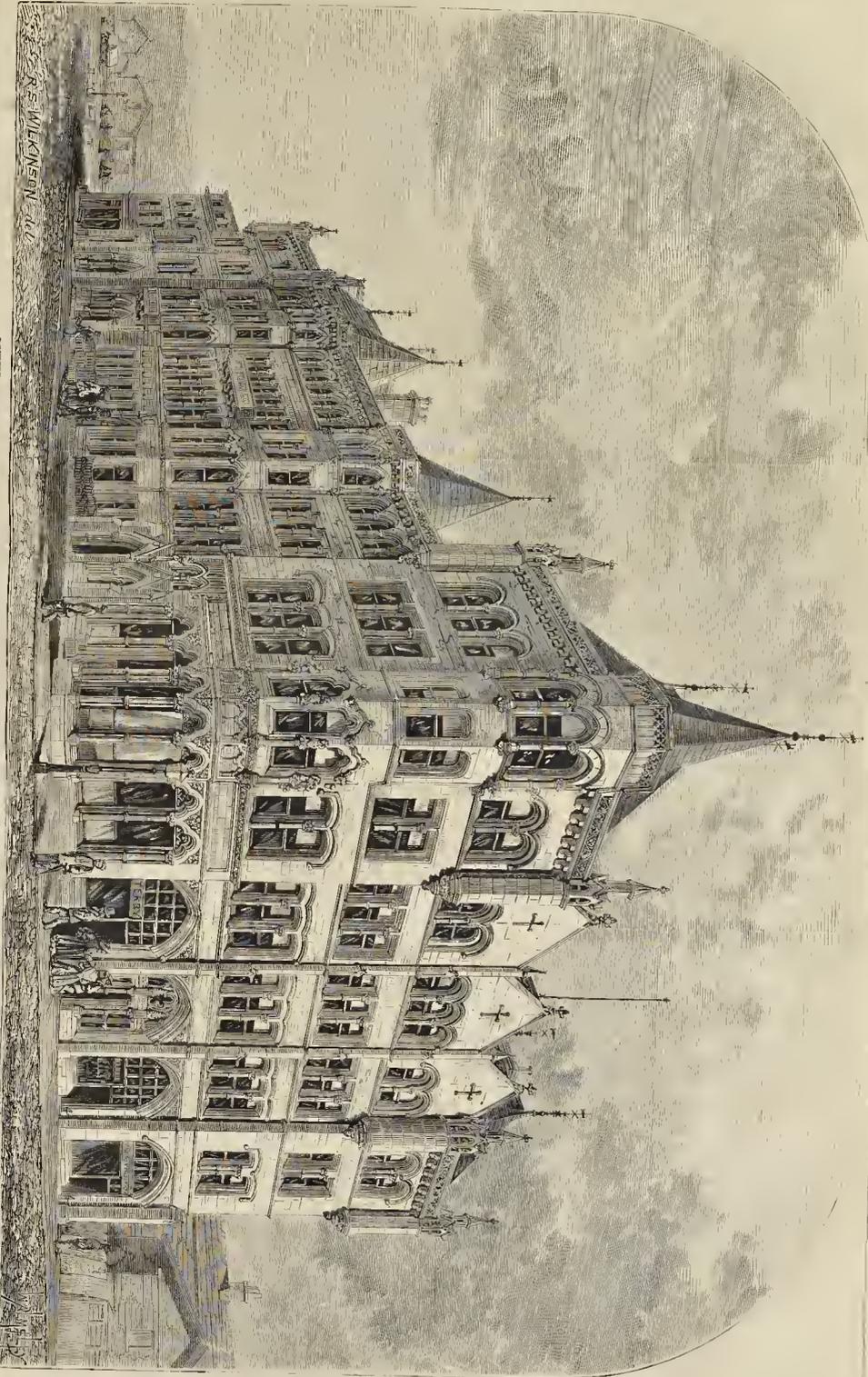
A. Porches and Lavatories.
 B. Infants' School,
 C. Girls' School.

D. Class-room.
 E. Parlour.
 F. Kitchen.

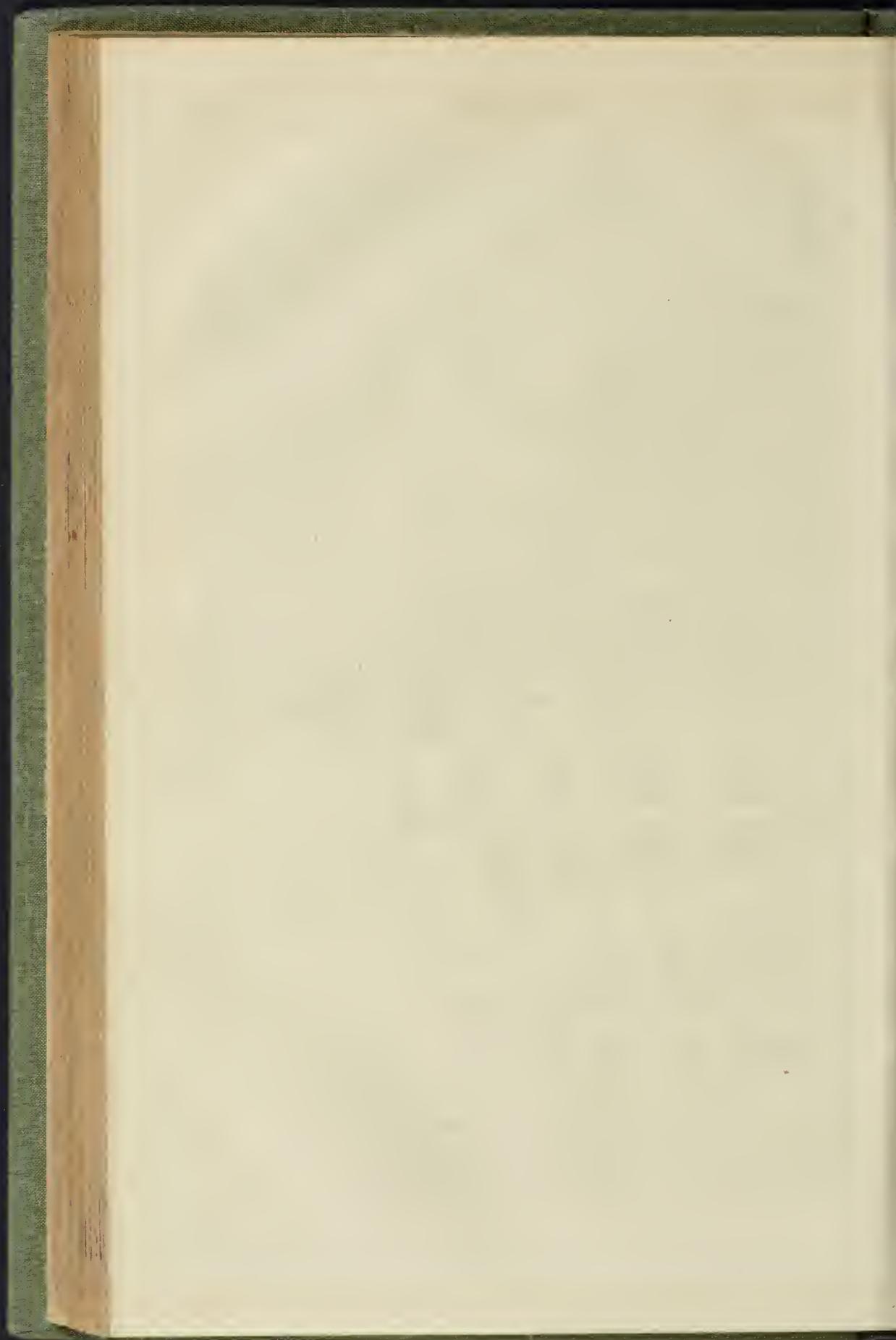
G. Scullery.
 H. Pantry.
 I. Out-offices.

ST. PETER'S NEW SCHOOLS, WALSALL.—MR. R. CHAMBERLAIN, ARCHITECT.

THESE schools, recently erected, occupy a commanding position, and have a pleasing appearance. They will accommodate 270 girls and infants; they are built of red bricks, with blue brick bands, and Hollington stone dressings. The roofs are open-timbered and covered with slates, and provision is made for ventilation. The total cost exceeded 1,300l. Mr. Adkins was the builder; the stonemason's work was done by Mr. Hanks; Mr. Kendrick was manager in charge; and the architect was Mr. R. Chamberlain,—all of Walsall.



NEW ESTATE OFFICE BUILDINGS, HUDDERSFIELD.—MR. W. H. ROSSLAND, ARCHT.



NEW ESTATE OFFICE BUILDINGS,
HUDDERSFIELD.

Our engraving represents a new block of buildings just completed for Sir John W. Ramsden, bart. In the central portion towards Railway-street are placed the Ramsden Estate Offices. The Westgate front over shops is wholly occupied by the Huddersfield Club, which, together with the central shop (converted into the Club vestibule and entrance-hall), is fitted up in an elaborate manner.

The remainder of the building is used as offices and warehouses, and the cost of the whole is about 35,000*l*. The work has been executed principally by local contractors, from the designs of Mr. W. H. Crossland, of London, who is also the architect for another large block of buildings adjoining, and now in course of erection.

A WORKMAN'S COGITATIONS ON
DOMES.

This is a vexed subject, I must admit, and I have often kept myself awake half the night in striving to think out some new and practical plan of dome construction.

The result, I am sorry to say, has not been a success. I have seen in my experience some very fine domes in appearance, constructed with great ingenuity, but every one of them looked better at a distance than near. Some were of timber and brick, some were partly of stone, and others of the three combined. I have long since got into my head that a cupola is not a *bona fide* dome, no matter what the Italian may be for it,* and I also believe that a man may construct a very good cupola and a very bad dome.

Some considerable analytical formulae have been given from time to time in the *Builder*, by architects and mathematical scholars, rather than by those whose interest I speak; but, sufficient for me to understand what the writers aimed at.

After all, I must say that true dome construction is hardly universal yet in this country, and true domes are not constructed from the mechanical and other difficulties attendant. Some of these difficulties arise from lack of technical education, others from the material, and not the least is in matter of experience, and the fear that if the big baby were left alone, its "understandings" would not be able to support its weighty body. There are but few of us who have not in the course of our lives witnessed unwieldy little children with howlers: well, like these poor little ones, so are most of our domes, for both have generally the "rickets." None but those architecturally informed, or belonging to the building profession, are aware of the many expedients that have been adopted in former days, and in recent times, to keep domes from collapsing; in fact, dropping in, or dropping down, like a house of cards. As the bow-legged child is hound, braced, and bandaged with "splints," so are many of our domes by a variety of contrivances not necessary to mention in a particular manner.

This is not at all clearing at this age of the world. I hope some members of the Institute of Architects will give us proper "lines," that our craftsmen may be able to put the "baby" firmly on its feet, and so that it may stand alone a thing of strength and proportion, and a thing of beauty.

Without running too cursorily over the subject, I take note that the theory of the equilibrium of domes has been said to be somewhat similar to that of the equilibrium of arches; but I have never sufficiently mastered the whole of the laws of the divergence; nor has it been made manifest to me where this divergence begins and ends. I have been told to consider this, and also about planes passing perpendicularly through an axis at a small angle to each other,—say, for shortness, a series of balanced arches,—connected at the crown, each of which would preserve its equilibrium if standing alone (but, in sooth, would not as at present constructed). Is the equilibrium in the dome really maintained by having the weight of each upper part of each series of companion arches or supported arches greater than what would be required to preserve the equilibrium of a balanced arch standing by itself? Viewing the circular courses of the stone, and taking them as voussoirs, do

the whole series exert a uniform lateral pressure on those on either side of it, and is their tendency to fall inwards, exactly of the same nature as the tendency of the stones of the regular arch which are locked tighter by the action of the same laws? From my deductions I think the principles that govern dome and arch construction differ much; but I am, I must confess, unable to explain them technically. The equilibrium of the common arch is insured by a different method. Putting aside the question of friction, the weight of the voussoirs composing the crown is brought up to a defined limit, neither greater nor less; but I believe it is admitted as a principle or theory that the equilibrium of the dome to be maintained must lie in the difference alluded to,—viz., when the upper portion of each circle or series of arches exceeds this limit, presupposing that the dome is composed of the series of arches already mentioned. I must say I would rather be quit of all these suppositions. They are extremely interesting, I have no doubt, as a theory, but in practice there is a mortal terror to be endured by both architect, builder, and workmen, and certain contingencies have to be provided for.

Now I have other notions in my head about domes,—I mean perfect domes;—and they are these:—Domes proper ought, in my opinion, to swell out at a certain defined height considerably beyond the circle of their base; in fact, like columns, they should have an unmistakable entasis, regulated according to the height they are from the ground, and proportionate with their dimensions. I would say that this entasis is necessary for the purpose of preserving their true and well-defined donical profile from being absorbed by the distance they are, or may be, from the eye. If we admit this entasis as a necessity in a very large and very high dome, then as a constructional idea we must imagine two series of converging concentric courses or circles of stone, descending and ascending from the mid point of the entasis on the dome.

In cutting the stone for such courses, there would need to be beforehand a very correct plan, and setting out; but I will not touch the subject of equilibrium in relation, as it is beyond my analytical powers. My readers must bear in mind that I am speaking now of solid and geometrical planning and stone-cutting in view of a solid dome of masonry, with no advantageous backing, bracing, or hidden expedient, to keep body and soul together from parting in this life.

As I am allowed, like others, to suppose a good deal about the theory of dome construction, that may not be absolutely capable of a practical working in all details, I will ask my readers to suppose something with me. Well, then, let us imagine the existence of an enormous block of stone a perfect cone in shape, and that out of this geometrically shaped boulder, it is desired to evolve a dome. To give room for the full play of intellect, let us say the cone is sufficient to allow for the cutting of a dome of the size of that of St. Paul's.

Here now we have a perfectly geometrical figure and basis for our starting-point, and what can geometers do for us in sweeping a number of curvilinear or spiral lines, so to speak, from the base of the cone to the required height of the dome within the cone? I apprehend there would be something useful evolved in the theory or practice of stone-cutting in working out this problem. There are many other questions which suggest themselves here on this head, but they are too minute. My reason for taking up the figure of a cone as a basis to work out some ideas about dome-construction, is simply to find room at once for the whole application of the conic sections for those who are capable of applying them for the production of a dome.

Now I will once more suppose that the dome is evolved from the huge cone, and the latter stands alone perfect in its outline, forming one of sufficient thickness to be utilised as a body,—say for a spire. Within the figure of the cone we have now a beautiful donical vault, or, perhaps, properly speaking of it as a concavity, a cupola. What then? The core of the dome proper has yet to be cut out, to give us the inside contour; and were it possible to place the huge body of stone, or imagine it placed, in a lathe, the turner could give half a dozen smaller domes, without all bothering his brain about the intersecting of lines and curves in the art of stone-cutting. As stones, however, have to be worked in series, and not as one body, we are perforce necessitated to consider them as atoms of defined shapes, and

deal with them in construction as best we may. So I will leave the further cogitation upon this part of the subject to others more competent than I am to deduce something now which I think is quite probable or possible. Only I fear lengthening out my notions beyond discreet limits, I would ask the reader to suppose other stand-points for building up some more ideas on dome construction. Here is one. Suppose we cut off the crown of a dome—mentally will do for the moment,—and imagine its inside space a well-hole, what is to prevent us in constructing all its courses of stone on the spiral or geometrical stair principle,—one winding on the back of another to the topmost ring, platform, or table? or could we not run the courses similar to the winding courses of an oblique arch, as it would appear if thrown up on its haunches? If possible or practical in stone, of course this would be a very expensive method; but it is the possibility of new constructions, not the expense, we are now considering. Would not each winding course, from top to bottom of this donical heft, taken as a whole, be a sort of elongated key-stone voussoir reversed? yet still developing as a natural law of its donical shape, an inward curve and splay locking the whole fabric together beyond a fear of collapse. Of course, the joggle or rebating, or other method of keying stone to stone, might be adopted for the greater security in connexion, to counteract a tendency to expansion or settlement in any shape.

In relation to the winding in the courses of masonry, each course might be made to wind only once, or make one complete revolution spirally, or as many as were desired. I believe it is admitted that a geometrical or spiral stair starting on a proper basis can be carried to any height, and still preserve its equilibrium. Is it, then, impossible to adapt the principle to the construction of a dome with complete safety? If it were required to run a stair spirally within or without any of our present domes, there is no difficulty in the way of its execution. Why should there be any in relation to the similar construction of the dome?

Without diagrams it would be impossible to convince many what might or might not be done, so I pass to another part of the subject.

Messieurs Engineers and others, a word with you. As a body you have given us a number of hideously ugly iron constructions, but a few of your profession have redeemed their order by giving us some noble iron bridges, which stand forth here and there in the island like beacon lights of hope. Can you, messieurs, do anything for us in the way of dome construction in iron? I do not mean in architectural composition, but in constructional exactitude. Do you think that a dome that can stand on its own legs, a thing of strength, not outraging Euclid or causing Archimedes to jump from his grave, is a work within your mental and constructional grasp? It ought to be, judging you by your own standards.

Presupposing that an anti-oxidative for iron were discovered at last capable of meeting all requirements, I believe that a good iron dome, cast-iron if you will, or "half-and-half," is quite possible, even of the dimensions of St. Paul's. It would be, perhaps, presumption on my part to point out the way it might be constructed; for, indeed, admitting the possibility of construction, the proper method would be a matter of professional opinion. Well, as a first instance, imagine a series of concentric circles of framed iron panelling, converging upwards every circle of bays in the entire circumference of the dome, distinct in itself, yet detachable one bay from another,—one series of bays placed on another, the top bolted to the under one, and so on. Two forms of construction could be adopted in the putting of the work together. A complete circle of bays could go together, and be lifted into its place; or the curvilinear upright sweep of converging bays or panels forming one complete piece of ribbed panelling from base to apex. This is the faint outline: the details could be worked in a variety of ways. The interior edges of the ribs could be cast or worked plain if it was thought advisable, in the first instance, and bronzed or gilt facings screwed on afterwards, worked to any form of tracery or finish. The ornamentation is a matter that has nothing to do with the safety of the construction, which I am speaking about. I have been supposing that a dome could be safely constructed of iron, and I believe one could be constructed, light and graceful in appearance, geometrically exact, architecturally beautiful, and successful as an engineering performance.

* The term "cupola" (from *cupa*, hollow) strictly speaking, applies only to the inside or ceiling part of a dome.—Ed.

In the matter of a large lantern, with hall, and cross at the top, like St. Paul's, this requirement would, in my opinion, if it had to be provided, only give the greater chance of successful construction. The ribbed, or perhaps the flying buttress principle under cover could be adopted here. The engineer would not care much for outraging style or pressing Gothic and Classic, Oriental and outlandish together so as it suited his ends, but the architect would pause and hesitate.

A few words more about dome construction. In these days of cheapness and innovation, did any one, I wonder, ever hethink himself of constructing a dome of concrete? Within certain limits it is of course possible; exceeding these limits the construction would require to be of a composite character.

A composite dome, I believe, could be constructed by casting hollow hoops of metal of sufficient thickness, representing the size of the different stones, and, as the work was put together, filling the inside with concrete, not singly, but filling several courses at the one time, so that the continuous bond might be preserved, and the whole body of work rendered more compact. A timber dome, well planned and well fitted together, inclusive of its covering, though a clever piece of handicraft, is not any extraordinary feat in constructive carpentry. Yet we have not many of them that are framed or covered well. Generally a great loss of time and a great destruction of material result from an imperfect knowledge of setting out the work and cutting the timber.

Such are my cogitations, Mr. *Builder*, and if you can detect any grains of reproductive seed in what may be designated by some much "claff," for sake of the principles involved and my love of the profession, let the matter see the light. Ere now a grain of productive corn has been extracted from within the swathing of an Egyptian mummy, more than 2,000 years in darkness. Domes are as old, and yet we are in some darkness concerning them. Let us think inwards and look onwards, and grope less among dead men's bones upon the Appian Way.

A CRAFTSMAN.

THE ANTIQUITIES OF BEWCASTLE, IN CUMBERLAND.*

In his introductory remarks the lecturer expressed a hope that he might be bringing under their notice a place which, while it really had a long and considerable history, was very little known and hardly ever visited. If, however, Bewcastle was known to any among his hearers, it would probably be because of the Runic monument in the churchyard, which was of course by far the most wonderful thing there, and was famous among those who had made Runes their study; but it was not the only interesting thing there. Although the inscription had been read, he had not seen much attention called to the historical value of the writing. He should pay most regard to that point, and should use it as a sort of text for a brief discourse upon the early history of the county of Cumberland. Tracing the present boundary between England and Scotland eastwards from the head of the Solway Firth, it ran first along the little river Sark, and then was continued along the river Liddle, one of the tributaries of the Esk, to the western end of the Cheviot hills, which it followed until it reached the coast. The line of division between Northumberland and Cumberland met that division about half-way, and made with it two angles; on the Northumberland side an obtuse angle, and on the Cumberland side an acute angle, in the point of which Bewcastle stood, so that it had been a border place throughout its history. The scenery of the surrounding country was not without beauty, but it was the beauty of solitude and desolation, the land being now so silent that it was hard to believe it was once busy with active life, and that the loneliness of its hills was disturbed by the tramp of marching armies and the wild scenes of border warfare, at a time when venerable Oxford was but a watery waste.

At Bewcastle, unlike most ruins, things had been left to themselves since the castle was more or less destroyed by the Parliamentary troops. What was once a strong Roman station, one of the outposts of the empire, is now marked by a grass-grown rampart and a few mounds; what

was probably a royal city has now shrunk to less than half a dozen houses; the castle is now only four mighty walls, without a trace of moulding or ornament, built evidently for strength alone, and built so well that one huge fragment which had fallen down, lay in the most entire piece of masonry. The churchyard is full of graves, almost every one having a headstone enriched with the armorial bearings of forgotten families; and there, too, is the famous Runic monument, standing as a solitary witness of departed civilisation. The Roman station had been placed on a low and irregularly-shaped eminence, and occupied an extremely strong position. The sides were steep all round, especially on the south, which arose abruptly from the little river called the Kirk-heck, i.e., the Church-brook, which ran into the Lyne—a tributary of the Esk. The station was four-sided in shape, and covered an area of six acres. On the north side there were traces of ramparts, which formed probably an outpost. Upon the eastern half of the station stood the church and parsonage, the castle, and a farm called the Manor House; on the south-east the land was washed away by the Kirk-heck. It was quite easy to trace the Via Principalis running across from east to west, and on both sides a break in the Vallum, with two round mounds on each side, probably guard-houses for the defence of the gates. The Porta Decumana on the north, and the Porta Hadriana on the south, were not apparent; the Manor House seemed to be built over the Pretorian Gate. At the north-west corner of the churchyard the foundations of a considerable building were visible, which might be those of the Pretorium or general's head-quarters. The clergyman at the parsonage had a small collection of coins and other things which had been turned up there; one piece of ware had stamped upon it, "Martini M.," i.e., that it was made by the hand "Mann," i.e., of the potter Martinus. Several altars had also been found. The relics which struck him most were the querns, which at Bewcastle seemed quite plentiful.

The Romans must first have visited Bewcastle under Agricola, who commanded here from 78 to 84. Under him they conquered the Isle of Anglesey a second time, pushed on northwards through Lancashire, Westmoreland, Cumberland, and the Lowlands of Scotland, and reached the isthmus between the firths of Forth and Clyde, where Agricola built a line of forts designed as a protection from the savage tribes beyond. Though Agricola gained a great victory over the Caledonians at the Grampian mountains, it had no lasting result, and the Romans never made any permanent conquests beyond the line of forts. Before 79 or 80, when the Romans visited Bewcastle, it might have been one of the strongholds of the Britons, and would therefore be fortified by the Romans to secure it. On the withdrawal of Agricola the Northern barbarians became so troubled as to bring about a less than thirty years such a state of anarchy as required the presence of the Emperor Hadrian, who drove back the Britons, and drew a vallum, i.e., a dyke and rampart across the island, from the mouth of the Tyne to the Solway Firth, to protect the country south of it. Bewcastle, however, lay north of Hadrian's dyke, and did not partake of its protection. The submission of the tribes to Hadrian was only transitory, for in the reign of his successor, Antoninus Pius, the northern district was again a prey to their incursions. To guard against this a rampart of turf was constructed along the line of Agricola's forts, now known as Graham's dyke. From the time of Severus until the victories of Theodosius the elder, the country between the two dykes was entirely abandoned to the natives for upwards of 150 years. Theodosius once again subdued it and gave it the name of Valentia, in honour of the Emperor Valentinian, in honour of whom he was withdrawn in 383, and never returned, and the province of Valentia, the land between the walls of Antoninus and Severus, were finally lost to the Romans. In 410, Honorius, the Emperor of the West, wrote to the State of Britain "to provide for their own defence," which brought them to the end of the first period of the history.

The Runic monument was the memorial of the next age. Mr. Nanson said he was not going to enter into the Pictish question, but would be content to suppose the people who occupied Bewcastle after its evacuation by the Romans were the same who were known later as the Picts. The question seemed a sort of ethnological hodgepodge, which most antiquaries and historians, unless they were fired with the zeal of Mr. Jonathan Oldback and his knightly antagonist, were con-

tent to leave alone. By these non-Romanised Britons was founded the kingdom of Strathclyde or Cumbria. It was an independent Celtic kingdom, and for some time sustained the honour of the British name in the North of England. The Cumbrian Britons were not an unmixed people, for there must have been amongst them a considerable number of Picts and Scots. The kingdom included three great principalities, named by Sir Francis Palgrave as follows:—1, Reged may perhaps be placed in the forests of the south of Scotland; 2, Strathclyde may be traced in Clydesdale, and the local name ought to have been confined to that region, but being the seat of the "Toyrn," to whom the other British kingdoms of the north were subject, the same appellation was easily extended beyond its proper boundary; 3, the Terra Cumbrorum, which included the modern country of Cumberland, together with its appendages, or dismembersments of Lancashire and Westmoreland, the principalities of which may be traced as the principality or kingdom of Westmore. Bewcastle would belong to the last division.

Speaking of the Runic monument, Mr. Nanson said he should follow Mr. Maughan's translation of the Runes. It was fixed upright in a stone pedestal, above which it rose to the height of 1½ feet, though it must once have been higher, there evidently having been a cross at the top. It was covered all over with sculpture in low relief, exceedingly well done. The ornament consisted of a vine twining up one entire side in exquisite curves, and on the branches were perched birds and squirrels eating the fruit. Two of the sides were sculptured with vines, and the wonderful and beautiful knots which were so favourite an ornament at that early period; there was also a large space filled like a chess-board with chequered diaper. The remaining side contained three figures and the principal parts of the inscription. The top figure was that of a man holding what appeared to be a lamb in his arms, which has been supposed to be St. John the Baptist carrying in his arms the Agnus Dei. Below were the words "Jesus Christus," and under them a figure in priestly robes, with a glory encircling the head, and the hand raised in the act of blessing. Below the figure of our Saviour was most of the writing, and at the bottom of the pillar a man standing sideways with a hawk on his wrist, supposed to be King Alfrith. The inscription was translated as follows:—"Hwætset, Wæthgar, and Alfrith set up this thin beacon in memory of Alfrith, a King, and son of Oswin; pray for them," or either "for them, their sons, their sons," or as some say, "for his soul's great sin." So that if the translation be right, it must be to mark the burial-place of Alfrith or Alfrid, king of Northumbria. Returning to the history of Northumberland, Mr. Nanson related the circumstances under which Penda, the son of Penda, was converted to Christianity by Alfrith, leading to the Christianising of Mercia; so that the hero of the Runic cross at Bewcastle might have been the means of sending Christianity into parts of England not far from Oxford.

SUB-MARINE TUNNELS.

Sir,—When I sent the few particulars relating to the Norwich works to the *Builder*, I had not any idea of entering into a controversy on the subject of the Channel tunnel; but, as "A Practical Engineer" puts certain questions, it is only not to employ to them. Duplicate engines were right to employ, because the sumps were placed at tolerably short distances apart, so that if any one engine or pump failed, it was assisted by those right and left of it; and, from the streets of the old city being very narrow, it was quite difficult enough to find space to place even one engine. At one important point we had three engines and pump together. Of course, where the pumping machinery, as in the Channel tunnel, would be about eleven miles apart, it would be absolutely necessary to have at least duplicate machinery.

With regard to the other question, "Did he keep the brickwork well up to the face of the mining?" the rule was, that when the miners had completed a 10 ft. or 12 ft. length, the bricklayers went in and put in their work; and were again succeeded by the miners. This was done unless any special circumstances prevented its being followed.

"The Secretary of the Company" states "that there are already some hundreds of miles of tunnels (colliery and lead-mine workings) under

* From a paper read at a meeting of the Oxford Architectural and Historical Society, on March 6th, by Mr. W. Nanson, Trinity College.

the sea." I much doubt this, and shall be obliged if he will name a few of the details, as I am much interested in the subject, and believe it will puzzle him to specify even ten miles. Moreover, the strata in which minerals are found consist of rocks and shales, either upper or lower; in fact, the metalliferous rocks have even allowed workings to be carried up to within a few feet of the bed of the sea; and in one place, in the Botalick mine, the miners actually broke through the roof of the heading into the sea, and the opening is now only stopped with oakum and a wooden wedge. Imagine this in lower chalk!

ALFRED W. MORANT.

COLOUR ON THE EYES OF GREEK SCULPTURE.

SIR,—May I be allowed to make a remark on your correspondent "Nemo's" letter of last week? While I am thoroughly desirous to agree that the "exquisite instinct of the Greeks" did eventually lead them to discard colour in sculpture, yet the "uniform blankness of the eye," which your correspondent claims for that taste, is not borne out by facts. In the Scleritine marbles at Palermo, black is distinctly traceable on the pupil of the eyes of the Medusa in the group of "Perseus and Medusa." A second instance is found in the Æginetan marbles in the Glyptothek in Munich, which bear traces of colour on the eyes, but *none on the flesh*. And, thirdly, in that splendid portrait relief from Marathon, of "Aristion," now in the Temple of Theseus at Athens, there is, if I remember rightly, distinct colour on the eyes, as well as in most parts of the dress and armour. I omit other more questionable instances. The three which I have quoted are enough to show that the instinct of the Greek did not uniformly restrain him from colouring the eyes of his statue.

G. S. DAVIES.

BELLS.

THE "Bell Catalogue," a trade-book just now issued by Messrs. Warner & Sons, of Cripplegate, contains information as to the cost of bells of various sizes and descriptions, which many will be glad to have. It includes also a long list of inscriptions for bells. It may be worth noting that the approximate cost of a peal of five bells and fixing, complete, is 290*l.*; of six bells, 500*l.*; and a peal of eight bells, 700*l.*

PROJECTIONS BEFORE THE GENERAL LINE OF BUILDINGS.

At the Westminster Police-court, before Mr. E. H. Woohy, an adjourned summons was heard upon a question of considerable importance affecting buildings in the metropolis as controlled by the certificate of the superintending architect of the Metropolitan Board of Works.

The complaint was preferred by the Vestry of Chelsea against Mr. Aldridge, the owner of the house, No. 27, Smith-street, in that parish, for having erected a lavatory which, it was alleged, formed a projection beyond the general line of buildings of Smith's-terrace.

Mr. Reeves, of the firm of Messrs. Pemberton & Reeves, appeared for the Vestry; and Mr. Brewer, from Messrs. Baxter, Rose, Norton, & Co., the solicitors for the Governors of the Hospital for Consumption, Brompton (who occupied the house as a home for patients), for the defendant.

Considerable legal discussion took place, particularly as there appeared to be a conflict of decisions in the Courts of Queen's Bench and Common Pleas, as to whether the magistrate was bound by the certificate of the superintending architect without the power of exercising any discretion on his own part.

His Worship decided in favour of the defendant, and dismissed the summons on the ground,—

1. That he considered he had a discretion, and was not conclusively bound by the architect's certificate.
2. That it would operate most injuriously if parties, who might innocently erect expensive buildings, were afterwards met by a certificate of a line of building of which they previously knew nothing, and were obliged to demolish their buildings.
3. That in the present case the architect's line was irrelevant to the question, it being a line for the houses in Smith-terrace, which were a considerable distance in the rear of the house in Smith-street, and which line, if projected to Smith-street, would cut off not only the entirety of No. 27, but one-half of the house next door. It appeared that the offending building did

not project so far as an existing ancient part of the house, in that it had been erected with the knowledge of the local surveyor, who at last simply complained of its height.

The magistrate expressed a strong view that it would be a very harsh application of the Act to authorise the demolition of the erection complained of. But on the application of Mr. Reeves, for the Vestry, he consented to grant a case, if it were desired to take the opinion of one of the superior courts.

In the Equity Courts, before Vice-Chancellor Sir R. Malins, an injunction has been granted in the case of Lord Auckland v. The Westminster District Board of Works. This was on a motion to restrain the defendants from taking any proceedings for the purpose of compelling the plaintiff, his builder, or any person employed by him, to abstain from erecting buildings upon so much of the site of Nos. 1, 2, and 3, Buckingham-row, Westminster, as was outside the line decided by Mr. Vallentyne, the superintending architect of the Board, to be the general line of buildings in York-place. In November, 1870, the Metropolitan Railway offered for sale, by auction, a part of their surplus lands in Westminster, and Lord Auckland, who had a house in Queen's-square, purchased, for the erection of stables, a lot on the south side of Buckingham-row, containing 2,560 superficial square feet. When taken by the railway, the plot formed the site of three houses with front gardens at the corner of York-place, but the houses had been pulled down, and the site was sold to the plaintiff for 880*l.* as building ground. The plans for the stables were submitted to the District Board; and, after considerable delay, they, having communicated with the Metropolitan Board on the subject, informed Lord Auckland that he could not be allowed to build beyond the general line of buildings in York-place; a decision which, according to the plaintiff's statement, rendered the land worthless for the purpose for which he had purchased it.

The Vice-Chancellor said he could not allow the Board to deprive the plaintiff of the benefit of his purchase without giving him compensation, and therefore granted the injunction.

CATHEDRAL OF PADERBORN.

MONSIEUR TRÈS-HONORÉ CONFRÈRE,—Veuillez vous m'ouvrir les colonnes de votre estimable *Bailler*, pour une petite rectification au sujet de la Cathédrale de Paderborn que Mr. H. W. Brewer m'accuse, dans votre numéro du 16 Mars, de classer dans les églises rondes et de confondre avec le dôme d'Aix-la-Chapelle.

Voici ce que je dis de la Cathédrale de Paderborn, dont je n'indique nullement la forme, mais que j'achasse seulement, sur l'autorité de Wiebeking (Architecture théorique, au Munich, t. v., in-4°, 1829), dans la partie de mon travail consacré aux Églises, dans la construction desquelles le souvenir du Saint-Sépulchre de Jérusalem exerça une certaine influence:—

"La Dom ou Cathédrale de Paderborn (Prusse) dut sa première fondation à Charlemagne, qui la fit ériger d'après des sources de la Pader, après le fameux diète tenu en cette endroit vers 777, et où ce prince reçut le serment de fidélité des Saxons; mais, suivant Wiebeking, l'évêque Mainwerk le fit reconstruire, au commencement du XI^e siècle, sur le modèle de l'église de Saint-Sépulchre de Jérusalem. Cette cathédrale, plusieurs fois incendiée de 1057 à 1138, fut réparée et agrandie de 1134 à 1243, grâce surtout aux soins des évêques Berard et (Elsin), et conserve encore des parties de l'église d'antique de l'évêque Mainwerk."

Voilà, je vous prie, tenir l'exemplaire qui accompagne cette lettre à la disposition de Mr. Brewer, en remerciement de la liste des principales églises rondes ou polygonales d'Allemagne qu'il indique, et dont je ferai mon profit pour le compliment de mon travail.

En vous présentant, Monsieur et très-honoré Confrère, tous les affectueux respects de votre tout dévoué,

CH. LUCAS.

A TECHNICAL COLLEGE FOR GLASGOW.

The proposal to found a Technical College in Glasgow has originated in the belief that no city in the empire stands more in need of such an institution, or will derive from it greater and more immediate benefits.

The object of the promoters is to provide such a system of technical education as shall embrace scientific instruction in the theory, and as far as possible in the practice, of the various great industries of the city, so that the manufacturers, managers, and overlookers by whom such industries are conducted may be thoroughly acquainted with the principles of science upon which they are based.

It is proposed that the Technical College of Glasgow shall be in unison with Anderson's University, the Mechanics Institution, and the School of Art, and Italian Academy,—institutions which already embrace instruction in branches hearing upon technical education.

The promoters of the college aim at ultimately raising a sum of at least 50,000*l.* to carry into effect the proposed object. This fund to be applied as follows:—

1. In providing lecture-rooms, class-rooms,

and suitable accommodation for apparatus and illustrative material.

2. In payment of lecturers and teachers.

3. In purchasing mechanical and chemical apparatus, models, drawings, specimens of industrial art, and natural products applicable to manufactures.

4. In meeting the general expense of maintenance and management.

We observe the names of three architects amongst the committee of promoters,—Mr. John Honeyman, Mr. Alex. Thomson, and Baillie Salmon. The Lord Provost and several members of Parliament are among the number. In short, those who have taken the subject up are men of the highest standing in Glasgow in connexion with the various industries to be benefited, and the scheme, we are glad to understand, has every prospect of being successfully carried out.

THE NINE-HOURS MOVEMENT IN LONDON.

SIR,—I trust you will not think it out of place to review in a brief manner the agitation of the nine-hours question between the masons and the master builders of London, which up to the present time has been conducted very quietly and almost privately.

In the first place, it will be as well to state that at the request of the employers we commenced working the nine hours for the three winter months, commencing on the 9th of November and ending on the 14th of February, in the winter of 1866 and 1867, being a reduction in wages of 8*d.* per week. That system has been continued, with great advantage to both parties, up to the present time. When the masons thought that the system might safely and advantageously be adopted throughout the year, they made it becoming a general thing in all branches of industry. They met together last November, and agreed to present a memorial to the employers on the 1st of January, 1872, giving them notice that we wished to continue the nine hours from the 14th of February of the present year; also asking for an advance of one penny per hour, to commence on the 1st of July, 1872, being six months' notice for the advance of wages, if it might be so called, but in reality it would be the same total (as our conge will admit of) for the 51 hours as it is now for the 56.

Well, sir, after the notice was sent in, correspondence and interviews took place between the masons' committee and Mr. Piper, the secretary of the Master Builders' Association; and ultimately the employers issued a statement to the masons, declining to concede the terms of our Memorial, stating for their reasons that it would cause public dissatisfaction and great inconvenience. On the receipt of that we held another meeting; and, to avoid a strike, the committee were instructed to write to the Builders' Association, respectfully requesting them to receive a deputation from our body, believing it would lead to an amicable settlement of the question in dispute. The request was granted, and the 18th of February appointed for the meeting; when, to our great disappointment, the employers' committee was not in authority to dispose of the question, but only to hear what we had to say for our cause, which they listened to with great respect and courtesy, and advised us to ask their Association to appoint a committee with power to make arrangements for finally settling the question; and from the general expressions and tone of their remarks, we had reason to hope that we were near a peaceful solution of our difficulty; but we were mistaken, for after we had sent in the request for them to appoint an authoritative committee, and waiting a fortnight for an answer, they wrote, saying they saw no reason to depart from the terms of their Circular, referred to above. So, after leading us to believe they were pacifically inclined, they turn round with a blank refusal for further negotiations. Whether they have acted wisely or unwisely remains to be seen. When our time comes we shall be prepared to set upon experience. My object in writing this letter is to clear ourselves from the charges so frequently and so freely made against us of being hasty and dictatorial. Let the readers of this draw their own moral from the above facts.

R. SCOTT, Stonemason.

THE TRADES MOVEMENT.

Oxford.—A meeting of masters and a deputation from the men engaged in the building trade, now on strike at Oxford, has led to a satisfactory arrangement, to the effect that 56½ hours shall constitute a week's work, to commence on the 1st of April, and that on and after the 1st of November 54 hours shall be sufficient.

Keswick.—The masons and wallors in Keswick are still out on strike. The terms they demand are 3*s.* per week advance during the summer months, which would raise their present rate of wages from 2*4s.* to 27*s.* per week. The labourers employed in the building trade also demand that their wages be advanced from 18*s.* to 20*s.* per week during the same period, the old rate to be paid in winter as hitherto.

Penzance.—A large meeting of masons has been held to consider the best means of adopting the nine-hours movement without injury to the masters. The chairman invited the opinions of the audience (numbering over seventy), when the following resolutions were adopted, viz.:—
1st. That 5½ hours constitute the week's work, the men working 9½ hours each day (except Saturdays), and on Saturdays working 6½ hours, leaving work at one o'clock. 2nd. To be paid by

the hour. 3rd. To receive 4jd. per hour for eight months in the year, and to receive 6d. per hour during the remaining four months, which consist of short days, being only eight hours' daylight. 4th. A deputation be selected, and requested to wait on the masters, to invite their consideration and approval of the same." The chairman said he sincerely hoped that the present harmony existing between masters and men would still continue; and he felt assured the masters (as on former occasions) would openly and fairly meet the deputation, and finally decide in favour of the men.

Abergavenny.—At a meeting of the employes in the building trade it was stated that the masters were agreeable to give the men 55 hours per week, but would not advance the wages. The men determined to strike. Six men were deputed to see the masters, with full authority to settle the question on the best possible terms. The whole body of masons, however, seceded, and said they would not again solicit the employers for another interview upon the matter. The same evening the carpenters, joiners, plasterers, &c., met together, when the deputation stated the masters would give the 54 hours and no more. It was then resolved that no work be commenced until the employers make a concession with respect to the wages, and the meeting separated with that understanding. Some of the master plasterers afterwards agreed to give their men 2s. advance, and the hours, which was accepted, and the men went to work. The body of carpenters from one firm went in by having the 54 hours only. Another body of carpenters commenced work on having 2s. advance and the hours asked for. It was afterwards understood that the remainder of the carpenters and joiners, who stood out, were to be paid 5jd. per hour and receive the reduction of hours. They agreed to commence work on the following day. A meeting of the masons was held. A statement was made that some employers were agreeable to give the hours, and an advance of 3d. per day. One master was agreeable to give time and money to those men who were worth it. A proposition was put to the meeting that the masons accept 3d. per day advance and go on to work. As an amendment, a speaker proposed that no work be commenced until they get the time and money asked for. Upon being put to the meeting, the amendment was carried unanimously. The masons plumed the town, warning those masons who might come to seek work not to accept it, as the men were on strike.

ST. STEPHEN'S CHURCH, HAGGERSTON.

On Tuesday, the 5th inst., the new church of St. Stephen, Goldsmiths-row, Haggerston, a densely-populated neighbourhood, where the want of adequate church accommodation, has been long felt, was consecrated by the Lord Bishop of London. In plan, the church consists of a nave of four bays, with north and south aisles, and apsidal chancel with aisles, that on the south side being used as a vestry, with an organ-chamber over. At the west end are two large two-light windows, surmounted by a circular window, and over the nave arcade on the north and south sides is a clearstory with two-light windows. At the east end of the chancel is a three-light trefoil-headed window in the centre bay, and single-light windows, also trefoil-headed, in the sides of the apse, all of which will hereafter be filled with stained glass. The ceiling of the nave is boarded under the rafters, that of the chancel being divided into rectangular panels filled with gilt stars on a blue ground. In the ceiling of the sanctuary, the martyr's crown and palm, in honour of the patron saint, are introduced; over the junction of the nave and chancel is an octagonal bell-cot of oak. At the west end of the nave stands the font, of sufficient size to admit of immersion, the octagonal bowl of which is of Caen stone, and is supported by a red Mansfield centre shaft, and four smaller angle shafts with moulded capitals and bases. In the panels on the "cardinal" faces of the bowl are introduced the sacred monogram, twice repeated, the Cross, and the Holy Dove.

The seats in the nave are of deal, stained and varnished, with open backs and solid ends. The chancel is elevated six steps above the floor of the nave, the table being raised on two additional steps. On the north side of the chancel is an open parclose of oak, separating the chancel from the aisle, and in the corresponding arch on the south side will be the organ. On the north side of the sanctuary is a credence-table, opposite to which is the usual arrangement of sedilia

and piscina. Above the altar is a re-table, over which is the reredos, in three compartments, the centre containing a large cross in statuary marble, on a diapered and gilt background.

The church is constructed of brick throughout, with coloured bands. It has been erected from the designs, and under the superintendence, of Mr. Francis T. Dolman; Messrs. Dove, Brothers, being the contractors.

The building will accommodate 600 worshippers, and the cost will amount to about 5,000l., a great part of which has been bestowed by one or two munificent contributors.

ACCIDENTS.

Fall of Building in Stockport.—An inquest has been held on the body of one of four men injured by the fall of an old building in the mill-yard of Mr. Dickie. A bricklayer, living in Heaton Norris, said deceased and others had been pulling down the walls of an old mill, under the direction of Glas. Hadfield, plumber and glazier. He was a practical man for that purpose. They had the roof off, and had got down a part of two of the upper stories. Witness was bricklaying at the boiler-house underneath. The wall which they pushed over was 10 ft. high by 13 ft. long, and built against the principal building that fell. There were two iron beams running over the round columns, but were without a tie, and when the wall was knocked down it so shook the building that it drew out the untied beams; the wall gave way, and the bricks fell upon the deceased, who was dressing the old bricks below. There was no contract work; all was day-work, both with bricklayers and labourers. Samuel Gaskill, manager, attributed the accident to the absence of any ties to the ends of the beams. The moment the old wall was removed, the building to which it was attached of course fell. Every precaution was used on the occasion. The jury decided that the cause of death was purely an accident.

Fall of a House in Dublin.—A house situated in Werburgh-street, Dublin, has fallen, the entire back part of the building coming down with a crash, leaving only the front wall standing. The police immediately took precautions to stop the traffic in the street, which is in a dilapidated state. Efforts were also made to get out the inmates, and, with the aid of the fire brigade, this was accomplished. One woman was insensible, and had to be sent to the hospital. Another was severely hurt, and a third only saved herself by clinging to the rafters until help arrived.

DISASTROUS FALL OF HOUSES IN CHELSEA.

On Tuesday last, Dr. Diplock, the coroner for West Middlesex, resumed, at the Chelsea Workhouse, an investigation respecting the death of Charles Free, aged sixteen years, who lost his life through the fall of two houses, 163 and 165, Marlborough-road, Chelsea.

Mr. G. Lewis, solicitor, appeared for Mr. Hill, contractor, who at the time of the fatal occurrence was engaged in making the two houses into one by removing the party-wall and putting up a new breastsummer; Mr. Roberts, of Gray's Inn, represented Mr. Watts, the landlord; and Mr. Newman watched the proceedings for Mr. Jones, a linendraper, who was the tenant of the fallen houses.

Mr. Walter J. Hill deposed that he was the son of Mr. Hill, the contractor. The fronts of both houses were taken out, and a new breastsummer had been put in, in order to support the upper part of the houses. The breastsummer was 30 ft. in length. In the front of the house and underneath the party wall there was an iron column, 4 in. in diameter. Witness did not know when the shoring of the houses had been taken down. The column rested on a wall, and neither the column nor the wall beneath had been erected by Mr. Hill. When the houses fell men and breastsummer came down; the men went through the flooring, and witness and the column had just time to run out into the street before both houses fell. He would swear that he did not remove the struts supporting the houses before they fell.

Mr. Sancton Wood, the district surveyor, said that on the 10th of February he received notice in accordance with the Building Act, that it was the intention of Mr. Jones to alter his shop-front. The notice did not state that the party-wall was to be removed. He then visited the premises, and he found that nothing had been done. He afterwards went to the houses several times, until at last he saw that a scaffolding had been erected in front of the shops, and they were covered with blankets, table-cloths, advertising placards, and, in fact, the greater part of the stock-in-trade of Mr. Jones. Witness then said to Mr. Jones, "When are you really going to build?" and Mr. Jones replied, "This is rather a good arrangement at present." It was then agreed that Mr. Jones should send a witness to tell him when the building commenced, but

he never did so, and witness there only saw the houses after they had fallen, and he then examined the basement walls of the houses. They were the worst walls that witness had ever seen in his life. He was aware that such walls were bad, and the mortar was merely road-scrapings. The houses fell through the giving way of the column.

Mr. T. Spradbury, builder, said that he had examined the fallen houses, and he believed that the catastrophe had been caused by the rottenness of the walls.

Other similar evidence having been given, the inquiry was adjourned till, this, Friday, 22nd.

We must compliment the coroner on the care and acuteness shown by him in the inquiry, and would suggest that he should obtain the opinion of a professional man unconnected with the work.

UNSAFE LANDINGS.

At a meeting of the St. George's, Hanover-square, Vestry, a letter was read from Mr. Goldsmith, of Font-street, on behalf of Col. Hamilton, of 118, Eaton-square, complaining of the unsafe condition of his landing, and announcing that he will not hold himself liable for any accident that may occur. A proposal was made to have the case settled by the magistrate, but Col. Scott said he hoped this course would not be adopted. A legal opinion—that of Mr. Thrupp—had recently been taken, which was against the Vestry. He understood that other parishes had been advised to repair such landings. Mr. Nicholl said the parish of St. Margaret, Westminster, repaired the landings on Cadogan-street, near the Catholic cemetery. If a poor parish like Chelsea could repair landings, surely a rich parish like St. George's might do it. He would suggest that the letter be referred to the Vestry, which course was adopted.

CHORLEY TOWNIAL COMPETITION.

Sir,—I would like to kind if you can learn for me the decision arrived at in this competition. The drawings were sent in on the 1st February, and no notice has been taken of them further than that they were to be exhibited to the public some three weeks ago. If any of your correspondents can inform me, through your columns, of the results of the committee's deliberations, it would interest not a few who competed.

A CORRESPONDENT.

MARBLES FOR THE NATIONAL GALLERY.

Sir,—I wish to call your attention to a large contract for marble-work about being put up in the Nations Gallery. The specification names Belgian marbles. I seen estimates to some London marble masons, who are my customers; but it appears Irish black marble will not be accepted (though equally good). Green marble is also required. There is no green marble in Belgium; the very finest is raised in Ireland. Is it not worth considering whether foreign marble should be used for a national building when better marble of the colours required can be had at home, and cheaper?

Edinburgh.

"LEAKY SEWERS."

The vagueness of "O. E. D.'s" answer to my letter on this subject in the *Builder* of Feb. 24th, being probably produced by a false misapprehension in not supplying sufficient data, I wish it possible to afford same.

The bricks used were "hard brimstone lumps," laid in Portland cement, one to one, the sewer being on an quarter of its diameter. There are only four junctions prepared for future connections, being say one every ten chains, which, practically, would be wasteful.

If any of your readers have tested the average leakage in a 2 ft. sewer of 4 1/2 in. brickwork due to percolation in different descriptions of soil, and will give me the benefit of their experience, I shall be much obliged, as a local question of some importance has arisen on this subject.

B. A.

ARCHITECTS' BENEVOLENT SOCIETY.

The annual general meeting of this Society was held on Wednesday, the 13th inst., at the rooms of the Royal Institute of British Architects; the chair being occupied by Mr. George Mair, F.S.A., in the unavoidable absence of the president, Mr. Sydney Smirke, R.A.

Amongst the members present were Messrs. C. C. Nelson, D. Mocatta, F.S.A., William Mosley, Thomas Cuny, Wyatt Papworth, J. Goldicutt Turner.

The Report laid before the meeting, and which the chairman read, showed that,—

"The net increase in the number of subscribers to the funds of the Society, after deducting the death and retirements, is twelve; the donations have exceeded the amount of the preceding year by 38l. 3s.; and the balance now in hand has increased by 22l. 11s. 8d. During the past year seventeen cases have been received of that number which were very widows."

The report drew attention to the circumstance that out of over 500 members of the Institute, only about 160 have as yet enrolled their names on the list of this Society.

The chairman having moved the adoption of the report,

Mr. D. Mocatta, in seconding it, said he wished to bring the fact before the meeting, the Royal Institute, and the profession, that during the past year the council had felt themselves only justifying in making grants to applicants for relief of a sum in total upon the year as would barely

give 10*l.* average to each, a gift, he considered, too paltry and insignificant, when it was borne in mind the class of persons who sought aid. He hoped the appeals of the Society would not be in vain.

Mr. C. C. Nelson said, speaking as a member of the council, he could assure the profession that if they knew the number of men deserving and distressing cases that came up for relief, he was certain more funds would be forthcoming.

Mr. William Mosley wished it known that neither was the amount of subscriptions fixed at 1 guinea nor was it only members of the profession who were eligible to become subscribers; and that all subscribers of 1 guinea could recommend applicants.

Mr. John Turner, the honorary secretary, called attention to the fact that whilst many members of the profession subscribed to the Builders' Benevolent Society, but few of that calling were subscribers to this.

The report was then adopted *nem. con.*

The treasurer, Sir William Pitt's, account, as audited by Messrs. Charles Fowler and Henry Jarvis, was then discussed, from which it appeared that the gross receipts for the year amounted to 28*l.* 8*s.* 4*d.*, gross payments, 317*l.* 10*s.* 4*d.*; balance carried to next account, 70*l.* 1*s.* 3*d.* of the payments, 62*l.* 1*s.* 6*d.* had been invested, and that the gifts to applicants were 136*l.*; the stock now standing in the Society's name amounts to 1,664*l.* 1*s.* 4*d.*

Mr. John Turner then announced some donations just received, which were—Sir M. D. Wyatt, 5*l.*; Mr. R. L. Roumie, 5*l.*; J. L. Phené, 5*l.*; George J. Mair, 5*l.*; John Turner, 5*l.* He also read a letter from Mr. J. H. Jackson, in which he expressed the intention of himself and his brother hereafter to double their subscriptions.

After the formal business had been transacted, the meeting was closed by a well-deserved vote of thanks to the chairman.

CONDITION OF NEWLYN, NEAR PENZANCE.

In September, 1870, we directed attention to the sanitary condition of this place. The authorities did make a feeble effort, and as ineffectual as feeble, to reform matters. It will be remembered that, for one thing, the local county magistrates tried to make a scapegoat of the county surveyor, and failed contemptibly.

And now the condition of the place may be gathered from the following, taken from the *Cornish Telegraph* :—

"WHEN WILL SUCH A STATE OF THINGS BE REMEDIED? In the course of an inquiry, at the late Penzance County Court, on the liability of parties to keep a drain repaired at Newlyn, it came out that the drainage of seven or eight houses in Factory-row emptied into a main sewer, which runs through the garden of the Navy Inn. This sewer is open in the garden, and passes by the mouth of a well, from which it is only divided by a kerystone! Then it passes under the Navy Inn. The present owner of the drain, who has his predecessors, has had to keep it in repair for the houses in the rear of his premises, said there had been two cases of fever in the house and two deaths. In the winter, with plenty of water, the drain under the house was tolerably clear, but in the summer it was foul and most offensive. The Judge ascertained from one witness that there are only five privies in all Newlyn, and from another there are certainly not ten! The Judge: 'And this is the state of Newlyn in 1872, a state of things which might have been expected 400 years ago, but is almost incredible now, except for the evidence of one's own senses, if he happens to visit Newlyn and—comes out of it again alive!'"

It will thus be seen that our report on the place, shocking as it was, was far within the real facts. At the time we were of opinion that the report of the Government inspector was far too complaisant to be of any use; we are sorry our opinion receives such powerful confirmation.

Pro.

METROPOLITAN TRAMWAYS JOINT COMMITTEE.

A COMMITTEE of Lords and Commons has been appointed to inquire whether it is desirable or not that any additional tramways should be laid within the metropolitan area; what should be the limits of the metropolitan area in respect to tramways; under what authority the construction and working of metropolitan tramways should be placed; and along what lines of streets, if any, the tramways shall be allowed to be constructed, and under what restrictions.

The Committee will meet to hear evidence on the 15th of April, after the Easter holidays.

Miscellaneous.

The Snow.—The metropolis was visited on Thursday with a heavy fall of snow, commencing about twelve o'clock and continuing for some hours. About two o'clock the scene was most picturesque. Scarcely a breath of wind disturbed the steady, graceful dance of the white aerial deposits. The trees in the parks and squares were lovely to behold. The mantle scenery and vista were most extraordinary. No artist on his travels could have failed to observe the beautiful subjects which Nature sends such a short time had presented, and which, even to the least-tutored mind, had a most delightful aspect.

The Tramways in South London.—The London Tramways Company are endeavoring to extend their system in South London. At the present time their trams run over 16½ miles. They run from Westminster Bridge to Brixton and Camberwell; also from Westminster Bridge, through Camberwell and New Cross to East Greenwich. They run also from Blackfriars Bridge to Brixton, and from the same terminus to Greenwich. The Company are about to apply to Parliament for leave to open some additional lines, including lines from the Horns, Kennington, to St. George's Church, Borough; from Westminster Bridge to Whitehall-place; from the Obelisk, St. George's-circus, over Waterloo Bridge, to the Strand; and Victoria-street, Westminster, to the Abbey. The company appear to be doing a considerable amount of business on their existing lines in South London, their receipts during the last four months of 1871 amounting to 24,709*l.* 2*s.* 5*d.*

The Health of London.—The periodical titled "Labour and Unity" thus urges a point before now pressed by us:—"We contend, the health of London can only be known, and thereby only attainable, by returns of sickness instead of the mortality it now gives us; because the only value to be relied on must be by the medical staff themselves. To the Ancient Order of Foresters and the Society of Odd-Fellows we can only look for information in this particular. These useful institutions record their rate of sickness per day per member, and from such information is compiled that valuable detail which may be called the true record of health. The readiness with which this information is obtained is as simple as it is effective, and if it can be so successful on the 700,000 to 800,000 members of these institutions it can be made also as available for the community."

Society of Arts Window for St. Paul's.—It has been suggested that the Society of Arts should provide a memorial of Thanksgiving Day in the form of a painted window, to be set up in the cathedral, thus helping at the same time to complete the decoration of the interior of that edifice. A fund for this purpose is being raised among the members by subscription, each member of the Society being at liberty to subscribe 5*s.* for himself, and the like sum for each member of his family. It is to be hoped that British glass-painters will be employed.

Discovery of Roman Remains in Gloucester.—Some interesting Roman remains have been brought to light on the premises of Mr. Rumsey, of Southgate-street. An excavation had to be made in the cellar, and at a depth of about 10 ft. from the surface of the footway, the workmen came upon the border of a tessellated pavement. The tesserae are of white and black, first in bands, and next worked in a design like that of a carpenter's square. The floor is in excellent preservation. The pavement is laid parallel to the street as it now exists.

Asphalte Pavements.—A new experiment, writes the *Mining and Commercial Times*, is about to be tried in the method of asphaltizing roads. The Patent British Asphalte Company have contracted with the streets Commissioners to lay its asphalte over the existing granite curbs in King William-street, City, so as to save the expense of removing the existing road-pavements, and insure a firm foundation for the asphalte covering.

Art-Union of London.—An advertisement in our present issue announces the approach of the last day for subscribing. It will be noticed that the first prize in the distribution will be a life-size marble statue, "The Wood Nymph," for which the sculptor, Mr. Birch, was awarded a premium of 600*l.* by this society, the result of a competition, when fifteen artists exhibited. The set of prints relating to the sea and coast scenery, from the works of David Cox, Copley Fielding, and Samuel Prout, given to each subscriber, are worth more than the guinea subscribed. Such is the result of co-operation.

State of Hammersmith Bridge.—In view of the approaching University Boat Race, attention is again drawn to the condition of Hammersmith Bridge, and the proprietors of that structure are entreated to employ an engineer, in order to report whether it can safely carry the weight which will be imposed upon it.

Mr. Henry Ashton, Architect.—The death of this gentleman, in his 71st year, is announced.

The Art Schools at University College, London.—The following is an extract from a private letter written by a lady now studying in the Art Schools of University College, which have recently been opened to students of both sexes:—"Since Christmas I have been working hard every day in the Art Schools, which have lately been opened under E. J. Poynter, A.R.A. I think male art students must be more amiable than medical students, for the utmost harmony prevails in our classes. We work together in the antique room, and three days a week from a half-draped live model; the other three days the male students have a nude model in one room, and the ladies a draped one in another. The mixed classes are by far the most orderly and hard-working. A few outsiders have made a feeble protest on the score of propriety, but I do not think they will be attended to, while the present arrangement answers so well. There are about eighty students, rather more than half women. The schools are open every day from half-past nine to five. Mr. Poynter visits each class about three times a week, and there is also an assistant master, who looks round now and then, and gives advice to the less advanced pupils. The rest of the time we are left to ourselves. A few of the students complain, but by far the greater part see that it is only by their own hard work that they can expect to improve, and that if their studies are rightly directed, it is all they need."

The Thames Embankment Question.—At the last meeting of the Board of Works the Parliamentary Committee submitted a report setting forth that they had considered the Bill introduced into the House of Commons by the Chancellor of the Exchequer, empowering the Board to purchase the land on the Thames Embankment for the sum of 40,000*l.*, or a sum to be ascertained by arbitration, and they had come to the conclusion that the Board would not be justified in paying 40,000*l.* for the land in question. With regard to the offer of arbitration, the committee thought the Board ought not to accept it, believing that the course recommended by the select committee of the House of Commons presented an equitable basis for an arrangement. The committee were of opinion that the Board might either pay an annual rental for the ground calculated on the basis suggested by the select committee; or, if it were preferred, pay the capitalised value of the rental, and thus become absolute owners of the ground. After some discussion the report was adopted.

The Society of Accountants in England. This Association has grown, and now numbers more than a hundred members of the profession, established in every part of the kingdom. Since the inaugural meeting, held at the Cannon-street Hotel, on the 11th of January, the council have framed a series of rules and regulations. The aim of the society is to promote the complete acquisition of those branches of knowledge which are essential to the practice of an accountant, to decide upon questions of professional usage or courtesy, to advance generally the efficiency and character of members of the profession, and so to guard those public interests which are now annually committed to the skill and honour of the accountant.

The Westminster Testimonial at Chester. At the Town-hall, Chester, on Saturday, a full-length life-size portrait of the Marquis of Westminster was presented by the citizens to the Marchioness on the occasion of his lordship succeeding to the estate and title, and in recognition of the connexion which, for upwards of twenty years, has subsisted between the city and his lordship, as its representative in Parliament. The work is by Mr. J. E. Millais, R.A., who has painted his lordship in hunting costume, and about to leave Eaton-hall and mount for the chase.

State of St. Silas's Church, Bristol.—The Church of St. Silas, Bristol, has been gradually sinking ever since its erection, four years ago, at a cost of between 5,000*l.* and 6,000*l.* The building is now broken right across, and rendered quite dangerous. Practical engineers recommend that the church be pulled down, and rebuilt on a better foundation, at a cost of from 1,500*l.* to 2,000*l.*; and this will probably have to be done.—*Wills Standard.*

Portland Drainage Competition.—We have received a letter on this subject, from Messrs. Glennie & Coke (authors of the plans marked, "Thorough"), but too late for our present issue.

The Purchase of Railways by the State. At the Inventors' Institute, St. Martin's-place, Trafalgar-square, on Tuesday night last, Mr. Raphael Brandon read a paper in which he advocated the Government management of railways. Glancing first at the difficulty of enlisting the public ear in favour of any new project, of which he adduced a succession of illustrations drawn from the history of inventions, of legislation, and of great undertakings within the past half-century, he argued that railways having become in the present day the great highways of the country, ought, as the king's highway was in the past, to be under the control and management of the State. It was indispensible detrimental to the interests of the nation that they should remain subject to the caprice of the different localities which they traverse, or to the tender mercies of companies formed purely for purposes of speculation. The transfer, he endeavoured to show, would involve no money payment, but simply a guarantee (which would not be difficult with the Government) with regard to punctual payment of dividend upon shares. In fact, it would give rise to a new Government stock much more saleable than railway shares as now constituted and dealt with. After discharging dividends, any surplus profit he proposed to apply to the general improvement of the railway system by providing sleeping and refreshment carriages, and other through traffic comforts and conveniences, and especially to providing separate sets of rails for goods traffic as distinct from passenger traffic.

Society for the Encouragement of the Fine Arts.—On Thursday evening, the 14th inst., a lecture was delivered before the members of this society, "On the Literature of Letter-writing," by Mr. T. R. S. Temple, M.A., Cantab. The chair was occupied by Dr. Doran. After giving the early history of letter-writing, the lecturer traced its gradual development from the first faint glimmerings of a good epistolary style in England down to the times of Pope, Lady Mary Wortley Montagu, Swift, Steele, Lord Lyttelton, Walpole, and Dr. Johnson. Among later writers, Sir William Jones, Burke, and Cowper, were to be commended. Owing to the cautious and practical business-like habits of our countrymen there do not exist an over and above number of love-letters. Modern authors were careless in the matter, in consequence of which their letters generally sank below, rather than rose above, the level of the best colloquial discourse. Scott, Burns, Campbell, Lord Byron, and Southey often were quoted as examples to the contrary, perhaps without much ground, although they possessed some qualities necessary to a good epistolary style. A discussion, opened by Dr. Doran, who made, as usual, some very interesting remarks, followed, in which also Dr. Altschul, Mrs. Lucy Newbery, Messrs. Gilks, Passmore Edwards, and others took part.

Ventilation and Purification in Factories.—M. Charles de Frécinet, mining engineer, was charged by the late Imperial French Government with a commission to visit the most important factories and workshops in England, France, Germany, and Belgium, and to report on the means adopted to prevent the ill effects of the various deleterious agencies on the health of the operatives. The results of this investigation were printed in four large volumes, and the *Journal of the Society of Arts* for the 15th inst. notes a few of the observations of M. de Frécinet, and especially of those which refer to foreign countries. In respect to our own country, we regret to observe, M. de Frécinet says:—"In England, the manufacturers, forming a part of the Government, and not fearing any censure, neglect to apply in their works the preventive systems adopted elsewhere." Were this true, it would be one of the most serious statements that were ever made against a nation or a Government; but M. de Frécinet is able to find "some exceptions." The value of M. de Frécinet's work lies, however, in his accounts of what has been done on the Continent, and these deserve serious study.

Bankruptcy of a Clerical Builder.—In the London Court of Bankruptcy, on Tuesday, the case of the Rev. Henry Marchmont came on for hearing. This was an adjourned sitting for public examination. The bankrupt, a clerk in holy orders, was described as of 29, Colville-square, Notting-hill, builder. It appeared that he had engaged in extensive building speculations in the neighbourhood of Kensington Park, besides officiating as a clergyman. The judge adjourned the sitting until the 12th of June.

The East Window in Windermere Parish Church.—A paper, by Mr. Frederick Clowes, on the characteristics of this well-known window, has been read by the Rev. Canon Stock, at the Bowness Pearly Readings. Mr. Clowes explained that being neither an artist nor an antiquary, he had collected together some of the views of the best artists and antiquaries who had studied the window, and gave the result. Before the old window was taken down, he stated, the responsibility of the treatment of it was felt by the church restoration committee to be a very serious one, and he was able to consult on their behalf Mr. C. Knight Watson, secretary of the Antiquarian Society. It was a fortunate circumstance that this gentleman, being the grandson of the late Bishop Watson (who was buried at the east end of the church), and feeling strongly the association of his family with the old edifice, felt a great interest in the subject of the window. He at once took it up, and by his advice the work was intrusted to Mr. Henry Hughes, who has done, under the auspices of the Antiquarian Society, some important restorations of old windows.

Kimberley v. Dick.—In the Rolls Court, Chancery-lane, on the 7th inst., this case, which was partially decided in November last, again turns up. It was directed, amongst other things, that the plaintiff should make out his claims for extra work, and accordingly he, with two surveyors from London and his foreman, went to Ireland about a fortnight ago for that purpose, but Mr. Fenton, Mr. Dick's agent, refused them access to the premises, and locked up the rooms. Accordingly an application was made to the Master of the Rolls for an order to enter the premises for the above purpose, and some discussion has just taken place on the subject, in the course of which the Master of the Rolls has expressed his opinion that access must be had, with as little inconvenience to Mr. Dick as can be, but that it does not seem to be possible to do it by sections as suggested. The case, however, was adjourned without any explicit order having been given. The judge signified that the costs of the futile visit to Ireland should be paid by Mr. Dick.

Edinburgh Architectural Association.—The usual fortnightly meeting of this Association was held on the 13th inst., in the hall, No. 5, St. Andrew-square, Mr. Hippolyte J. Blanc, president, in the chair. The minutes of last meeting were read and approved, after which a paper was read by Mr. J. D. Marshall, jeweller, entitled "The Origin of the Forms of Classic Ornamentation." He traced the forms used in Greek architectural ornamentation to an Assyrian and Egyptian origin. In their first use it is probable they had a symbolic and religious meaning, but when adopted by the Greeks they became mere instruments of decoration, and in their hands assumed a peculiar elegance and beauty. The paper elicited considerable discussion, and at the close a vote of thanks was awarded to Mr. Marshall.

Proposed Brighton New Parochial Church.—A proposal for building a new church on Albion-hill is before the town. The edifice is to be known as the Church of St. Barnabas, and will be adjacent to the Home for Female Penitents. The site of the church is described as suited for the purpose. The committee are desirous that provision should be made at once for all the machinery which will be required for the proper and efficient working of an independent parish. Contributions are therefore being requested for the following objects:—1. The site, which can be purchased from the trustees of the Home for the sum of 950*l.*, which has been certified by a competent surveyor to be a fair and reasonable price. 2. The church. 3. The parsonage. 4. An endowment. It is thought that these objects cannot be accomplished for less than 10,000*l.*

Durham Courts of Justice.—Judge Mellor, in charging the jury at Durham Spring Assizes the other day, said,—"Let me congratulate you on the reconstruction of your Courts of Justice. This is the first time I have had the honour of presiding in this court since it has been reconstructed, and, as far as I can observe, it is highly creditable not only to the county, as a temple of justice, but to the architect and those persons who superintended the arrangement. Of course there are minor details on which it is impossible to pronounce an opinion until the business of the court has proceeded. You have now one of the best-arranged courts which it has been my lot to witness."

TENDERS

For completing two houses at Silverdale, Sydenham, for Mr. J. A. Bartrum:—
Bysh 2900 0 0
Rickett 880 0 0
Slaford 870 0 0
Wilson 750 0 0

For building new chapel, at Barnet. Mr. T. W. Horne, architect:—
Bracher & Son 23,220 0 0
Wicks, Bangs, & Co. 3,550 0 0
Conder 3,525 0 0
Wood 3,500 0 0
Dove, Brothers 3,475 0 0
Scribner & White 3,433 0 0
Adamson & Son 3,379 0 0
Higgs 3,333 0 0
High 3,100 0 0

For repairs and alterations to the Regent's Canal Iron works, Eagle Wharf-road, New North-road, Hoxton, for the Henri Ribbed Barrel Company, Limited. Mr. H. A. Alexander, architect. Quantities by Mr. Henry Laxton:—
General House and Works. Offices. Total.
Browne & Robinson 2739 2315 5054
Potter & Ferrige 1,060
W. H. & J. Mansbridge 761 290 1,051
Sawyer 650 802
Baxter 577 245 822

For the completion of six houses at Berrigee-road, Gipsy-hill. Mr. H. A. Alexander, architect:—
Baxter 2870 0 0
Farket 800 0 0
Jelly 632 10 0
Mundy 627 10 0
Lovejoy 623 0 0
Swain 623 0 0

For house on the Magdalen Charity Estate, Hastings. Messrs. J. Jeffery & Skiller, architects:—
Bridgland (accepted) 21,300 0 0

TO CORRESPONDENTS.

H. F. K. J. P. E. R. J. F. E. R. W. & Sons—A. A. W. C. R. H. C. F. R. T. R. E. S. J. L. A. H. H. E. H. J. B. J. H. O. W. H. C. J. D. H. M. C. O. R. (the statement as to the moving of houses is quite correct).—"Mistress and Servant" (in type). "Barrow" (last week).—

All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication. Note.—The responsibility of signed articles, and papers read at public meetings, rests of course with the authors.

NOTICE TO ADVERTISERS.

GOOD FRIDAY.

"THE BUILDER," for the week ending MARCH 30th, will be published at ELEVEN a.m. on THURSDAY, 28th. Advertisements for insertion in that Number must therefore reach the Office before THREE p.m. on WEDNESDAY, the 27th.

Bath and other Building Stones of Best Quality.—RANDELL, SAUNDERS, & CO. Limited, Quarrymen and Stone Merchants. List of Prices at the Quarries and Depôts, also Cost of Transit in any part of the United Kingdom furnished on application to Bath Stone Office, Corsham, Wilts.—[ADVT.]

Ashton & Green, Slate and Slab Merchants and Quarry Agents.—Shippers, Merchants, and Contractors furnished with Price-lists of every description of ROOFING and MANUFACTURED SLATE, Railway-rates, &c. Agents for London and Country for the Sale of the celebrated WHITLAND ABBEY GREEN SLATES. Drawings and Prices of A. & G.'s RED RIDGE TILES, specially prepared for use with these Slates, on application.—Offices and Show-rooms, 14 and 15, Bury-street, St. Mary Axe, London, E.C.—[ADVT.]

Turret Clocks.—Mr. Streeter, 37, Conduit-street, London, W., Manufacturer of Turret clocks [with gravity or dead-beat escapement for Churches and Public Buildings. Estimate and plans on application. Price:—Village clocks, from 15*l.*; church clocks, from 40*l.*;—Village wheel-work throughout these clocks is of best hard brass or gun-metal. No iron wheels used. Timekeeping and durability guaranteed. Whole sale Entrance—Burlington Steam Works.—[ADVT.]

Architects, before committing themselves to any system of warming, should send to TRUSWELL, BROTHERS, & HOLDEN, 10, Nottingham-street, Sheffield, for a prospectus of their Improved Patent Hot-Air Apparatus.—[ADVT.]

ART-UNION OF LONDON,

444, WEST STRAND, W.C.

Instituted 1837.

1872.

Incorporated 1846.

THIRTY-SIXTH YEAR.

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Vice-Presidents.

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THE SUBSCRIPTION LIST WILL CLOSE 30th MARCH, INSTANT.

Every Subscriber of One Guinea will receive, besides a Chance of a Prize
 at the Annual Distribution in April,

A SET OF IMPRESSIONS OF
EIGHT PLATES OF COAST SCENERY,

Engraved in the Line manner by E. P. BRANDARD, C. COUSEN, T. A. PRIOR, and
 A. WILLMORE, after Drawings by COX, FIELDING, and PROUT.

THE PRIZES INCLUDE

A MARBLE GROUP, THE WOOD-NYMPH,

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THE RIGHT TO SELECT A VALUABLE WORK OF ART FROM ONE OF THE
 PUBLIC EXHIBITIONS;

BUSTS IN PORCELAIN OF H.R.H. THE PRINCESS LOUISE;

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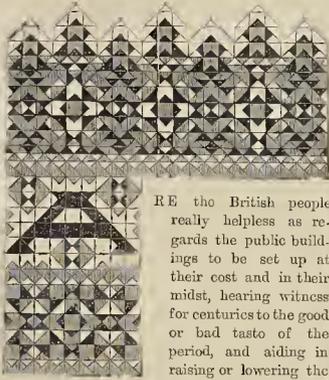
And other Works, all produced exclusively for the Society.

ARTISTS' PROOF COPIES OF THE PLATES, WITH FIVE CHANCES IN THE DISTRIBUTION, MAY BE HAD FOR FIVE GUINEAS.
 INDIA PAPER LETTERED PROOFS, WITH TWO CHANCES, FOR TWO GUINEAS.

The Builder.

VOL. XXX.—No. 1521.

The Designs for the Law Courts.



RE the British people really helpless as regards the public buildings to be set up at their cost and in their midst, hearing witness for centuries to the good or bad taste of the period, and aiding in raising or lowering the national taste, as the

case may be? Is the selection of designs for such buildings ever to remain a matter of chance, or worse? It would seem that the reply in both cases must be in the affirmative.

In the House of Commons, last week, Mr. Cavendish Bentinck asked the Chancellor of the Exchequer whether the finally settled designs for the new Courts of Justice were identical in all material particulars with those exhibited in the library of the House in the month of July last, and moved that, in the opinion of the House, the designs prepared by Mr. Street for the new building of the Courts of Justice were unsatisfactory, and ought not to be executed. For many years it had been considered that, inasmuch as the House of Commons voted money for the erection of large public buildings, they should have some voice as to the selection of the plans. He did not hesitate to affirm that when the eye of the House had been removed from those plans, they invariably met with disaster; and such had certainly been the case in this instance. For a year or two the matter had slept, and it was not till the session before last that his right hon. friend the member for East Sussex called attention to the plans, when the First Commissioner stated that the foundations were being proceeded with, but gave no hint as to what architectural form the building should take. He showed that no opportunity had been afforded to the House to form a real opinion on the plans, and referred to the objections which had been widely raised to them out of doors. He agreed with those who considered the design was not what we were ambitious enough to require for Courts of Justice; and what we did require was a building, the façade of which would proclaim as intelligibly as words could, "These are the Courts of Justice."

Mr. Bressford Hope was brave enough to say that the sum total of the charges brought against the architect was, that he had first arranged his plan, and then made his Strand elevation accord with it; Sir Roundell Palmer thought it sufficient reply to objectors to say that it was quite clear no architect would ever please his brother architect,—an incorrect assertion; Lord Elcho tried to induce the erroneous impression that it was simply a struggle between the partisans of the Classical and the Gothic styles; and Mr. Ayrton, without the acuteness which usually distinguishes his observations, said Mr. Bentinck's motion was four years too late! The corollary from this

last assertion is, that, to be effectual, the objection to the present unsatisfactory design should have been raised at least two years before it was produced; and that, no matter how monstrous the design might have been, the country could not now be saved from it. Mr. Bentinck's motion was ultimately withdrawn, and it was stated that contracts would be entered into some two months hence on the basis of the present design.

We reiterate, and will continue to do so, that the design for the Strand front is unsatisfactory in the highest degree, and that, if it be carried out, the result will prove a discredit and an eyesore. We will not withdraw a line of the expressions we used when the design was first made public at the end of last year:—"The overhanging turrets at the two extremities (the details of which, moreover, are so poorly designed that they would not pass muster in a suburban villa); the overhanging pinnacles of the staircase turrets; the meanness and insufficiency of the main entrance; the ugliness of the great window; and the feeble treatment of the gable of the central hall, are amongst the weaknesses which will strike most critical observers. The great objection to the design, however, is utter want of unity, and of anything like the dignity and grandeur which should mark an important public building. The more the central portion of the design, especially, is studied, the less satisfactory it appears; and if a model of it were made, the objections would be even more strongly seen. If the end of the great hall, brought forward, were seen from bottom to top, we should have, at any rate, a central feature; but as it is, with the end of the hall some 70 ft. behind, there is here nothing but a hole, the common gabled buildings seen on each side increasing the meanness of the effect."

We have no desire to bring about an interference with Mr. Street's appointment as architect of the Law Courts. The chances of war and one or two good friends hoisted him over the decision of the judges; and although we fully agree with Mr. Low when he said,—“The effect of what has occurred will not only tend to throw discredit on the Government, but to put an end to the system of competitions altogether;” we have no wish to interfere in this direction. What we earnestly seek to do is to obtain such a revision of at any rate the Strand front, as may give us a dignified, noble, and monumental structure, in lieu of the present conglomeration of inharmonious morsels. In Mr. Street's published account of his first design, he himself claimed that he had made all his “façades tolerably regular in their arrangement,” and that he had given “a distinct centre to the south front.” Where is the regularity now, and what has become of the distinct centre to the south front? They have vanished, leaving nothing but anarchy and a huge gap. As has been said before in this journal, treating of the same subject, buildings have special purposes, which, according to their dignity, require, and in unsophisticated ages seem naturally to generate, expression of like grade of dignity. A purpose so defined has its own coherency; it is itself a combination of primary and subsidiary purposes; and a balance and unity are thus its very essence. It is on this account that a structure that is apt to accommodate such a complex but still congruous purpose, will itself bear the visible impress of congruousness and subordination. In this our day at last the confused disorder of English law is being reduced to the happy regularity of a digest,—shall we choose this very day to house it in a structure only fitted to symbolise that very wilderness of obsolete craze out of which at last is proceeding our hopeful exodus?

We will not believe that this matter is settled.

ON THE ORIGIN OF THE ELEMENT OF GRANDEUR IN THE ANTIQUE.

ALL persons possessing even the slightest claim to a cultured taste are aware of the unrivalled beauty of that which is called, *par excellence*, the antique. The charm is said to be unrivalled, indescribable, inexplicable. It attaches to certain relics of Grecian sculpture and architecture, as a perfume lingers in the petals of a rose, even after they have fallen from the plant. A great English poet, who felt this glamour, as poets instinctively appreciate the charms of Nature herself, while conscious of his own want of artistic training to analyse its elements, has well expressed a very general sentiment:—

“I leave to learned fingers and wise hands,
The artist, and his ape, to teach and tell
How well his composureship understands
The graceful bend, and the voluptuous swell:
Let these describe the indescribable!”

The idea that there is something in the beauty of Grecian art that defies analysis, is to be traced in the expressions of almost all writers on the subject. That language must fail to convey to the mind even a shadowy idea of the Athenian sculpture and architecture, may be freely admitted. But it does not follow that a systematic attempt to arrive at the elements of the grandeur and beauty that, after the lapse of two thousand years, speak in such vivid poetry to the human heart, need altogether fail of success.

There is a characteristic in human art which may be regarded as universal. It is one to which attention has been rarely, if ever, duly directed. It is independent, almost entirely, of the stage of excellence, or the degree of perfection, at which that art has arrived. As connected with the natural history of nations, and with the philosophy of human progress, it is a feature of the utmost importance. It is this,—the art of any nation, age, or separate epoch, reflects the features of that age. From the rudest caricature to the most finished portrait this similarity can be traced. In comparing the art of different eras, the phenomenon becomes strikingly manifest. It is not a mere question of fashion, of choice, or of imitation. If there be any truth in physiognomy, which is almost the same thing as saying if there be any reality in art, the reason lies far deeper. When we observe in the portraits of any of the great courtiers of the Tudor reigns a resemblance to the peculiar air and pose of King Henry VIII., we may suppose that the delicate flattery, or at all events the flattery of imitation, may account for the fact. But when a little later, as in the case of the beautiful portrait by Vandyck of the Countess de Brignole and her son, we find the gait and attitude of bluff King Hal reproduced in the bearing of the child, we cannot thus account for the fact. If we consider that the social habits, the moral sentiments, the intellectual requirements,—all that goes to make up the national life of any given era,—find expression not only in dress and in mode, but in the very cast of countenance and characteristic attitude of the actors in the historic drama, we can understand these marked resemblances. The reigning sovereign, it may often happen, has been the very embodiment of the genius of his age,—the foam on the crest of the wave. On the other hand, at times his character has been inharmonious with that of his era, as in the case of Louis XIII., and we then fail to group the portraiture of the reign around a central royal figure. But that portraiture is none the less peculiar and expressive. If it were possible to review a series of scenes representing with photographic accuracy the history of mankind, we should not be liable to make any very material error as to date. At times we can trace the effect of some great personal impulse; at other times the movement is more that of the general mass; but at all times, and under all circumstances, among European nations, the dress, the manners, and the general appearance of society has borne an impress characteristic of the period.

A remarkable example may be taken from the long reign of Louis XIV. No monarch, since the time of Charlemagne, has been so absolutely the central figure of European civilisation. With his beautiful and impetuous youth coincided the culture of graceful and flowing locks in all polite society. As he advanced in life, and as the years of his declining age were overshadowed by the up-growth of that giant crop of evils of which he had so unsparringly sown the seeds, he failed to accept the evidences and the dignity of

* See *Builder*, vol. xxix., p. 949.

age. His locks were not allowed to fade into that silver grey which is a crown of honour, but were replaced by a prodigious wig. So sacred was this adornment, that it was the only article of attire in which the king arrayed himself. It was handed into his bed, when he awoke in the morning, on the cad of a stick, so that not even the eyes of the most familiar attendant should light upon the features of the poor bald old man. This wig became the characteristic of the time. Europe grew old with Louis XIV. Western civilisation became aged under his decrepit influence. The painful superstructure of Court etiquette erected by his hands, the careful systematising of personal favour, the erection of servility into a title of honour, the *petites entées*, the *justes aux corps aux brèves*, the emasculation of France by the crushing of that great aristocracy with which Louis XI. first commenced an interminable war,—all these matters, or rather the spirit that underlay them, all had a mighty influence which was felt throughout the whole of Europe. In England the reflection of the French glitter was most conspicuous. In the graceful demi-toilettes of Lely we trace one symptom of this influence. In the stilted, histrionic, bewigged figures, such as those which now crown Temple Bar, as if with an impenitent contempt of truth, and even in the imperial Roman attire in which the solid Dutch form of William III. is arrayed in his marble statue in the Bank of England, may be traced symptoms of the decadence of the Grand Monarque.

The reflection of the spirit of an age by contemporary art is less dependent than might be anticipated upon the genius of the artists of the period. That great artistic genius may affect the age is, indeed, undeniable. A great sculptor, painter, or architect may, for a time, exercise more influence on the aspect of surrounding society than even a royal or military celebrity. The taste of such an artist, when himself a highly-cultured man, will be one of the main influences felt in the formation of the general taste of his time. Pageants, dresses, equipages, and arms have been arranged, designed, and ornamented by some of the most illustrious artists; ever since the time when Valen wrought the shield of Achilles. The pseudo Classic taste that deformed the age of Louis Quatorze had no doubt been highly fostered by the mythological predilections of Rubens. That great portrait-painter, the equal, in his purest productions, of Vandyk, sank into a mere decorator in such work as his series of pictures for the New Palace of the Luxembourg, in which he commemorated the marriage of Henry IV. Fat nymphs, and outrageous Tritons, form part of the *cortège* of the most Christian king. In the picture representing the disembarkation of the new queen, the sea-gods come to the front of the scene. The brilliant charms of the young Florentine princess, half astonished at her own elevation, half uncertain as to the stability of the gangway over which she is conducted; the stately submission of her attendant ladies; the eager tendance of the squires; the stern air of authority of the Grand Prior of France, Reigner de Guercy, who leans on his *bizet* at the poop of the galley, are contrasted with an exuberance of physical development in the Nereids who aid to moor the vessel, that, to the taste of our time, is destructive of the pictorial truth, no less than of the historic value of the picture. But even in the works of this very artist, who exercised, no doubt, an abiding influence on courtly attire and habit, is to be traced the stern operation of the law to which we have referred. The king, queen, and courtiers of Rubens are the living flamed by his hand. Here still upon the canvas. Habit, air, dress, all are truthful to nature, no less than features and expression. And not only so, but even in scenes illustrating Classic history, as, for instance, in the Rape of the Sabinæ, instead of the half savage, wholly Italian, girls, upon whom the eager youths of Romulus rushed like wolves upon their prey, we have substantial Flemish matrons or maidens, clad in silk and velvet, and calling, not too loud, on the Madonna in their exigency.

If we compare, in like manner, the works of any artist since Giöto, with what we know of the tone and habit of his day, the same truth becomes apparent. For the artist, it must be remembered, is a man subject to like passions with those by whom he is surrounded. The spirit and genius of his age speak within him, as well as seek expression at his hands. His models, the range of his experience, and thus the range of his ideas, are all circumscribed

within certain limits. If he strives to ennoble his genius by the patient study of the antique, he must also dip his pencil into the fresh colours of contemporary life. If he fails to do this, he fails to be an artist of his own time. He may attempt to recall the past, and will then become simply an anachronism. This is well illustrated by the works of two artists who did study, and deeply and lovingly study, the antique. But they could not reproduce it. Andrea Mantegna, adding to study of the past, observation of the present, gave to his Roman processional triumphs a character of their own. To much of that yet lingers in Italy, be added a picturesque richness and harmony unknown to the sterner sculpture of the triumphal monuments of Hadrian, or of Antoninus. He gives us a translation of Latin chronicles into the sonorous and dignified Italian of his own day. Flaxman, on the contrary, whose sketch-book, as he wandered through Italy, is not enriched by one portraiture of the ardent, graceful, enthusiastic life of the Peninsula, but who accurately copied every scrap and shred of the past, in attempting to become wholly classical, failed either to reflect the spirit of his age, or to inscribe a permanent chapter of his own in the history of art.

If the art of a period be so certainly the reflection of the contemporary life which surrounds it, the artist, the antique art of Greece must be the reflection of the antique life of Greece. This is the first premise in any attempt to arrive at the elements of that grandeur which, more than any other quality, characterises the art, especially the sculpture, of the purest ages of Grecian history. The reflection is one that opens the way to clear elucidation. For we have much to enable us to contemplate, and even ideally to realise, the antique life of Greece. We have far more than *torii* and mutilated fragments in Greek literature. The bombs that wrecked the Parthenon could not destroy the verses of Homer; Temple and tower have gone down, but *Alexis* lives, almost as she did in the age of Euripides himself. It is true that of the nine great branches of the fictile, plastic, and pictorial art of the golden age of Athens, we have but few and mutilated specimens. Of the architecture, while we can restore much on paper—the sublime and overpowering effect upon the mind produced by the perfect and glittering structures, fresh from the chisel of the mason, shining in the clear atmosphere of the Mediterranean shores, and thronged by graceful youths and beautiful women, clad in garments appropriate at once to the climate and the form, can never again be experienced. Still, we can tell very much of what the genius of the architect laboured, and that successfully, to express. In painting, but one sole relic is known to exist of the golden age of Athens, the pictures of Cortona painted in a wax medium upon stone. To that solitary testimony may be added such argument as we can draw from the beautiful painted vases of the best age; remembering, however, that in Greece, of all places in the world, we can least judge of the perfection of high, from the condition of merely decorative, art. But it would be absurd to doubt that the works of Apelles, in their own province, were inferior to those of the other two artists distinguished by the Macedonian Conqueror as the portrayners of his own features. We know something of what was the workmanship of Lysippus; we know more of that of Pyrgoteles. For Apelles to have received the testimonies which were paid to his genius, he must have been no unworthy fellow artist of these great men.

The first characteristic, then, of the sculpture of the Greeks, is, that it reflects the life of Greece, as seen, felt, and represented, by the Greeks themselves. A second, but still important question is, what rules did the great sculptors prescribe to themselves for effecting that representation. By what law did they so regulate their labour, that they should attain the highest range of the ideal, while at the same time they steered as wide as can be possibly conceived of that capricious irregularity which lesser artists have learned to term original.

Since the pre-historic time, when man first raised his face towards heaven, no period of which we have any account, and no race of which we have any record, was distinguished by the golden age of Greece. The physical beauty of a beautiful Aryan race was cultivated with a care that was at once religious and political. The beautiful was the great object of conten-

plation and of desire—the *kalon*, the noble, and the grand, whether in moral stature, in intellectual culture, or in the physical expression of the vigour and beauty of the mind. The climate was such as to encourage the development of a beautiful race, by turns to stimulate and to soothe the natural and noble passions, and to the youth of the world, and to allow of just so much or so little clothing as consisted with the occasion of the hour, and with the most graceful draping of the form. Manly vigour was not only necessary, in a time when to every man's hand was entrusted the defence of his life and his honour, but was systematically cultivated, to a pitch of which modern training can give but a feeble idea, for the occasions of the great Hellenic games. We can see from the various types of manly beauty, preserved in the sculptures of Greece, that the physical education of the people was thoroughly understood, and religiously prosecuted. For each class of manly excellence there was an appropriate crown. For the slight and agile youth, the foot-race afforded at once a stimulus and a delight. For the man of more massive proportion, and more matured strength, there were the *costus*, the *discus*, and the wrestling matches. For the cultivation of accuracy of the eye, and steadiness of nerve, as distinguished from the fury of attack, there were the chariot races. The one element of physical education which has lately received attention at our national universities, the boat-race, was not wanting. The horse-race had not then sunk into a mere means of accumulating money. The sanction of religion was appended to the celebration of the great international games; and the periods at which they recurred were so regulated as to insure a steady and deliberate training of the flower of the Grecian youth, and of all who might hope to attain Olympic or Isthmian crowns.

With all this powerful influence on the development of a manly race were blended domestic habits of like tendency. Personal purity was exalted. The bath was the first rite of hospitality offered to a guest. The temples of the gods were not to be approached by the unwashed. The monastic superstition that connects sanctity with filth would have been regarded by the Greek youth as simply blasphemous. Nor was the care of the women less enlightened. A grand majestic figure was regarded as the first, not only of feminine charms, but of feminine virtues. Aristotle quietly hints how the exercise so necessary to female health was to be insured, during periods of natural weakness, by directing the matrons to pay daily visits to the temples. The thoroughly domestic life of the Greek women, the presence and direction of queens and great ladies in all the labour of domestic service,—in baking, weaving, spinning, in training the maidens for their future position as mothers and mistresses of families,—all this tended, with irresistible force, in the same right and wise direction. Again, the rites and order of sacrifice, as among the Hebrew people, involved the use of a nutritious diet, and the attention, as a sacred duty, to the purity and excellence of both vegetable and animal food. The golden fruit of the Hesperides—the greatest boon to the health of the Mediterranean people—was then probably only known as an exotic rarity. But scarcely less precious to human health and welfare than the olive itself, was the nutritious luxury of the fig.

This wise and unrivalled course of physical training, an object not of fancy or of chance, but of the profoundest philosophical speculation, coincided with an intellectual education of little inferior excellence. All that was then thought to be within the compass of the human mind was mapped out by wise men, and taught in famous schools. The boundaries of scientific knowledge have been enormously extended since that time, but the powers of the human mind have never been so brilliantly displayed. It is true that the culminating point of the intellectual excellence of Greece dates somewhat later than what we regard as its artistic zenith; but it is not to be expected that the highest point of excellence in all branches of culture should be simultaneously attained. Looking, not at any particular decade, but at Greece, we find the noblest and grandest productions of the Aryan mind to have then and there originated. Poetry was there native,—the epic, the tragedy, the comedy, and the ode. What has any other age added? History was there born, and was characterised, in one instance, by a

Religions and careful adherence to truth, and in another by a philosophical and calm treatment, that excels modern historic work as the day does the night. Eloquence then rose to a pitch never excelled, and only once rivalled. Politics, the most thorny of subjects, because in their pursuit most men seek, not what is true, but what is consonant to their tastes and passions, was reduced to something like an exact science by Aristotle, — so much so, that the surest test of accurate science, the power to predict, was exerted by that great moralist in the case of the Persian conquests of Alexander. Amid this systematic and complete intellectual training must be included those geometric rules for architecture, and for sculpture both in relief and in the round, which, being committed only to the faithful but perishable safeguard of oral tradition, are now not only lost, but not even imagined to have existed.

Nor must we allow the more clear enlightenment, or more narrow prejudice, of our own religion and morality to refuse that meed of admiration which, under widely differing circumstances, is due to the religion and morality of Greece. That the peasantry were not much more enlightened than those of Italy, of France, or of Ireland, at the present day, is extremely probable. That they regarded the exterior allegoric and poetic forms of their mythologic legends as historic narrations, is as likely as that Europe in mass still attaches a literary historic interpretation to those things as to which, in the opinion of Josephus, Moses spoke "philosophically." That they were anywhere sunk in such extreme degradation as is evinced in modern, and even in present, times, by a belief in the magic power exerted by the priesthood, there is no reason to suppose. The religion of Greece, like all early religions, shared with that of Palestine the character of being a figure for the time then present, in which were offered both gifts and sacrifices, that could not make him that did the service perfect as pertaining to the conscience. That ritual had a shadow of good things to come, and not the very image of the things. There was an esoteric as well as an exoteric doctrine. The mysteries communicated, to those only who were carefully prepared to receive them, the inner meaning of the external rite. Regarding the philosophy of the religion of Greece, and separating, as far as may be, those historic traditions of early kings, queens, and demi-gods, which became confused with the original impersonations of a magnificent celestial hierarchy (as is the case in the Romish calendar), we cannot but regard with wonder and with admiration the mode in which the noblest faculties of the heart and mind were clothed in poetic beauty, and held up as objects of imitation.

The Greek poet who spoke of the birth of Wisdom, perfect and armed, from the brain of Jove, might have used the words of the writers of the Book of Wisdom, — "*Condor est animi spiritus Dei, in interitu habitus ejus.*" "His word runneth very swiftly," is almost a Homeric phrase as applied to the Messenger of Heaven. Whenever the Hebrew poets and prophets speak of what we call the attributes of the Divinity, they draw their language from a source that seems common also to the Greek poets. The impersonation of Iris, as the herald of a Divine mission, — the one mythologic form which it passed the power of sculpture at all worthily to represent, — may bear comparison, for its beauty, with any other legend attached to the rainbow. These physical, as well as moral, truths were enwrapped in the shadows of Olympus. The far-acting wrath of Apollo is yet to be dreaded in the sunstroke. In spite of scepticism, we are slowly rediscovering the danger of keeping exposed to the rays of the full moon. The well-enclosed quivers of the brother and sister luminaries are yet to be feared. Time would fail to enter into the minor beauties of a religious and allegoric system, which, never reduced to writing, — because it was too sacred to run the risk of divulgement, — is now regarded with the same stolid ignorance which causes a horse-laugh at the calumnious terms of those great precursors of modern science, the alchemists. Belief in the inferiority of our ancestors is perhaps the most fatal sign of national decay, and of the degradation of race. Such, at all events, is the witness of the Hebrew faith.

It thus occurred that the artists of Greece had their imagination fired by grand and noble subjects, while they had around them objects of beauty which offered apt models for their illustration. Nor must we omit the fact that, whatever the amount of light that they possessed,

the antique people were a reverent, earnest, God-fearing race. Their moral code might not be like our own; but that code had a sanction which was believed to be divine, and, in the main, that code was obeyed. We do not find men going to war on lying pretences, and daring to invoke Divinities, every one of whose acknowledged laws they passed their lives in openly violating. No atrocities, such as render infamous the name of Philip II. can be charged against any Grecian form of faith. A tyrant who persecuted the noblest of his people, as did the fourteenth Louis, would have been held up to secular execration. A man who had plunged a people into a mad, unprepared, unprovoked war, such as that of 1870, would have been considered as pursued by avenging furies, and blinded by divine wrath. A sense of earnestness, of the divine reality of life, of duty, enforced by divine vengeance in the infringers, and of the religious, acceptable, worthy character of the exercise of every human faculty; the gratification, within due limits, of every natural human passion; and the belief that our enjoyment of life is in itself pleasing to the Giver and Ruler of life, tended to invest the whole Greek nature with an unspeakable grandeur. Nothing would have been held more impious, in the better times of Greece, than the ascetic spirit which prescribes and cultivates the virtues of sloth, celibacy, and filth.

SANITARY LEGISLATION.

IMPORTANT and well-attended meetings have been held, on the initiation of the British Medical Association, and of the Social Science Association, on the subject of the Public Health Bill, described in our last number. It was resolved to seek for an interview with Mr. Stanfeld, in order to urge upon the Government the addition to the measure before the House of eight specified items, which may be summed up in the words, — Consolidation of Sanitary Law, Unity of Sanitary Code, and Hierarchical Medical Inspection. There will be but little difference of opinion among sanitary reformers as to the importance of the objects contemplated by the resolutions. As to consolidation of law, we propose to aid its advocates by a sketch of the history and actual condition of our sanitary jurisprudence. But there is a consideration of importance no less urgent than any which they have discussed that has not yet received sufficient attention, either from the Commission, the Government, or the gentlemen who desire to amend the Bill. We refer to the engineering nature of the operations required. The medical side of the case has been well discussed; inspection, registration, and powers of entry and of removal of nuisances are essential, and are admitted so to be; but the importance of systematic organisation in the physical part of the matter is at least equal. The expenditure here to be incurred will be the heaviest part of the matter, as well as the most irreparable loss if botched and tinkered. If we have on the one hand the medical inspector, insisting on the drainage and purification of dwellings, and on the other hand some other officer, insisting on the non-pollution of streams, we shall be at a dead-lock unless we find the proper link between these two very different requisites to be duly and providently supplied by the services of the engineer.

We shall return to the subject next week.

LEAD SOIL-PIPES AND SEWER GAS.

THE effect of sewer gases on lead pipes has been alluded to before now in our pages. On this subject Dr. Andrew Ferguson has submitted some statements to the Social Science Association, the pith of which we may usefully circulate:—

About fifteen years ago I first detected perforated soil-pipes. At first I merely looked upon them as a nuisance, because offensive, and did not connect them with disease; neither did I then know how these perforations were produced.

In the first pipes I inspected, as the perforations were on the upper side, I imagined that pieces of lime might have dropped down on the pipes and eaten their way through. This opinion I abandoned, as I found the perforations were from within. I also found that they were generally on the upper surface of the pipe, and that, therefore, the destruction could not be caused by fluid conveyed through it. I also observed that the pipe usually affected in this manner was the cross one, leading from the

closet to the main descending soil-pipe; and that if there was a bend or arch in the pipe, the upper surface of the bend or arch would become perforated. Another element to be taken into consideration is, that these perforations are most frequently found in the upper floors of houses, and, occasionally, in the sides of the descending soil-pipes.

The question now arises, how is this destruction of good well-made lead pipes effected?

If we remember the position of this destructive action in the pipes, and take into consideration the results of chemical analysis, as well as the increased rapidity with which this action takes place in pipes that are not ventilated, I think we are justified in coming to the conclusion that these results are owing to the action of sewer-gas. Specimens show that the destructive action is from within, and that in some places the pipes are more or less corroded even where the action has not gone the length of complete perforation.

Of course, my own discovery of such pipes in houses has only been where I have been attending professionally, and where the diseases were of such a type as are known to be produced by breathing the results of the decomposition of excreta. The diseases I have observed as resulting from this state of pipes are typhoid fever, diphtheria, scarlet fever, diarrhoea, &c.; and in one or two cases I have had to order the removal of families who were suffering from ill-health from this poison, without exhibiting symptoms of any well-defined disease.

About three years ago I was asked to visit the child of the superintendent of a large public institution. I at once suspected typhoid fever, which proved to be the case. I was, moreover, told that it had twice already been in this gentleman's family; and that the year before the whole family had suffered from diphtheria. On making inquiry as to the state of the drainage, water-supply, &c., I was told that the water was Loch Katrine, and so beyond suspicion. The master of works for the institution was a most intelligent man, who had paid special attention to the drainage. He had soil-pipes with extra depth of traps, indeed the deepest I have seen, and it was difficult to account for the manner of infection, the pipes being pronounced free from any defect; but, in a short time, another child was seized, as well as several of the officials of the institution. In passing a particular spot in the superintendent's house, however, I perceived a faint odour of sewer-gas; and on mentioning this to him, he most promptly had the pipes uncovered, and perforations were at once discovered in the vertical soil-pipe.* This led to a complete overhaul of all the pipes in the house, and the removal of those that were defective; and since then I have not heard of a single case of typhoid or diphtheria in the establishment. Plumbers do not readily detect this defective state of pipes, as they look for a liquid leakage. Some time ago, in visiting a case of typhoid, I asked the mother of my patient as to the state of the closet and pipes. She replied, "Oh, Doctor, you are wrong this time; all these things were renewed only two months ago." Of course, I was extinguished; but still ventured to inquire what might be the cause of a very perceptible, and by no means agreeable, odour. A dead rat was suggested as its possible origin. However, as it was no matter to trifle with, I requested that the plumber might be sent for, and also that he should be told that the soil-pipe close to the cross-pipe was eaten away.

At my next visit, the lady told me that the plumber had been very much astonished to find the pipe exactly in the state I had predicted. Lead has generally been used as the material for soil-pipes, and as we have seen how capable it is of corrosion, it becomes a very important sanitary question, to inquire how long a good lead soil-pipe will hold out. I have been studying this question for several years, and it is now about five since I first exhibited decayed pipes in public; yet I would not wish to dogmatise on the subject, but rather give approximations, and would remark that the time will vary under the various circumstances according to the strength and rapidity of flow of the sewage, as well as the original thickness of the pipe. But after allowing for this, we must broadly distinguish between soil-pipes which are ventilated and those which are not. By the former, I mean when the pipe is carried up to the roof of the house, and open to the external air; by the latter, I

* I would by no means be understood to say that smell merely as such, produces disease; it is simply a quality of what in this case does so.

mean when the pipes are closed up. Of these last-mentioned, the duration may be stated to be about twelve years, the extremes of variation being from a minimum of eight to a maximum of twenty years.

In ventilated pipes, the duration may be stated to be nearly double, running from twenty-one to twenty-three years, the extremes of variation being from eighteen to thirty, or even more years. The practical sanitary conclusion which it concerns us all to keep in mind is, that any house, no matter how carefully or well built, may become unhealthily from this source; and that when cases of typhoid fever, diphtheria, &c., occur, the pipes should be thoroughly inspected—especially their upper surface,—and the whole of the soil-pipe uncovered.

I must strongly insist on this, as in many cases the plumbers have declared the pipes to be all right, which turned out to be very defective when uncovered. For some years back, I have insisted on a careful examination of the soil-pipes wherever I have cases of typhoid or diphtheria, and in every case where I could get this carefully carried out, I have detected these perforated pipes.

Another way in which sewer-gas may act injuriously is by its passing up the waste-pipe of the cistern, and becoming absorbed by the water. In houses that have been shut up for a few months, this should be guarded against by running off all the water, and clearing out the mud at the bottom of the cistern, before the houses are re-inhabited. I also propose to insert into the waste-pipe a long wire cage with a circular head, and to keep this filled with seaweed or other charcoal, which should be replenished from time to time. Of course, it would be much better if all water used for cooking or drinking were drawn direct from the main.

It would prolong the duration of the pipe, and be an important sanitary improvement, if the soil-pipes were in every case carried up to the roof, and left quite open to the air. The expense of this would be more than compensated to the landlords by the greatly-increased duration of the lead pipes.*

THE NEW TOWN AND PORT OF BARROW-IN-FURNESS.

NEW WORKS AND BUILDINGS.

A FEW weeks ago we gave, in the columns of the *Builder*, a short descriptive notice of the cemetery now in course of construction at the new and rapidly rising town of Barrow-in-Furness, situated at the north-west corner of Lancashire, and immediately open to the sea. The rise and extraordinary expansion of Barrow is something almost fabulous, and is, perhaps, without a parallel in the history of any locality in the United Kingdom, if not, indeed, in the world. Before briefly glancing at the immense piles of buildings for manufacturing purposes, docks, shipbuilding-yards, hotels, churches, and other public and private buildings, which have already been erected, and are now in course of construction, it will give the reader some conception of the increase and expansion of this remarkable young town when we state that whereas within twenty years ago the population of the place was under 200, the inhabitants residing in a few straggling cottages, it now contains, according to the census returns of last year, a population of 76,000 souls, engaged in almost every branch of commercial and manufacturing enterprise, and with its immense docks and shipping, presents all the appearance of one of the leading seaports in England. Barrow may with truth be said to have risen, in an incredibly short space of time, from an isolated waste to a town of vast importance and wealth, where miles of new docks have been formed for the trade of a shore which only a few short years ago was washed by the tide, and there is, perhaps, no town in Britain that affords such a striking example of enterprise and engineering skill. Barrow is situated within a very few miles of old Furness Abbey, one of the finest ruins of its class in the country; and a recent writer on the wonderful rise and growth of Barrow, appropriately remarks, "Could some of the monks who were located in Furness when the Abbey was in its zenith rise, Rip Van Winkle like, to-day, they would find extensive workshops and warehouses

where there were rocks and sands; docks and lines of railway where were witnessed the water's ebb and flow; steamships and crafts of all dimensions tacking to, and bringing from distant lands the produce and material which is the very existence of mankind; and the locomotive puffing along like a fiery serpent over the very ground which in their day, might have been the scene for the hunt of a wild boar or the deer, a sport much enjoyed by the denizens in Furness about the fourteenth century."

The great secret of the rise of Barrow is that it contains a magnificent bed of iron ore, and it is, doubtless, owing to this fact, in conjunction with its immediate proximity to the sea, that the town has already attained such a position and eminence as a great commercial and shipping centre. In the year 1816 a railway was opened from a place called Broughton to Dalton, and in the following year, 1817, it was extended to Barrow, to facilitate the export of the iron ore, which had hitherto been put into small crafts from a wooden pier. For many years after the formation of the railway there were very few passengers. In the year the line was commenced, the traffic was 103,768 tons, whilst in the year 1863, it amounted to 621,525 tons, of which 408,612 tons were sent to Barrow for shipment and consumption, the remainder being sent inland by rail. At this time the whole of the inhabitants of Barrow were engaged in agricultural work or in the export of the iron ore. It was in the year 1859, that Messrs. Schneider & Co. commenced the erection of blast furnaces on a site which now forms the north-western extremity of this large and enterprising town. Additional furnaces continued to be built in succession, and kept in full operation, until in 1867 there were in all eleven furnaces, which gave employment to a large number of workmen, and from this source alone the inhabitants were more than trebled. Thus it was that these iron works inaugurated, so to speak, the birth of the town, and gave the first great impetus to building operations and manufactures in the locality, leading at the same time to the formation of the magnificent docks now filled with shipping. About this time a pressing demand for pure iron throughout the country raised the price of the material to a high rate, and the result was that large steel works were erected by a company in close proximity to the iron works of Messrs. Schneider & Co., who subsequently transferred their iron works to the Steel Works Company.* The company's works which were commenced in 1865, have been considerably enlarged since they were first opened, and now cover an area of 25 acres, upon which stand large blocks of buildings for the company's purposes. Amongst the articles manufactured are steel rails, weldless tyres, steel plates for shipbuilding, boilers, girders, iron roofs, bars, angles, guns, and forging of every description in steel; and in addition to this branch of their business, the company also supply from their own mines, the hæmatite ore and pig iron from which the steel is exclusively made. These Bessemer steel works, at Barrow, are said to be amongst the largest and most complete in the country, and their immense size and capacity may be conceived, when it is stated that they at the present moment give employment to about 3,000 workmen.

The rise and development of Barrow thus date from the great works just described; and their establishment has been followed by the laying out of long and wide streets and other thoroughfares, and the erection of numbers of manufactories of a varied character, each of which has swelled the population, and been followed by the erection of entire streets of houses, which are every day receiving additions; but notwithstanding that building is proceeding at an active rate, in order to meet the requirements of the constantly-increasing inhabitants, there is a great difficulty in procuring houses for the population, the demand being much greater than the supply; and a co-operative building society has just been formed. The town, which runs from south-east to north-west, may be said to be angular in form, and covers altogether an area of more than 2,000 acres, its greatest length, from east to west, which is at the extreme north side, being between two and three miles. The streets are well laid out, and chiefly at right angles, several of them being wide and spacious,—more especially Hindpool-road, which is one of the principal business thoroughfares in the town, and almost one mile in length. Amongst the

several establishments in the town which employ a large number of hands are extensive brick-making works, extending over an area of five acres; a large ship-building yard at the west of the town, belonging to a private firm, together with another similar establishment, the property of the Furness Shipbuilding Company; whilst a third company, called the Barrow Shipbuilding Company, has just been formed. This company has purchased a large area of land at the north-west angle of the town, having a long frontage to the Walney Channel; and they are now constructing a ship-building yard and engineering works, together with a graving dock capable of accommodating the largest vessels.

The company have already entered into a contract for the building of six steam-ships, of 5,000 tons burthen each, for a local steam-ship company, who are about to establish a line between Barrow and Canada. The several other premises are timber yards and steam saw-mills; then come several engine and boiler works, steam rope works, very extensive steam corn-mills, the Furness Railway Company's works, wagon works, steel-wire drawing works, and the Barrow Rolling Mills, all of which give employment to several thousands of artisans. In addition to these, what are called the Barrow Flax and Jute Works, situate at the north-west end of Hindpool-road, not far from the Hæmatite Steel Works, are just on the eve of completion. These extensive works, which occupy an area of between five and six acres in extent, will, when finished, give employment to between 2,500 and 3,000 artisans. The exterior of the building, the designs for which have been furnished by Messrs. Paley & Austin, of Lancaster, architects, presents a prominent and attractive appearance. The main front elevation is 612 ft. in length, and three stories in height, with two side elevations of the same height, and 350 ft. in length or depth. The materials used are vari-colored bricks, and the French style of ornamental architecture has been adopted, the building resembling more that of a Government office than a factory for the spinning and weaving of jute. The machinery, engines, and boilers are on the most extensive scale, and very costly; and the entire outlay incurred in the erection of these important works, which will give employment to large numbers of women and young persons of both sexes, is estimated at upwards of 200,000.

The public buildings in the town are numerous, and many of them handsome and ornamental architectural structures. The town-hall, market-place, and municipal offices are situated in a square in the centre of the town. The town-hall is not yet completed, a clock-tower requiring to be added in order to finish its architectural exterior. The interior, which is most elaborately fitted up, contains a public room, 90 ft. by 45 ft., which will hold upwards of 1,000 persons. There are also several reading and other rooms. The municipal offices, which contain, amongst other apartments, the council chamber, is situated on one side of the square, not far from the town-hall, whilst the market-place, which is now being enlarged, is on the other side. The town can also boast of a commodious theatre, which is now being enlarged. Baths and wash-houses have also recently been erected by Mr. James Ramsden, the mayor, who has held that office for some years, and is closely identified with the growth of the borough; whilst a large and commodious working men's club has been erected by Mr. W. H. Schneider. There are several handsome churches, St. George's Church, which is a fine architectural structure in the Gothic style, having been built at the joint expense of the Dukes of Devonshire and Buccleuch, whilst another church has been erected by Mr. Schneider. There are also a large Roman Catholic church, and several Congregational churches. The hotels are very numerous, and many of them large and elegantly fitted up. Amongst the leading establishments of this character are the Burlington, the Royal, the Imperial, the Hartington, and the Devonshire, besides many others.

The spacious and magnificent docks are amongst the chief attractions which Barrow possesses, and their enormous area will be understood when it is stated that it exceeds that of the whole line of docks on the Lancashire side of the Mersey, the former being between 350 and 400 acres in extent, whilst the water area of the Liverpool docks is not more than 250 acres. The Devonshire and Buccleuch docks, which were opened in 1867, are of great size, containing respectively a water area of 30

* In some examples that we have seen we found the soldered seam along the pipe perfect, while the lead on each side of the seam had perished.—Ed.

* The title of which is the "Barrow Hæmatite Steel Company."

and 33 acres. The Devonshire Dock is 2,500 ft. long, and the Buccleuch Dock 3,000 ft., and the width of each is 750 ft.; the entrances are 60 ft. In addition to the two docks just named there are also two timber-ponds containing a water area of 105 acres; whilst the Ramsden Dock, now in course of construction, is of immense dimensions, containing a water area of 200 acres. Its extreme length is upwards of 6,000 ft., or nearly one mile and a quarter, whilst its extreme width, at the point where it is connected with the Buccleuch Dock, is 2,500 ft. The entrance from the river to this dock is 100 ft. in width, being more than sufficient to admit through its gates the largest ship of any class or character ever yet built. When this dock is completed, the entire water-area of the Barrow docks will be 360 acres, whilst the wharfs adjoining them are 200 acres in extent; and extensive blocks of warehouses, four stories high, with a floor area of 17,000 square yards, abut upon them. Some thousands of workmen are engaged at the present time upon the Ramsden Dock and the timber-ponds, and the works are thus being pushed forward with great rapidity. It should be stated that at the entrance from the channel to the Devonshire and Buccleuch docks there is 25 ft. of water on the dock sill at ordinary spring-tides, and 18 ft. at neaps; whilst at the entrance to the Ramsden Dock, now in course of construction, the depth of water at ordinary spring is 31 ft., and at neaps 2½ ft. The depth of water maintained in the docks is 24 ft.

Such is the present of this remarkable modern town and seaport. What will be its future it would be difficult to foretell.

THE CITY CORPORATION VACANT LANDS.

It may seem almost incredible that the unproductive vacant lands in the metropolis belonging to the Corporation represent a million and a half of money in value. It appears that in consequence of the defects in the system in use for the letting of these vacant lands by tender, and the City architect not being able to attend to them owing to his being already overworked by his general duties, a special committee of the council was appointed some time ago to consider that system and report whether any change was desirable. After investigation, the committee reported that the course pursued with regard to the letting of the lands by tender was inefficient in its working and unsatisfactory in its results, and they recommended that the several committees having charge of vacant lands should have the power of offering a commission to any person introducing a tenant, and that an officer should be appointed whose duty it would be to take charge of all vacant land belonging to the Corporation, to attend daily at the Corporation City offices, and answer any inquiries in respect of such lands, and to state the rent or price at which any site would be let. The report was adopted by the Court of Common Council, and the salary of the officer was fixed at £300. per annum, and a commission of 5 per cent. on the first year's rental of all lands he might dispose of. On these conditions Mr. C. W. Thompson was appointed to the office in October last, and had since that time performed its duties; but it appears from the proceedings of the Court last week that the Improvement Committee declined to place any vacant land in Mr. Thompson's hands, notwithstanding the resolution of the Council instructing them to do so. The result was that at last week's meeting the special committee recommended to the Council that it be an instruction to the several committees to place in Mr. Thompson's hands all such vacant lands as they desired to lease. The discussion on this recommendation brought out some curious revelations as to the manner in which these vacant lands have been leased during several years past, and the loss which the Corporation have sustained under the operation of the system hitherto adopted. Mr. Isaacs, in endeavouring to show that since Mr. Thompson's appointment several sites of vacant land had been let which for years had been idle, said that amongst other cases a piece of land in Oxford-street had been placed by the City Lands Committee in Mr. Thompson's hands, and there was now a formal offer in writing for the larger half of that land of greater amount than any offer for it since 1867; and there was also an offer for the remaining half. From this fact Mr. Isaacs contended that as that land was disposable in 1867 five years had been lost in

respect of it, and he urged that if it had been earlier in the hands of an officer who had an interest in its disposal by the payment of a commission, the probability was that it would have been let five years ago, and 22 per cent. of the value saved. As another instance, he stated that the Bridge House Estates Committee had placed some land in Bevis Marks in Mr. Thompson's hands, and plans were now being prepared, and an offer for it would soon be received from a large capitalist. Mr. Isaacs added that under the old system the Improvement Committee had done nothing with the Clerkenwell Improvement property, which they had had in their hands since 1868, and some of it since 1854; and that property represented in the accounts of the corporation nearly a quarter of a million of money. He strongly urged that as the value of the unproductive land belonging to the Corporation amounted to a million and a half of money, they would perceive the need for utilizing it by a different process than had hitherto been pursued. Mr. Shaw, the chairman of the Improvement Committee, on the other hand, defended the old system, and was in favour of the lands being let through the architect's office, rather than through Mr. Thompson; whilst, as regarded the Clerkenwell property, it was owing to its having been in the hands of the railway, and only recently come back to the Corporation, that it had not been let. He stated incidentally that, as regarded the Holborn Improvement property, the viaduct was not opened until 1869; and that since then ground had been let producing a yearly rental of 11,000l. Mr. Alderman Sydney said it was most unfortunate that so large a portion of the City should be lying waste, and expressed himself in favour of offering a commission to any architect or agent whatever who brought them customers. Mr. Fowler, in supporting the recommendation of the special committee, said it was not right or proper for any committee to say they would have nothing to do with Mr. Thompson as a duly appointed officer. As an instance of what had taken place under the old system, he stated that the site of Whitecross-street Prison had been let to a gentleman who had since re-let it to a railway company, at an annual profit of 1,000l.; and the company stated that they had known nothing about the property, or they would have had it before. The report of the special committee was adopted, the several Committees who may have vacant lands to let being instructed to place them in Mr. Thompson's hands.

IMPROVEMENTS IN NORTHAMPTON.

THE new Post-office, which has been erected in Abington-street, is about to be opened, though not quite finished. It is of the Doric order of architecture, from designs supplied from her Majesty's Office of Works. The lower part of the front elevation is of Bath stone, and the upper part of red brick, with the exception of the windows; the jambs, &c., of which are also of Bath stone, surmounted with entablatures. The building is of four stories, including the basement, which has five rooms for letter-carriers, sorters, store-room, battery-room, with coal-cellar, &c. The first floor comprises the public office, the sorting office, the telegraph office, and the postmaster's room. The public office is 38 ft. long by 18 ft. wide, and will amply provide for the requirements of the town when it becomes much larger than it is. Behind the public office, but in full view of it, is the sorting office, which is 56 ft. long by 28 ft. wide, and is fitted up with a large number of sorting places, with mahogany divisions. The telegraph office, which is to the left of the public office when entering, is 38 ft. long by 11 ft. wide, and to the right of the same office is the postmaster's room. The first and second floors contain four rooms, each with lavatories, &c., and these were originally intended for Inland Revenue offices. These offices will not, however—at present at least—be transferred to the new post-office. The ground floor is so constructed that all the operations in the office will be under the eye of the postmaster. The building has been erected by Mr. Dunkley, of Blisworth, under his own superintendence, and the constant presence of his manager, Mr. Brown. The cost, exclusive of the purchase of the premises, is about 4,000l.

In few towns of late years, says the local *Herald*, have greater improvements been made in the buildings and general appearance than in Northampton. Not only have villas been erected at the outskirts of the town, but large factories

have been built on spots which, a few years since—in some cases only a few months since—were devoted to agricultural and horticultural purposes. Nor have the shops been behind hand, for within the last few years, not to speak of other parts of the town, where great improvements also have been going on, the appearance of "The Drapery" and Gold-street have been completely altered by the erection of shops which would be an ornament to any town. Abington-street, which has hitherto been completely stationary, has now entered upon an active career of improvement; and in addition to "The Nunnery," at the top of the street, and the new Post-office, there are signs of great progress in the shops also. Of this, the "Repository of Fine Arts," just opened by Mr. H. J. Atkins, who has removed from Gold-street, may be mentioned as an instance. It would be an oversight not to mention the new railway station in St. John's-lane. As an evidence of the progress made during the last few years, the breweries erected in Bridge-street and Commercial-street might be mentioned; but on this subject a difference of opinion to some extent prevails; as, in the estimation of some, breweries are a sign, not of progress, but of the contrary. They are considered, however, to be an addition to the architectural appearance of the town.

THE FALL OF HOUSES IN CHELSEA.

THE adjourned inquest was resumed before Dr. Diplock, the coroner, on Friday the 22nd inst., at the Chelsea Workhouse. Mr. Geo. Lewis appeared for the contractor, Mr. Hill, and Mr. Newman for the tenant, Mr. Jones, as before.

Mr. Jones, in reply to the coroner, stated he never saw the contractor's foreman examine the wall in the basement. He believed there was a support under the bressummer at twelve o'clock on Thursday morning, when he left home, the day of the accident. A witness was called, who said he saw the houses fall, having previously seen all the supports knocked away. The evidence of this witness, however, could not be depended upon, as in his answers to Mr. Lewis there was a confusion in his mind between the raking shores, the dead shores under the bressummer, and those under the trimmer which was suspended to the bressummer by irons, to support the joists. This uncertainty appeared to exist in the minds of two other witnesses who were called at the previous examination to prove that all the shores were removed from under the bressummer. Three of Mr. Hill's workmen were recalled, and again swore that the centre support to the bressummer was not removed. One man said, shortly before the houses fell he remembered distinctly placing his hand on the shore to steady himself as he was looking up to speak to a fellow workman; and in reply to Mr. Lewis, one of the witnesses said "it would have been an act of madness to have removed that shore and imperilled our lives." The iron column to be placed under the centre of the bressummer was on the premises, and the men were only stopping for orders to fix it.

Mr. R. Bell was called, and said, I am the district surveyor of St. George's, Hanover-square. I have examined the house, and believe it was the giving way of the basement wall under the column in the centre of the premises, that supported the party-wall above (the portion of wall in the shop having been at an earlier time removed) that caused the accident. The doorways cut in this wall would have a tendency to weaken it. If the wall had been sound, the house would have been standing now. It was a wretchedly-built wall, and the bricks which I looked at were as clean as if no mortar had ever touched them. The bressummer put up by Mr. Hill I consider was strong enough to carry four times the load which it had to bear.

By Mr. Newman: Even if the basement-wall had been a good one, cutting the doorways would have weakened it, as it only left 9 in. of brickwork; but in a wretched wall like this, built with mortar similar to garden-mould, it was fatal. As a proof that the one column was sufficient, it is now in a perfectly sound state, and rings clear as a bell.

By the Coroner: Was it possible that the front of the house gave way, and dragged the column from its place, and so caused it to slide off the basement-wall?—Mr. Bell: No.

This concluded the evidence, and the coroner then summed up, remarking that the first point upon which there was any discrepancy was as to the notice to the district surveyor, the statements

of Mr. Jones and Mr. Wood being contradictory, and he queried whether the notice given was sufficient under the Act. Having quoted from the Act those clauses relating to the point alluded to, he said it appeared that full particulars had not been given as required. It was also a question for the jury to consider whether the bressummer put in was of sufficient strength. According to Mr. Bell, it was strong enough to carry four times the weight which was upon it. He also commented upon the discrepancies in the evidence of the two costermongers and the butcher on the one side, and Mr. Hill's workmen on the other, and also between that given by Mr. Salter and Mr. Jouses. A great weight appeared to have been thrown upon the pier of the basement wall which had given way. Mr. Bell had stated that the horse had yielded in the centre, and had drawn the rest in like a vortex. If they thought there had been culpable negligence on the part of those who had been engaged in altering the premises, it would amount to manslaughter; but if they considered that ordinary care had been taken, it would merely be the result of accident. If more than ordinary care had been exercised, no doubt the horse would have been standing at this time.

The jury deliberated for half an hour, when their verdict was,—

"That the deceased, Chas. Freed, had been killed by accident; and they considered that Mr. Hill was deserving of censure for carrying on the work without having it examined by a competent surveyor; and that the foremen, Salter and Bradon, were also deserving of censure for undertaking duties which they were too inexperienced to discharge."

To this verdict we take one very important exception. Mr. Jones, the tenant for whom the alterations were being made, was the person who should have called in an architect to advise him as to the proposed works, and to have superintended them during their execution. When will the public see the folly of dispensing with the services of a professional man? The prevailing idea is to save his fee; but of the short-sightedness of this view there can but be one opinion, for not only does the employer have the work properly done by calling in an architect, but it is a check upon charges made by the builder. Had a competent professional man been employed in the case before us, there doubtless would have been no necessity for the inquest.

There appeared to be a wish on the part of some few of the jury to prove that all the supports were removed from under the bressummer, and that it broke, bringing down the houses with it. However, there was not the slightest reliable evidence of this: all went to show that the failure of the column in the centre of the premises was the cause of the disaster.

Mr. Hill wishes us to make it clear that he had nothing whatever to do with the party-wall, either in shop or basement, and we willingly do so.

THE LONDON CHARTERHOUSE SCHOOLS. AT GODALMING.

These schools are now nearly completed, so far as the contract is concerned. In our volume for 1870, p. 567, we gave an illustration of the design, and some particulars. The architect is Mr. P. C. Hardwick, and the contractors are Messrs. Lucas, Brothers. The style is Gothic, and the stone is native largetate, with Bath stone dressings. It is intended to occupy the building in June. The school is to accommodate 160 boys. At present it consists of a series of blocks of buildings, placed at angles, and forming in their position the letter Z. The chief approach is from the Peper Harrow-road on the west, facing Hartmore, a broad drive having been constructed there. The head master's residence and school for his pupils form the north-west block; the gown or foundation boys occupy the middle of the Z, so to speak; the matron's apartments and the south-east block contain the second master's apartments and offices for other boys in the school. Thus the matron's and gown-boys' apartments are to the south-west of it.

The ground-floor contains the usual living-rooms and reception-rooms of the masters, the boys' dining-rooms, for the pupils, and other offices. The dining-room at the head-master's will accommodate sixty boys, and is 39 ft. by 21 ft. On the first and second floors are the dormitories. These are fitted up to accommodate fifty boys each. The rooms are 21 ft. wide, and each sleeping compartment is 7 ft. long, and divided from the other by a wooden partition,

8 ft. high, thus leaving a passage of 4 ft. through the apartment. The room is heated with hot water, and attention has been paid to ventilation. Adjoining the dormitories are eight studies on each floor, 6 ft. by 7 ft., which are also warmed with hot water. The floors throughout the establishment are fire-proof. The plastering is the "sclenic," of General Scott, R.E., prepared entirely by machinery; it sets firmly in about 48 or 50 hours at the most. The mortar also has been made in the same way. The bath-rooms, lavatories, kitchens, and other domestic offices are as perfect almost as it is possible for science and ingenuity to make them. Throughout the building provision has been made for Monie's patent earth-closets to be fixed. All along the rear of the building are cloisters, with columns and arches of Bath stone, so that access can be gained from one part of the building to another without any exposure to the weather. The ceiling of the cloisters is composed of yellow deal, stained, and furnished with Gothic ribs. There will be no paint used about the woodwork in any of the compartments; all of it will be stained in this manner.

The schoolroom itself is a capacious and lofty detached edifice, being only connected by the cloisters to the main building. It is 82 ft. by 32 ft., and on either side there are three commodious class-rooms. It has an open stained timber roof, with cross-beams, key-posts, and circular ribs; and at the east and west ends there are two fine lancet-headed windows, with quatrefoils above in Bath stone.

The church is not yet commenced. It will be in the Gothic style, with traceried and stained-glass windows, and a spire about 125 ft. high. One of the chief objects in the front of the western elevation of the main building is the central tower. This is 160 ft. high. Over the entrance are oval windows in carved Bath stone, and above these are lancet-headed windows, with jamba and mullions richly carved. The whole of the tower is profuse in carved stonework, and above the lancet window is a niche, in which it is intended to put a statue of Sir Thomas Sutton, the founder of the school. The whole is surmounted by a spire, which has an ornamental finish of iron. This tower is not only ornamental, but useful, as within, it contains a tank capable of holding 7,000 gallons of water, and into which the water supply of the house will be pumped.

Ample provision has been made for an efficient water supply. A well, 175 ft. deep, has been sunk, and there is never less than 25 ft. of water in it. From the bottom of the well to the height of 40 ft., there are iron cylinders, and above that the well is bricked to the top. The water is to be pumped up by steam power, which is also available for the laundry. This latter has not yet been erected.

The whole of this work has been carried out by the contractors, who have had all the joinery work sent up from their manufactory at Lowestoft. At one time there were 420 men employed on the building. The general work is under the superintendence of Mr. Carpenter, the clerk of the works, and of Mr. Huntley, the foreman.

The grounds around the building are of great beauty, and about seventy acres in extent, from which some of the finest scenery in Surrey can be viewed. A piece of ten acres has been appropriated for a cricket-ground.

THE ROYAL HIBERNIAN ACADEMY.

The annual distribution of prizes to the successful students connected with this Academy has taken place. On this occasion there is some reason for congratulation, as commendable effort has resulted in lifting the essays on the part of the students out of the chronic rut of mediocrity, which was the distinguishing feature of the majority of former sessions.

The Government Commissioner who was sent over to assist in the awarding of the prizes has reported favourably of the progress evidenced on the last examination.

The President (Mr. Thomas A. Jones, M.R.I.A.), delivered a lecture "On the Life and Works of Raffaele," referring to his early career, his works in the Vatican, and his early death, saying that in invention, composition, and expression, the world has unfortunately none like him, and that his works were, in fact, transcripts of his imagination; also that the technical example of

his life was that in order to be successful they must begin with careful elaboration.

The bye-laws of the school need remodelling, and the hints thrown out by the Government Commissioner are to receive a careful consideration. It may not be amiss to state here that the Royal Hibernian Academy owes its foundation to the noble gift of an able architect, and the subsequent generosity of his wife, who completed her husband's intentions by an additional grant. Upwards of forty years have now passed over since its establishment and the death of its founder; yet the city he heartified and the arts he has benefited have scarcely done ought to prove their appreciation of his merits or his memory.

DANGEROUS CONDITION OF ADELPHI TERRACE.

At Bow-street, on Monday, Mr. Napier, on behalf of the Metropolitan Board of Works, applied to Mr. Vaughan for an order of removal, under the Building Act. He stated that five houses in Adelphi-terrace were in a very dangerous condition, owing to the sinking of the vaults underneath. A notice to that effect had been served upon the inhabitants, but they had not quitted their residences.

Mr. G. F. Hayward, the district surveyor, deposed to the dangerous state of the various houses, and alleged that at one of them,—No. 2,—the staircase would have fallen down, but for the shores which he had ordered to be put up.

Mr. Vaughan at once granted the order for the removal of the inhabitants.

We have had occasion to examine the houses and vaults, and fully endorse the opinion expressed by the district surveyor. Under the direction of Messrs. Scully & Wright, for the owner, Mr. Drummond, the buildings are being secured by means of strong shores; but in the vaults that were occupied difficulties were thrown in the way by the tenants, and thence the above application. Not a moment should be lost in getting the whole shored up.

We were, in the first instance, inclined to view the railway and drainage works in the Embankment as partly the cause of this disaster; but this is not altogether borne out by appearances in some of the vaults, where the failure seems rather above than below the foundation.

SCHOOL BOARDS.

Barnsley.—At an adjourned meeting of the Barnsley School Board, called partly for the purpose of selecting plans for the new schools, the members having inspected the twenty-eight sets of designs and plans sent in for the erection of a school in Park-road, among which were designs marked "Knowledge is Power," 2,060l.; "Alpha in the Circle," at 2,000l.; and "No Name," 2,100l., after some discussion the design "Alpha in the Circle" was accepted. It was stated that the authors of the design were Messrs. Wade & Turner, architects, Barnsley.

Dronfield.—The Uxstun School Board have appointed Mr. Rollinson, Chesterfield, architect to the Board. A requisition had been sent to Mr. Lambert, asking that the site selected by a set of schools at Nether Green, should be changed for one preferred by the Board opposite the railway-station at Uxstun. No reply has yet been received.

Drighlington.—At a meeting of this Board the clerk read a letter from the Education Department, in reply to his communication of the 10th ult., explaining that the inspector had reported that there were no efficient schools within the school district, and that the deficiency of 800, or, according to the statements of the Board, 900, should be supplied by a central school, to be erected at or near the spot suggested by the Board. The letter concluded by stating that, before the Education Department could recommend the Public Works Loan Commissioners to grant a loan for the purpose of erecting the proposed elementary school, the Department must be satisfied with (1) the plan and cost of the site; (2) the plan, specifications, and cost of the buildings. It was proposed, "That the advisability of advertising for plans for a new central Board school be considered at the next monthly meeting." This was carried unanimously.

Ordsall (Retford).—At a special meeting of this Board, it has been resolved that a school

shall be built to provide accommodation for 300 children, and that the building committee appointed last January be requested to obtain plans for the erection of a new school and school-house from not less than six nor more than nine architects, on such terms and conditions as the committee may think fit. The clerk read letters from the Education Department, giving instructions as to the building of schools and the transfer of existing public schools to school boards.

Southampton.—At a recent meeting, the architect was instructed to prepare plans and estimates for the proposed schools in Bevois Town.

CHESTER CATHEDRAL RESTORATION.

A MEETING has been held in the Birkenhead Music-hall, for the purpose of assisting to raise funds towards the complete restoration of Chester Cathedral. The chair was occupied by Mr. J. Laird, M.P.

The very Rev. Dean Howson gave an account of the restoration. The tower had been completed and paid for; the cost, including the restoration of the turrets and pinnacles being 6,000*l.* Having entered into details of the work in the chapter-house, cloisters, nave, transepts, and other parts of the cathedral, he said the original estimate for the complete restoration was 55,500*l.*, and he did not believe it would have been exceeded but for certain things which could not possibly have been predicted. They found, when they came to restore the eastern parts of the cathedral, that they had been absolutely built on no foundation at all, but on the green grass. The walls, being built of a frail stone, and being pressed upon by the roof, had been mouldering away, until there was imminent danger of the collapse of a portion of the structure. They had been in time to save the building from such a catastrophe, but the putting in of the foundations cost 2,400*l.* The restoration of the Lady Chapel was estimated to cost 1,700*l.*, but it had cost 3,000*l.*, the walls being so dilapidated. The tower, which was estimated to cost 3,000*l.*, had cost more than 4,000*l.*, leaving out the cost of the exterior decorations at the summit, which were not included in the estimate. The sum expended up to the present moment amounted to 40,000*l.*, towards which the Ecclesiastical Commissioners had given 10,000*l.*, while the subscriptions had realised the remaining 30,000*l.* At the end of last year the subscription list was rather more than 40,000*l.*, nearly all of which had been paid. In consequence of the impulse given at the beginning of the year, there was now enough money in the bank to carry on the work for several months. He estimated that about 30,000*l.* would be still required to complete the restoration. His present wish was to obtain 10,000*l.*, of which already 4,000*l.* had been contributed during the present year. He thought it would not be unreasonable if he were to expect from the Hundred of Wirral 1,000*l.* of new money.

A resolution was passed, "That this meeting highly approves of the restorations at Chester Cathedral, which it considers have been carried out with great architectural ability."

It was also agreed that subscriptions be solicited from the inhabitants of the Hundred of Wirral.

Subscriptions amounting to about 450*l.* had been received since the issue of the circular calling the meeting.

ANGLO-SAXON REMAINS NEAR WITNEY.

SEVERAL ancient interments have been discovered in removing soil between Witney and Burford, in Oxfordshire, where there are ancient fire-clay barrows. In one case the skeleton was that of a young woman. An earthenware urn stood at the head, and there were a necklace of glass beads, from the size of a pea to that of a crab-apple, and a bronze tooth-pick and ear-cleaner, on a bronze ring. "The figures," says a correspondent of the *Church Times*, "lay on her left side, with her face towards the west, and bent down upon the bosom; the knees bowed as one lies in bed when one's feet are cold. Her arms were folded across her breast, and on the third finger of the left hand was a ring of twisted bronze wire. Was this a marriage ring? If so, it indicates the use of the ring for this purpose as prior to Christianity amongst the Teutonic nations. On her breast were two flat silver brooches, each brooch the size of a five-shilling piece, each brooch

ornamented with a pattern of six small incised circles round the centre of the field. A small diamond-shaped bronze pendant was found near them; at her wrist a silver buckle, about 3 in. long, with slight and rude pattern. A knife lay close by, evidently having hung at her girdle. Beside his mistress (indeed his bones mingled with hers), lay a little lap-dog. The bones of a child of about two years of age, lay a few paces off northwards, and between them two skulls (which had been cooked) of the '*Bos longifrons*,'—a very rare find in a Saxon burial-place. Some paces away from the grave the spade disclosed the former existence of a circular excavation, the made soil descending about 4 ft. down through the natural stone trash. This was almost certainly the remains of one of their dwellings."

MISTRESS AND MAID.

WHILE we admire the munificence of the Baroness Burdett-Coutts,—her good sense and good works,—are there not humble and not far-off means within the reach of others of her sex to do good, though in a more limited degree, which in the aggregate would tell favourably towards easing a grievance that is more or less felt in middle-class society,—a class that represents perhaps the largest portion of all civilised communities?

It is not necessary to be rich to do good, though riches go far, if well dispensed, towards accomplishing good upon an extensive scale, as we have of late years been fortunate enough to witness. Great and grand effects occur in nature, which produce sudden and vast changes in the physical condition of the globe; so likewise do important results arise, though more slowly, from long-continued insignificant causes, each in its way equally desirable for the provision and well-being of the human race, one of the noblest of whose characteristics is to take into consideration the welfare and prosperity of succeeding generations.

The Legislature has now taken up the subject of education, and of improving the social and industrial condition of the working classes. The "street Arabs" and "gutter children" even will probably not be long without their guides and instructors; but there is a class afloat that seems to be *let alone*, to steer its course in the best way it can without such advantages, and this class is represented by the ordinary domestic servant, such as fills that capacity in families where only one or two are kept,—and a very large number of young women and girls are thus employed. Taken as a whole, what a disturbing cause they are permitted to be; and whose fault is it? Not entirely their own, most certainly, for some blame at least is attached to those who employ them, and who are supposed to possess better balanced minds, resulting from the advantage of a better training and education, and who could, if they would take the trouble, really do much towards improving their habits and character. As, however, there are some we cannot improve, so also are there mistresses who can do no good to their servants; but these are few compared with those who can, in some degree, benefit and instruct.

Ordinary schools cannot, of course, be used by those engaged in domestic service, nor are they necessary; for each household is, or ought to be, in itself a school, with all needful appliances at hand, and the mistress the proper guide and instructor. A well-regulated household is the right sphere for carrying on this good work, and the head of it is in no way doing her duty unless she exerts herself to correct and improve those beneath her who are thus brought into daily, almost hourly, contact with her. Subdivision of labour in all cases facilitates and perfects the work in hand, whatever it may be; so would the subdivision of instruction under these circumstances,—one teacher, one guide, daily teaching common things, and fostering a higher tone of mind; nor would it be found irksome were the importance of it once conscientiously acknowledged. Many ladies, however, may shrink from the idea of doing this, if they fancy they are being called upon to exert themselves on behalf of the low, vulgar type of domestic servant.

That need not necessarily be the case. Let her first select one suited to her own position in life, leaving the rougher sort for rougher situations; then follow the course recommended. There will always be something to regulate and influence for good with the best of them, and the

work will be equally useful to the community at large. Glancing at schools generally, they are found of all grades,—the village, ragged, national, cheap day and boarding, and, lastly, those of a higher and finishing character. Each of these may be represented by a single family, since there are certainly households of as many degrees: thus may the upper class be absolved from interfering with the lowest, and so be released from what may at first appear a too trying duty.

There are plenty of benevolent persons ready to be the friends and advisers of the poor; numbers visit them in the hope of rendering some service to both body and soul; in this way a sort of intimacy is established which aids them in their work: it is just this personal knowledge of each other that is required between mistress and maid; for it is chiefly through the heart that the best feelings are reached, and it is quite possible to cultivate this intimacy without encouraging an improper freedom. No one who speaks in unison with common sense and kind feeling need fear a loss of dignity or respect; it is only the ignorant, the vulgar and coarse in expression, who are likely to draw forth impertinence and contempt. Each class can show its high as well as its low type of human nature, and natural good sense is as likely to be found in the lower as in the upper orders: wherever found it will not be appealed to in vain. No one need suppose it is making any great sacrifice to do these things. Life ought not to be spent selfishly: a helping hand ought ever to be extended towards our fellow creatures; and this is one way, and a very important way, of assisting them. While doing it we improve ourselves, inasmuch as the mind is led into a train of thought that strengthens and tempers the whole character, and at the same time keeps up a habit of self-restraint and consideration for others; likewise, as we are the better for frequent and free intercourse with our superiors, so do we benefit by occasional conversation with those beneath us. Be it also remembered that, as we come into the world and share, at once, the benefit arising from the mental energy of our predecessors, the least we can do is to add our mite to the general advancement of our species; a brick or a stone added by each passing individual has been known to accomplish such results. Once more then be it urged upon every mistress: "kindly instruct and discipline your servants," so that they at length become sensible of a progress, of a step onwards in civilisation; though they may not know it by those "fine words," they are sure to feel it; and how much better for us all than discharging them and letting them again loose to disturb other households.

THE TRADES MOVEMENT.

Cambridge.—At a crowded meeting of the Building Operatives of Cambridge held at the Guildhall, it was resolved "that a deputation of six from the united body be appointed, asking for a conference with an equal number of the Master Builders' Association, to confer upon the basis of our circulars; and that the following be the deputation:—Messrs. J. H. Cooke and F. Burwick (carpenters), F. Lowings and R. Ison (bricklayers), and W. Scott and W. Cook (labourers)."

Middlesbrough.—An adjourned meeting of operative house-painters has been held to consider the reply of the masters to their demands for 6*d.* per hour and nine hours per day, overtime to be paid 7*d.* per hour. Of fourteen masters eleven concurred all these demands, one merely objecting to payment of overtime till after 8 p.m., and another declining to pay any overtime at all. A vote of thanks was passed to the masters who had made unqualified concession, and a hope expressed that the others would follow their example, the men pledging themselves to work no overtime for those who did not.

Shrewsbury.—A considerable number of men connected with different branches of the building trade have turned out, in compliance with a resolution passed at a meeting held during the earlier part of the week. Another meeting of the men was held; and they seemed unanimous in their determination not to resume work until the nine-hours system has been adopted. A committee was appointed to meet the masters should they express a wish to communicate with the men.

Chicago.—Mr. John D. Prior, General Secretary to the Amalgamated Society of Carpenters and Joiners, Manchester, thus writes:—"I find

that large numbers of building operatives are at the present time leaving this country for Chicago under the impression that there is a great demand for labour in that city, and that skilled artisans are receiving from five to seven dollars per day. It may, perhaps, be interesting to some of your readers to know that I have just received a letter from the secretary of our Chicago Branch, who informs me that trade in that city is very dull, that the supply of carpenters and joiners is more than equal to the demand, and that the rate of wages at present is from two to three dollars per day.

Workmen's Revolt.—The men employed in Messrs. Rothschild's mines at Witkowitz, in Moravia, broke out recently in revolt, and did various acts of plunder and destruction, owing, it is reported, to a delay in the payment of wages. The disturbance was quelled by military, after four of the rioters had been killed, 50 wounded, and about 100 taken prisoners. Workmen's strikes with us are tame affairs compared with this; and think of Rothschild not paying up his workmen's wages!

THE NEW ESTATE OFFICES, HUDDERSFIELD.

IN connexion with the view and particulars of these new buildings, in Huddersfield, given in our last issue, we are asked to add the names of the various contractors and others engaged in the execution of the works, and willingly comply. They included Messrs. Ben Graham, mason; James Christie, carpenter and joiner; James Walsh & Son, of Halifax, plumbers and glaziers; E. J. Goodwin, Brothers, slaters; D. Sumner-cliffe & Sons, plasterers; Knight & Jackson, painters; Minton, Hollins, & Co., Stoke-on-Trent, tilers, encaustic; Hodgkinson & Co., of Coventry, Medival iron-work and gasfittings; Longdon & Co., of Sheffield, grates; Fisher & Dyson, of Huddersfield, marble chimney-pieces; T. Outhwaite, of London, marble chimney-pieces for club and estate offices; Geo. Jennings, the closet and lavatory fittings; R. Dennett, fireproof floors; H. Brook, ironfounder; and Farmer & Brindley, carvers. Mr. Rd. Phillips was clerk of works.

CONCRETE AND BREAKWATERS.

WE have frequently had to comment on the great difficulty and expense of building and keeping in repair the breakwaters on our fishery harbours on the northern coasts. It is not long ago since nearly 40,000l. were actually flung into the sea at the harbour of Anstruther, a town on the Fife-shire coast, of a small and insignificant fishing population, in trying to provide a safe harbour. The harbour at Wick has also been another rock of offence in this light. But it seems at length that the northern engineers have adopted a material capable of resisting the tidal action and the ravages of storms. Glancing at the report of the British Fisheries Society regarding the Wick Breakwater, we find that it states that the breakwater has been exposed recently to two very severe south-easterly gales, and has sustained some damage; but the concrete blocks at the extreme end of the works have not been injured, and this appears to show that *solid cemented masses will resist the force of the waves better than the best masonry, however large the stones, and however strongly they may be bound together.* The directors propose to repair and strengthen the erection up to the point it has already reached. Before proceeding further seawards, it will be necessary to obtain additional funds, and they think it is advisable to suspend operations for a year in order that the stability of the work may be thoroughly tested.

The reports of Messrs. Stevenson, the engineers, are appended to that of the directors, and one states, *inter alia* (the last, dated 5th March, 1872), that the breakwater has sustained damage during the last gales, when, for a period of about twenty days, with little intermission, the work was exposed to the impact of waves about 30 ft. high, and which, on striking the work, projected the spray to the height of about 200 ft. The damage is confined to the portion of the work built without the parapet. The number of stones fractured is not great, but it shows the excessively intense force of the sea on this part of the work, which struck the breakwater with such force as to fracture blocks of the same density as granite, and having a strength three times greater than that of Craig-leith stone,—a fact unparalleled in the history

of sea works. They are of opinion that, if left exposed, the sea will ultimately make a breach in the wall by shattering the stones, and think the directors should, if possible, arrange, in preference to extending the work next season, to deposit blocks of cement rubble of 80 to 100 tons weight outside of the wall, which would not only protect the wall itself, but tend to tranquillise the water inside of the harbour. They estimate the cost of depositing concrete blocks in front of the outer portion of the breakwater, which is most exposed, at about 5,000l.

THE METROPOLITAN WATER SUPPLY.

IN a summary of Dr. Frankland's analytical examinations of the waters supplied by the eight metropolitan companies, he contributes to the annual report of the Registrar-General some valuable remarks upon the London water supply in 1871. The daily supply to London is now about 107 millions of gallons. Of this 20 millions are "good wholesome water from wells and springs in the chalk," and 87 millions are "more or less impure water derived from polluted rivers." The Chelsea and Lambeth companies draw their supplies from the Thames after it has received the polluted Mole and the sewage of 600,000 people, including the filth of Oxford, Reading, and Windsor. The West Middlesex, Southwark, and Grand Junction companies draw their water from the Thames above the junction with the Mole, but after it has received the sewage of the three above-mentioned towns, as well as of smaller places. The East London Company takes its supply of water from the Lea, below the sewer outfalls of Luton, Hertford, and Ware. The Lea, however, is less polluted than the Thames, and Dr. Frankland remarks that it is to be "regretted that the East London Company have just spent about 500,000l. in conveying water from the Thames to their works in the Lea Valley." This new source of supply will probably come into use in the current year, when "a considerable deterioration in the quality of the water supplied by the company may be looked for." The New River Company draws rather more than half its supply from chalk wells, and the rest from the River Lea above the sewer outfalls of Hertford and Ware, but below those of Luton, Whitwell, and Welwyn. The Kent Company is the only one of the metropolitan companies which draws its entire supply from chalk wells, and does not distribute any water from polluted rivers; "this water is uniformly excellent for drinking and all domestic purposes, but is too hard for washing." As the Kent water is drawn entirely from deep chalk wells, it is not filtered before delivery, and the natural filtration it receives through the chalk is so superior to the best artificial filtration, that this company's water has never for several years past shown any signs of turbidity. The Chelsea and Lambeth companies, however, "periodically deliver water so muddy as to be entirely unfit, on this account alone, for domestic use." Living organisms were found during 1871 in most of the turbid samples delivered by each of the companies drawing their supplies from the Thames, excepting only the West Middlesex, which "on all occasions sent out well-filtered water."

SCHOOLS OF ART AND SCIENCE.

The Lambeth School of Art.—The distribution of prizes to this successful institution has been made by Canon Gregory, at the school, Miller's-lane, Upper Kennington-lane. Miss Agnes Schenk was awarded the gold medal for design for lace, and also received the Prince of Wales's scholarship of 25l. The silver medallists were Miss Alice Parkess, for a head from life; Mr. Arthur Barlow, for a model from the antique; and Mr. Tom Hunt, for a life study. There were seven bronze medals, and numerous other prizes, including books, money, and several useful articles. Canon Gregory sketched the eighteen years' history of the academy, from its modest origin, with which he was personally connected, to its present useful and large proportions. The aim of its founders and existing managers was to render the teaching a practical adjunct to the iron and pottery industries of the district. This was the first occasion of the pupils being able to display beautiful objects of pottery art of their own conception and workmanship, a result due in great measure to the liberality of Mr. Henry Donlon, and the taste, and ability of Mr. Sparks, the head master,

Owing to the rebuilding and enlargement of the premises, he appealed to the overflowing audience to contribute something towards wiping off a debt of 300l. This extension had left unpaid. Mr. Tom Taylor, after the distribution, recited an address upon Art, taking for his leading theme the street-decorations of the recent Thanksgiving Day. Speculating upon the unfavourable impression they must have produced upon the minds of the youthful Japanese sent over to study our habits, tastes, and institutions, and who were in St. Paul's on the day, he thought they must have said to themselves this could not be the England of 500 years ago, of which they had read, or the country that set so high a value upon the beautiful productions of their own Japan. In this strain he reasoned, contending that the art taste of the nation had degenerated, but argued that institutions of this kind were destined to restore correct notions, amongst the people, of the picturesque.

SOCIETY FOR THE ENCOURAGEMENT OF THE FINE ARTS.

MR. T. GILKS delivered a lecture before this Society on Thursday evening in last week upon "Thomas Bewick, and the Revival of Wood Engraving in England;" Mr. J. A. Henson, R.S.A., in the chair. There was an exhibition of chiaroscuro by Baptiste Jackson and Goldins, some large Dürer cuts, some choice large cuts by Bewick, five different portraits of him, and most of his works. Mr. Gilks began by a retrospective glance at the low state of the art in England anterior to Bewick. The lecturer then spoke of his birth, education, love of art, and apprenticeship, and alluded to his first cuts, his visit to London in 1776, and the few persons he found then practising the art. Mr. Gilks laid great stress upon Bewick's intense love of nature. He also drew an analogy between Michelangelo, who was called "the master of live stone," and Bewick, who certainly was a "master of live wood;" and he urged that not even Dürer or Holbein had so faithfully interpreted nature as Bewick. Mr. Gilks referred to Landseer's "Life and Letters of W. Bewick," and the light it shed upon the engraver's estimation by the literary world. The lecturer critically examined Bewick's *modus operandi*, and showed how he attained superior results to the modern mode. A discussion ensued, in which Messrs. J. G. Waller, T. Reed, Palmer, Sadder, Captain Britton, the Chairman, and the Hon. Secretary, took part.

THE ROYAL ALBERT HALL.

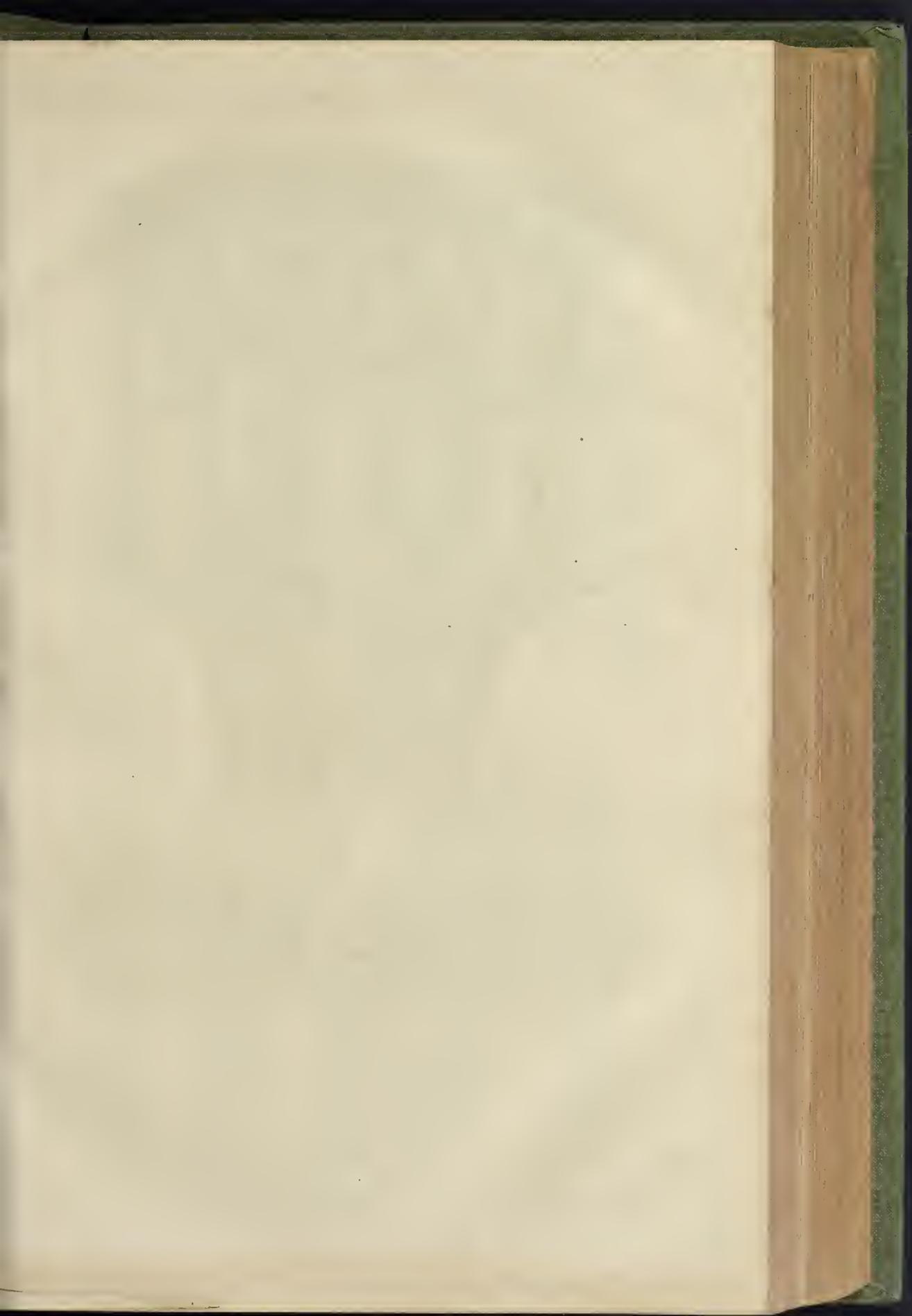
HIS Royal Highness the Duke of Edinburgh presided at the first meeting of the Corporation, on Monday last, in the East Lecture Theatre of the establishment, when the draft constitution was submitted, and, after a few alterations, adopted. The Duke made an excellent address, giving the history of the undertaking, and an account of its present position. General Scott read a report from the Provisional Committee, which was also adopted: all the proceedings were characterised by great unanimity. About a hundred members of the corporation were present.

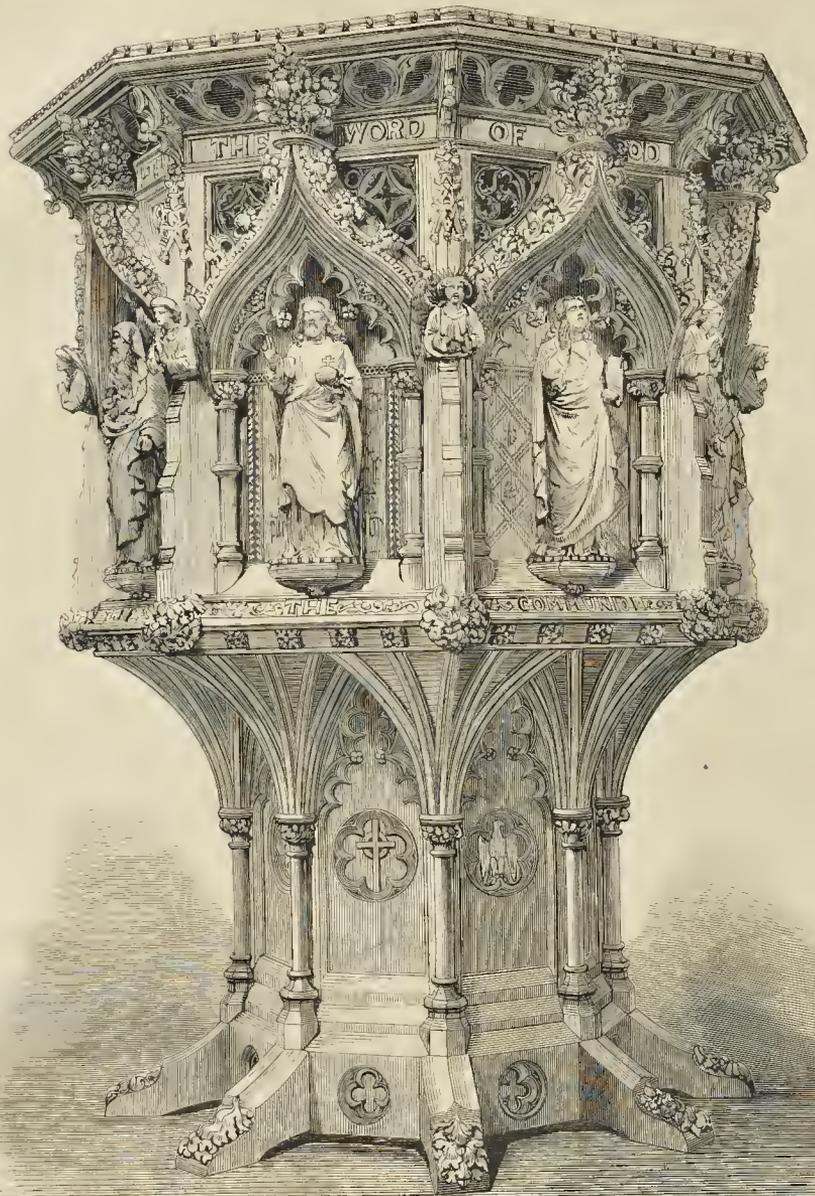
JEBEL EL KUMRI.

SIR,—May I be permitted to say that this word Kumri, which you seek to ally with our aboriginal Welshmen, is only a form of the common Arabic word for moon; thus, Jebel el Kamar is the moon-mountain, called luns, in the plural, the mountains of the moon; the well-known backbone of Central Africa.

The Welsh word for "moon" is *Henad*, cf. Latin *luna*. Had our Cymreig really retained so important a word from a supposed Semitic ancestry, we should find a more striking similarity between Welsh and Arabic than is now apparent.

A. HALL.
* Mr. A. Hall is no doubt quite correct in his Arabic, but we made no attempt whatever to show, or even to hint at, anything like either an Arabic or an Arabian origin of the people of Cumberland, of which district we were speaking; or of those of Wales either. Our argument pointed to Africa; and the only question here would be, whether the word Kumri, applied by natives to African mountains, may not be connected with some ancient African language, as well as have, in another form, a meaning in Arabic. "Kumri" and "Cynury" are "closely akin."





PULPIT. HOLBEACH CHURCH.

Designed by Mr. Christian, Architect; executed by Mr. J. Forsyth.

HOLBEACH PULPIT.

THIS pulpit, recently placed in Holbeach Church, as a memorial, is executed principally in oak; but its architectural effect is heightened by a mixture of teak and other woods. The height of the pulpit is 6 ft. 6 in., and it is octagon in form. Each segment of the octagon (excepting the one for the entrance) contains canopied panels, which form the setting for the figures.

those being seven in number. The figures represent, in the order of their position, Moses, Abraham, Elijah, our Lord, St. John, St. Paul, and St. Simon, and are all carved in oak from models made expressly for this work. On the base, under each figure, appear their appropriate emblems. These figures, together with much richness in ornamental and moulded detail, produce an imposing effect. The cost was nearly 300l.

Mr. E. Christian was the architect (under whose superintendence the church has been restored), and Mr. J. Forsyth the sculptor.

Honour to Literature.—The Metropolitan Board of Works have decided to rename Oakley-square, Chelsea, and to call it henceforward "Carlyle-square."



FLECHES : GERMANY.

FLÊCHES.

The "Flèche," for which we have no English name, unless "spirelet" may be used, forms a most graceful and interesting feature in Continental Gothic architecture, and it is a singular circumstance that the ancient architects of this country should never have introduced it. In their smaller churches they seem always to have preferred using the bell-gable, and in their larger cruciform churches the central tower is almost universally to be found. Probably, however, Westminster Abbey had a Flèche before Sir C. Wren added the present stamp of a central tower which disfigures that building; and it is known that there was one at Beverley Minster before the existing abomination was erected over the "crossing" of that beautiful church.

A flèche of large dimensions exists at South-void Church, in Suffolk, and the "louvres" over our dining-halls partake of the character of this feature, but all the ancient English examples, and they are very few, seem to be clumsy and ungraceful in their outline, and quite wanting in the elegance and grace of the Continental ones.

Flèches appear to have first come into use in the thirteenth century, and a few examples of that date are to be met with in France. In the fourteenth century they were of such frequent use that nearly every church in Germany of that date seems to have possessed one. The examples we give, from the Minorite Church at Cologne (fig. 1), from St. Michael's Church, Bamberg (fig. 2), the Kloster-Kirchoth Cassel (fig. 3), and the Chapel of the Town-hall at Cologne (fig. 4), are all of this date, as are also those of the cathedrals at Münster and Halberstadt, and the churches of St. Andrew at Hildesheim and of the Franciscans at Limburg-on-the-Lahn. In fact, most of the churches erected by the mendicant orders of this date possess this feature, as their rules did not permit them to erect towers. During the fifteenth and sixteenth centuries flèches continued to be used, and examples of the fifteenth century are often exceedingly elegant and beautiful. Those of St. Maria in Capitol at Cologne (fig. 5), and St. Mary in Thal at Rothenburg (fig. 6) are of this date. The latter is of stone, and bracketed out from the western gable. The flèche of the interesting and beautiful convent of Himmelsport, near Würzburg, is a charming example of the latter part of the sixteenth century (fig. 7).

The spiral portion of this example is of wood covered with slate, but the rest of it is of red stone, and it is carried down through the church to the ground. The arrangement internally is singular, but very picturesque. It occurs just over the centre of the nave of the church, and not between the nave and the chancel, which is the usual position for a flèche. The portion of the nave to the west of this flèche is raised upon a crypt, that between the flèche and chancel is consequently 12 ft. or 14 ft. lower than the western portion. The part of the nave which is raised is used as a choir for the "religious," and the basement of the flèche combines with a kind of roof-structure, separating this from the eastern portion of the nave, which is used by the secular inhabitants of the convent, who are thus stationed between the choir and the chancel of the church. The lower portion of the flèche, i.e., that part of it which rises from the floor of the church, contains a staircase communicating with the choir of the "Religious" and the crypt below. This singular and interesting church is of various dates. The crypt under the nave (we call it a crypt, although it is entirely above ground) and the south doorway are "First Pointed" work. The chancel, which is small and square-ended, is "Second Pointed"; and the nave is "Third Pointed." The flèche and gables are of the latter part of the sixteenth century. There is another flèche of the same date, and equally picturesque, though smaller than the one we have described, over the refectory of this interesting convent.

The little flèche or bell-cot represented in fig. 8 is from the chapel of a small convent at Bamberg, in Bavaria; it is probably a work of the sixteenth century; and that represented in fig. 9 is from the western end of the Cathedral of Limburg-on-the-Lahn, and dates from the seventeenth century.

All these examples, except figs. 6 and 7, are constructed of wood. The example from the Minorite Church at Cologne (fig. 1) is entirely covered with lead, and the crockets are beaten out in that metal. The basement is adorned in a peculiar manner with a number of small shields.

The example from St. Michael's, at Bamberg,

is also entirely covered with lead. The example from Cassel (fig. 3) has its spire and base covered with small slates, whereas the wood is left exposed in the open portion of the flèche. Fig. 4, from the town-hall at Cologne, is entirely covered with lead, and is exceedingly elaborate. Fig. 5, from St. Maria zu Capitol, Cologne, has the upper portion of its spire covered with lead, the lower portion of the spire with slate, the open portion covered with lead, and the base, which is in the form of a spire, covered with slate. Below this flèche is a pretty little stone oriel window, forming internally the receptacle for a small altar. The whole of this flèche has been recently restored, and apparently with considerable care.

In figs. 8 and 9 the roofs alone are covered with slate, the timber being left exposed in their lower portions.

THE DARLINGTON FEVER HOSPITAL COMPETITION.

SIR.—As you are always ready to expose injustice, I will, in as few words as possible, recount the *grossest* case that I have ever met with in the course of my professional career.

The Town Council of Darlington invited the local architects to compete for two premiums for an infectious hospital. Five of them complied. Four of the designs being (as you and most of your readers will, of course, expect *all* would be) on the "Pavilion plan," but varying, no doubt, in merit as to carrying it out; the fifth is, however, on the old long-abandoned "ward plan," with windows only at one side and one end, and a window about 3 ft. square, into a narrow passage. And will you believe me, sir, when I assure you it is a positive fact that although you, as well as Miss Nightingale and others, have explained and advocated the pavilion principle for years, so that a complete revolution has been effected in hospital construction, the Hospital Committee actually selected this "ward" plan as "*the best*," and although asked by the other competitors to call in you, or some other "expert" on the subject, before making their report to the council, refused to do so, but sent in their report, which was almost as a matter of form adopted, only one voice being lifted up in favour of a skilled and impartial adjudicator, and in vain?

The most painful part of the affair is, that at the meeting of the committee who practically selected the design, of the three members besides the mayor present, two of them are the partners in business, and one of them a "client," and considered to be a decided partisan, of the architect whose design they selected as the best.

It is perfectly certain that the Government officer who has to approve the plans of hospitals built with public money will not approve the design, but the committee of partners took good care not to make any stipulation as to that in awarding the premiums: only get their friend appointed architect, and he can, with the aid of the other designs, probably make a fresh design to pass.

Can you conceive a more cruel case of injustice to the other competitors? And can you, with your great experience, suggest a remedy, or must they "grin and bear it?"

"ONE WHO LIKES FAIR PLAY."

ARCHITECTURAL ASSOCIATION.

THE visit of the members, on Saturday afternoon, the 16th inst., was paid to the new buildings for the learned societies, now in course of erection on the old courtyard of Burlington House, at the present time roofed in, the scaffolding removed from it, and the masonry of the upper stories cleaned down, and preparations are being made for beginning the internal plastering.

At the ordinary fortnightly meeting, held on Friday evening, the 22nd, thanks were voted to Messrs. Banks & Barry, the architects, for the opportunity of visiting their building. A paper was then read, by Mr. G. H. Birch, "On Christian Iconography," which he defined, for the purpose of his paper, as the regulation of the representation of holy things by paintings, statues, glass and wall decorations in Christian churches, and their appendages; advocating, 1. The employment of the arts to teach the people as well as to decorate sacred buildings,—a principle largely acted on of old, though in more modern times fallen into some disuse. Also, 2. The application to the different divisions

of churches of a set system of decoration, the reference in paintings, sculpture, &c., only to subjects having a special and peculiar suitability to the parts and their ordinary uses. Basing his remarks on the information conveyed in a single view in M. Didron's well-known "Manuel d'Iconographie Chrétienne, Grecque et Latine;" and instancing examples from England and the Continent of the traditional treatment of the various walls, windows, and fittings; Mr. Birch proceeded to indicate what seemed to him the method of applying the same to modern needs. Recommending most strongly the devotion of the north sides of all churches uniformly to the history of the elder world, and of the southern sides to history since the appearance of the founder of the Christian faith; also, among other matters, censuring the use of holy symbols in floors, and the introduction of memorial windows filled with delineation of modern buildings or of portraits and personal traits. He also pointed out what seemed to him the unlimited field for able work if thorough schemes of church completion became the rule instead of the exception; though all the work should be sober and dignified, he did not consider there was any need to resort to archaic drawing to obtain that repose and character. Treated at first hand with all the freshness of true talent, the old subjects of Christian art may take a continual newness from the artist's hand, even though he works within the trammels of traditional iconography. In the discussion which followed, some stress was laid on the necessity for real interest in the subjects depicted, in order that they may be permanently of value; and doubts were expressed as to the possibility of direct didactic result from any art, or of the real usefulness and high character of art produced under more prompting. Notice was also taken of the avoidance of modern subjects in churches, an undesirable exclusion, as the speaker seemed to think, of a portion of the world's history that ought to be interesting above all others to moderns; and the possibility of attaining completeness and interest with but little reference to tradition was hinted at.

EXCAVATIONS IN ROME.

WILL you permit me to take advantage of the wide circulation of your paper to make known to my numerous friends in England and the subscribers to the Roman Exploration Fund, that I have this day been through the subterranean passage from the vestibule of the great ancient Maestri Prison (commonly called the Prison of St. Peter), under the Church of the Crucifixion, near the Arch of Septimius Severus, and the principal chambers of that prison called the Lautumiao, now cellars under the houses in the Via di Marforio and the Vicolo del Ghiattello? This passage is 80 yards long, nearly 2 high, and 1 wide, and the construction as well as that of the prison is of the large blocks of tuff, usually called in Rome the walls of the kings, the same as that of the earliest part of the Cloaca Maxima. The excavation of this passage has been a tedious, difficult, and expensive work, and I hope it will be duly appreciated by the subscribers. It clearly settles another long disputed question among scholars, and demonstrates that this is the prison in the middle of the City, mentioned by Livy as made in the time of Anens Martius (A. U. C. 121; B. C. 632. Livy Hist. lib. 1, c. 33). All the disputed points in the historical topography of Rome might be settled and demonstrated in the same manner, if the necessary funds were forthcoming. I have had plans and sections made of this, and shall have them published as soon as possible and sent to the subscribers.

JOHN HENRY PARKER, C.B.

DOMESTIC ARCHITECTURE AND THE ART SCHOOLS.

AT a meeting of the South Kensington District Schools last week, Sir Coutts Lindsay, who distributed the prizes gained by the students, said he had been asked by Mr. Cole to suggest anything he thought needful with regard to the schools, and he had mentioned the subject of domestic architecture. He proposed to offer a prize of 5l. to the student who should produce the best design for a dwelling-house to be erected on a given plot of ground in town or country. He also proposed to give a prize of 5l. for the best study, executed in marble, from a design from the antique. It might be but a part of a

figure," for probably a whole figure would be found to be too costly as regarded the material. He would also give a prize of 5l. for the best understood and most gracefully arranged drapery copied from life, not to be elaborately finished, but to be sketched so as to serve, if needful, for elaboration afterwards; we had many such sketches by Raffaele, from which one who understood drapery could readily see how that master had intended that the details should be filed in. He thought that a number of draperies should be provided for the school, and that the students should study them placed upon one another, and variously arranged.

NEW RAILWAY STATION AND RE-ARRANGEMENTS, LOUGHBOROUGH-ROAD.

The works now going forward in connexion with the loop line of railway from the main line of the London, Chatham, and Dover Company to the Crystal Palace High-level line, involve a very important reconstruction of the Loughborough-road station arrangements. The present booking-offices and station at Loughborough-road are very inconvenient and altogether inadequate to the traffic, the only accommodation for passengers being under two of the company's arches, whilst the approaches to the railway platforms are still more unsatisfactory. On the completion and opening of the Crystal Palace Junction, a great improvement will take place in this respect. The directors have resolved altogether to close the present booking-offices and approaches, and to erect a large and commodious new station on the street level, on a plot of ground fronting Coldharbour-lane. The exact site of the new station will be in the fork between the main line and the new junction line to the Crystal Palace, now in course of construction.

ST. MARY WOOLNOUTH.

SIR,—There are rumours afloat that the existence of Hawkmoor's noble church, St. Mary Woolnoth (admirably situated at the corner of Lombard-street), is included under the Loudon Churches Act.

I am sure it is only necessary to state this fact to secure the co-operation of all who care for the old architecture of England, in a rally for its preservation. The works of Hawkmoor are not so many that we can afford to lose so excellent a specimen of an artist in whose hands the modified Italian of Wren assumed a peculiar character of dignified prettiness. VIGIL.

* * * We fully agree with the expression of our correspondent, and hope to be speedily assured that no such disaster as the destruction of this building will be allowed to occur.

METROPOLITAN BOARD OF WORKS AND DISTRICT SURVEYORS.

At the usual weekly meeting of the Board of Works on the 22nd, Mr. H. L. Taylor wished to ask the Superintending Architect whether Mr. Power, the district surveyor of the southern district, was entitled to charge 10s. 6d. each for inspecting the parapets and roofs of their buildings in Ludgate-hill before Thanksgiving Day. He wanted to know if the district surveyor was entitled to make this charge for buildings not inspected.

The Superintending Architect said that the district surveyors were directed by order of the Board to make an inspection of roofs and parapet walls, and he believed that was on the motion of Mr. Fowler.

Mr. Eli said he seconded the motion, and that all that was required was that notices should be served upon the householders, drawing their attention to means being taken for their security. The subject then dropped.

GLASS AND GLASS PAINTING, SOCIETY OF ARTS.

THE next course of Cantor Lectures to be delivered on Monday evenings, commencing on the 8th of April, will treat of Glass and Glass Painting, as the following letters show:—

Lecture I.—On Silica, Silica, and compound of these with other substances—Fluorine, &c. Lecture II.—Solutions of Silicic Acid—Silicates—Glass (composition of)—Different Kinds of

Glass—Methods of Making Glass. Lecture III.—Manufacture of Glass (continued)—Coloured Glasses—Glass Staining—Glass as a Decorative Material—Glass Painting. Lecture IV.—Glass Painting (continued)—Mosaics—Enamels. Lecture V.—Styles of Glass Painting—Illustrations with the Electric Light, illustrative of the Nature of Colour. Lecture VI.—Silicates as Painting Vehicles, and some other of their Useful Applications in the Arts.

Every member has the privilege of introducing two friends to each lecture.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the Ordinary Meeting, held on the 18th of March, the paper read was,—"On the Fall of the Brick Dome of the Koltovskote Church, at St. Petersburg; with an Account of its Construction, and the Theory proposed for the Safe Erection of such Structures: being a Communication from M. Bernhard, Architect, of St. Petersburg," by Mr. Wyatt Papworth.

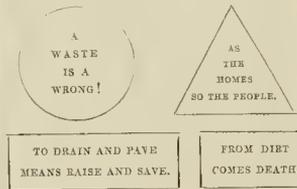
The following have been elected as honorary and corresponding members:—Mons. Espérandien, of Marseilles; II. Cavaliere Giuseppe Fiorelli, of Naples; II. Cavaliere Antonio Cipolla, of Rome; II. Cavaliere Enrico Alvino, of Naples; II. Cavaliere Pietro Rosa, of Rome.

On the recommendation of the council with regard to the nomination of new members, it has been resolved that,—

"The Nomination Paper must be accompanied by a separate written statement by the applicant as to his professional education in the case of Associates, and as to his professional education and works in the case of Fellows; and by another written statement by one of the three Fellows who have signed the Nomination Paper, giving particulars of his acquaintance with the candidate in the case of Associates, and of his acquaintance with the candidate and his works in the case of Fellows."

HEALTH APHORISMS.

SIR,—I in common with some other "women workers" in a densely-populated neighbourhood, take charge of a class in the Sunday School; and it has occurred to me to suggest through your columns that, as well as the present beautiful Scripture mottoes which we distribute to the children on cards and other pictorial illustrations, we could at the same time do much good by a similar dispersion of some of your sanitary maxims or Health Aphorisms, such as,—



A suggestion from your able pen might so influence the administrative department of the Religious Tract Societies that they would be induced to print these.

PRISCILLA.

EXPENDITURE ON THE NATIONAL GALLERIES AND MUSEUMS.

A RETURN has been furnished to the House of Lords, on the motion of Lord Overstone, as to the sums expended on the following public galleries and museums:—

National Gallery.—1. Total amount expended on account of purchases from the date of its commencement to the present time, 337,196l. 9s. 10d.; 2. Total amount expended during the same period on account of annual cost of the establishment and other outgoings, 133,384l. 11s.; 3. Total amount expended on building account, 102,406l. 1s. 8d. Note.—The amount of 7014l. 6s. 9d. was received by sale of catalogues to March 31st, 1871, and paid over to her Majesty's Exchequer.

South Kensington Museum.—1. Total amount expended on account of purchases, from the date of its commencement, in 1853, to the present time (March 31st, 1871), 308,677l. 2s. 7d.; 2. Total amount expended during the same period on account of annual cost of the establishment and other outgoings (including schools of science and art), 1,133,617l. 19s. 2d.; 3. Total amount expended on building account, 231,740l. 5s. 8d.

National Portrait Gallery.—1. Total amount expended on account of purchases, from the date of its commencement to the present time (March 31st, 1871), 14,832l. 7s. 3d.; 2. Total amount expended during the same period on account of annual cost of the establishment and other outgoings, 11,997l. 4s. 9d.; 3. Total amount expended on building account (including rent), 4,320l. 4s. 2d.

British Museum.—1. Total amount expended on account of purchases and acquisitions (including the amount ex-

pendent in excavations) from the commencement of the year 1824 to the present time (March 31st, 1871), 778,347l. 13s. 6d.; 2. Total amount expended during the same period on account of annual cost of the establishment and other outgoings, 1,637,786l. 12s. 4d.; 3. Total amount expended on building account, including acquisitions, during the same period, on commission, from Michaelmas, 1823 (when new buildings were commenced), to the 31st March, 1871, 1,239,087l. 5s. 1d.

MARBLÉS FOR TILE NATIONAL GALLERIES.

SIR,—Having given estimates to several builders for the marble work to be put up at the National Gallery, our prices being for Belgian Black and Genoa green, may be permitted to remark, on behalf of ourselves and others who have estimated, for the same, that we think that it would be unfair to us were any estimate for Irish marbles accepted, the difference in price being so considerable as to make our prices appear extremely high to those who do not understand the difference between the marbles; and we are also doubtful if Irish green could be obtained the size required, viz., 13 ft. 9 in. long, 20 in. diameter each, in one stone, and certainly in colour it would be greatly inferior to the Genoa green.

As other marble merchants may have given estimates for Irish green and black, on behalf of themselves and others to whom we have given our estimates according to the specification, it is likely to add to our prejudice and do us injury, unless it is shown that there is a great difference in the price of the different marbles.

J. W. BIRD & CO.

* * * We have received three other letters on this subject, but must refer the writers to the architect.

TUNNEL UNDER THE CHANNEL.

SIR,—As the subject of effecting an improved communication between England and the Continent by means of a tunnel is occupying considerable attention just now, I think it would be well that the most practicable site should be selected. To my mind the line proposed by Mr. G. Remington from Dungeness to Cape Griznez is the best, for by it the chalk formation which is so porous would be entirely avoided, and the work would be carried through the strata containing beds of strong clay and other impervious strata.

This line has the advantage of starting from a low level, and therefore the level required under the Channel would be more readily attained, the approaches could be in open cutting, and the tunnel would not exceed twenty-six miles in length. Following this route, the shaft in mid-channel affords great facilities for sinking an intermediate shaft, so that only half the time would be required than if driven from shore to shore.

The Dungeness line would shorten the distance between London and Paris, and would afford greater facilities for uniting with all the existing railways, and would therefore give the public greater accommodation. It is to be regretted that to insist upon the idea of tunnelling through the chalk, when such strata as the wealden are so near at hand, appears to me to be a great engineering mistake, and in such a case the cost of the tunnel would be increased by any other amount for proposed works could be laid out to better advantage if employed on works at Dungeness.

I think that the secretary of the company has, in his letter published in your paper of the 9th March, come to erroneous conclusions when he refers to colleries and lead mines under the sea, as the shaft in mid-channel which these works are carried out not chalk, but generally compact and impervious.

It seems to me, therefore, that the Dungeness line is the proper one to follow, and that the works may be carried out with the certainty of success. J. H.

THE INNS OF COURT HOTEL.

THE Inns of Court Hotel in Holborn, which, since its erection, has been extensively used by members of the legal profession, is, nevertheless, now in liquidation, and has just been disposed of by public auction, at the Mart, Tokenhouse-yard, by Messrs. Norton, Twist, & Watney, the sole including the unfinished building in Lincoln's-inn-fields, and the whole covering half an acre of freehold land. The upset price of the property was 48,550l. There was a very numerous attendance, and a spirited competition for the property took place. It was ultimately knocked down at 52,700l. to Mr. Henry Albutt, who, it is understood, has purchased it on behalf of the Midland Land Corporation of Birmingham.

The previous bidder was Mr. Tewson, of the firm of Debenham, Tewson, & Farnes, who offered 52,600l. on behalf of a client. It is a matter of surprise that the property did not realize a higher sum when, according to the statement of the auctioneer, the amount at which it was knocked down is only slightly in excess of the cost of the site.

PORTLAND DRAINAGE COMPETITION.

SIR,—In your impression of the 9th inst. "An Engineer" inquires what has become of the above competition, and complains that he has been unable to get any information about it since the plans were sent in.

We imagine that he is not singular in this respect, and that it will be found that the competitors have been left almost entirely to gather their information as best they could from the local newspapers or from private sources.

In this manner we are enabled to give him and others whom it may concern, the following history of the case. Six sets of plans were sent in, and a notice of them with the various estimates appeared in the local papers, and also in the *Builder*—the estimates, however, being somewhat increased in price. The plans were subsequently on view at the Royal Hotel, Fortuna's Well, for a week.

The Local Board being unable to decide for themselves as to the merits of the different schemes, determined to call in professional assistance, and ultimately appointed an architect of Weymouth to report on them.

This report was received at a meeting of the Local Board on 16th November, the local papers giving a full account of the meeting and its summary of the report, in which the competitors were placed in the following order:—"Thorough," "Sero ac Spero," "Paire mon devoir," "Sanitas No. 1," "Experience," "Sanitas No. 2," and the Board proceeded to award the first premium of £60, to "Thorough," and the second, of £20, to "Experience." The envelopes containing the names of the competitors were, however, left unopened.

At a meeting of the Board on 18th December, during a discussion as to carrying out part of the drainage of Fortane's Well, it was proposed that they should have a proper surveyor to superintend the works. This seems to have been decided on at a subsequent meeting, for in the local papers of 6th January an advertisement appeared for a "Drainage Surveyor," to superintend the carrying out of certain drainage works, "and to perform all the duties connected with and pertaining to the office of surveyor to the Portland district under the Local Government Act 1858." "Salary about 100*l.* a year."

We immediately wrote to the clerk to the Board asking if the Board intended ignoring the competitors, and carrying out the works themselves, and received answer that either of the above courses was what was intended to be carried out, and that their present surveyor being incapable of drawing a plan, they felt they required a superior person where there was so much to do.

As this was not very explicit, we sent a letter to the Board (timed so as to arrive with the applications for office of surveyor) putting forward our claim to carry out the works, on the ground of our plans having been awarded the first premium, and the objections issued to competitors stating that the claims of those gentlemen whose plans, &c. were chosen should have "the Board's favourable consideration." We also offered to send the Board to explain the details of our plans and to give any other information that might be required.

No notice was taken of this letter; but in the local papers of 27th January appeared an account of a meeting of the Local Board (probably 17th January), at which several applications for the office of surveyor were received. One letter is not mentioned, but a letter from "Experience," in his own name, is given in full, offering to carry out his own plan at a salary of 150*l.* for twelve months, and, after a discussion, he was appointed surveyor to the Board, and the duties assigned to him, the duties set out in the advertisement, and to his plans being approved by the Local Government Board.

We at once protested against the course adopted by the Board in appointing the second premium competitor to carry out the drainage works at a higher salary than that named in the advertisement, without giving us the opportunity of submitting our terms.

Our letter was countersigned at a Board meeting on 8th February, and on the 18th we received answer that the Board had decided not to carry out either of the plans sent in by competitors; that the plans by "Experience" were most in accordance with the recommendations of Mr. Harrison, who conducted the inquiry instituted by the Local Government Board, but that our plans as a whole were considered the most complete and correct.

The newspaper report of the meeting, however, states that a letter from "Experience," accepting the offer of the Board, was approved of, and, with regard to sending his plans to the Local Government Board, the meeting was adjourned to give an opportunity of communicating with him as to various alterations required. At the adjourned meeting on 12th February a resolution was passed that no alterations should be made in the plans until the next general meeting.

We have since written to ask whether the letter we received from the Board or the newspaper report is to be taken as correct, as we considered them at variance, but we have as yet received no answer.

The above we believe is a correct outline of the history of the case down to the present time,—any comment upon it we think would be superfluous.

WALTER H. GLENNIE,
W. LANGTON COKE,
Authors of the Plans, &c. marked "Thorough."

FROM SCOTLAND.

Edinburgh.—The subscription towards the restoration of St. Giles's Church, though as yet only promoted in a private way, has reached the sum of 1,900*l.*, being nearly two-thirds of the amount required for the first stage of the undertaking,—that is to say, the renovation of the High Church. The committee are having specifications prepared, with a view to obtain estimates for the work, which is intended to be commenced immediately after the General Assembly's meeting in May. When the choir of the old cathedral shall have thus been restored to a proper condition, says the *Scotsman*, the committee will direct their attention to other parts of the building. The portion occupied by Trinity College congregation will probably be vacated at no distant date, on the completion of the new church in Jeffrey's-street. This portion, accordingly, will next fall to be dealt with in accordance with a general plan for opening up the entire building, of which the restoration of the choir, now arranged for, is to be regarded the first instalment. In course of time, we may hope to see the Metropolitan Cathedral cleared of its present disfigurements.

Wick.—One of the recent additions made to the architecture of Pulteney-town is a new shop, says the *John O'Grady's Journal*, which has just been opened by Messrs. Gow & Sons, merchants, at the junction of Dempster-street and the South-road, and opposite Thurst-street. The building is of dressed freestone, and has four

front windows of plate glass, 9 ft. by 6 ft. The interior accommodation and fittings are complete. The building plans were furnished by Mr. J. Ross, Inverness, and Mr. J. J. Harper of this town. The mason work was done by Messrs. Gow & Sinclair, builders; and the joiner work by Mr. John Bain, jun.,—the whole having been done under the immediate direction of Messrs. Gow & Sons, for whom the work was performed. The walls are lined with wood, varnished, thus giving a clean and airy appearance to the interior. A villa which is being erected in the new street which has been opened off the South-road, opposite the Episcopal Chapel, is nearly finished; and the new Pulteney-town Free Church Manse will be forthwith commenced in the same street.

Desford.—A new church, according to the *Elgin Courier*, has been opened for divine service at Desford. The old church overlooks the Desford Burn; the new one is built about a quarter of a mile farther west, and close to the turnpike road between Cullen and Keith. The Earl of Seafield is the only proprietor in the parish, and has built the new church at a cost of about 1,000*l.* There is accommodation for 500 persons. The style of the building is Pointed Gothic. It is surrounded with a walled-in shrubbery, and stands east and west. The façade is to the west. Over the entrance-door, of Mediaeval form, there is a two-light window, with tracery above it. On each side of this window is a lancet one, and the façade is surmounted with a belfry and bell, the first in keeping with the architecture beneath it. In what may be called the imitation traipse on each side of the church there are three-light windows, with different tracery above them from that in the one over the door. The other side windows are single lancet ones, all in diamond panes. The vestry stands at the east end of the church. The gallery in the west end is high above the ground-floor, supported on ornamental pillars. The architect was Mr. John Miller, Cullen House, the architect on the estate; the mason, Mr. Wm. Bennett, Cullen; the carpenters were Messrs. J. & W. Duffus; and the slater was Mr. Alex. Desson.

SCHOOL-BUILDING NEWS.

Hull.—The foundation-stone of a boys' school in connexion with St. Paul's Church has been laid. The site is on the north side of the vicarage, and has been presented by Mr. Liddell. The edifice will consist of two main schools and two class-rooms, and are capable of accommodating 390 boys. The main front is to be towards St. Paul's-street, and immediately adjoining the vicarage. The building is designed after an early type of Mediaeval architecture to harmonise with the church, school, and vicarage already erected, and is to be executed in red brickwork, with Yorkshire stone dressings. It will have an open-timbered roof, and be plastered internally. The work has been let by competition to Mr. Barrett, of Hull; the architect being Mr. Samuel Musgrave.

Reigate.—The new boys' school at St. Matthew's, Redhill, has been opened by the Bishop of Winchester. The new building has been erected, under contract, by Mr. Carruthers, from designs gratuitously furnished by Mr. Heeketh, of the Mount, Redhill. The new building, standing as it does behind the girls' school, and consequently almost hidden from view, can scarcely be said to be an additional architectural ornament to the town. The site was gratuitously presented by the Rev. H. Brass, and the situation is convenient. The school itself has cost 1,000*l.*, but another 150*l.* have been expended in putting the girls' school in thorough repair, whilst other necessary expenses for drainage, fencing, warming apparatus, &c., have brought the total expenditure up to 1,400*l.*, of which sum about 100*l.* have yet to be raised.

Shaftesbury.—Schools in connexion with the Church of England are about to be built in the parish of St. James, Shaftesbury, to afford accommodation for ninety boys and girls (mixed) and eighty-five infants respectively. The architect is Mr. James Soppit, of Shaftesbury.

Tisbury.—A school is about to be built in this parish, to accommodate ninety-two infants. The architect is Mr. James Soppit, of Shaftesbury.

Llanfist.—The foundation-stone of new schools about to be erected at Llanfist, near Abergavenny, has been laid. At the foot of the gigantic Blomange Mountain stands the little

village, and within a few hundred yards of the parish church, now crumbling in decay, it is proposed to erect the new school buildings, which will consequently stand on a considerable eminence, overlooking the town of Abergavenny, and in full view of the Holy Mountain, the Little Skirrid, the Sugar Loaf, and many other peaks of the Black Mountain range. The new schools are being erected to supply a want long felt, and, as the inhabitants of the district have not deemed it advisable to place themselves under the governance of the School Board, private subscription was the only means by which the scheme could be carried out, and it is chiefly, if not entirely, due to the late Mr. Crawslay Bailey that the erection of new school buildings has become practicable. The school is being built upon a portion of the globe land, from the designs of Mr. J. Neville, architect, Abergavenny, and Mr. Foster, of Abergavenny, has undertaken the contract for the sum of 315*l.* The building will be of native stone, which is very durable, and the main school-room will be 30 ft. in length, by 17 ft. in width, whilst the adjoining class-room will measure 14 ft. by 12 ft. Accommodation will be afforded for 84 children, allowing 8 ft. space for each child. Registers of a new kind, invented by the architect a short time ago, and adapted to unions and sick-wards, will be introduced. Provision has been made in the plans for the addition of a master's house at some future time.

Books Received.

Practical Geometry for the Architect, Engineer, Surveyor, and Mechanic. By E. WYNDHAM TARN, M.A., Architect. London: Lockwood & Co. 1871.

This is a work of remarkable merit in its class, and will be found of real use by those to whom it is addressed. The rules laid down are simplified, and they are fully illustrated by 164 wood engravings. We should have been glad to find a separate chapter on the theory of domes, concerning which Mr. Tarn has elsewhere shown himself well informed.

The Monumental Inscriptions of Middlesex. With Biographical Notices and Descriptions of Armorial Bearings. Vol. II. By FREDERICK TEAGUE CANSICK. London: J. R. Smith, Soho-square. 1872.

It is this second volume of a work, the first volume of which has already been favourably noticed in the *Builder*, the collection of epitaphs, copied from the existing monuments of distinguished and noted characters in the cemeteries and churches of Saint Pancras, Middlesex, is completed; and although not so curious and interesting as a whole, probably, as the first volume, the record of them will become more valuable as time runs on. Mr. Cansick, we believe, contemplates the publication of other volumes of a similar kind as to city churches and churchyards.

VARIORUM.

IN English Exhibitions sufficient attention has not been paid to mining and metallurgy, their processes and products. The *Mining Magazine* has the following remarks on the subject:—"What is wanted is a more correct classification, coupled with a more complete organisation. When it comes to the turn of mining and metallurgy in the Annual Exhibitions at South Kensington, it is to be hoped the classification of 1862, the best we have yet had, will be followed, with the improvements that experience cannot fail to have suggested to those intrusted with the arrangements of the class or classes. We should like to see, in order of their localities, and in connexion with similar products of other countries, a complete assortment,—first, of the various ores precisely in the state in which they are found; secondly, of the ores in the various stages of dressing; next, as they assume a defined shape as metals; and fourthly, as they are applied in the primary stages of manufacture. We would suggest as a model of what we mean the arrangement of woods shown in the Colonial Department in 1862, than which nothing could well have been more perfect.—Speaking of glass for horticultural purposes, the *Gardener's Magazine* remarks,—

"The selection of glass for horticultural purposes receives far less attention than the case demands, especially in gardens where glass is largely employed. It is not an uncommon thing to see the leaves of plants blotched and spotted, sometimes pierced with holes, in consequence

of inequalities in the texture of the glass, and the consequent focusing of the sun's rays upon it, the specks and bubbles in the glass constituting so many little "burning glasses." In other cases we see plains drawn and of a sickly colour through deficiency of light, and when this occurs the production of flowers and fruit is reduced considerably below the degree of possibility, for light is the grand agent in the promotion of a healthy development of every vegetable and secretion. There is much bad glass in the market, and it meets with ardent sale because of its apparent cheapness; but in no department of horticulture is it of more importance to secure a good article, and that which commands a comparatively high price is usually the cheapest in the end. . . . The best glass for ordinary purposes is 21-ounce sheet. It is usually of good quality; but, as above remarked, there are bad samples in the market. In making a purchase of glass, the buyer should see that it is free from specks and bubbles, and the examination of a few sheets will suffice to determine the character of the whole. To be lured by mere cheapness is to jeopardise the prospects of the gardener, and low-priced Belgian glass should always be purchased with caution. An even texture is of the utmost importance, and fortunately a person who has had but little experience in the purchase of glass may very quickly determine if a sample is faulty; for, in truth, the fault cannot be hidden, and, to quote the older Mothers, when he looked through a hole in the frying-pan on the stage, we may, if we buy rubbish, easily "see through our folly."

Miscellaneous.

Dover.—Building operations at Dover Castle have been enlivened by the frequent discovery of human skeletons. Recently a skeleton was found by the workmen in the course of their excavations for the battery in front of the military hospital; and another has been dug up at the south side of the Pharos. It was lying in a horizontal position, with the fleshless hands crossed over the bony framework of the breast. The arches in the Pharos, blocked up in the time of the Duke of Wellington, are now being again exposed to the light of day. Lieutenant Peck, R.E., has charge of the restoration, in the course of which it was seen that the Pharos goes down into the earth about 6 ft., and is built on a bed of clay, free from grit or foreign matter of any kind. During the excavations a stone was found bearing the inscription, "St. Adigmund's." Public attention at Deal is engrossed with the subject of the proposed tramway from Ramsgate, through Deal, to Dover, all the towns giving their approval, the opposition that has been encountered being from the country gentlemen and farmers. Irritation is felt that, as upwards of 70,000 persons have signified their desire for this method of communication (notably between Deal and Dover), there should be any difficulty placed in the way by those to whom a tramway is no desideratum.

Processes for Ornamenting Glass are given in the *Zeitschrift für Farberlei*, No. 20, 1871, by F. Springmühl. Bleached shellac is coloured by alcoholic solutions of any of the aniline colours; this is spread upon glass or mica after they have been warmed. Gun-cotton, dissolved in ether, when coloured with any of the aniline dyes, forms beautifully-tinted films. This coloured solution can be cut into any pattern, and the film attached to any transparent surface. These processes remind us of those suggested in the *Builder* many years ago. One of these was the conversion of glass itself into iridescent films by blowing, and then laying them on the back of thin sheets of heated copper or other metal previously gilt, and ornamentally perforated (or it might be by laying the films on heated ground glass itself, of gold or other colour, after being perforated); so that the iridescent films should shine through the perforations if the whole could be annealed or gradually cooled, so as to retain the film entire. Such experiments, as we stated, had been suggested by partially successful ones with perforated cards and shellac varnish films cast upon water, and lifted upon the backs of the perforated cards. Perhaps the gun-cotton or collodion might be of use in thus imitating gems in cheap ornamentation, by causing films to shine through perforated cards or thin metallic plates.

A New Public Hall for Peuge.—A substantial public hall has just been erected and opened at Peuge: it is intended to be used for meetings, lectures, concerts, and other entertainments. The building was opened last week, when the Crystal Palace Lodge of the Improved order of modern Templars held a tea meeting, at which a company of 240 were present. Afterwards a public meeting, presided over by Mr. J. Broomhall, of Peuge, was held in the hall.

Bromley Local Board.—Mr. Hugh S. Cregeen has been appointed surveyor to the Bromley Local Board.

The Artesian Well in Boston, U.S.—The work of boring this well was begun in the latter part of the month of March, 1871, and has been going steadily forward up to the present time, the progress made being from 1 ft. to 15 ft. each day, at a cost of 15 dollars per foot. The well had reached a depth of 1,000 ft. when we last heard of it. When the work was first commenced, a drill would last thirty-six hours without sharpening; now the same kind of drill will only last one hour. The diameter of the bore is 5 in.; the drill is 4 in. across. The drill and iron shafting which connects it weigh now 1,200 lb., and the rope by which it is lowered weighs 900 lb. The power is furnished by a 16-in. horse-power engine, with a walking-beam of 36-in. stroke, at the rate of about thirty strokes per minute. It is said to be the intention of the company to keep the drill at work until they obtain a sufficient volume of water for their use, unless their money gives out, or the drill goes through on the other side.

Midland Steam Boiler Inspection and Insurance Company.—The chief engineer's report for 1871, to the twentieth half-yearly meeting has been printed. The explosion of 1871, it states, do not point to any particular form of boiler as being especially dangerous, as nearly all those commonly in use can be made equally safe with proper care, and most of those often denuded of weak shape had worked safely twenty or thirty years, and had exploded from evils to which all are liable. The experience of the year shows the need of greater care in construction, to provide proper stays to ends, the want of stronger girders to manholes to prevent the edge of the plate cracking with the extra strain upon it, and the necessity of hoops or other means of strengthening weak internally fired tubes, and the greater care in executing repairs, so as to restore the strength, and with sound work to prevent the leakage from corrosion so often found in boilers repaired with rough screw-patches. There has been a considerable increase in the examinations of boilers and flues by this company's officers.

Boiler Explosions.—The report of the chief engineer of the National Boiler Insurance Company for the past year has been issued in a printed form at Manchester. It states that, although the explosions reported in 1871 were numerous, their total was below the average of recent years. The reporter had information of 43 serious explosions, which caused the deaths of 49 persons and serious injury to 103 others; total, 152 persons killed or injured. Since the commencement of the Company's operations in July, 1864, no less than 149 serious explosions of steam-boilers had occurred in the United Kingdom, causing 512 deaths, and, in addition, 860 persons were seriously injured. None of the boilers which exploded during the past year were under the inspection of the Company. The number of boilers under their care, and insured with them, has greatly increased; the accidents to them had not been many; and none of them were accompanied by serious results. The report is instructive as regards the kinds of boilers liable to explosion, and the more immediate causes of accident and means of prevention.

Iron and Steel Institute.—The third and final meeting of this society for the present season has been held at Willis's Rooms, St. James's, Mr. Bessemer in the chair. There was a large attendance of gentlemen interested in the iron trade, and several machines for improving the manufacture of iron were exhibited. The Chairman opened the proceedings by inviting a discussion on the papers which were read at Wednesday's meeting. A discussion then ensued of a technical character, and a variety of opinions were given as to the value of silicon and phosphorus in the manufacture of iron. Mr. Bessemer at the close said he believed they had inaugurated an institution which would, from year to year, be making its way before the world; and that it would cull from various sources an amount of information on specific subjects which would be interesting to them.

The Destruction of the Academy at Dusseldorf.—The *Cologne Gazette* gives particulars relative to the burning of the Academy of Dusseldorf.—Several studios of living painters were wholly destroyed, with all their contents; one large painting being an altar-piece by Andre-Müller, on which he had been at work for four years, and which was nearly finished. All the archives, records, engravings, plates, pictures, &c., of the Westphalian-Rheinish Club are lost.

Copying Drawings by Electricity.—A method of rapidly copying drawings or engravings is suggested by M. Chandery, who uses the induction coil for this purpose. The method adopted by draughtsmen consists in puncturing holes through the design, and thus obtaining an outline, which is subsequently transferred by sifting plumbago or other powder through the holes,—a very laborious task where the drawing is large or has much detail. In the plan proposed, a table covered with tin foil is connected with the negative pole of the inductorium, and on it are placed as many sheets of paper as the spark will penetrate. A metal bar, insulated with gutta-serena, serves as the positive pole, and as a pencil for copying the tracings. This point is moved about on the outline of the engraving, and sparks pass through the paper to the tin sheet underlying it every time connexion is made, puncturing four holes through the tissue at each passage. It is said that but little skill is required to guide the pencil, as the ink tracings, being good conductors, carry the pencil easily along.

The Polytechnic Exhibition at Moscow. The Vienna correspondent of the *Eastern Budget*, says:—"A Vienna paper warns the manufacturers of the empire against taking part in the Polytechnic Exhibition which is to be opened at Moscow in May, on the ground that the chief object of this Exhibition will probably be political, not industrial. There is reason to believe that this will only be a second edition of the famous ethnographical congress. It appears from the private accounts which arrive here from Moscow, that neither the space which is to be allotted to foreign exhibitors, nor the arrangement of subjects, can give the proposed Exhibition any claims to the appellation of 'international.' Industrial interests, it is said, are only so far considered as they may affect Russian manufacturers, and even the Government attaches but little value to the Exhibition as such. The committee has announced to the promoters of the Exhibition, that deputations would come to Moscow from all the Slavonic nations.

The Judge and the Carpenter.—The *Dorset Chronicle* reports that during the progress of the assize business in Dorchester, Mr. Baron Bramwell was repeatedly interrupted by the noise of a chisel and hammer. The judge despatched a request that the work should be put off, but he had again and again to inquire, "Who's that knocking?" which was loud and incessant. The answer to the third inquiry was that the industrious carpenter did not see the force of obeying the judge, and had put the query, "Who's to pay me my day's wages, I should like to know?" The learned baron, vexed apparently at the man's persistent knocking, but amused at his impudence, said, "Go and tell him to come and show cause why he shall not be fined 50l. for contempt of court!" No longer were law and justice impeded, or the dignity of "my lord judge" slighted by "that knocking" within the precincts of the court. Nevertheless it was hard upon the poor carpenter.

Telegraphic Progress.—A novel and successful experiment in telegraphic reporting was made in connexion with the Oxford and Cambridge Boat-race. In order to transmit a description of the race, as it was rowed, arrangements were made by the proprietors of the *Central News* to pay out a cable from one of the steamers which follows the racing-boats. There is no novelty in telegraphing through cables as they are being payed out, but there is no precedent for performing such a work at the pace of racing-boats. The leading facts connected with the race, including the varying positions of crews, and the times at which they reached well-known points, were telegraphed before the race was concluded. By this means the *Central News* was enabled to transmit throughout the kingdom, and to place before readers hundreds of miles distant, more information respecting the race than was known to the spectators on the banks of the Thames.

Fish Torpedoes.—A number of workmen in Woolwich laboratory, it is whispered, are specially employed in the manufacture of "fish torpedoes," machines of iron, in shapes somewhat like a fish, about 5 ft. long and 1 ft. in thickness, each containing a little engine worked by compressed air, capable of propelling the torpedo a considerable distance under water with wonderful accuracy. When it strikes the hull of a hostile ship it explodes with fearful force.

Model Dwellings for Boston, U.S.—The first annual report of the Boston Co-operative Building Company has been printed (Deland, printer, Boston). The directors have purchased ground, and are now erecting ten small houses in a block. The general plan is, that each floor should be so arranged as to accommodate one family only; and thus, though the entrance and the stairway will be in common, there being only one set of occupants on each floor, a tolerable degree of privacy will be secured. Each apartment will be furnished with water and gas, and will be thoroughly airy and comfortable. There being, however, great need of dwellings for single persons, or for families of two members only, it has been arranged that some floors shall be subdivided, giving the front to one person or family; the back to another. Meantime, buildings already in existence are being remodelled, and the Company are proceeding hopefully with their good work. They desire to extend the capital already in hand.

Preservation of the Hackney Commons.—The Metropolitan Board of Works have determined to take under their control, for the preservation and recreation of the public, the collection of open spaces known as the Hackney Commons. Under this general name are included London Fields, Hackney Downs, Hackney Common, North Mill Field, South Mill Field, Stoke Newington Common, and Clapton Common, with pieces of waste land, near Dalston-lane, and Grove-street, all situated to the north of Victoria Park. A scheme for the local management of these places, and their preservation, in the interests of the public, has been prepared by the Board of Works, and certified by the Enclosure Commissioners, under the provisions of the Metropolitan Commons Act. This step on the part of the Board of Works will effectually prevent all future attempts to build on the Commons.

Chicago requires Self-help.—A Chicago paper has let the world into the secret that, although contributions in aid of the ruined and destitute people of that city were sought all over the world, the part of the city which remained burnt has done literally nothing for the relief of its starving neighbours. In the same way, from a Chicago letter in the *New York Times*, we learn that the luxury and extravagance of the place are greater and more ostentatious than ever. There are, it seems, 2,000 saloons,—1,987 being known to the police,—where drinking and gambling on an extensive scale are carried on. There are five theatres; and a new Opera-house, cost 400,000 dollars, is projected. The writer of the letter goes on to say,—“The support of 1,000 saloons at 5,000 dollars only, costs 5,000,000 dollars a year, and this is a mere sagatello oven for burned-out Chicago.”

Poplar New Town Hall.—At the last meeting of the trustees of the parish of Poplar, a report from the Committee of Accounts on the completion of the new town-hall and parochial offices, as read and unanimously adopted. The committee said in conclusion,—“Your committee do feel much indebted to Messrs. Harston, the architects, for the attentive manner in which they have watched over the interests of the trustees, and recommend that a letter be written to Messrs. Harston, expressing the thanks of the trustees for the careful consideration which they have given to the directions of the committee, and for having designed a building so reliable to the parish. Your committee further recommend that a letter be written to Mr. din Sheffeld, testifying your appreciation of the manner in which he had carried out his contracts.”

Kimberley v. Dick.—The Master of the Chancery has made the following order:—

“The plaintiff to give to the person in charge of the house two clear days' notice of an intention to visit the house. The visit to be from 10 a.m. to 4 p.m. in each day. No locking of doors; free access to every room to be given to the plaintiff, his surveyors, and workmen. The plaintiff undertaking on behalf of himself, his surveyors, and workmen, to do all in their power to avoid giving any inconvenience or annoyance to any person residing in the house at the time and to be answerable for all damage done to the house or to any of the furniture or ornaments therein, and the defendant to pay the costs incurred by an ineffectual visit to Humewood, and also the costs incurred of the last motion and of this motion.”

Private Views.—The private view of the exhibition of pictures by artists of the Continental School, will take place at the French Gallery, on Saturday, the 30th of March; that the Institute of Painters in Water-Colours on Tuesday, April 20th.

Further Addition to St. Luke's Workhouse.—Although recently enlarged, St. Luke's Workhouse has been found too small for the requirements of the Union. No estimate, says the *Clerkenwell News*, has yet been furnished of the cost of the proposed enlargement, but the contemplated outlay so alarmed Mr. Eastace, that he expressed his belief that before long the burdens of taxation would bring down many ratepayers to the position of paupers. In view of such a contingency, Mr. Mathews thought it would be desirable to make the workhouse as comfortable as possible, and the Board generally appeared to agree with him, for they adopted the report of the committee, recommending the erection of new buildings.

Consecration of Corbridge Cemetery.—Two acres of ground, situated on the south side of the River Tyne, on the road between Corbridge and Dilston, were purchased by the Local Board, who borrowed 1,500*l.* to meet the cost of purchasing the ground, and erecting two chapels, a cottage for the keeper, and walling in the ground. Mr. J. J. Lish, of Newcastle, was appointed architect, and he designed the two chapels, one for members of the Church of England, and the other for Nonconformists. The style of architecture is Gothic of the Early English period. The cemetery is divided into two equal portions, one-half for members of the Church of England, and the other half for Nonconformists. The Church of England portion has been consecrated by the Bishop of Durham.

Sea Water Utilised.—Something novel in the way of sanitary improvement has been undertaken by the Borough of Tynemouth Corporation. Mr. Adams, contractor, Darlington, is making a reservoir in a field in Hawkey's-lane, near the former town, 49 ft. square, 6 ft. deep, and to hold 52,000 gallons of sea water, which the corporation intend to supply from a pumping station on the Low Light Shore. There will be two services of pipes, and it is anticipated that Turkish and public baths will be supplied with salt water. The water, however, will be principally used for flushing the sewers, watering the streets, extinguishing fires, and general sanitary purposes. Private houses and hotels, no doubt, in the line with the pipes, will be able to contract for a supply of salt water for baths.

Curious Facts in the Wood Trade.—Among other trade circulars to hand is “Edward Chaloner's Wood Circular.” From it we learn that Mr. Chaloner, whose name and character are well known, has been a broker for fifty years. Also, that in the last week of February last, 1,890 tons weight of mahogany, cedar, lancewood, lignum vitæ, and teak, were sold by auction in Liverpool among 90 actual buyers, of whom 68 were non-residents, and who in the aggregate travelled 13,600 miles journeying to and from the auction. Further on, Mr. Chaloner says, “The highest price ever paid for mahogany was paid at this sale by Messrs. T. Mills & Co., cabinet-makers, of Bradford—viz., 29*s.* 4*d.* a foot, a London buyer being the previous bidder.”

Surveyor's Services in Islington New Workhouse Arbitration.—At a recent meeting of the Islington Board of Guardians, the clerk read a letter from Mr. Sparling, the solicitor to the Board, certifying that the claim of Mr. Gritton, surveyor, for 498*l.* 16*s.* 3*d.*, for services rendered in connexion with the recent arbitration in the matter of the guardians and the contractors for the new workhouse, was correct. Mr. Hillman said the guardians had lost nearly 2,000*l.* by accepting the contract of Messrs. Nutt. Mr. King said he was of a contrary opinion. He believed Messrs. Nutt had lost largely by the contract, and the Board had enjoyed the full benefit. The account was ordered to be paid.

An Amphibious Circus.—There is at Rulroort, in Prussia, a circus of remarkable construction, although the kind appears to be not uncommon in the United States. It is an immense float, or boat, 300 ft. long, and nearly 80 ft. broad, built in sections, and made to contain 2,500 spectators, when put together. It has on board lodgings for the company, stables for twenty-five horses, a restaurant, gasometer, printing-office, and two steam fire-engines. It is now going down the Rhine, giving performances at the towns on the banks.

London Institution, Finsbury-circus.—Interesting lectures are given here on Thursday evenings. On the 21st, the subject was “How Plants are fertilised,” by Mr. A. W. Bennett.

The Tunbridge Wells Cottage Improvement Company.—The report of the last year states that by a liberal and judicious expenditure on their old cottages, they have now been made into decent and respectable residences, which are let at moderate rents paid regularly. This is the work which the directors desire to proceed with as opportunities occur for making fresh purchases; but, without increased capital, it must soon come to a stand-still. Purchases have been made during the past year. Notwithstanding drawbacks, they recommend a dividend of 4 per cent. on the paid-up capital of 2,640*l.*, and leave 32*l.* to be carried to next year's accounts.

The Sewage Question at Ware.—The Ware Board of Health having petitioned the Local Government Board for an extension of time to provide means for preventing the flow of sewage or other offensive matter from their district into the River Lea (further time having been refused by the Lea Conservancy Board), in pursuance of this petition Mr. Robert Morgan, the inspector appointed for the purpose, has held an inquiry as to the subject-matter of the petition at the offices of the Ware Local Board of Health. The evidence taken by the inspector will be laid before the Local Government Board, after which the Board of Health will be informed whether their petition for an extension of time is granted or not.

The Fires Bill.—Colonel Hogg, M.P., intends to move in committee on the Fire Bill the insertion of the following clause:—“Inquiries respecting fires under this Act shall be held by the police magistrates within the metropolis, and by such one of those magistrates as acts within that part of the metropolis to which the inquiry relates, and elsewhere by the justices or the stipendiary magistrate acting within the division or place where a fire has occurred, and an inquiry under this Act is to be held.”

Street Improvements in Blackfriars.—Amongst the improvements noticeable in the vicinity of the new railway station which is now being proceeded with at Blackfriars, at the west end of Southwark-street, is the opening out of a broad thoroughfare leading from Southwark-street to Bankside. The demolition of a number of small and dilapidated-looking property has been a decided gain in appearance. A broad street has been made, which is laid in asphalt by the Limmer Company.

St. Paul's Cathedral.—The choir of St. Lawrence, Jewry, and other friends have subscribed to present to St. Paul's two handsome caskets for the wine and water, which will, we believe, be used for the first time on Easter-day. They stand 9½ in. high. The bowl is of crystal, and the mounts are gilt silver. The foot, neck, and cover are chased in relief, and they correspond with the alms-dish lately presented. They have been designed and executed by Messrs. Lias & Son, of Salisbury-court.

Cost of Illuminating a Church Clock.—A committee appointed to inquire as to the cost of illuminating the dials of Limehouse Parish Church have reported that the entire cost of illuminating the dials, gasfittings, and other works to complete the same, will not exceed 400*l.*, and that the cost of lighting and annual maintenance of the same will not exceed 60*l.* The dial is 188 ft. from the ground, and 12 ft. in diameter: it is visible on the Thames. The work is to be done.

Theatres.—It is proposed to erect a new theatre in Edinburgh, on the south side of the town. The project is to be on the joint-stock company principle, and is being got up by the friends of the lessee of the Royal Princess Theatre, Mr. McNeil. One of the sites that has been mentioned is Nicholson-square Gardens, nearly opposite the Princess Theatre, for which the owner asks 6,000*l.*

The Wellington Monument.—In reply to a question from Mr. Goldsmid, the Chancellor of the Exchequer said he had every reason to believe that this monument would be completed within the contract time, although at present the sculptor was ill. The progress made thus far was rather architectural than sculptural.

Plans for the Portsmouth School Board. Designs, prepared by Messrs. Alexander & Henman, of Stockton and Middlesbrough, architects, have been selected, second in order of merit, from among forty sets submitted in competition for schools for the Portsmouth School Board.

The City Sewers.—The reports, as to the interception of the sewage of the City from the Thames, by Mr. Bazalgette and Mr. Hayward, and report, with return from the City Sewers Commission to the Court of Common Council on the main drainage rate paid, and the other charges of the Metropolitan Board, have been issued by the City Sewers Commission in a printed form.

Asphalte Paving in the City.—It has been further resolved that the footways in King William-street be paved with asphalte, and that that portion of the footway of King William-street between Lombard-street and Cannon-street be paved with Barnett's asphalte, at 4s. 6d. per square yard, he undertaking to keep it in repair for ten years without further charge.

Varnish.—To Varnish Beech.—It is a poor-looking wood, with little curl or figure: therefore stain with the following:—Burnt umber and soap lees, and if any knots, give an extra touch or brush; let it stand to dry; the next day following size it over twice; and the next day, varnish it: use the best varnish.—G. Y.

Land in London.—Mr. Richard Tress, architect, has taken a lease for eighty years of all that angle at the north-east end of the Holborn Viaduct having a frontage to the Viaduct itself, a rounded frontage towards St. Sepulchre's Church, and about 200 ft. frontage on Snow-hill, for which he is to pay 1,725*l.* per annum. The quantity is said to be about a quarter of an acre.

The Literary Fund Dinner.—The dinner of this corporation, to be held in St. James's Hall on the 8th of May, under the chairmanship of H.M. the King of the Belgians, promises to be a brilliant affair. The list of stewards, not yet published, but already numbering 201 names, is a remarkable document.

Holbein Pictures.—The Burlington Club intend to hold an exhibition of pictures and drawings by Holbein in the house of the Club, and to open the same at the end of April next. This exhibition will include pictures and drawings from Windsor Castle and other Royal palaces.

The Agricultural Labourers' Strike.—The agitation amongst agricultural labourers has extended to the counties of Buckingham and Northampton. Meetings have been held at various places to consider the question, and it has been agreed to ask an advance of wages.

Visitors at South Kensington.—The number during the week ending March 16th was 33,019, against an average of corresponding week in former years of 12,742. This serves to show the interest excited by the Duke of Edinburgh's collection.

Tunstall.—The memorial-stones of a new Wesleyan chapel and schools, in Cardridge-street, Sandford, have been laid. The cost of the edifice will be nearly 700*l.* It will be a plain brick building, 36 ft. by 45 ft., and will accommodate about 250 persons. One portion will be partitioned for school purposes, and the partition will be capable of being withdrawn, so that the old building can be used when required for divine service. The architect is Mr. R. Dain, of Burslem; and the builder, Mr. Joseph Lunt, of Tunstall.

TENDERS

For Messrs. Cook's new premises, Ludgate-circus, Fleet-street, Mr. H. Gundry, architect. Quantities supplied:—

Kelly, Brothers	£29,033 0 0
Manley & Rogers	18,350 0 0
Conder	18,120 0 0
Foster	17,377 0 0
Adamson	17,060 0 0
Henshaw	16,673 0 0
Perry & Co.	16,558 0 0
Hill, Keddell, & Waldram	15,897 0 0
Elkington	15,200 0 0

For the erection of twenty-three cottages and reading-room, &c. at Wonerah, Surrey, for Mr. Edwin Ellis, Mr. Henry Peak, architect. Quantities supplied:—

T. & J. Lee	£4,330 0 0
Peak	4,197 0 0
Garnett	3,708 0 0
Pollard & Son	3,540 0 0
Moon	3,613 0 0
Strudwick	3,809 0 0
Mason	3,600 10 0
Ambrose	3,542 15 9
C. & H. Brown	3,467 0 0
E. Mitchell	3,423 0 0
John Mitchell (accepted)	3,454 0 0
Sturdy	3,350 0 0
Wells	3,333 0 0
Burdett	3,173 10 6

For alterations and additions to house and premises No. 205, Western-road, Brighton, office of *The Brighton Times*, Mr. John Hill, architect. Quantities not supplied:—

Lockyer	£200 0 0
Kemp	184 0 0
Patching	70 0 0
Barnes (accepted)	166 10 0

For new ware-rooms and alterations at the rear of 23, High-street, Guildford. Mr. Henry Peak, architect:—

Garnett	£423 0 0
Burdett	422 0 0
Lee	410 0 0
Pollard & Son	314 10 0
Mason	338 0 0
Strudwick (accepted)	333 0 0

For party-walls and stone pilasters for proposed extension of front shops to thirty-nine houses in Edgeware-road, for Lord Portman. Mr. R. Hesketh, architect. Quantities supplied by Messrs. Franklin & Andrews:—

HR & Sons	£2,878 0 0
Elbs & Sons	2,781 0 0
Phillips & Son	2,754 0 0
Brid.	2,580 0 0
Harris & Sons	2,340 0 0
Simpson & Son	2,230 0 0
Longmire & Barge	2,467 0 0
Broune & Robinson	2,487 0 0

For the erection of a new sacristy, west porch, and rereading, and other works at the parish church, Polkington. Mr. S. Slingsby-Stallwood, architect:—

Extra for tile Allowed instead of for old stone paving materials.	
Dunk	£1,008 0 0
Brooks & Co.	965 3 0
Webster	879 2 10
Holborn	830 19 0
Bowley (accepted)	800 10 0

For the erection of hall and premises at Market Harborough, Leicestershire, for the Institute Company (Limited), Mr. Charles Bell, architect. Quantities supplied by Messrs. H. Lovegrove and W. H. Barber:—

Mason	£1,957 0 0
Matlock	1,849 0 0
Lovelady	1,599 0 0
Palmer & Son	1,572 0 0
Northam	1,530 15 0
Barlow & Peach (accepted)	1,493 0 0

For building casual wards, stable and coach-house, and other works at the workhouse, Bridge Union, Canterbury. Mr. B. Adkins, architect. Quantities supplied:—

Festerton	£2,212 18 0
Gaskin & Golden	2,175 0 0
Stephenson	2,157 0 0
Stiff	2,019 0 0
Epps	2,047 0 0
Richardson	2,042 0 0
Harnett	2,040 0 0
Wilson	2,023 15 0
Bourne	1,987 10 0
Toad (accepted)	1,925 0 0
Judges	1,897 0 0
Woodcock	1,837 0 0

For erecting two new chapels, one entrance-lodge, mortuary, and front laundry-wall, to be proposed new burial-ground in Hither-green-lane, Lewisham, Kent. Mr. F. P. Thorne, architect. Quantities supplied by Messrs. Osborne & Russell:—

Kirk	£3,905 0 0
Henshaw	8,213 0 0
Lord	7,980 0 0
Staines	7,908 0 0
Sahy	7,798 0 0
Leatherdale (accepted)	7,685 0 0

For the erection of casual paupers' wards, tailors' shop, &c. at the Chesterfield Union Workhouse, for the Board of Guardians. Mr. S. Rollason, architect:—

Masons', Bricklayers', Slaters', Plasterers', Smiths', and Founders' Departments.	
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Porter	1,015 0 0
Marsh	993 11 8
Walters	974 19 9
Mar (accepted)	898 11 10

Carpenters', Joiners', Plumbers', Glaziers', and Painters' Departments.

Glossop	£850 0 0
Marsden	648 0 0
Bromhead, Brothers	630 10 0
Maitin	625 2 0
Horie & Handy (accepted)	593 11 0
Heath	553 0 0

For the erection of workshops and offices, for Mr. Bell, at Chelsea, including boundary-wall for Chelsea Vestry Hall, Mr. F. A. Dovey, architect. Quantities supplied:—

Myers & Sons	£2,130 0 0
Scrivener & White	1,989 0 0
Manley & Rogers	1,957 0 0
Kelly, Brothers	1,885 0 0
Temple & Forster	1,880 0 0
Langmead & Way	1,837 0 0

For stopping at Windsor House, Hampstead, for Dr. Cooper-Rose. Mr. N. T. Randall, architect:—

Deduct if zinc roof in lieu of lead.	
Faulkner	£350 0 0
Minchin	548 0 0
Watts	533 0 0

For the completion of Holloway Hall, N. (second contract). Mr. George Treutlich, architect:—

Ennor (accepted)	£1,022 0 0
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For Wesleyan Chapel, at Penrith, Cumberland. Mr. G. Woodhouse, architect:—

Masons' Work Only.	
Slee	£2,182 0 0
Little	2,146 0 0
Grisenhwaite	1,831 0 0
Dixon, Brothers (accepted)	1,683 0 0
Hope & Co.	1,627 0 0

Joiners' Work Only.

Cowper	£2,136 18 6
Pollock	1,758 14 3
Richardson (accepted)	1,713 13 0

Slater.

J. Bailey	£200 0 0
G. Bailey	199 0 0
Grisenhwaite	183 0 0
Barton (accepted)	181 0 0

Plumbers', Plasterers', Glaziers', and Painters'.

Scott	£583 0 0
Forster (accepted)	533 0 0
Jackson	533 0 0

For making additions to the parochial schools, Teynham Sittingbourne. Mr. B. Adkins, architect:—

George	£390 8 0
Ratcliffe & Johnson	389 4 6
Judges (accepted)	317 0 0

For new Baptist Chapel, at West Crofton, for Mr. J. A. Spurgeon, Mr. J. T. Barker, architect. Quantities by Mr. D. J. Brown:—

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Carter	7,760 0 0
Dove, Brothers	7,650 0 0
Hart	7,650 0 0
Nightingale	7,676 0 0
Ettings & Son	7,595 0 0
Wood	7,450 0 0
Wright, Brothers, & Goodchild	7,500 0 0
Hollidge	6,930 0 0
Waterston	6,500 0 0
Pollock	5,839 0 0

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£50	£3,909
Rider	3,048
Dove, Brothers	3,483
Bullivant	3,483
Henshaw & Co.	3,240
Sharpington & Gile	3,273
(accepted)	150

For alterations and additions to the City of London Schools, under the City architect:—

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Phelps	1,133 0 0
Carter & Son	1,127 0 0
Henshaw	996 0 0
Perry & Co.	987 0 0
Cook & Groom	725 0 0

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Tarrant	5,283 0 0
Grover	5,185 0 0
Goodman & Poole	5,072 0 0
Linsell	5,125 0 0
Collier	5,400 0 0
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Crabb	4,950 0 0
Perry & Co.	4,954 0 0
Brown & Sons	4,929 0 0
Turner & Son	4,871 0 0
Sahy & Co.	4,700 0 0
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Garrud	4,474 0 0
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The Builder.

VOL. XXX.—No. 1522.

The Japanese Craze.



HERE have been during a comparatively short period, as all our readers who take note of such things are aware, several successive tendencies among English architects and decorators towards the imitation and adoption of first one and then another fashion in the treatment of ornament, borrowed from people separated from us by

either time or space, or both. These changes in decorative taste have taken place much more rapidly than those in architectural style in the wider sense; two or three at least having already supervened upon the increased use of the forms of Gothic architecture. With that we had, of course, at first the imitation of the ordinary forms of detail and decoration common in our own country in the Middle Ages; commencing with the later, and going back by degrees to the earlier forms. Then followed, after some coquetting with Egyptian work, the neo-Greek school, with which some Egyptian "dodges" in colour and design were incorporated, with their barbaric character in some cases (not in all) more or less refined out of them. Now we are entering on a similar predilection for Japanese work, and Japanese colour and ornamental design.

All these different succeeding tastes have one thing in common in their development. They have all commenced by a sincere appreciation and admiration of the real merits of some one class of ornament on the part of a few persons; they have then been taken up and carried out in modern English work to supply the demand for novelty in ornament, and have finally lapsed into a mere foolish fashion, a dilettantism for fashion's sake, and only to be rightly described by the word we have used above, as a popular "craze." With a certain clique of amateurs, the taste, or appetite, or whatever we may call it, for Japanese work has for some little time past reached the "crazy" state; and a paper read the other day at the Architectural Association, the greater part of which appeared in our columns, appears to sound the note for a further development of this fancy among the rising generation of the architectural profession.

Our object in reverting to the subject is not by any means to attack either Japanese art in general, or Mr. Audsley (who seems to have become practically a Japanese) in particular. In regard to the general subject, we believe we were the first to call attention, a good many years ago, to the peculiar freedom of hand and felicity of design betrayed by the Japanese in their conventionalised treatment of foliage ornament, of which we gave illustrations from time to time; to have reproduced these with the colour which is perhaps their chief excellence, would have been travelling beyond the limits necessarily set to illustrative additions in a journal of this nature. And we willingly gave further currency to a paper on the subject by an

architect who seems to have paid a good deal of attention to it, and who had something to tell his audience about it. It is in order to draw attention to the defects as well as the merits of Japanese art, and (which is still more important) to recommend a discriminating and critical study of the subject, instead of a blind and exaggerated admiration, that we feel impelled to say a word in the way of criticism on Japanese ornament and its prophets.

For it cannot be too often repeated that there are two ways of studying and adapting from any ancient or foreign school of design. One way is to get up an over-wrought enthusiasm about it, to believe or affect to believe everything about it to be marvellous and perfect, and to endeavour to reproduce it wholesale, "with all its imperfections on its head;" the other is to study it critically and carefully, arrive at a settled conclusion as to what in it is really admirable in principle and what is not, and then draw from its best points suggestions and lessons for the amelioration of our own art or manufacture. The former is by far the easiest and most popular method, requiring only the expenditure of some time and patience in examining and copying specimens; the latter, which requires an admixture of intelligence and critical insight, is the only method of studying which it is worth while for any educated man to give his time to. If our readers think this a truism, we can only reply that it is one which we mean to reiterate until we see it a little more carried out in practice than it is at present. Now, it is not difficult for any unprejudiced person to see to which method of study the present increasing fever of admiration for Japanese work belongs. To judge from the expressions used by Mr. Audsley and others of the Japanese *dilettanti*, it would seem that the Greeks themselves must have been mere barbarians by the side of these artists of the Eastern Seas. It is claimed for them that they have been "for centuries the great students of Nature;" that in colour, in form, in variety of design, they are completely fitted to be the masters and teachers of the West. "Marvelous," "wonderful," "almost superhuman" (!), are the epithets which seem to be considered quite within the mark in speaking of them. Now, what is the truth of all this?

There appear to us to be two points in the art of the Japanese, in regard to which it would be scarcely possible to speak with too much admiration. The patience and manual dexterity shown in the minute finish and elaboration of much of their ornamental work, notably in the cabinets and the *cloisonné* enamelled ware, are really something wonderful; and such works, like the enormous granite temples of Egypt (the architectural antipodes of Japan), speak of a country and society where time was "no object;" secondly, their natural feeling for harmonious combinations of colour, rich without garishness or over-brilliance, is remarkable, and renders their enamelled ware in particular as delightful to the eye as it is suggestive and instructive to the student of colour. It is noticeable that in these works pure primary colours are little used, and only in very small detached portions, warmed secondary tints being, however, very largely introduced. This taste in colour distinguishes the Japanese from some other Eastern nations which have shown great aptitude in decoration. In the mere manipulative dexterity mentioned above, the Chinese are their rivals; but in regard to colour, though the Chinese show that a natural ability to deal with it which belongs more or less to all Eastern nations, civilised and uncivilised, the bright, strong, and comparatively raw tones of their work seem coarse and commonplace by the side of the Japanese work. There is accordingly much in the colour designs of the Japanese which affords the most valuable hints to the Western decorative artist and student of colour, and from their enamelled ware might

be taken many motives and ideas for the treatment both of stained glass and of mural and ceiling decoration,—not in the way of direct imitation, of course, but by working out in our own fashion and in our own materials the hints given by the Eastern workmen. The free, and yet perfectly suitable and characteristic manner, too, in which the forms of flowers and leaves are conventionalised to adapt them to their situation in the ornamental design, a manner in which much of the freedom and grace of nature is retained along with the degree of symmetry and regularity required by artistic design, cannot but strike every critical observer of these works: (as to the delineation of animal life we have a word to say just now). All this would certainly strike any one on examining for the first time one or two of the best specimens of the Japanese *cloisonné* ware; indeed, we believe the first impression generally is, what we remember ourselves to have experienced, a feeling of astonishment that things so elaborate and characteristic in their treatment should have remained so long practically unknown to Western artists.

An inspection on a larger scale by degrees modifies to some extent this first admiration. It becomes evident that whatever the minute variations of detail, the character of treatment and the idea on which the ornamentation is based vary very little in objects of the same class; and that in many cases there seems indeed to be no "idea" at all but bow to cover a given space in the richest and most varied manner with elaborate ornament. The colours, the general effect, the character of detail, will scarcely vary appreciably in a dozen specimens taken at random; and it is as possible to get tired of *toujours perdrix* in this as in many inferior works of art-handicraft. In regard to what may be called intellectual interest, indeed, the Japanese ornament cannot be compared either with the Greek in the purity of line and of general form or details (the outline of their vases in particular being often very ugly and clumsy), or with the Saracenic in the dexterity with which these are incorporated into one design. On this latter point the Japanese artist is utterly careless, not only disregarding symmetry in the relation of the various parts, but quite careless even as to fitting the design to the size or shape of the object to be decorated.

With the bappy consistency of blind admiration, this irregularity is pointed out to us as one of the things to be specially admired. That professed artists can be found deliberately to say this, is a significant fact; as significant as the theory we saw put forward in a contemporary not long since, also by a professed artist (a painter), that all ornament ought to be irregular because there was no regularity in the disposition of the starry heavens! Such ideas serve to indicate the sad nonsense that people will talk when they follow a fashion in art, or commence theorizing without any definite basis. We have no hesitation in asserting, and we feel sure that every really thoughtful critic will bear us out in a view illustrated by all the greatest styles of ornamental art, that the relation of a design to the space and figure it has to occupy is just one of the things which most gives intellectual interest to it, and which requires often more thought on the part of the designer than any other part of his work; and that the ignoring of this, and the overlaying an object with ornamental design at random, is simply an avoidance of one of the most difficult and interesting problems in design, and is more than anything characteristic of the "childishness," as we may call it, which always belongs to the work of a semi-civilised people. It is true there is something very interesting in this childish *naïveté*, when it is genuine, just as there is in the simplicity and efforts of childhood in general; but it would be no less absurd for men to imitate deliberately

the manners and voice of children, than for the artists of an intellectual and educated society to deliberately imitate the unstudied irregularity and purposeless character of much of the Japanese ornament. Whatever charm might belong to the original will be found to have completely evaporated in the copy; and we hope the young architects of our day will not be persuaded to try any such foolish tricks in design.

We referred just now to the claims for admiration put forward for the Japanese as delineators of animal life. Within certain limits these claims are justifiable enough. In the representation of birds in particular, which are their favourite objects, we find, notwithstanding a certain stiffness, that close imitation of minutiae of outline and action frequently found in the drawings of half-civilised nations, depicting with care and exactitude exactly what they see before them. In the treatment of quadrupeds they are, as far as we have observed, less successful, the difficulties of drawing and foreshortening being greater here. But one point which is conceded even by their most enthusiastic admirers is, that the Japanese never have shown the ability to introduce the human figure with success, or with artistic power in their works.

This was admitted at the lecture at the Architectural Association before referred to; but the real significance and importance of this deficiency does not seem to have occurred either to the lecturer or his audience. The fact is, that the human figure is the one object in nature in regard to which mechanical copying will effect little or nothing for art, in which we demand not merely a correct representation of the physical characteristics of the species, but the representation of thought and feeling, and mental character through the medium of form; and this is just what a half-educated and infantile people never have arrived at, and never can. In every marked period of art, the degree of power shown in the representation of the human figure and of human character as exhibited through its medium, is almost the exact measure of the intellectual power of the artists and of the intellectual value of their productions; and the want of this power is always the mark of a barbaric, or semi-barbaric, art. Without this, a national art may exhibit ingenuity, patience, dexterity of hand, and correctness of eye, and even a very refined feeling for colour; but it will never answer fully the demands of educated minds, nor bestow the highest class of enjoyment which such minds are capable of deriving from art. We have been for some time confined in our convictions as to this distinction by the observation that among those amateurs and collectors who make the greatest display of this exaggerated fancy for some particular branch of ornamental art, the majority appear to have no faculty for comprehending the works of the greatest masters of art, and trouble themselves very little about them. We remember hearing of one of these ornament-fanciers one day observing condescendingly, in response to some observation as to the beauty of Flaxman's designs—"Yes, I believe he was very clever." Any comment would spoil this; but we could multiply instances of similar Boettianism.

On the whole, then, we conclude that while there is in Japanese art a feeling for colour, a delicacy of manipulation and finish, and a peculiar naive charm and freedom in ornamental design, rendering its productions objects of great beauty and interest, and in some respects highly suggestive and instructive; on the other hand, it exhibits, though in a more refined form than usual, all the characteristics of what may be rightly termed a semi-barbaric art, and possesses little or nothing of what can be called, in the highest sense, intellectual interest. The now celebrated miniature cabinets, with their odd and interesting variety of ornament increasing the whole without any apparent rule, except that of elaborating every part of the surface available for ornament as highly as possible, show, with all their delicacy and minuteness, little thought on the part of the designer in proportion to the amount of work displayed; for real thought, in ornamental design, is evinced not in crowding every part of an object indiscriminately with ornament, but in the faculty of judging where to ornament and where to stop; what part to emphasise, and what to leave as a foil to the rest. And this want of intellectual interest is rendered more marked by the absence or total failure of delineations of the human figure, without which the highest and most intellectual feelings cannot find voice

in art. The Japanese art, in short, is one in which ingenuity, patience, and (in general) good taste take the place of that great power in art which we call *genius*. It is an art for the pleasure of the eye, and not of the mind; and, whatever, its real beauties, such an art ought never to be slavishly worshipped by those whose higher education and civilisation should fit them to appreciate higher things.* In regard to those articles which are becoming the staple object with "collectors," it may be said "they that buy them are like unto them;" for nothing has a greater tendency to weaken and deaden the appreciation of the more intellectual productions of art than the indulgence of this kind of forced taste for an imperfect or restricted form of art. In this view, the whole philosophy of the subject might be summed up in the words from one of the finest sonnets of Drummond:—

"Of this fair volume which we World do name,
If we the sheets and leaves could turn with care
Of him who it corrects, and did it frame,
We clear might read the art and wisdom rare.

But silly we, like foolish children, rest
Well pleased with colour'd vellum, leaves of gold,
Fair dangling ribbands, leaving what is best;
On the great writer's sense nor taking hold.

Or if by chance we stay our minds on aught,
It is some picture on the margin wrought."
Which thing is an allegory.

THE PROGRESS OF SANITARY LEGISLATION.

THE Public Health Bill, of which we recently gave an analysis,† is founded on the second Report of the Sanitary Commissioners presented to both Houses of Parliament by command of her Majesty. This document was printed in 1871, and bears the mark C. 281; but, extraordinary as it may seem, is not dated. We propose to give some further attention to this Report; to inquire how far the Bill now before Parliament does, or does not, carry out its recommendations; and, in so doing, to take a general survey of the present state of this most important subject.

It is now, perhaps, for the first time in the history of this country, that it has been proposed to introduce into our law an entirely new branch, the necessity for which has been ascertained, and the object of which has been formulated, on scientific grounds. While an attempt of this nature is, in itself, a great stride in the progress of civilisation, it is the more necessary to guard against any avoidable complication, and to take care that, in the inception of a new code, no false steps are made. Pressing, as the subject is, it is one in which haste is not necessarily coincident with good speed. It is the more useful to examine where the bounds of the new laws should be drawn, because in this, as in all comprehensive questions, there is a wide margin of debatable ground. It does not follow, because certain points bear more or less directly on public health, that they are, for that reason, to be removed from the province of police or of criminal law, and handed over to the operation of a new machinery, destined, in its original organisation, for the discharge of another class of duties.

Legislative protection against dangerous nuisances is not, however, altogether new in this country, although the general review of matters affecting the public health cannot yet be said to be at all complete. So early as the twelfth year of Richard II., A.D. 1388, an Act was passed, imposing the heavy penalty of 20*l.* on persons who cast animal filth or refuse into rivers and ditches. In 1489 an Act was passed prohibiting the slaughtering of cattle within cities and boroughs. The common law, and the Sheriffs' Court and Courts Leet, took cognizance of unhealthy nuisances; and in 1552, and again in 1558, the father of William Shakespeare was fined for depositing filth in the public street of Stratford-on-Avon, and for not keeping his gutter clean.

In the reign of Henry VIII., the Statute of

* It is amusing enough to hear, as we did the other day, from a correspondent in Japan, that the people there are taking just now to imitating our costumes, the ladies in particular procuring all the adornments of chignons, &c., while we in England are manufacturing imitations of their ware. We are afraid it can hardly be said that they are the gainers in this exchange; but if the Japanese in this country go on as they seem inclined to do, crying up every branch of Japanese art-manufacture as something wonderful, and giving fabulous prices for any small ugly-shaped pot with an enamel pattern over it, it may be hard to say which will prove in the long run the more absurd "craze" of the two.

† See p. 218, ante.

Sewers was passed, authorising the issue of commissions to superintend the cleansing of rivers and streams, and the maintenance of dykes and sea walls in specified districts. From the reign of George II., the more populous and wealthy towns have applied to Parliament for special local Acts for paving, lighting, cleansing, and improving their districts. But it was the alarm caused by the ravages of the Asiatic cholera, in 1831, that led to the first move in sanitary reform. In 1832, the powers already exercised by the Privy Council under the Quarantine Act of 1825 were extended. In 1833 a new Lighting and Watching Act imposed penalties for the contaminations of streams by gas. In 1835 the Municipal Corporations Act was passed, the importance of water supply, the want of open spaces in crowded cities, the necessity of superintendence being exercised over common lodging-houses, and the need of public baths. The appointment of Local Boards of Health and of inspectors was also recommended by the committee.

In 1836 a most important step was taken by the appointment of a Registrar-General of Births, Deaths, and Marriages. Sanitary information was now, for the first time, officially collected and abstracted, and the basis for enlightened legislation was thus prepared.

In 1839, attention was called, in consequence of the report of the Registrar-General, to the excessive mortality of towns. A select committee of the House of Commons reported, in 1840, as to the evil of interments in towns, the importance of water supply, the want of open spaces in crowded cities, the necessity of superintendence being exercised over common lodging-houses, and the need of public baths. The appointment of Local Boards of Health and of inspectors was also recommended by the committee.

In 1840 inoculation for small-pox was prohibited; and in 1841 the expenses of vaccination were charged upon the poor-rates. In 1843 a royal commission was appointed to inquire into the causes of prevalent disease, and the best means of improving the public health under the then-existing laws. The evidence before the committee traced, in the cases of fifty towns, the origin of excessive mortality to defective drainage and similar causes. In 1845 the commissioners made a second report, recommending that the Crown should inspect and supervise the sanitary improvement of towns and populous districts, and that the powers and areas of operation of local authorities should be enlarged. After two failures the legislation required for accomplishing these purposes was effectually commenced in 1846.

In that year was passed the first of a series of Acts of Parliament for the removal of nuisances, Summary jurisdiction was given to justices in petty sessions, acting on the information of town councils, commissioners under local Acts, or Boards of Guardians. Nuisances were defined to comprehend filthy and unwholesome dwellings, accumulations of offensive matter, and the existence of foul drains or pools. The powers of the Privy Council to make regulations for the prevention of formidable contagion was also extended by this Act, which, however was only to remain in force until the session of 1848.

In 1847 the Towns Improvement Clauses Act, and the Towns Police Clauses Act, were passed, for the purpose of consolidating the provisions usually inserted in local Acts for public purposes of a sanitary kind. Nine "Clauses Acts" were passed in the year 1845-7. In 1848 was passed the first Public Health Act, which may be regarded as the groundwork of all our sanitary legislation. This measure was designed to affect towns and populous places in England and Wales, not including the metropolis. It was not to come into force in any locality unless on the petition of the ratepayers, or on the initiation of the Board of Health, on the ground of excessive mortality. A General Board of Health, consisting of a president and two members, one of whom was paid, appointed by the Crown, was established. A second paid member was added in 1850 by the Metropolitan Interment Act; which imposed additional duties on the Board. This body was to be continued during five years, and was empowered to appoint inspectors. In 1849 was passed, and in the following year was amended, the Nuisances Removal and Diseases Prevention Act, in substitution for the Act of 1846, which was then about to expire. It was on this occasion, for the first time, that legislation of a permanent character was attempted.

In 1849 came the second outbreak of cholera, and the pernicious effects of impure air and

water were very fully illustrated by the medical reports of the time. In 1854 occurred a third visitation of the same pestilence; with the result of stimulating the Legislature to unprecedented activity. A comprehensive Act was passed, in 1855, to consolidate the law relating to the removal of nuisances; and a separate Act for the prevention of diseases,—the Legislature not yet having attained sufficient intelligence to regard these two details of supervision as parts of one sanitary code.

In 1854 the Board of Health was reconstituted; and from that date its powers were annually renewed, until 1858, when the Board was allowed to expire, and certain of its powers were vested in the Privy Council. The Local Government Act was passed in the same year. It is to be construed together with the Public Health Act of 1854 as one measure; and this combined law forms the principal sanitary legislation now in force. The Local Government Act was amended in 1861 and in 1863; and further powers were given to local boards by the Sanitary Acts of 1866 and following years. The Act of 1863 restricted the operation of the original measure, declaring it to be inoperative in places having less than 3,000 inhabitants, unless with the approval of the Secretary of State.

In 1860 a Nuisances Removal Amendment Act reconstituted the Guardians as the local authorities, and enabled them to appoint committees for the execution of the Act. A new Amendment to this Act, in 1863, gave powers for the seizure of unwholesome articles of food.

In 1865 the Sewage Utilisation Act, applicable to the whole of the United Kingdom, enabled local councils, improvement commissioners, and vestries, to deal with sewage for economical purposes. It conferred certain specified powers on their bodies, under the title of sewer authorities, and for the first time introduced sanitary measures into rural districts. This Act was amended in 1867.

Sanitary Acts, under that title, were passed in 1868, 1868, 1869, and 1870, which gradually extended the powers of taking precautionary steps with regard to the public health. There are thus now on the Statute-Book no less than fifteen Acts in concurrent and confused operation.

Some of them apply to Scotland, to Ireland, and to London; which have also their peculiar Acts. In upwards of seven hundred districts, councils, commissions, or elected boards, now exercise the powers of the Public Health and Local Government Acts. A comparatively small number of towns are still governed by Local Improvement Acts alone. But there are still many places with very defective sanitary government; and still more with practically none at all, owing to the defective exercise of the powers which the law confers.

The Commission of 1860 have given a summary of the beads under which they consider that legislative protection of public health should range. But their point of view has rather been that of the lawyer than that of the engineer. They have regarded rather the method in which the principles of local government may be developed with reference to sanitary measures, than the absolute physical conditions of the problem set before them. We think that this has led to a less simple and comprehensive result than that at which the civil engineer would naturally arrive. Thus the Commission state that the subjects of local government generally may be separated into two main classes,—those of police, and those of the supply of public requisites, which latter class subdivides itself into ordinary requirements for the general community, and the public provision for those who depend on the support of others. Without stopping to criticise this statement as being in itself erroneous, on the ground that there is a confusion between restrictive measures and measures of supply, and that the latter can only to a very limited extent be matters of local government at all, we cannot but remark that we fail to perceive the natural connexion between police and local government. Police, or the machinery for the prevention of crime, and for the detection of crime when committed, is a highly important branch of criminal law. Where a special ministry of police does not exist, the regular state of this service naturally falls within the province of the executive, and within the department of the Ministry of Justice. The displacement of the old parish constables by an organised force of police, is a consequence of this view of the case; and any attempt to localise the authorities that

exercise police functions, and thus to impair the simultaneous action of the detective and protective force throughout the country, would be a great comfort and encouragement to the criminal members of society. For this reason we hold that those measures which, although no doubt affecting the public health indirectly, are not properly matters of sanitary regulation, but of criminal repression, should be as little as possible referred to the action of local authorities. It is hardly possible that any statesman should have contemplated this method of interference, except from the anomalous position of this country in the want of a public prosecutor. Such matters as the adulteration of food, and the supply of unwholesome articles of consumption, are criminal offences. They resemble, in their nature and effect, such offences as the use of false measures and scales, more closely than any other. It is not proposed to remit to the new sanitary authorities the supervision of the weights and measures used by retail tradesmen. No doubt the poor are as much ground by means of short weight and measure as they are by actual adulteration. Between the sale of under-weight loaves of beer made from improper ingredients, and of meat, fish, and vegetables that have been too long exposed for sale, it is impossible to draw any philosophical distinction. We would facilitate the punishment of all dealing of this kind. We would give every facility to complaints, whether from individual sufferers, or from those who, by their position, as medical men, as guardians, counsellors, vestrymen, or sanitary authorities, or otherwise, become acquainted with any instances of such unprincipled roguery. But we would not complicate the working of the new law, and throw upon those who ought to be its efficient administrators at once the onus and the unpopularity of exercising a supervision over retail trade, which is properly a matter of police.

Removing, then, from the direct charge of the sanitary authorities the responsibility for the inspection of food, which, if exercised by them, would at all events demand a special staff, and a direct association with the machinery of the law, the whole of the sanitary government of the country will classify itself under two heads. These may be called either the duties of inspection, and those of provision, or the medical and the engineering functions of the administrative authority. One item included in the list of subjects drawn up by the Commissioners should be settled once for all,—if, indeed, it be not now so settled. We refer to the provision for the burial of the dead without injury to the living. This is no question of local government, but is a matter of national prosperity, to be determined on broad and simple rules, and requiring none of that constant vigilance as to the removal of the active nuisances chiefly dealt with by sanitary authorities that must be given to sanitary works proper. Again, the registration of death and of sickness is a national necessity, no more devolving on the irregular action of various local authorities than the registration of births and of marriages. Let us see the subject discommodated of those matters, which, though connected with the health and welfare of the people, are not, properly speaking, sanitary measures. The field left for our exertions will still be ample. It may not, even then, be perfectly homogeneous. But, if restricted to its medical and its engineering features, and freed from any irregular police action, it will be both intelligible and practical.

Sanitary provision, thus restricted, comprehends the following subjects. First, the supply of wholesome and sufficient water for drinking and domestic purposes. This is a large and a purely engineering question. It contemplates not only the wants of the population of to-day, but those of the continually increasing numbers of the people. It cannot, therefore, be dealt with on merely local, or hand-to-mouth, considerations. The division of the whole island into watersheds, and the application of the rain falling within their limits to the supply of the district population, must be primarily borne in mind. Intimately connected with this question of the supply of water, are those of prevention of the pollution of streams and rivers, and of the method of dealing with sewage. These two items are, naturally, referred to by the Commission, but we do not find in the Report any indication that the essential connexion between these different branches of the hydraulic survey and distribution of the country has been grasped by the Commissioners. Two other questions, intimately connected with the above, are left un-

noticed in the Report. These are, the arrangement of a sound system of irrigation, instead of the wasteful and clumsy mode practised in many of our valleys; and the provision of urban water conduits, that shall be quite unconnected with the sewers. Confining our attention at the moment to the one great engineering question of the water supply, we require means to prevent waste, to look to due and proper fields of collection, to see how the requisite quantity is to be supplied to great towns, how it is then to serve as a carrier of refuse from the houses, and how, while the water follows the great river courses to the sea, we can make the most of it in its passage, and avoid contamination of its channel. The subject is immense. It is not to be dealt with by the simple plan of rendering the pollution of rivers penal two years hence. To attempt to secure sanitary propriety by simply prohibiting the discharge of sewers into rivers, is like attempting to secure the cleanliness of a dwelling-house by stopping up the drains. The matter must be looked in the face, and dealt with on sound engineering principles. It is perilous to throw the onus upon comparatively uninformed and unintelligent local authorities. In every large town, or class of large towns, different conditions exist; affecting, and indeed indicating, the course to be taken as to the proper method of dealing with the sewage. But, so far from this being a reason for leaving every town to settle its own plan, often on its own unassisted notions, it renders it indispensable that a general system should be created, applicable to all different conditions; and that each special system of works should form a harmonious portion of this grand well-considered plan. If this be lost sight of, our efforts at sanitary legislation will only result in sowing pestilence broadcast through the country.

Let any one compare, for instance, the position of such a town as Oldham, the local legislation for which has recently been referred to as exemplary, with that of such a town as Reading; the former lying on the steep and rocky hills, the latter situated on an alluvial basin, hemmed in by the courses of two navigable rivers. The provisions proper in these two cases will be entirely different. Certain dangers will have to be guarded against in one case that are not very pressing in the other. On the other hand, considerable expense will have to be incurred in the lowering town in lifting the whole quantity of liquid sewage to a considerable height before it can be allowed to filter by gravitation. The prevention of the irregular dilution of sewage by rain-storm will be much more important in one case than in the other. Again, the course taken by the effluent water, when it escapes from the confines of the sanitary arrangements of the district, will require more careful watching in the case of the more inland town. This is only one illustration, out of hundreds that might be taken, of the supreme importance of a well-ordered engineering plan of dealing with the watershed of the country, under its three great divisions of supply of human need, supply of vegetable nourishment, and use as a carrier in the removal of *excreta*, with the necessary provision that it shall not serve as a conveyor of poison to more seaward places. This is what may be done, if properly taken in hand. It is what must be done, if we would not sow the seeds of a plague more fatal than cholera, or any visitation of modern times. It will involve, necessarily, a large outlay. This outlay will be either a mere frittering away of money in costly failures, which will be the case if the carrying out of the prohibitory provisions of the Bill is merely left to the unskilled parsimony of the local authorities, or it will be the most beneficial expenditure ever yet made in any country,—a public investment than which the value of our railway capital itself will be less important and less productive,—an expenditure that will not only replace itself within a decade, but more than treble the agricultural produce of the country. The future of the country is, in this respect, in the charge of the civil engineer. Let him be consulted at once.

Worthing College.—The boys of this college, through the consideration of the principal for their sports, have been enjoying themselves this winter by skating upon asphalt, he having in the vacation of 1870 put an iron roof over a large area of ground and paved it with Claridge's patent asphalt, which, we are told, answers the purpose admirably, and is in no way injured by the rollers of the skates.

Handwritten notes on the right margin of the page, including the numbers 100, 18, 28, 70, 5, and 50.

THE ORGANISATION OF EDUCATION,
CIVIL, MILITARY, AND NAVAL.

With the exception of the imperfect provision for the education of the masses, which, wo trust, will now soon be remedied, there is, perhaps, no other country in the world which possesses such a wealth of scholastic institutions as Great Britain; but these are so disconnected and deficient in any concerted plan of action, that their power is in a great measure frittered away, and thus they fail to exercise that larger and healthier influence which would inevitably be consequent on united action.

Being painfully impressed, several years ago, with this terrible absence of organisation in the educational forces already at our disposal, I ventured to address the following letters to the editors of the *Daily News* and of the *Builder*. These are given in the order in which they appeared. That to yourself, October 31st, 1868, was headed,—

"THE ARTIST 'MASTER OF ARTS.'—Felix Summery' did good service the other day by directing attention, through the medium of the columns of the *Builder*, to the greater consideration and larger share of time devoted to the study of art in the continental colleges and schools than in England. This opens a question of great moment, a subject requiring thorough ventilation. Is not the sabbat 'Master of Arts' a mischievous sign of a complete education, when it may be, and is commonly, earned by men that ritically and practically unacquainted with the two great arts of painting and music? The classics, it is true, were for many centuries the only studies in the liberal spirit of art, and therefore gradually assumed a prescriptive and undue importance in the college curriculum, which, in due time, strengthened into an overbearing prejudice in their favour difficult to combat. There are, however, signs at the ancient seats of learning of a better temper, and a more gracious bending to the times. The more modern collegiate institutions have adopted every thing, not only for the classics and the mathematics, but science, chemistry, and medicine,—but even in these there is still much to be desired. The study of art, and of music, civilisation,—painting and music. This is strange when it has been so long admitted that an improved taste is daily becoming a more crying national need, for the present and future craft of our manufactures; nevertheless, though such an educational reform promises greater mercantile prosperity, a plethora of wealth, the country remains unmoved, to any sensible extent, even by the prospect of the promised golden reward. This immobility after the importance of a change has been long demonstrated is truly English.

When the Schools Commission was pursuing its useful work in 1868, I took advantage of a professional position, to call the attention of one of its body to the disadvantages under which the study of art in our colleges and schools commonly labours, and, whilst urging the importance of the study, and the immediate necessity for some reform in this direction, stated that the study of art was not merely important as the proper means of education, but to appreciate the beautiful, but in a direct utilitarian point of view,—for that, when drawing is properly taught, it is a most potent means for perfecting the faculty of observing correctly, of looking at things rightly,—of enabling people, in fact, to see properly. How inaccurately people do generally observe what is before, or going on around them, is only fully known to art-teachers and the quinquers of the Courts of Justice; and this will continue till the importance of training the two leading senses of sight and hearing be as thoroughly recognised and important object of education. It is not, therefore, a matter of indifference, I urged, "how drawing is taught in public and private schools; whether the students be condemned to *make-shift* in respect to time and place of study; whether the time set apart for it be pinched in between the more favoured claims of Greek and Latin, or carried on in the class-room, the worst lighted and adapted for the purpose. Moreover, the slight consideration it receives is too frequently aggravated by the so-called 'practice of drawing' being nothing more than mere crude water-colour blots being drawn, and more than half performed by the teacher. For the study of art to fulfill its true educational function, it should beget a habit of exact comparison, and this is only to be induced by experienced teachers conversant with that thorough discipline and training of the eye which is acquired in the art-school proper,—the student commencing his studies from the simpler forms of leaves, fruit, and flowers, and gradually rising, step by step, to grapple with the subtleties of the human form. One great hindrance to the introduction of a better system of studying drawing in schools is doubtless the ignorant satisfaction which parents evince at those wonderful landscape performances, enlivened with impossible rustic figures and dwellings, surrounded with a blaze of impossible foliage. Such performances are unfortunately too often preferred to the dry and less showy but more useful work under a good teacher.

In returning to the subject of the 'footing' on which art ought to stand in our great seminaries of learning, I would ask why it should not be the same as that of the more favoured subjects? Has there not been already sufficient reasons adduced why it should be so placed? An art student, too, ought to have it in his power to pursue his general, simultaneously with his special study, and to take the degrees of B.A. and M.A. The question of which naturally suggests itself to me is this,—whether, as the reorganisation of our educational system must soon become an important consideration, it would not be better that every college should adopt a leading speciality. Thus we should have a College of the Fine Arts, of Medicine, of Engineering, &c. in which the degrees of B.A. and M.A. could be gradations for as well as the specialties of R.A., M.D., or C.E. The plan would have this advantage, that the greatest talent in each speciality could be concentrated. This would appear to me to be the best mode of combining special with general studies, and one which would not materially disturb our present educational prejudices. Oxford might retain the classics as its speciality, Cambridge the mathematics. The Royal Academy or South Kensington might be transformed into a College of the Fine Arts, the College of Physicians into a great Medical College, and so on.

We will now turn to the letter addressed to

the editor of the *Daily News*, December 28th, 1868. This had more immediate reference to the Slade Professorship; but it incidentally touches upon the more general question of the organisation of education:—

"Although I have from time to time advocated the establishment of a Faculty of Fine Arts in each of our principal universities, I have only recently become aware of the existence of the Slade bequest for that purpose, and I think you will agree with me that for the interests of art it would be well if the chief features of this bequest were made more widely known. There is no less a sum than 45,000*l.* bequeathed, free from legacy-duty, by the late Felix Slade, of Woburn-place, Lambeth, to endow, within two years after his decease, three or more professorships in the universities of Oxford and Cambridge, and also in University College, London; moreover, to endow art exhibitions or scholarships for proficiency in the fine arts, for students under nineteen years of age. And if, after providing for these several trusts and purposes, there shall be any surplus, it shall be applied for the encouragement, benefit, and advancement of the fine arts in England, and every part of such surplus which shall not be so applied within five years is to fall to the residuary personal estate. I have recently proposed that every college should have a leading speciality, so that a student in any of the liberal arts would be able to matriculate at the same time, and pursue a course of general and special degrees. There would be, according to this proposal, the College of Fine Arts, the College of Medicine, the College of Engineering, &c. A student would receive a general education, and then, after having obtained an education under difficulties. This proposal, however, is but a compromise, or rather one collateral to that for a Grand Central College, submitted to the Royal Commission in 1851, and which provided that all the means for a general and special education should be concentrated in one locality. A proposal to convert the Royal Academy into a College of Art, and to have the Royal Academy as an impracticable one, and indeed may be so now; but had the Slade bequest been available before the new building, the Royal Academy might have been justified in considering whether it should not separate its schools from its exhibitions, and carry them on under the roof of a University College, whether it could combine its own with the courses of the bequest. At the College there would be every facility for studying anatomy, chemistry, &c. on the spot. As this conjuncture has never occurred, University College cannot hope to make art its dominant speciality; it would be useless to attempt a 'little rivalry with the Royal Academy and Heriot's' which would occur. University, then, which appears to be left open to the council of the college, is to proportion its intended art department to its place in a comprehensive scheme of general education; and a very important position, I conceive, that should be. So far back as 1865, whilst the Schools Commission was pursuing its useful course, I took occasion to direct the Commission's attention to the fact that the study of art was not only important to educate men to appreciate the beautiful, but to train them to observe, to see correctly what is passing before them. How imperfectly,—inaccurately,—people do observe, is only fully known to art-teachers and queen's counsel. Some painters may think that the establishment of the faculty proposed would only tend to swell the number of those who pursue art for art's sake; but it should be borne in mind that the college art-classes would at the same time cultivate a taste for and an appreciation of art in students never intending to follow art as a profession. We must look to the art-teachers in countries where art is more widely cultivated than in our own, when the fact must be recognised that all who study art cannot be painters, sculptors, and architects, but that some students must direct their talents to the manufactures. The whole question, however, requires careful consideration before it is held to be now important. The benefits to be derived from a more extended study of art."

But long before writing these letters, and so far back as 1850, I had projected the foundation of a Grand Central College of Art, Literature, and Science, at South Kensington or elsewhere, already referred to, and that the surplus fund of the first International Exhibition should be devoted to the realisation of the project. In projecting this central college, the ruling idea which possessed my mind was this,—that the central college should be the institution to which all other educational establishments in the Kingdom should converge, and that every means should be used to enlist the best representatives of every department of inquiry, in either hemisphere, as its professors; and thus to make London the great educational centre of the world. All other scholastic institutions were, according to my conception, to graduate up to this. The pamphlet which contained this first suggestion for a Central Polytechnic College was in the hands of the Royal Commissioners of the Exhibition of 1851.

We are all, I believe, now coming to understand the first and foremost condition of a true system of education, viz., the importance of including those subjects which are essential to the development of the mind,—that knowledge and training which give a man the power of turning himself to good account in whatever speciality he may select, which completes him mentally and physically as a man. These subjects are very many fewer than most people are apt to suppose,—and should form the real nucleus of every educational course in the Kingdom. There is no practice which requires more repeated consideration than that of "cramping"; too many subjects into the curriculum of general education. I believe that both mental and physical power are weakened by an ignorant persistence in this course; that practical capacity

is lowered rather than raised by this too-prevalent educational fashion.

National education, then, may be broadly divided into two important and distinct sections: first, that central or general education which should be accorded to all; and, secondly, that special or professional education which should be provided for some; and as most men in England are destined for some special work, the organisation of the special or professional section of education becomes a very important subject for consideration.

The nation has of late years got a notion that special or technical education is a very important thing, and has some hearing upon national interests. The country has tortured itself into the utmost confusion on the subject, and is now intent on providing and applying remedies precisely where they are not wanted. Let us consider for a moment that there are two estates of the realm which require this professional, special, or technical education,—viz., the middle and the working classes. Now, for the technical education of the latter, or the working class, there is no country on the whole earth in which this kind of education is so well provided for. The college in which the English workman obtains his special education is, as Charles Burton well observes, "the workshop,"* and the workshops of England are unsurpassed. Yet it is precisely in this direction that the public is clamouring for technical education. "It is not here," as the writer just named rightly observes, "that technical education is required," and with the caution, "beware how you interfere with the workshop!" It is the special or professional education of the middle and wealthier classes which urgently needs improvement. The office cannot do for the art-learned pupil what the shop can do for the apprentice. The professional pupil requires, before or after passing through the office, a wider range of study touching upon his speciality than could by any possibility be acquired there. All the professions, therefore, require their own special colleges, as I have previously suggested. This need has recently been felt by some of the professions, and the system has received further extension in proposals for two more special colleges, "the Legal" and "the Naval." The mention of the latter leads me to note that the military and naval education of the country ought to be a part of a comprehensive educational scheme. The following list of special colleges exhibits the extension of the principle in conformity with my own views:—

Theological, Civil Service (Diplomatic, Social Science, &c.); Fine Arts, Music, Mathematical (Astronomy, Physics, &c.); Legal, Military, Naval, Medical, Engineering, Chemical, Mineralogical, Zoological (Veterinary, &c.); Agricultural, Preceptors, Ancient Literature, Modern ditto, Pharmaceutical, Mercantile (Colonial, &c.), Oriental.

The centre of this system of special colleges would be the Grand Central Polytechnic College already referred to; this, if carried out on the scale proposed by me in 1851, would bring all the special colleges under one roof; in that case the special education of London professionals, would be provided for in one locality. Such an institution, however, might prove too colossal for convenient management, so that I think the central institution should represent the head of the system of special colleges, and that the highest representative of each of the specialties tabulated should occupy a chair in the Central Institution, from which he would have to lecture on his particular subject, at stated times, to any students of the special colleges then assembled. This Central Institution should also have libraries and museums on an extensive scale, and be the centre from which all London Diplomas should be dated. Under this arrangement the special colleges for London would exist as separate institutions, conveniently located, and ranged at moderate distances around the central college.

The several kinds of institution necessary for the educational welfare of the country appear to me to be the following:—

The Central College, Special Colleges, Public Schools for the youth of both sexes (established for several degrees of citizens, and to meet difference of means); Private Schools, District Military Schools, ditto Naval ditto, Volunteer Officers' ditto, Working Men's Colleges, School Board Schools.

* Art, Pietorial and Industrial."
† Special Colleges already existing, or about to be established.

A more equable distribution of collegiate institutions could, as the Ormond-street College, be needed. It is a very great inconvenience and expense to provincials to have to send up and support young men at any one of our few educational centres, and a practice which is not unfrequently fraught with mischief. Every county town of importance ought to have its properly-constituted medical college, where young men intended for that profession might matriculate *pari passu* for their special and general degrees. I very much doubt whether medical schools ought to be attached to hospitals; it would, it appears to me, be a better plan to have properly-located medical colleges, the students being permitted to "walk the hospitals" lying in their own particular district.

The Royal Academy should either be a college of art, or simply a syndicate to confer degrees and appoint the most able masters of the theories of painting, sculpture, and architecture to the art-professorships at the central college. The special college of the fine arts, the schools, and annual exhibitions could then be transferred to other management.

All colleges but the central, let me repeat, should have but one leading subject,—one speciality. The misfortune at present appears to me to be this, that every college is trying to make itself as comprehensive as we propose the central institution should be, without having the means, the money, or the room, to carry out the ambition of its directory; and, therefore, the attempt only complicates, encumbers, and involves the management.

With respect to the establishment of public schools, I would merely suggest that such should be insisted on a similar plan to those of which the middle class can avail itself, but on a reduced scale of fees, in order to meet the more limited means of the lower middle and upper working classes.

There are two other institutions on my list about which I have something to say, viz.—District Military Schools and Working Men's Colleges. And, first, of the Military Schools,—which I proposed as the basis of the localisation of our military forces in a letter to the editor of the *Pall Mall Gazette*, March, 1867. This was, of course, before those events which have proved "localisation" of such potent advantage. The outline of the scheme which I sent to the *Pall Mall* was afterwards more fully developed in a lecture delivered at the Royal United Service Institution, March 12, 1869, and published in its Transactions for that year.

The chief features of my proposal were, that the country should be divided into military districts. That every district should have its military school graduated to the requirements of youths training for commissioned officers, non-commissioned officers, and privates. That the recruiting depot for the district should be in proximity. That there should be drill-grounds and workshops for instructing the boys, destined for private soldiers, in employments which would render the army, as much as possible, independent of any non-military artificers. These Military Schools would be special, professional, or technical schools—the workshop in which the soldier would be made. And I believe the establishment of these schools, and the localisation proposed would render our voluntary military system adequate to all our requirements. It was also suggested that Naval Schools on a similar plan should be established on the seaboard.

And now, touching the institution called the Working Men's College. I have no doubt in my own mind that that in Great Ormond-street is destined to be the precursor,—has been, indeed, already,—of many similar institutions throughout the kingdom. Colleges of this kind would fulfil several important and useful functions. They would afford opportunities to workmen and others, having but limited means, to improve and extend their information in their leisure hours. In Ormond-street there are classes for the study of Greek, Latin, history, art, mathematics, physiology, &c., at a very small term-fee. The programme is as extensive as that of the great universities; but it can seldom fall to the lot of working men to be able to take advantage of the entire course: yet it always affords men the opportunity of taking one or two subjects in which they may be specially interested. And now and then, when a man is conscious of possessing superior ability, to educate himself up to the higher mark he has proposed. But that this kind of institution may be of an extended national advantage, I think they must become a part of the Government scheme of education.

It can scarcely be expected that many institutions could, as the Ormond-street College, be taught on the voluntary principle, by unremunerated teachers. We have there been bound together by enthusiasm in the cause, and a sincere respect and regard for the Rev. the Principal. It requires great determination, and a rigorously-ordered working life, to be able to give, through the years, regular attendance to duties of this kind. I am therefore inclined to believe that when the merits of this institution, the useful functions which such colleges are calculated to fulfil, come to be better understood, and the establishment of working men's colleges throughout the great towns be contemplated, the voluntary system of teaching will have, if not entirely, to be partially abandoned. The Rev. the Principal was, however, sanguine that it would not. My own notion is that the most feasible and practicable plan for their extension would be by widening the local and provincial art schools of the Science and Art Department to the functions of working men's colleges.

Finally, I should desire to direct attention to the importance of drawing and music in general education,—in that education which is to form the manhood; they are essentially human and humane studies. The study of the arts would cover those dry bones of physical science, to which modern notions in their cold mechanical pride would confine education. The arts are the golden links in education; they are, too, as utilitarian as those studies to which this virtue is most attributed. I have repeatedly touched upon this subject, and will only now recapitulate the strong arguments in favour of their becoming an essential part of general education, of all college and school courses. Drawing and music are the proper exercises of the two most important of our senses, the eye and the ear. We should bear in mind that it is through the senses of seeing and hearing that we chiefly bear witness to what is passing in the world, and those who have the training of these senses only fully know what false witnesses the senses generally are, before they are properly educated. Neither let it be forgotten that it is upon these generally untrained and neglected senses, that character and life are frequently at stake. The desire to obey the command, "Thou shalt not bear false witness," may sometimes be strengthened by being put upon oath, but the truth of evidence cannot be guaranteed by that course. If a witness be an imperfect observer, as the majority of witnesses of course are, in default of proper training, he may, and often does, conscientiously swear to the absolute truth of his erroneous impressions, and he cannot conscientiously do otherwise. In teaching drawing, this moral may be inculcated: "If you misapprehend the truth with regard to the fact, the model immediately before you, and bidding your time for deliberate inspection, how can you expect to correctly observe and accurately record the fleeting facts and occurrences of every-day life?" It is not, however, in the witness-box only that trained senses are required, but to appreciate harmony and beauty in nature, to preside watchfully over all kinds of work, and to endow a nation's manufactures with that taste and permanent excellence which will insure their appreciation throughout the civilised world. I am now speaking more immediately of the education of the eye, and I will venture to say that you would find that painters and sculptors could more readily be inducted to any kind of handicraft,—could more readily turn their hands to any kind of work,—than any other class of the community; and why? Not only because these arts require the greatest dexterity of hand, but because painters and sculptors see better. I know that there is as much to be said in behalf of music as an essential study, and has been said by musicians who are more competent than I to speak upon that subject.

The thorough organisation of education should be the question of paramount importance with a nation's rulers. It is education which moulds a people for good or evil. Take care of that, and England may rest hopeful and confident in her future. No difficulties should be permitted to stand in the way, nor expense be spared in order to have it the most complete in the world. W. CAVE THOMAS.

The Alexandra Palace.—The Alexandra Palace and Park, at Muswell Hill, will shortly be opened to the public. Mr. Gilbert R. Redgrave has been appointed to be the manager, and the building is close upon completion.

EXHIBITION OF DOMESTIC ECONOMY IN PARIS.

An International Exhibition of Domestic Economy will be opened at the Palace of Industry, in the Champs Elysées, Paris, on the 15th of July next, under the auspices of the National Society for the Encouragement of Industrial Workers (*Travailleurs Industriels*). This society has for its object, in its own terms, the honour of labour, by protecting, encouraging, and rewarding it, the raising of the intellectual and moral level of the workman, the facilitating of his independence by means of the Savings Bank, and providing for him in his old age, by other methods than the assistance given by the State.

The exhibition is divided into forty-six classes, composing ten groups, comprising every object that can contribute to the material as well as the moral welfare of the artisan.

We draw the attention of our readers to Groups 3 and 10. Group 3 is devoted to buildings, and contains five classes, which are thus described:—

Class 18. Models and plans of married or single working men, characterised by cheapness, combined with comfort and healthfulness; models of furnished rooms.

Class 19. Models and plans of public buildings, for the use of artisans, schools, lecture-rooms, hospitals, almshouse, baths, wash-houses, &c.

Class 20. Building materials. Wall papers.

Class 21. Examples of barrack buildings, and sailors' lodgings on shipboard; camp furniture.

Class 22. Municipal and domestic hygiene, ventilation, water supply, and drainage.

Group 10 contains but one class; but its scope is sufficiently comprehensive. It consists of historical documents of every kind relating to the moral condition of the artisan, from the earliest period to the present. Books, pictures, engravings, examples of clothing, tools, &c.

It would be in every way desirable if English architects would give their neighbours the benefit of their studies for the improvement of the dwellings of the working classes. The conditions under which the French and English workmen live are radically dissimilar, it is true; but if no other purpose were served than the opportunity of comparing two entirely different systems, it would be worth the experiment. There are but few architects who have not at some time of their lives exercised their ingenuity upon the production of a cheap and good labourer's cottage, and it would be interesting to see these designs placed side by side with designs for similar objects from other countries.

The numerous inventors of cheap building appliances, improved sanitary arrangements, labour-saving machines, &c., in this country, should also be represented, and we invite attention to the opportunity thus presented, because, from some cause or other, the exhibition does not appear to have been properly advertised in England.

The prizes, which will consist of gold, silver, and bronze medals, and honourable mentions, will be awarded by an International jury to the exhibitors. Certificates will also be presented to workmen who have invented or produced articles exhibited. The Exhibition will be open from the 15th of July to the 15th of October next. Applications for space must be made before the 15th of June, 1872, specifying the name and address of the exhibitor, the nature of the object he desires to exhibit, and the space required. All communications should be addressed to the Direction of the Universal and International Exhibition of Domestic Economy, 23, Rue de la Chaussée d'Antin, Paris; or to the Vicomte de Vallat, French Consulate, No. 38, Finsbury-circus, London.

ARCHITECTURE IN EDINBURGH.

As the season advances architectural projects are developed and the prospects of the profession brighter; for although at first there seemed a probability of a falling off, building operations appear to be going on as briskly as last year.

Several new churches are projected. The congregation of the Holy Apostolic Church, which meets in a very modest building in Barony-street, have resolved upon erecting a handsome new edifice upon a site at the north-west angle of East London-street, and Broughton-street. Four architects have been invited to send in designs, the successful competitor to be employed in carrying out his design, and the

other three to receive a fee of 35*l.* each. The style prescribed is Norman. Provision is to be made for a large double channel and other features of a ritualistic character. The construction is to be of stone, within and without, and the cost to be between 7,000*l.* and 8,000*l.*, exclusive of fittings, tower, &c., which last-mentioned feature is not to be proceeded with in the mean time, but is to be embodied in the design.

The Rose-street United Presbyterian congregation intend to abandon their present church, and have secured a site at the angle of Palmerston-place and West Maidland-street, whereon it is intended to erect a new church, at a cost of about 8,000*l.*, from the designs of Mr. Dick Peddie.

A limited competition has been invited for a new Free church at Morningside, to supersede the present building,—a specimen of the "Batty Langley" style; and an additional United Presbyterian church is projected in London-road, to the eastward of Brunton-place.

A movement is on foot to establish a new club, upon a site in one of the streets leading off Princes-street; but we learn that it has as yet received only a limited amount of support.

In domestic street architecture nothing remarkable is on foot in the new town, except the opening up of new ground upon the Drumsheugh estate, where first-class mansions, after the designs of Mr. Dick Peddie, are to be erected. In the old town the practice of keeping up the ancient style is pretty generally adopted. A very picturesque group has been erected at the angle of High-street and Blackfriars-street, one feature of which, a piazza, has been objected to as forming a refuge for idle loungers. As an architectural feature, however, it is quaint and pleasing.

The old Bavian House in Bristol-street has been erased, and an imposing and characteristic block of shops and dwellings has been erected on its site. The architect, Mr. R. Thornton Shiells, has caused a panel to be inserted, giving the date of the erection and destruction of the old house; and in another part of the same block a similar panel commemorates the fact that here stood a bastion of the ancient city wall. Mr. Shiells has also prepared designs in the old Scottish style for another block in course of erection in Forrest-road, upon the site of the old city Poor-house; and opposite this another block is being proceeded with from the designs of Mr. J. C. Hay, in rear of which an Odd Fellows' Hall is to be built.

The new street from the Lawn Market to the Bank of Scotland, to be called St. Giles-street, is being pushed forward, and several blocks are being roofed in. Mr. Bryce, who is architect, has been saving in ornamental detail in this instance, and has sought for effect by bold and telling outline.

The two southernmost blocks are five stories in height, gabled and finished at the angles by high pointed towers. Those towards Princes-street have large turrets corbelled out from the angles, which are conspicuous from the distance.

Adjoining this, in Market-street, a new hotel has been erected from the designs of Messrs. Beattie & Son, who have adopted a Flemish type. In outline it harmonises well with the surroundings; but we would have preferred it without the blank windows in the west elevation, which are neither beautiful nor useful, and are quite out of place in a building of this kind.

DRINKING FOUNTAIN, CLIFTON DOWNS.

THE Society of Merchant Venturers having munificently granted the enjoyment of the Clifton Downs to the citizens of Bristol for ever, a liberal and much-esteemed citizen, Mr. Alderman Proctor, at his own cost, has erected a drinking fountain to commemorate the event.

The fountain stands on the site of the old turnpike, a most admirable position, as it is approached by four roads, leading respectively from the Hotwells, Durham Downs, Kellands, and the city, as well as by a pathway from the new zig-zag walk up the cliff. The structure has the novelty of being triangular on plan; thus, effect is obtained for a certain expenditure without making it so massive as would have been the case had it been square. The stone used is the Box ground, with alternate voussoirs to the arches of red Mansfield; the three arches spring from columns the shafts of which are of Rouge Roule marble polished: the

basin is red Mansfield with a polished, veined marble curb. Inside the basin stands what may be termed the fountain proper, from which the taps project; this takes the form of the structure, and there is a tap in front of each arch. The under side of the superstructure is groined. Over the arches are gables, with coping and carving under it, and they have each a central finial. At the three angles there are buttresses, terminating with gables detached from the pyramidal roof which rises from the centre, and is topped by a handsome finial. In the gables over the three arched openings are circular sunk panels containing the arms of the Merchant Venturers, the arms of the city of Bristol, and those of the donor, Mr. Alderman Proctor, carved in red Mansfield stone, with their several mottoes. Cut in a panel in the base of the fountain is the following inscription:—

"Erected by a citizen of Bristol to record the liberal gift of certain rights over Clifton Down made to the citizens by the Society of Merchant Venturers, under the provisions of the Clifton and Durham Downs Acts of Parliament, 1861, whereby the enjoyment of these Downs is preserved to the citizens of Bristol for ever."

The fountain stands on three Pennant stone steps; on one side a fourth is added, for the accommodation of children. The steps take a hexagonal form, the lowest being 12 ft. 9 in. through. The whole structure is 25 ft. 6 in. high, to the top of the curved finial. It is surrounded by a plain but substantial iron railing, forming a circle, which is to be laid out with flower beds and gravel paths. In connexion with the fountain there is a cattle-trough not far off, which will be continually supplied with water.

The work has been carried out from the designs of Messrs. G. & Henry Godwin, of London, architects, by Messrs. Broad & Tucker, of Bristol.

The scene on Easter Monday, when the fountain was first made available for the public, was a remarkable one, and showed that the donor has supplied a want. Numbers were waiting their turn all the afternoon, and it was found necessary to obtain half a dozen loose caps, so that the children amongst the excursionists clustered round it might be quickly supplied.

The citizens of Bristol are to be congratulated upon obtaining such a valuable concession on the part of the Society of Merchant Venturers; but they certainly are to be congratulated equally upon having amongst them so generous a fellow-citizen as Mr. Alderman Proctor.

PRIZES FOR STUDENTS.

"A DISGUSTED PUPIL" writes us a letter of two parts, blowing hot and cold. He inquires if certain premiums offered to members of the Architectural Association for designs for the iron roof of a Corn Exchange, have been awarded, and complains, justly, that the very people who call out for inducements to work when such inducements are offered do not take advantage of them. He then goes on to complain of architects that they do not offer a sufficient number of prizes of good amount to induce members of the Association to come forward, and says pupils and assistants are as little cared for as day-labourers. There is more truth in the first part of his letter than the second. There are plenty of medals and premiums offered every year in various quarters to architectural students, but these scarcely call forth so many competitors as might be expected. It is much easier to say, "I wish I could distinguish myself," than to exert the amount of energy and application necessary to effect this. Men must work if they would win, and not be depressed by a failure or two at starting.

TURNER'S "LIBER STUDIORUM."

AN important collection of proofs and prints illustrative of Turner's "Liber Studiorum" has been made by the Burlington Fine Arts Club, and is now on view at their house in Savile-row. It includes choice impressions of first states, touched proofs, and unpublished plates, and for the first time shows in its full strength this remarkable work of our remarkable countryman. As all students know, there was no copy of the "Liber" issued containing only early impressions; to obtain such a one several had to be sacrificed. An interesting catalogue has been published for the assistance of visitors. As the writer of it points out, the issue of "Liber Studiorum" began in the year 1807. Its publication was fitful and unbusiness-like. Turner employed no publisher to put forth the work for him; and, so far as we have

been able to ascertain, there is no trace of any prospectus or advertisement intended to recommend the work to the public. Five plates were issued together in a part, and it is supposed that the work, according to the original plan, should have extended to twenty such parts,—that is, one hundred plates. The first four were issued under an arrangement with Mr. Charles Turner, the engraver, according to which he was to engrave all the plates. On all but a few of the earliest of these his name appears as publisher, as well as engraver, and it has been suggested that the original design of the work was partly due to him. Rather a hard bargain is said to have been struck by the painter with his namesake for the performance of these twofold duties. However that may be, the engagement between them terminated not very amicably after the appearance of twenty plates, and thenceforward Turner, the painter, became his own publisher, arranged the work himself, and sold the copies at his own house. Each part contained five plates. They were stitched together in a blue-grey cover, with a badly-printed title. The price asked for the first numbers was, prints, 15*s.*; proofs, 1*l.* 5*s.*; "to be paid for on delivery;" but it was afterwards raised to, prints, 1*l.* 1*s.*; proofs, 2*l.* 2*s.*

We can remember a visit to the artist's house, backed with a letter of introduction, for the purpose of purchasing a copy. "Have you got the money with you?" The money was produced. "Go up and get a copy" (addressing his dirty old servant), "and mind, take the top one: I'll have no picking." However, let this pass: the recollection is not an agreeable one. The subjects treated in the "Liber Studiorum" are very varied, and show the range of the artist's power. For the full appreciation of the work an education is necessary, and this exhibition will afford it.

SCHOOL-BOARDS.

Chesterfield.—The report of Messrs. Smith & Haslehurst having been given to the Board, it was resolved that the plans for the new schools in Hepper-street and St. Helen's-street, which bore the motto of "Simplex Munditiis," be adopted. Upon looking at the letter accompanying the plans, the architect was found to be Mr. S. Rollinson, of Chesterfield. It was then resolved that the clerk apply to Mr. Rollinson for all information in respect of the building, to be placed before the Education Department, previously to the amount required being borrowed for the building of the schools.

Eckington.—It has been resolved "That Mr. Robson, consulting architect of the London School Board, be appointed architect to the Board."

Bradford.—At the last meeting of the Board two letters were read from the Educational Department, enclosing one from Alderman Shepherd, who had called the attention of the department to what he considered the extravagant expenditure of the Board. The letters also gave the substance of the report of their local architect upon the proposed schools at Fersham-street, Bowling Back-lane, and Ryansham-street, which he regarded as too expensive in character. It was further pointed out that these schools would almost cover the entire deficiency which the inspector had reported to exist in the borough, so that the accommodation in them would appear to be excessive, especially as the Board contemplated the erection of four additional schools in other districts. These communications were referred to the committees of the Board. The Mayor, as chairman of the Board, then made a statement showing that the expenditure in providing schools for 5,000 children at a total cost of 100,000*l.*, would, if the money were borrowed from the Public Works Loan Commissioners at 3½ per cent, be simply covered by a rate of 3*d.* in the pound. Alderman Mitchell afterwards brought on his motion for appointing a committee to inquire into the cost of the proposed schools and sites for schools, with a view to the diminution of the expenditure on each or all of them. He estimated that if the Board carried out their present scheme in regard to these schools, the total cost would be at the rate of 1*l.* 6*s.* 10*d.* for every child accommodated, and quoted figures to show that in other towns School Board schools were being erected at a much less cost. The motion gave rise to a debate, and was ultimately defeated by nine votes against five.

Ipswich.—In consequence of the advertisements which appeared for plans of school buildings, several architects in the town pointed out

that sufficient time had not been allowed to get out the plans, and that there was an apparent want of harmony between the ground plan referred to in the advertisement and the rules and regulations defined by the Committee of Council on Education. As to the first point, the clerk to the Board stated at their last meeting that, under the direction of the vice-chairman, he wrote to the architects informing them that they might calculate upon having an extension of time; and as to the second matter it was pointed out to him that the scale for the breadth of the rooms was fixed at 20 ft. in the rules and regulations for building schools, and that this scale was binding. He had an interview with Mr. Westhorp, and with the inspector, Mr. Alington, and, as a result, he wrote to the Department asking if, in building the schools required, the Board were necessarily limited to the breadth of 20 ft. He received the following reply:—"The breadth of the schoolrooms need not be strictly confined to 20 ft., but all experience shows that narrow rooms fitted with groups of desks and benches along only one side of the room are far more convenient for school purposes than the wider rooms fitted with groups against the opposite sides. Moreover, the narrow rooms are readily partitioned off into class-rooms if necessary, which cannot be done in the case of the wider rooms without considerable expense. In the opinion of their Lordships, the Board would do well to re-consider the arrangement of the plan herewith returned." A long discussion ensued as to what should be the action of the Board in reference to the matter. An opinion was expressed that it would be a great mistake for the Board to confine their large rooms to 20 ft., seeing there could be no possible objection to the room of the size fixed upon in the ground plan, which had been approved of by this Board. But it was pointed out that the breadth of 20 ft. was a general instruction, and that if the Board departed from the instructions which had been laid down, they might afterwards get found fault with by the Government authorities. It was also remarked that this Board could hardly set itself against the experience and strong representation of the Government. Mr. W. Fraser pointed out the advantages which resulted from the school-room being of the size laid down by the Government, and urged the desirability of the Board altering their ground plan. A letter was read from Mr. S. Westhorp (who was unable to be present), expressing his opinion that it would not be wise for the Board to adhere to the plans they had prepared, but to advertise for plans generally, and have the schools only 20 feet wide, as it appeared to him that the department would eventually approve of none other. Eventually a proposition by Mr. Fraser, to the effect that the ground plan approved of at the last meeting, should be withdrawn, and that the architects should be apprised thereof, was carried unanimously on the understanding that the clerk should procure information as to whether the school-room, divisible into class-rooms, was of itself sufficient without class-rooms. It was also resolved that the plans should be sent in on the 1st of May.

SOCIETY OF BIBLICAL ARCHÆOLOGY.

At the meeting on Tuesday, April 2nd, a notice of a "Curious Myth respecting the Birth of Sargina, from the Assyrian Talhots, containing an Account of his Life," by Mr. Henry Fox Talbot, was read. Mr. Talbot showed that Sargina the First was a very ancient king of Bablyonia. The date of his reign is uncertain, but it may be roughly estimated at fourteen or fifteen centuries before the Christian era. He was a legislator and a conqueror; and his arms appear to have reached the distant Mediterranean. He fixed his capital at Agani, in Bablyonia, a city whose site has not yet been discovered. His history, like that of other ancient conquerors and legislators, has become partially involved in fable. An account of his birth and infancy, preserved on a tablet in the British Museum, offers a great similarity to that of the infancy of Moses, as related in the second chapter of Exodus. For, we read that the mother of Moses "took for him an ark of bulrushes, and daubed it with slime and with pitch, and put the child therein: and she laid it in the flags by the river's brink. And Pharaoh's daughter saw the ark among the flags, and she sent her maid to fetch it. And when she had opened it she saw the child." All this agrees

very closely with the conduct of Sargina's mother as described on the Assyrian tablet. "In a secret place my mother had brought me forth. She placed me in an ark of bulrushes: with bitumen she closed up the door. She threw me into the river, which did not enter into the ark. The river bore me up, and brought me to the dwelling of a kind-hearted fisherman. He saved my life, and brought me up as his own son," &c. The inscription appears to have been a long one, but only a small portion of the beginning has been well preserved.

SINKING SHAFTS THROUGH WATER-BEARING STRATA.

THE INSTITUTION OF CIVIL ENGINEERS.

At a recent meeting, Mr. Hawksley, president, in the chair, the paper read was "On the Kind-Chaudron System of Sinking Shafts through Water-bearing Strata, without the Use of Pumping Machinery," by Mr. Emerson Bainbridge. Of the total expenditure necessary to open out a coal-field, one of the chief items of cost was caused by the heavy expenses incurred in sinking the shafts, and when such sinking happened to pass through water-bearing strata, the proportion due to this head, of the total cost, was much increased. When a shaft exceeded 200 or 300 yards in depth, and when the water occurred near the surface, it was usual to keep the water back by the insertion of cylindrical metal "tubbing," placed upon a hard bed of rock at a point immediately below the lowest feeder. Where pits were less than 100 or 200 yards in depth, the application of tubbing was not of much service, as the movement and dislocation of the strata, consequent upon the removal of the coal, generally caused the water to find its way into the underground workings. The sinkings in which there was the largest quantity of water had been carried in Belgium through the chalk, and in England through the Permian series; these rocks usually being sufficiently porous to contain large volumes of water. Without exception, in England, all such sinkings had been made by the use of pumping machinery of sufficient power to keep the pit, during the process of sinking, comparatively dry.

It was stated that the question of dealing with wet sinkings in the most economical manner would, before long, become of much greater importance than heretofore. In the report of the Royal Coal Commission an estimate was given of the coal remaining in the British Islands, as follows:—

	Million Tons.
Coal yet remaining which is or will have to be reached by sinkings through the coal measures	99,527
Coal yet remaining which is or will have to be got by sinkings through the Permian and other formations overlying the coal measure	104,419
Total	194,946

The plan of sinking pits hitherto practised in this country consisted in dealing with the water by means of large pumping-engines, in leaving the bottoms of the pits dry enough to allow the sinkers to block the well, and in keeping back the water in the upper strata by metal rings, cast in segments about 4 ft. long, and connected by wooden joints, which were wedged tight, when all the tubbing was fixed. The evils of this system were:—1. The heavy first cost of the plant, when special pumping machinery was used. 2. The expense of the wedging tuis, and the cost of fixing them. 3. The delay caused by the sinkers being compelled to work always in water. 4. The high first cost of the tubbing and of fixing it in the shaft, and the liability of the tubbing leaking in consequence of the numerous joints.

In the application of the Kind-Chaudron system these evils were to a great extent avoided. This system consisted of a combination of Mr. Kind's well-known apparatus for boring wells, with an ingenious device, invented by M. Chaudron, for fixing cylindrical tubbing under water in such a manner as to make it quite secure and watertight. In the latter part of 1871, the author, accompanied by Mr. W. Cochrane, visited the Mourage pits, near Mons, where two shafts were being sunk by this process. These shafts, though having a depth respectively of 373 ft. and 593 ft. at the date of that visit, had been bored that depth under water with a diameter of 13 ft. 6 in., the water having been constantly standing at a depth of 37 ft. from the surface. The Chaudron system consisted of the following distinct processes:—1. The erection of the

machinery on the surface. 2. The boring of the pits to the lowest part of the water-bearing strata. 3. The placing of the tubbing. 4. The introduction of cement behind the tubbing to complete its solidity. 5. The extraction of the water from the pits, and the erection of wedged cribs to secure the moss-box. The machinery on the surface consisted of a capstan engine, which raised the debris from the pits, and a vertical engine, by means of which the boring tools were lifted at each stroke; the speed of the latter engine varying from fifteen to eighteen strokes per minute. The first tool applied was the small trepan, which weighed 8 tons and bored a hole 4 ft. 8½ in. in diameter, the depth of the boring being increased at the rate of from 6 ft. to 10 ft. per day. The pit was enlarged by a trepan weighing 16½ tons, which increased the size to 13 ft. 6 in., and was kept from 10 to 30 yards behind the pit made by the smaller trepan. The larger boring-tool had twenty-eight teeth, and the smaller tool fourteen teeth, each tooth weighing 72 lb. The boring by the larger trepan did not progress faster than about 3 ft. per day of twenty-four hours. The boring was generally carried on in the day, the remaining twelve hours being employed in raising the debris from the pits. When the bottom of the water-bearing strata was reached, the tubbing, which consisted of metal cylinders cast in complete rings of an internal diameter of 12 ft. and a length of 4 ft. 9 in., was placed in the shaft, the rings of tubbing being connected by bolts. The tubbing was tested by hydraulic apparatus to one-half more pressure than it was expected to be subjected to. The rings of tubbing were let down into the shafts by means of the capstan; the moss-box at the bottom of the tubbing being placed in the pit first. The moss-box consisted of two cylinders, one sliding inside the other, and each having a flange broad enough to form a chamber to hold a quantity of ordinary moss. When the moss-box reached the bed which was prepared for it at the bottom of the pit, the weight of the superincumbent tubbing pressed upon the moss, and formed a water-tight barrier. The tubbing being thus fixed, the annular space between it and the sides of the shaft was filled with cement, thus ensuring the solidity of the tubbing; after this was finished, the standing water in the shaft was drawn out, and the joint below the moss-box was permanently safe, by the fixing of several rings of tubbing resting on two strong wedging cribs.

The comparative cost of sinking by the processes referred to was shown by two tables, one of which exhibited the complete cost of sinking, and the time occupied by the ordinary system, at eighteen different collieries, whilst the other gave the same information for ten collieries put down by M. Chaudron's process. The results showed that, whilst with the system of sinking by the aid of pumping machinery, the average cost per foot had amounted to 114-7L., and the rate of sinking to 8-9 ft. per month, with the Chaudron process the average cost of all the pits was equal to 22-9L. per foot, and the speed of sinking to 15-8 ft. per month.

WORKS AT THE EXHIBITION PALACE, DUBLIN.

We recently gave particulars of progress here. Since then various new works have been determined on. A grotto fountain, consisting of a large central stalactite cavern, and two smaller caverns at the sides, is being constructed at the southern end of the nave. In front of the smaller caverns at the sides will be figures of the Spirits of the Land, standing in ornamental basins carried on light curved and foliated ribs springing from a larger basin of rock-work; into which, after passing through the basins before described, water cast from ornamental jets rising above the figures will be discharged, and will flow through the rock-work of the rim, and over concealed coloured lights. Within the large central cavern there will be Naiads.

The summit of the grotto will be crowned with a figure of Erin, seated on a bank of shamrocks, and a cataract will rush over, and cover the entire of the mouth of the central cavern, and be acted upon by lime-lights and coloured reflectors. The interstices of the rock-work will be filled with ferns, mosses, and drooping foliage, and a flower-slope will be brought down from the rim of the main basin to meet the floor.

Another fountain is in course of erection in the part of the nave opposite the Colonnade,

with reclining figures bearing ornamental lamps. Outside the rim will be a border of ornamental tiles, manufactured by Messrs. Kerr, of the Belleek Pottery Works. Within the rim there will be, at either side of the centre of the basin, a group of four storks. In the centre of the fountain there will be a group rising to a height of about 20 ft. above the floor; and around the base there will be four figures (emblematical of the four provinces of Ireland), each seated on a nautilus, with sails set and extended ears. The group is crowned by a figure of St. Patrick trampling underfoot a toad-stool, and banishing the serpents from the soil. The right hand is extended, the left grasps a staff, above which is a cluster of shamrock-leaves, containing large ornamental water-jets.

Two colossal figures of St. Michael are being carved in Portland stone,—one for each of the garden fountains,—and a spacious orchestra is being erected at the north end of the nave.

The Naisies between the central cavern of the grotto fountain will be in Portland stone; the groups in front of the side caverns, and also the colossal figure of Erin, in Sicilian marble. The rim of the fountain front of the colonnade will be in violet vein marble, the stork groups in majolica, the basins in light Bardiglio, the base and serpents in Egyptian green, and the nautilus shells, figures, and foliage generally in natural colours.

The entire of the works are being executed from the designs and under the superintendence of Mr. Walker Emden, architect. The carved work of the grotto fountain and of the garden fountains has been entrusted to Mr. Edward Mitchell, of Crowndale-road, Camden-town. The whole of the ornamental work of the central fountain is being carried out by the Marezzo Marble Company, of Oxford-street, for whom the modelling has been done by Mr. Broomfield, of Kennington-road. The grottoes and rustic work generally are being constructed by Mr. Nadal, a French artist; and the artistic lighting will be by Defries & Sons. The constructive works of foundations and basins have been executed by Mr. Thomas Henley, of Holloway; and the hydraulic engineering by Messrs. Edmondson, of Capel-street, Dublin. Mr. Beer, of Tennis-street, London, who is well known in connexion with many of the London theatres, is engaged in decorating the concert-hall and dining-room.

CONDITION OF THE HOUSES IN ADELPHI-TERRACE.

At Bow-street, on Tuesday last, Mr. Biron, instructed by Mr. Napier, attended the court with Mr. Hayward, the district surveyor to the Metropolitan Board of Works, by the request of Mr. Vaughan, with reference to an application for an order for ejection under the Building Act, which he made on Monday, the 25th of March.

The application was made respecting the dangerous state of five or six houses in Adelphi-terrace, and the result was that Mr. Vaughan granted an order for the removal of the inhabitants, one of the houses being the Junior Garrick Club. Afterwards several of the inhabitants, accompanied by Mr. Fladgate, solicitor, waited upon Mr. Vaughan, and in consequence of their assertions that the houses were perfectly safe, Mr. Vaughan suspended the order, and requested Mr. Fladgate to attend on Tuesday, when notice would also be given to the Metropolitan Board of Works.

Mr. Vaughan said there was no case before him upon which he could decide. He suggested that Mr. Fladgate should take out a summons against the Board of Works to show cause why the order should not be cancelled. After some little discussion, this course was adopted, and the summons made returnable at once.

Mr. Fladgate then stated that the houses had been built about a hundred years, and had been somewhat neglected. There were cracks in the walls and basements, but they had not increased during the last ten years. They were sufficient perhaps to frighten the district surveyor, who had only recently seen them, but their true nature did not justify the steps which he had taken to eject at once the inhabitants.

Mr. Robert Driver, of Whitehall, said that he had been surveyor of the Adelphi estate for twenty years. He had recently examined the houses in Adelphi-terrace, and was satisfied of their stability. No. 14, the Junior Garrick Club, was in the same condition as it had been for the past ten years. There were large cracks, but they had not increased during the past ten or twelve years. There was certainly no danger of the house falling. The same re-

mark applied also to Nos. 1 and 2, except that the latter was the worst. No. 3 was in very good order. No. 4 was not so good, but it was in no danger. Some of the cracks might have got a little larger, but there was no fear for people sleeping there.

Mr. Wm. Scurry, architect and surveyor, deposed that he had received notice to shure up the foundation, and the work was in progress. He had made a careful survey of Adelphi-terrace, and he considered the houses quite secure. The Club was perfectly safe. On being cross-examined, the witness said that one of the piers or supports of the arches under one of the houses needed rebuilding, and he was appointed to see to the repairs. He had shored the place in such a manner that there was no immediate danger of the house above falling.

Mr. Vaughan said the question he had to decide was whether the shoring was sufficient.

The witness replied that he should consider so himself.

Mr. Fladgate said that he had other witnesses, but their evidence was only in corroboration of what had already been said.

Mr. Hayward stated that he considered the houses were in a very dangerous condition, and that the reconstruction of the piers was a very delicate operation. It was exceedingly unsafe for people to remain in the house while the reconstruction was being carried on. He had advised 100 men to work at it on Sunday, on account of the immediate danger.

Mr. George Vulliamy, the superintending architect to the Board, made similar statements.

Mr. Vaughan said he was quite prepared to express his opinion that the order must not be cancelled.

The order for the ejection was therefore held good.

THE PROPOSED WIDENING OF THE POULTRY AND CHEAPSIDE.

The Works and General Purposes Committee of the Metropolitan Board of Works have reported to the Board that they have inspected the locality, and also received a report from their architect, from which it appeared that the width of the Poultry was about 39 ft., and that it was proposed to throw 13 ft. 6 in. in depth by a length of 50 ft. into the street, increasing the width for the said 50 ft. from 39 ft. to 51 ft. 9 in. at Old Jowry, and 53 ft. 3 in. at the eastern end of the improvement, being a continuation of the line of the setting back of the site of St. Mildred's Church and of the Union Bank of London. The gross cost of this, the architect was informed, was 44,400. 17s. 9d., and the ground at the rear of the improvement left for recoupment had been let at a rental of 1,200. per annum, which at twenty-five years' purchase was 30,000., and, deducted from the gross cost, gave 14,400. 17s. 9d. net, as against 15,810. 17s. 9d., the estimated cost. The committee believed this to be a very valuable improvement, in which the Board might properly assist. They thereupon recommended the Board to contribute one-half of the cost, such contribution not to exceed 7,220.

The report of the committee was adopted by the Board unanimously.

THE SAFETY OF SASH-FASTENERS.

Sir,—While agreeing with "A Craftsman" in his statement that the desire for cheapness, and the great competition amongst manufacturers, have resulted in producing at the present time goods which, as a rule, are "flashy and bad," I think his letter in some respects is likely to mislead.

To understand the difficulties to be overcome, I would put shortly before you the present position of the fastenings of our windows.

1st. The police authorities find, from the daily reports furnished them throughout London and other large towns, that a very large proportion of the robberies committed in houses are effected by the thieves obtaining entrance thereto through the windows, and that, naturally enough, they wish to render this easy ingress more difficult. The entrance is easy sometimes, because, through the carelessness of the servants, the sashes are not fastened.

2nd. When they are fastened, the fasteners can be quickly and easily opened from the outside by the use of a common knife. I am here alluding to the ordinary sash-fastener which is in such general use.

It will, then, be seen that this is not a question of good or bad workmanship, but a question of design. What is wanted is a sash-fastener which shall satisfy those requirements, and it should therefore be:—

1st. Of that configuration that it may easily be seen whether it is shut, while a person is standing in almost any part of the room.

2nd. It must not be possible for thieves to open it from the outside by the use of a knife or thin steel blade.

Therefore, the old spring screw sash-fastener, which your correspondent much praises, will not satisfy the requirement. The servant may not

have screwed it, and as it is a little trouble, most probably has omitted to do so. Yet the eye of a master or mistress will scarcely detect it, without trying the fastening. Herein is the old sash-fastener inferior to the one in general use, which can at a glance be seen whether it is fastened. The further objection to the spring screw sash-fastener, is fairly stated by "A Craftsman." This fastener, then, is not likely to be again brought into general use.

Next, let me examine "A Craftsman's" own idea; namely, the rebating of the meeting bars themselves, of which he says, the more he considers that process the more he is convinced of its security, and that he is prepared to meet the objection that may be urged against it.

The objections I would advance are, that in any sashes constructed in the usual way, and having cross-bars, there is no security because the rebate cannot be made sufficient. This will be apparent if a section be drawn; or a model, still more so if the sashes be made, or a model, it is not novel, being but a repetition in wood of the rebated sash-fastener, which has just been found a failure. Even if it could be made to answer, it would not meet the difficulty, for it is not to be supposed that all houses could have new sashes; and therefore its application would be almost limited to new houses. This I need not speak about, however, until I am shown to be wrong in respect to its uselessness. Practically the only remedy is a sash-fastener giving security without much (if any) increased expense.

It is foreign to the question to say, as your correspondent does, that if the thief cannot open the sash-fastener, he will resort to other modes; because all that is desired is that he shall not enter by reason of the defectiveness of this one article. Every additional impediment in the burglar's way means increased security to the householder. Further, it must be remembered that many a thief would be afraid to carry with him the articles "A Craftsman" names,—drills, jemmies, and centre-bits, a diamond, and a leather sucker; and it is certain that if caught with any such things about him, they would ensure his conviction; while if he only had a pocket-knife, he might escape.

The necessity, then, exists of selecting from the very many sash-fasteners (the number of different kinds of which I may mention has greatly increased of late) some few of which while they have the requisite security, have also cheapness to insure their general adoption.

The reason I say some few is because I consider it an advantage that a variety should be used, so that the burglar may have some little uncertainty as to the particular kind which is on the windows of the house he proposes to attack.

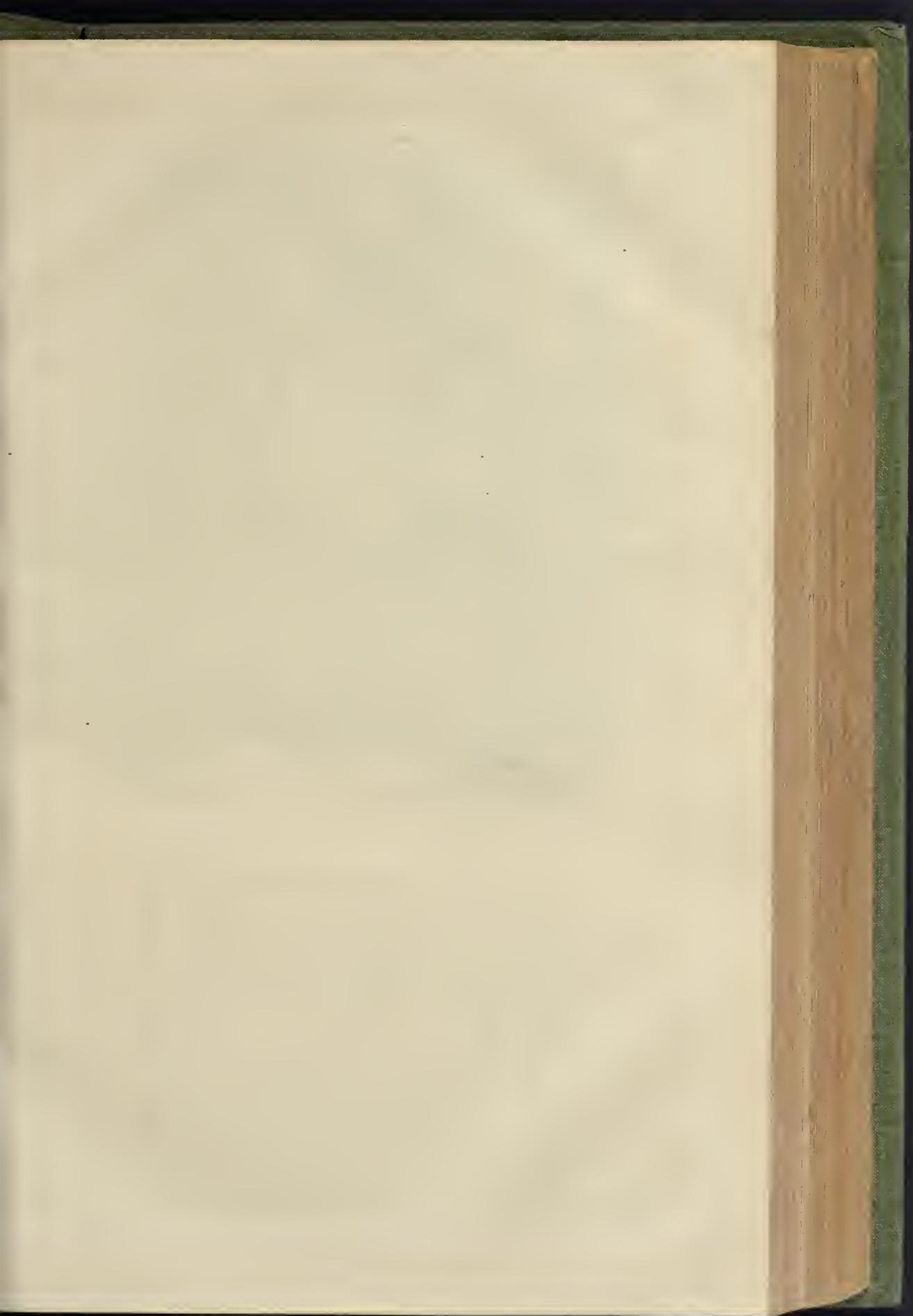
I trust shortly to have arrived at a decision on the merits of the great number of sash-fasteners I have had submitted to me, which result I hope to be able to present to your readers.

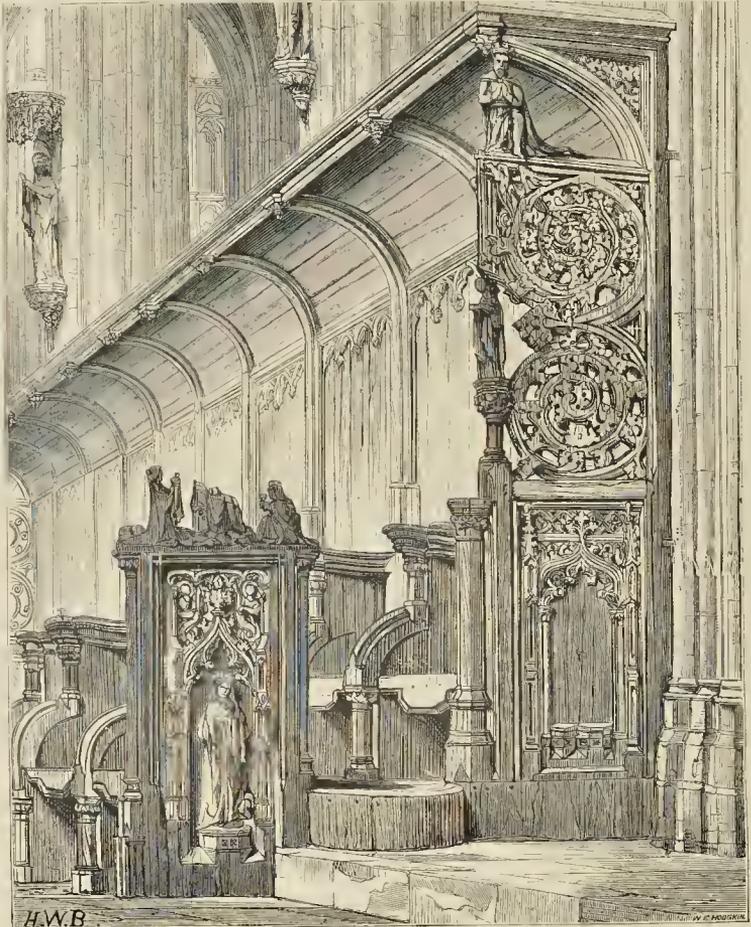
B. FLETCHER.

THE NEW PUBLIC OFFICES.

ABOUT a month since, a question was put by Lord Rodesdale in the House of Lords as to the block of houses in Parliament-street in front of the new Home and Colonial Offices, and Lord Lansdowne replied on behalf of the Government, that this block would remain for the present, as a matter of economy, inasmuch as the houses were producing rent. Of course, Lord Lansdowne replied according to his instructions, but the answer is so palpably absurd on the face of it, that it is marvellous how the officials of her Majesty's Office of Works could have ventured to put such words into his Lordship's mouth. Some of the houses are empty, or let to book-stall keepers and such like; so that the income must be very little. *Par contra*, the extra cost to the contractors must be enormous; for any passer-by can see that, on account of the confined space, there is the greatest difficulty in getting in the materials. Not only is a large unnecessary cost thus put on the contractors, but they must be inevitably delayed to a serious extent; and as the Government are put to cost and inconvenience for the want of these offices, it is plain that the interest on the outlay which is lost by delay in completing them must be tenfold the trifling rents which the Government are receiving from weekly or monthly tenants. It seems the fate of her Majesty's Works to be continually governed with the mixture of reckless extravagance and miserable parsimony so well described by Mr. Gladstone some two years since.

A LOOKER-ON.





STALLS IN THE CATHEDRAL OF BOIS-LE-DUC.

STALLS IN THE CATHEDRAL OF BOIS-LE-DUC, HOLLAND.

THE Cathedral of Bois-le-Duc, to which we have already frequently referred, offers us yet another illustration. The stalls here represented are of a type far from uncommon in Holland and Northern Germany, but not frequently to be met with in England. The continuous "coved" canopy does not seem to have found much favour with the English Medieval architects, who seem always to have preferred placing a separate canopy over every stall; and where the coved canopy is to be met with in the stalls of English churches, it will generally be found that they are of foreign workmanship and design.

Another foreign peculiarity is to be noticed in the stalls at Bois-le-Duc, and that is the singular pierced scrollwork filling up the end of the stalls.

We believe that a somewhat similar treatment was to be seen in the old stalls at Wells Cathedral before they were removed to make way for stone niches, which now occupy their place; but we do not know of any other English example. On the Continent, however, the examples are numerous and very varied. Sometimes the scroll is simply foliage, as in the case before us;

at other times, figures are introduced, as at Hildesheim. At Breda, the mysteries of the rosary are introduced into the scrollwork; and at Moosburg, grotesque animals. The most interesting examples of this kind of stall-end which we have met with are to be seen at Hildesheim, Erfurth, Halberstadt, Moosburg in Bavaria, Breda and Bois-le-Duc in Holland, and the Cathedral of Palermo.

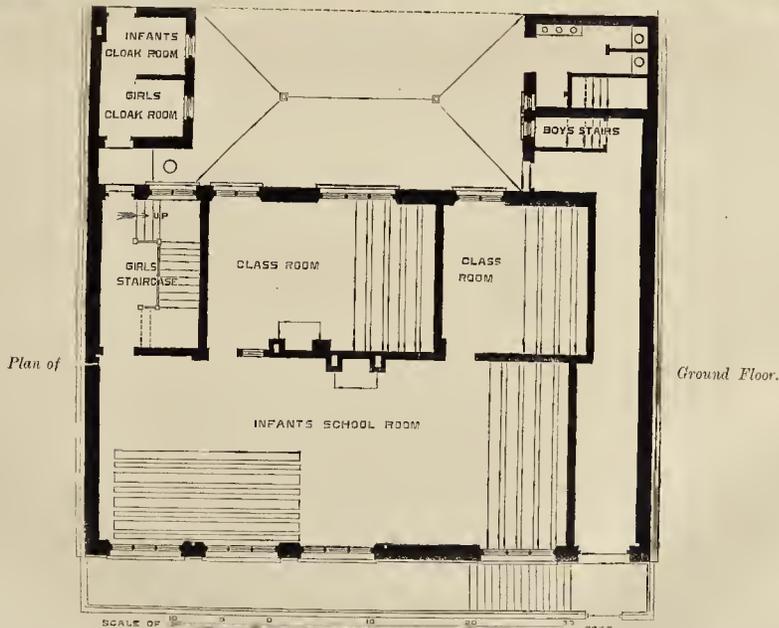
THANET STREET NEW SCHOOLS, ST. PANCRAS, MIDDLESEX.

THESE new schools are built on three floors, and include three large schoolrooms, with four class-rooms, and accommodation for 552 children. In the basement there is provision for a soup-kitchen and coal-store; also for an industrial kitchen, if hereafter required. In the rear of the building is a small playground. The site runs through from Thanet-street to Sandwich-street; and at the Sandwich-street end it is intended immediately to erect a two-storied building, consisting of a mission chapel above, to hold about 200 people, with a mission-house below for the various benevolent agencies of the extensive parochial machinery. The cost of the

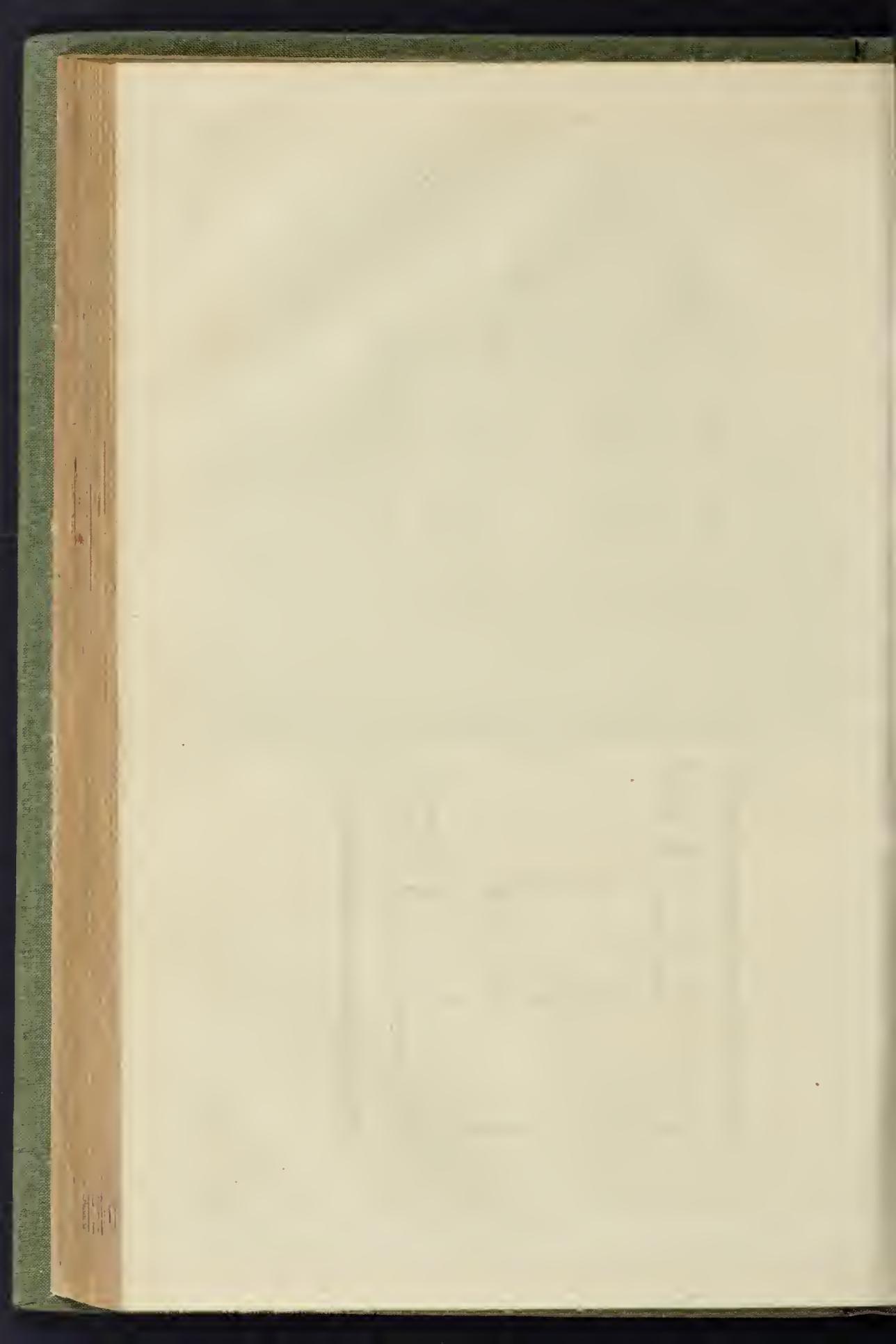
entire site, including the freehold, has been 2,510*l.*, and the total cost of the school-buildings, 3,996*l.* 3*s.* 1*d.*, making a total of 6,536*l.* 3*s.* 1*d.*

The Bishop of London's Fund has contributed 500*l.*, and 500*l.* more have been produced by the sale of stock, to which must be added 5,216*l.* 11*s.* 10*d.*, contributed almost entirely by the residents in the neighbourhood and friends of the ragged schools formerly held here. The schools have been planned and the money raised by the persevering efforts of an influential local committee, of which the Rev. Prebendary Thorold, M.A., Vicar of St. Pancras, and a member of the School Board for London, is chairman. The schools have been built without a building grant from Government, and they amply supply the neighbourhood with efficient school accommodation, without any burden on the ratepayers. Messrs. Wm. Milford Teulon & Cronk, of Wimpole-street, are the architects; and Messrs. Sewell & Sons the builders.

The building is constructed of brick; washed stock facings, here and there relieved by red kiln-brick bands and moulded red brick cornices. The windows to the front are of Bath stone, with moulded kiln-brick arches and moulded brick label mould. The roofs are covered with slate with red tile ridge.



THANET STREET NEW SCHOOLS, ST. PANCRAS, MIDDLESEX.—MESSRS. W. MILFORD TEULON & CRONK, Architects.



THE TREATMENT OF THE EYE IN GREEK SCULPTURE.

SIR,—May I be allowed a word in reply to your correspondent, Mr. Davies, on the above subject. The illustration I suggested, in connexion with your article "On Conventionalism in Art," had reference solely to the absence of any sculptured representation of the iris and pupil of the eye, exclusive of colour. Unless it can be shown that it was thus left for the very purpose of being coloured, and was thus invariably coloured, though trace of this has since disappeared, it would, I presume, remain an illustration of that for which it was added—the conventional treatment. I was quite aware of the researches which have been made, hinging upon the use of colour in Greek architecture and sculpture, and presumption is much in its favour as to its decorative employment; but the evidence seems too indeterminate, both from existing remains and contemporary literature, to lead to any safe conclusion as to its general or precise employment, or that their statues were parti-coloured in an ultra-imitative manner. If, as Mr. Davies suggests, colouring was abandoned at the dictate of a purer taste, that they did not then resort to any sculptured equivalent in treating the eye, affords, if anything, a more remarkable instance of an adherence to the conventional principle. It would be an interesting experiment if some of our sculptors and painters would combine in giving the fullest use to colour in statuary, to decide what is gained or lost thereby. The late Mr. Gibson's attempt was not regarded, I believe, as a favourable one.

NEMO.

CHRIST CHURCH CATHEDRAL RESTORATION, DUBLIN.

DURING the works proceeding at this cathedral, some notices of which we have already given, several interesting features have been brought to light concerning the original structure and subsequent additions. Not the least of these are the "finds," which will possess much interest for archaeologists and antiquaries. Among these are carvers' tools, huttons, keys, a flagon of glazed earthenware (slightly artistic), a stone cannon-hall (supposed, but may in reality be a rolling hall used in some games or pastimes common to the people), some pieces of different coloured glass, a large collection of tiles of various patterns, various encaustic tiles, among them one of Moorish pattern, bearing impressed figures of different animals, and other sundry tiles, in which the designs were burned in. A great number of these patterns of pipes known as "Danos' pipes" in the sister kingdom, has also been unearthed; some with long shanks, and exhibiting the distinctive characteristic of thickness and obliqueness in the shape and form of the bowl. Among the coins there are several Danish, Elizabethan, and some of other reigns less decipherable.

In respect to the restoration, the old north wall of the nave is completely taken away, and is being rebuilt up to the sills, which are nearly 8 ft. above the old floor level, or about 20 ft. above the adjacent street. Under the nave and supposed original choir, the old crypt that was unharmed showed evidence of very early construction in mixed, round, and pointed arches, some good carved caps and stopped chamfers at the angles of the square piers which supported the vaulting. These features are also to be found to some extent in the transept of the church, and are accounted thirteenth-century work. The eastern portion of the crypt is planned with an apse, with aisle around, and three square-ended chapels on the east of this aisle. The peculiarity is that the side chapels open into the aisle without intervening arches; the aisle around the apse in consequence presents no marked expression. When the choir is restored, its piers and walls will apparently stand upon the existing walls below in the crypt. This will lead to the peculiarity being followed or preserved in the finished design.

The groining of the centre chapel will be divided from that in the aisle by an arch corresponding to that in the crypt, but the groining of the aisle and side-chapels will be continuous, without intervening arches. A flight of steps was come upon during the excavations on the southern side, from the crypt to the cells or under-chamber of the old courts of law once existing in the vicinity. When the old wall was being removed of the north aisle, a spiral or winding stair was discovered leading to the

door. The workmen also came upon the remains of an old chapter-house projecting from the main structure. The details connected with the latter have been deemed sufficient by the architect to lead him to design a new building upon the old plan. It was originally intended to utilise all the columns of the northern arcade of the nave, but on subsequent examination they were said to be too much decayed to be depended on, so they will be replaced. This is rather a sweeping elimination of old work. The southern wall of the nave will come down, and will be rebuilt to match the northern side, and the southern aisle wall is already down to the ground level. Below the aisle an accumulation of several feet of rubbish had to be removed, and during the removal two doorways were brought to light in good preservation, one leading from the south aisle into a building in an angle between the transept and aisle, and thence to the crypt. This is a well-defined doorway, with detached shafts and jambs, handed at short intervals, and presenting features, it is said, similar to those of the doorway of St. Canice's, Kilkenny.

The building of the western wall will shortly be commenced; the gable and arch of the western window have been taken away, the arch is brought out from the angles, window-lights are put in, and the early jambs restored.

THE SEWAGE QUESTION AT HERTFORD.

THE Town Council of Hertford having obtained permission to borrow 3,000*l.*, have at length determined to carry out in their integrity the plans of their engineer, for the enlargement and improvement of their deodorizing works. "While hoping for the best, we cannot but fear," says the local *Mercury*, "that the Council have committed a grave error in committing themselves to Mr. Grindle's scheme, on the authority of Dr. Letheby alone, and without submitting it to the opinion of some eminent civil engineer. We have no adequate guarantee that when the 3,000*l.* are expended it will not be found to have been money thrown away. Nearly every town which has adopted the deodorizing process has been forced to give it up, and resort to irrigation. Why should we expect Hertford to prove an exception to the rule?" The Council appears to have finally decided upon Mr. Grindle's plan because the primary outlay is small, and because the promised results will enable them to attain the standard of purity inserted in Mr. Stansfeld's Bill, which is not yet law.

THE TRADES MOVEMENT.

Leicester.—The workmen engaged in the numerous brickfields around Leicester have come out on strike. They demand an increase of wages, at the rate of 4*d.* per thousand for making, 3*d.* per thousand for grinding, 2*d.* for carrying, and other branches of the trade in proportion.

Hartlepool.—The operative joiners of the Hartlepoons have turned out for a concession of 2*s.* per week on their present wages of 28*s.* per week.

The Potteries.—The bricklayers of the Staffordshire Potteries and Newcastle-under-Lyme district have gained the concessions recently demanded of their employers. The builders at once acceded to the application for a reduction of working hours and an increase of wages, and this week the new arrangement has been formally ratified. Working hours have been reduced from 58 to 55½ per week, and wages have been raised from 6½*d.* to 6¼*d.* per hour.

Bromsgrove.—Up to this time the masters engaged in the building trades have taken no notice of the request of the men for an alteration in the mode of work, a slight increase in pay, and a limitation of the hours of labour. The committee have issued circulars to the masters, giving them notice that on and after the 1st of May next they will demand to work by the hour system only, and to finish work on Saturdays at one o'clock; and that they will claim wages on and after that date at the rate of 6*d.* per hour for all skilled labour, and for unskilled labour in fair proportion. They also gave notice that unless the masters gave a satisfactory intimation in writing of their intention to accede to the demands on or before Friday, the 29th ult., the men would not resume work after the 30th until such concession had been made.

Edinburgh.—A meeting of the joiners of Edinburgh has been held, Mr. George Rintoul in

the chair, to consider the answers received to the men's demand. It was stated that the following employers had either signed or agreed to the code of bye-laws.—Messrs. Macgibbon, Crow, Duncan, John Smith & Son, Black, A. Wilson, Ponton, Robertson, Leith-walk; Lamb, Bellevue; Grievie, Hutton, McKellar & Swan, Shclair & Fortune, McNaughton, Cowie, Hunter, Lothian, Edinburgh Co-operative Building Co. It was reported that many more of the employers would sign the bye-laws whenever they were presented for signature, as they only objected to some of the travelling points and other minor details. The workmen in those shops where the demand was not conceded, with very few exceptions, gave notice to leave work. As near as can be estimated, upwards of 300 joiners gave in their warnings to leave. It was stated at the meeting by the secretary that he had jobs for sixty men in shops where the employers had signed the bye-laws, and that these shops would be the first supplied with men. A conference between representatives of the employers and workmen, however, afterwards took place, Mr. James Waterston in the chair. The working regulations, as proposed by the operatives, were gone through in detail. Several alterations were proposed by the employers, and a number of mutual concessions were made. The conference separated with the understanding that the rules as amended would be submitted to their respective constituents, with the recommendation that the bye-laws would now be adopted by the whole trade, and that the threatened strike should not take place.

UNVEILING OF THE QUEEN'S CANOPIED STATUE AT BOMBAY.

THE Queen's statue is about to be unveiled at Bombay by the Guicowar of Baroda. The design was submitted to and approved by her Majesty. A view of it appears in the *Builder* for 1869, page 567. The cost has been 15,500*l.* It is a colossal sitting statue of her Majesty, in the best Carrara marble, with an elaborate canopy, nearly 50 ft. high, also executed in marble of various colours. The Royal coat of arms is placed on the front of the pedestal, and the Star of India in the centre of the canopy, while, on the enriched part, immediately above the statue of her Majesty, the rose of England and the lotus of India, accompanied by the mottoes, "God and my Right," and "The Light of Heaven our Guide," are introduced. Besides these accessories, others also are introduced in the design. Four panels between the columns have been provided as spaces for the inscriptions in four languages. The effect of the whole is good.

PROPOSED STATUE OF THE LATE PRINCE CONSORT AT HOLBORN CIRCUS.

At the last meeting of the Court of Common Council, the Improvements Committee submitted a report, accompanied with a design for the pedestal of the equestrian statue of the Prince Consort, at a cost fixed by the Court, viz., 2,000*l.*; and the committee recommended that the sides of the pedestal be filled with bass relief, at an additional cost not exceeding 600*l.*

Mr. Saunders strongly objected to the design of the pedestal submitted, as out of accord with all canons of art.

Some discussion ensued, and Mr. Isaacs moved, by way of amendment to a motion adopting the report, that the matter as to the design be referred back to the Improvement Committee, and that they be instructed to invite designs, the carrying out of which would not involve an expenditure of 3,500*l.*

The debate was adjourned.

MISUSE OF CEMENT IN IRON SHIPS.

At a meeting of the Institute of Naval Architects, a paper "On the misuse of Cement on Iron Transport Ships, with Suggestions for making half-worn-out Iron Ships perfectly Sea-worthy, at a small Cost," was read by Mr. William Poole King. He said, in reference to cement,—There can be no doubt that the half-worn-out plates of iron ships may be much strengthened by the application of the cements in ordinary use, composed of silicate of lime and alumina. The plates are found covered with scales of oxide of iron; and, when the cement is applied in a wet state, an imperfect chemical

union is formed, consisting of silicate of iron, lime, and alumina, which hardens into an artificial stone of some strength; the plates are firmly backed up, and the ship is much strengthened throughout her structure. As long as there is little cargo in the ship, she makes but little water, and seemingly is in perfect order for the longest sea-voyages; this, however, is delusive, for when the ship is loaded, say 20 ft. deep, and her plates are a little strained by the motion of the ship, she begins to leak.

By affixing cement upon the inside plates of an iron ship, a most deceptive trap is laid. In dock, under survey, the ship appears abundantly strong, and resists the strenuous and honest strokes of a wood mallet. Borings may be taken which seem compact: the ship may not even leak till a small hole occurs deep in the outward surface from working in rough water: when the ship labours, the trap falls, and lucky are the sailors if they escape.

In cementing vessels, it would be well to fill in solid between the frames, and flush with the lining or ceiling about the bottoms of coal bunkers, leaving a course for water in the centre of each bay by inserting a piece of iron piping; the bottom parts of the vessel, forward and aft, should be filled in to nearly the top of the floor-plates, and such other parts as it is difficult to gain access to.

MOVING A CHIMNEY.

We learn from an American newspaper that the great chimney of the Cabot mill at Brunswick, Me., has been moved 20 ft., to allow of the enlargement of the mill. The work was done by a process similar to that by which ships are launched, the chimney being slid along on greased planks. The chimney is 70 ft. high, and nearly 8 ft. square at the base, and it was moved, the flues connected, and the fires started, in eight hours and a half.

WHAT MIGHT BE DONE.

THE LAW-COURTS.

Sir,—Having read your remarks in the last *Builder* relative to the New Law-Courts, I am induced to write the present letter.

You ask whether the people of England have no means of making their sentiments known and felt on the question of the Law-Courts. The answer must be, Yes; and it only requires a little organisation to effect it. The legal profession are chiefly concerned in obtaining convenient courts, as it is in these courts most of their lives will be spent. The next in order is the general public. Well, this being so, all that is required is, that a few men taking an interest in the matter hold a preliminary meeting at some friend's chambers, appoint a committee, elect a chairman and secretary, adjourn to a public room, invite the gentlemen of the press to be present, and enter into the discussion, examining the plans, sections, elevations, and drawings, so that the whole business could be brought before the country, and a fair and impartial judgment be arrived at. The legal profession is a powerful body, and possess great political influence, so that the metropolitan members of Parliament and many representatives of the provinces would certainly attend.

ABOVS.

THE NEW "OLD BANK," MALVERN.

The new premises now occupied by the Old Bank are not quite new, as premises, for the original building was before occupied by Messrs. Salmon & Co. The entire shop-front has been taken out, and new fenestration substituted, of Cradley stone supports, oak bronzed frames filled with extra thick plate-glass, protected with Clarke's patent revolving shutters. The entrance-door, a double-margin one, constructed to match, opens into a lobby 7 ft. square, common to the bank and the manager's residence. The doors leading to the banking department, also of oak, and glazed, are hung folding, and flanked with bronze columns of Ionic character, surmounted with elliptical entablature, also bronze. Entering through these doors is the public business portion of the establishment, which is about 30 ft. by 20 ft., filled with counters and desks of mahogany. The doors and finishings are of oak, relieved with bronze mouldings and ornaments, all the wood being French polished. Godwin's encaustic tiles, specially designed for these pre-

mises, form the floor of the bank and the lobby. The books are kept, when out of use, in "the strong room," underneath the floor. To convey them to this place a hydraulic lift, with a capacity of 4 cwt., has been constructed, by means of which the books are lowered at night and lifted in the morning by the expenditure of only 184 gallons of water for the double journey. This room is approached in the ordinary way, and for ordinary purposes, by an iron staircase, which, as well as the lift, is guarded by thief and fire proof iron doors, and with all modern improvements for the purpose of keeping out thieves, fire, or damp. Inside it is finished off with Parian cement, having a polished face. It is fitted up with iron shelves for boxes, &c. An additional security is afforded by a Cubb's patent door, gate, bolts, bars, and locks.

The manager's room is situated at the west end of the bank, separated by an oak glazed screen, in keeping with the other doors. The whole of this department is heated with hot water, circulating in iron pipes, on the low-pressure system, the pipes being enclosed by specially designed ornamental bronze cases. The walls are of Parian cement, painted and decorated.

The doors are protected by electrical appliances, and on being tampered with, alarms are rung in various parts of the premises.

The general contractor for the work was Mr. John Everal, of Malvern, whose foreman was Mr. Thomas McCann. The heating apparatus gasfitting, bellhanging, &c., were supplied by the trustees of Messrs. Guy & Son, Malvern; the hydraulic lift, stairs, folding-doors, &c., by Whitmore & Binyon, London; the electric bells, by A. Boyd & Son, London; the iron fittings in the safe, by Hansher, Malvern; the plumbing and glazing, by Davis & Son, Malvern; and painting, paper hanging, decorations, &c., by Mrs. Adams, Malvern. The entire arrangement of the work was carried out under the superintendence of Mr. H. Haddon, architect, Malvern; clerk of the works, Mr. J. S. Alder.

PRESTON COVERED MARKET.

THE people of Preston have been unlucky as to their proposed market. If we remember rightly, after its erection, in January, 1870, at a cost of 6,000*l.*, it fell down in May of the same year. Recently a contract for its re-erection was entered into by Messrs. P. D. Bennett & Co. These gentlemen have now stopped the work, and have written:—

"We unhesitatingly say that a roof constructed in accordance with the plans and drawings furnished to us cannot stand, and this must be strictly true to any engineer accustomed to work of this description."

The committee have since instructed the engineers to call on the contractors to complete the work in accordance with their contract.

SHAKESPEARE'S LAND.

MR. HALLIWELL-PHILLIPS, whose recent accession to a new name and fresh fortune has already been marked by some munificent acts, has just purchased the theatre at Stratford-on-Avon, a very ugly modern brick building provokingly standing in the centre of Shakespeare's New Place Gardens, and intends to pull it down, and give the site to the public. We have no doubt whatever that Mr. Halliwell-Phillips is well advised, and that his liberal act will be to the general advantage, but we, nevertheless, should be sorry to think that Stratford-on-Avon is to be left without a theatre.

DORKING PUBLIC HALL.

THE progress of the works in connexion with the New Public Hall at Dorking, has, during the past few months, been rapid. The walls of the front building, containing the assembly-room or concert-hall, are up to their full height; all the roof principals are in position; and everything is nearly ready for the commencement of the slating. It is not at present intended to carry out the full designs and wishes of the architects as regards the internal decorations of the walls and ceilings. The block of old buildings formerly the model lodging-house, has, under the hands of the architects, been transformed into extensive suites of rooms available for various purposes, either by themselves or in conjunction with the large hall. On the same floor with the assembly-room, and

connected with it by a short corridor, is a room suitable for magistrates' meetings, lectures or supper room, &c., with retiring-rooms, offices, and other necessary conveniences. At one end of the assembly-room is a retiring-room for performers, having also direct communication with the street by means of a separate staircase. On the floor above and opening into the large room, is a gallery that may be used either for an orchestra or a ladies' gallery, with retiring and cloak rooms attached. On the ground floor, in addition to the covered space under the assembly-room is a smaller ball suitable for small public meetings, lectures, &c., and to which separate access can be obtained when desirable by means of the entrance-door at the side of the old building; and under the principal staircase are arranged gentlemen's lavatories, &c. The architects are Messrs. Driver & Row, and the contractor is Mr. Shearburn, of Dorking.

COMPETITIONS.

Sandgate Church, Kent.—Designs for a new memorial tower (to commemorate the recovery of the Prince of Wales) have been submitted in competition by Mr. Morley, architect; Mr. J. Gardner and Mr. S. S. Stallwood, architects, of Folkestone, and the committee have decided to accept the design submitted by Mr. Stallwood, which will be carried out as soon as the necessary funds are raised.

School-Board for London.—The following six gentlemen have been invited to compete for the schools at Hatcham (Greenwich district):—Messrs. Joseph Gale, John Giles, Charles F. Hayward, G. Gilbert Scott, jun., John P. Seddon, and E. Wyndham Tarn.

New Presbyterian Church, Liverpool.—The committee of this church have selected, in limited competition, the design bearing the motto, "We Fight to Win," the authors being Messrs. J. E. Murray & G. H. Thomas, architects, Liverpool. The second premium is not yet awarded.

FOREIGN CONGRESSES.

At the Institute of Architects, March 18th, Mr. F. P. Cockerell, hon. secretary for foreign correspondence, announced that the thirty-eighth session of the Scientific Congress of France would open at Saint Briou, on Monday, the 1st of July next. All persons interested in the progress of science, literature, and the arts are invited to co-operate.

The proceedings of the session will be divided into five sections:—

1. Natural Science, Physics, and Mathematics.
2. Agriculture, Industry, and Commerce.
3. Anthropological and Medical Science.
4. History and Archaeology.
5. Philosophy, Social Economy, Jurisprudence, Literature, and the Fine Arts.

It was also stated that the Royal Academy of Belgium proposed to celebrate their hundredth anniversary by a festival, to be held on the 28th and 29th of May next. The Institute had been invited to send a representative, and Professor Donaldson, past-president, at the request of the council, had kindly consented to attend on the occasion, in conjunction with Mr. E. Anson, vice-president.

BOARD OF PUBLIC WORKS IN IRELAND.

Sir,—The article in a recent number of the *Builder*, relating to the proposed changes in the Board of Public Works in Ireland is a proof of the catholic interest you take in whatever concerns the architectural profession in all its branches. Of this, indeed, there are numerous instances in the goodly row of volumes of the *Builder* that I possess now, dating back a quarter of a century, from 1846 to 1871. I therefore trust that you will afford me space to supply an omission in the article referred to, and for a few general remarks on the subject of it.

A reference to Thom's Official Directory will show that in addition to the officers mentioned as constituting the architectural staff, there are six district clerks of works located in the principal cities and towns of Ireland, whose duties are to survey sites for new buildings, to inspect works in progress, and measure them up when completed, to check and certify contractors' accounts, and to prepare specifications, &c., for alterations and repairs of existing buildings in their respective districts; so that it is they who

have to take the long drives and perform the other services attributed to the surveyors, who only leave Dublin a few times at most in the summer; indeed, one of them, although otherwise no doubt very hard-worked, has not I believe left home even once a year for some time past.

The duties of the surveyors are chiefly confined to the buildings in Dublin, and revising the specifications and submitting reports and accounts forwarded by the district clerks of works under the general direction of the architect.

Having set this matter of fact right, permit me to refer to the changes indicated; and as it appears that not only the chairman of the Board, as at present, but a third Commissioner, as director of works, is to be a Royal Engineer, it may be well to glance at the working of the now defunct Board of Ordnance under those officers. The *Builder* having taken a leading part in the discussion of the subject at the time, you will probably remember that the late Lord Herbert of Lea (when at the War Office) contemplated severing the connexion between the military and civil branches of that Board, as it was found that they worked badly together. You then advocated transferring the works at barracks and other buildings to properly qualified civilians, and leaving fortification entirely to the military corps, and it was generally supposed that, had Lord Herbert lived, some such arrangement would have been carried out; however, the decision was subsequently reversed, and the civil branch is now in course of being broken up, and it is thought that some of the civilians up may also be provided for at the Irish Board of Works by the changes now under consideration. If those changes are correctly shadowed forth, they would convert the Board of Works almost into a revived Board of Ordnance, where the military heads would have power and the civilians practical knowledge, which would in course of time produce the same results as caused the breaking up of the Board of Ordnance.

As you intimate the probable disappointment of the present staff of the Board of Works in their long-deferred hope of receiving better pay, may I in conclusion add a few remarks on that subject. Some years ago the surveyors were placed on the same footing as first-class clerks in the secretary's and accountant's departments, and the district clerks of works got the same maximum salary as the second-class clerks, their minimum salary remaining as it had been for many years before, when the architect and the surveyors were clerks of works; but since then the clerks in each class received an advance which neither the surveyors nor the district clerks of works shared with them. Surely the surveyors should possess qualifications at least equal to the higher clerks in addition to their professional knowledge; and the district clerks of works certainly must be fit to discharge the duties of second-class clerks to properly fulfil their own, which require special training and long practical experience, and involve the endurance of much hardship and privations when travelling to remote and almost inaccessible places in all seasons; yet it is a fact that they are, and probably may continue to be, worse paid than the ordinary clerk, with whom they were classed some years ago, although the clerks in the Board of Works and other public offices in Ireland justly complain that their pay is much less than in the corresponding departments in England.

AN OFFICIAL.

THE CHELSEA EMBANKMENT.

THE contract to embark the northern shore of the river Thames, between Chelsea Hospital and Battersea Bridge, was let to Mr. Webster for £33,950, including a portion of the sewer corresponding in length with the Embankment, and the foundation-stone was laid by Colonel Hogg, the chairman of the Metropolitan Board of Works, in August last year.

The works, which are now in active progress, consist of an embankment wall three-quarters of a mile in length, by means of which, when completed, 9½ acres will be reclaimed from the foreshore of the river. The area behind the wall will be occupied by a roadway, 70 ft. wide, and by ornamental grounds; while at a depth of more than 30 ft. below the roadway-level will run the sewer. The wall is formed of Portland cement concrete, faced with granite, being similar in this respect to that of the rest of the Victoria Embankments. The face of granite, however,

instead of being dressed smooth is simply hammer-dressed, the style of masonry being that which is technically known as drafted and scabbled-faced. The parapet and pedestals for the lamp-standards will be of solid granite, and will be fine dressed work, although the contour will be bolder and less refined than in the other embankments. The concrete backing of the wall is 12 ft. thick at the base, 7 ft. 9 in. midway of its height, and 4 ft. 6 in. at the top, immediately under the footing of the Embankment. The concrete is tipped into its trench behind the granite, and when the tide has nearly risen to the top of the trench a sluice is opened, by which means the water is admitted and covers the concrete work. When the tide has fallen below the level of the trenches the water is rapidly pumped out, and the work again proceeded with. This arrangement is necessary, as the work is being executed without the aid of whole-tide cofferdams, the comparatively shallow depth to which the foundations of the wall extend entailing those expensive items of construction to be dispensed with.

WASTE-PIPES AND DRAINS.

Sir,—Allow me to make a suggestion in your columns on one point to which I attach considerable importance. It has often been pointed out (see *Builder*, March 30, page 240) that the water of our cisterns is liable to contamination from the effluvia arising from the waste-pipe, which I believe, as commonly constructed, delivers immediately into the house-drain.

The remedy is simple and easy. Let the waste-pipe be made to deliver into the supply-pipe, between the cistern and the closet-pan. By this arrangement, if there is any overflow it will pass off through the pan without any direct communication with the drains, and thus all access of foul air will be cut off.

I have myself adopted this plan to my own closets without difficulty.

EXPERTUS.

*. The remedy proposed is by no means complete. The waste-pipe should discharge into an open sink, whence the water should flow off to the drains.

CHANGE IN PAINT.

Sir,—A reader of your paper, who signs himself "Gas-fitter," asks, in last Saturday's number, why his light-coloured paints, in London, tarnish and turn grey and black, assuming a metallic lustre after a short wear; and gives his opinion that it is owing to inferior white-lead. But the very best white-lead will turn black, and will assume that peculiar mother-of-pearl appearance, rather than metallic, when exposed to an atmosphere containing sulphuretted hydrogen gas, such as would be the case in London.

There is a paint manufactured in Liverpool, by the "Salem Paint Company," that has no white-lead in it, and therefore would probably not tarnish.

THE GASFITTER'S FRIEND.

PRESERVATION OF IRON.

Sir,—I shall feel obliged if any of your readers can inform me where I can procure a preparation for dressing iron shafting, metal castings, &c., so as to prevent them from rusting through coming in contact with water, and at the same time leave the water quite free from stain of any kind. If any preparation of a liquid nature is in existence with which the iron or metal could be dressed, and afterwards be free from liability to rust, and from which water could carry no stain, perhaps some of your readers may be able to inform me, through the medium of your paper, where such may be obtained. The medium dressed would require to be in contact with water several weeks between each dressing.

R. P.

RIGHT TO PAINT WALLS.

At Nisi Prius in Ipswich, before Mr. Justice Blackburn, in the case of Fox v. Clarke, this was an action for trespass and painting part of the walls of the plaintiff's house. The defendant pleaded not guilty; that the house wall was not plaintiff's, that it was defendant's; that plaintiff gave defendant leave and licence to paint it; that the plaintiff granted the right to do so to Mr. Phipson, Mr. Clarke's predecessor, and Mr. Phipson had granted it to Mr. Clarke. Defendant paid 1s. into court.

Mr. O'Malley put a photograph of the *locus in quo*, which was two houses in Museum-street, Ipswich, one of which belonged to Mr. Fox and the other to Mr. Clarke. These two houses were built upon one architectural design, which included a pediment in the centre block, which was over the door of Mr. Clarke's house, but the tenement did not square with the outer architectural design, the party-wall running some distance from the end of the pediment. Another architectural feature was a portico over the defendant's door, but the internal party-wall ran between the column of the portico next Mr. Fox's house and Mr. Clarke's door, so that the column of the portico of Mr. Clarke's entrance was really part of Mr. Fox's house. Mr. Fox had hitherto painted the piece of pediment which was upon his house, and the trespass complained of was that Mr. Clarke had painted the piece of the pediment, the string-course, and the column of the portico which were in front of Mr. Fox's house.

A good deal of discussion took place, in the course of which Mr. O'Malley said there would be no difficulty in arranging for the whole portico and pediment to be painted alike, Mr. Fox having not the slightest wish to disfigure the houses by doing otherwise. His only object was to decide the question of right to the wall, which might be of importance in case of alteration to the property. The case for the defendant was that the whole portico was his property, and the wall of Mr. Fox's house behind it was a party-wall "returned," used in the architectural sense.

Mr. Justice Blackburn said his opinion was against the contention of the defendant. He thought the party-wall should be drawn straight out to the street, and entered a verdict for the plaintiff on the issues which raised the question of right, giving the defendant leave to move the Court of Queen's Bench, the Court to have power to draw all inferences of fact, and say whether he was right to admit the evidence of Mr. Luff, damages 1s., with certificate for costs. He expressed there would be no necessity for an undertaking as to the painting in future.

Mr. O'Malley said certainly not. His client would be willing to permit the defendant to do it on payment of a nominal rent.

DARLINGTON FEVER HOSPITAL.

Sir,—Please correct a misprint in my letter, p. 240, ante. In 3rd paragraph, 4th line, the last word "the," should be *his*, making it read the mayor's, not the architect's partners.

ONE WHO TAKES FAIR PLAY.

Sir,—That "One who likes Fair Play" has not had it, is very evident; and my advice, gained from painful experience, is "Get in and cadure it."

He asks, "Can you conceive a more cruel case of injustice to the other competitors?" And since it is, so it is said, some satisfaction to know that some one is worse off than yourself, I would console him by saying that as he does not mention that the committee actually instructed architects to send in designs upon the Pavilion plan, and were consequently free to select what they pleased, and of course they chose the worst.

What, now, will "One who likes Fair Play" say to a case where positive instructions were issued that certain schools should be planned in accordance with the "rules of the Committee of Council on Education," and then selected a plan totally in opposition to those rules, and yet were so polite to the competitors as to say they had chosen the one most to accordance with them?

I do really hope that something will be done some day to make committees responsible at law for such palpable breaches of faith.

ONE WHO BOUGHT HIS EXPERIENCE AT WORCESTER.

ON OUR ROYAL ACADEMY.

Sir,—It is now above a hundred years since the Royal Academy was first established. As an artist who, having his three elder brothers students of the Academy, naturally expected to be permitted to enter also as a student when his father had selected him from feeling as an artist, while those brothers were permitted to be there rather than be idle at home, judge his astonishment when his father, a Royal Academician himself, declared he would not allow him to enter there as a student until he had been under him some years; for, said he, "I shall ground you more thoroughly in art than you can become grounded there." His mother, overhearing the observation, said, "The Royal Academy will then say your son is not qualified."

Time reveals most things, and the recent advertisement in the *Times*, for "Ridicemental and Technical Instructors," for the Royal Academy, explains upon the reason why that Royal Academician refused to allow his youngest son to enter so soon as a student. In this case, it appears that there is a sad deficiency in that royal institution, not only in admitting members excellent only in auxiliary art, and omitting to set objective art in the human figure as first and foremost to all others.

The Royal Academy is sufficiently rich to have a branch academy at Rome, where a Royal Academician might, if adequately supported as president, and where the student, having received his travelling medal, would derive advantage from his teaching, and be fostered with every aid.

ART.

THE EAST LONDON MUSEUM AT BETHNAL-GREEN.

It is at last authoritatively announced that an endeavour is to be made now to open this museum to the public. We gave a view and plan of it in our volume for last year, pp. 46-47. With the exception of some slight details at the main entrance the building is now completed, and the internal decoration is also finished. Great numbers of objects of art and science are daily being removed from South Kensington to Bethnal-green, under the superintendence of Mr. Henry Cole, C.B. The museum will be partly stocked with collections lent for the purpose by her Majesty, the Royal Princes, the Marquis of Westminster, the Duke of Abercorn, Lord Elcho, Sir Coutts Lindsay, and others. At the request of Mr. Cole, Sir Richard Wallace has promised to lend the magnificent gallery of pictures known as the Hertford collection. Those collections which are sent from the South Kensington Museum will be changed from time to time, but the food collection will hereafter be permanently located at Bethnal-green. The hours during which the East London Museum is to be opened will be the same as at South Kensington, viz., on Mondays, Tuesdays, and Saturdays, free days, from 10 a.m. to 10 p.m.; and on Wednesdays, Thursdays, and Fridays, from 10 a.m. until sunset, on which days a charge of 6d. for admission will be made.

THE PRIZES OFFERED BY THE
TURNERS' COMPANY.

SIR,—According to a prospectus issued by the Worshipful Company of Turners last year, it is proposed to give each year the silver medal and the freedom of the Company to any one workman or apprentice in the trade who may send in the best specimens of hand-turning for the year.

As there will no doubt be prospectuses issued shortly, will you allow me to point out to you some of the conditions of last year's prospectus which I consider act unfairly towards the majority of the competitors, and I hope will be altered in this year's conditions? In the first place, I do not think that a master turner ought to be allowed to compete against a journeyman, as was the case in last year's competition, for the successful competitor was (and is) a master employing several journeymen. Had it been understood that the term "workman" included masters and journeymen several masters would have sent in specimens. Few journeymen turners have lathes and tools of their own, and those who have would have to work after they have already done a day's work to make their specimens, whereas a master can easily afford to lose time to make such things, as well as having a better chance to buy materials, &c., when he has the profits of several journeymen to depend upon. And I am certain that many masters will compete this year unless this condition is altered, and therefore the chances of a journeyman getting the prize will be very small indeed. In another paragraph it is stated that a certificate of good conduct must be sent in by each competitor. I cannot understand how a master could send in a certificate, because he might be a perfect reprobate, and yet, by employing steady and good workmen, give satisfaction to all his customers.

Paragraphs 2 and 3 are as follow:—
"The materials to be used will be varied in different years, so as to include Wood, Ivory, Metals, Stones, Spar, &c."
"The competition for this year (1871) will be Turning in Wood."

The prize specimen was in wood and ivory. I think the prospectus ought to state whether a combination of materials will be allowed, as I cannot reconcile the award with these two conditions.

There were six qualities mentioned which would be considered in awarding the prize, but I shall only comment upon three of them.

Quality 1.—"Working to exact dimensions, illustrated by a cylinder, 6 in. long and 2 in. in diameter, or any other object which shall measure exact inches without fractions."

To my mind it would have been better to have fixed dimensions, because a competitor making a cylinder, 6 in. by 2 in., would have a chance, according to the conditions, of getting the prize; whereas, another one making one 18 in. long by 1 in. diameter, would stand no better chance, when [there is obviously] no comparison in the amount of skill necessary to make the two articles.

Quality 2.—"Exact copying, so that two objects produced, such as two cups, vases, boxes, or chessmen, may be fac-similes in every part."

It ought to be clearly defined how those fac-similes in every part are to be produced; for, if one competitor turned, say a set of chessmen, in pine, with ordinary gouges and chisels, and the other turned a set in ebony, with tools made to the pattern like a moulding-plane iron, the latter would not have done such a skillful piece of work as the former, and yet possibly he might get the prize.

Quality 3.—"Neatness of design, symmetry of shape, and good form of mouldings."

The company should state whether the competitors are to design their specimens, for one might procure a first-rate design from a designer (as was the case last year), and another attempt to design his own, and however faulty it might be, the latter would deserve more credit than the former. It ought also to be stated by the competitor whether the specimens were designed by himself or not.

The conditions should also state if the specimens are to be glass-papered and polished, as those two processes often put a good finish to bad work.

And, to make these competitions of any practical use, the specimens ought to be exhibited to the trade, with their good, and, if any, bad qualities pointed out by the judges, so that the unsuccessful competitors may see their failings, and benefit thereby, and the trade in general derive a great deal of valuable information.

I must concede, sir, that the honourable company have a perfect right to give away their prizes under any conditions they may think fit; but I feel sure that unless the conditions are altered in something like the direction I have suggested, the company will not have the confidence of the great majority of wood-turners.

I think if a few turners would take up this subject, it would benefit the trade very much.

W. A. BARBER.

Books Received.

Technical Manuals: Gothic Stonework. By ELLIS A. DAVIDSON. London: Cassell & Co. We have spoken with commendation of several of the manuals prepared for this series, by Mr. Davidson, and should be glad to know that they were largely circulated. We must speak in more measured terms of the little volume before us, well intentioned as it is. The illustrations are so spiritless, so entirely devoid of anything like the Gothic feeling, that they are calculated to do more harm than good. Gothic details and ornaments can be drawn properly only by those who have well studied the style, and not always by them. There are some persons who think they can do everything: this is usually a mistake.

The glossary of terms, too, is unsatisfactory. It is an error, for example, to state under the head "Bay Window," that if carried on projecting corbels, such windows "are called Oriol windows." Oriol windows are not necessarily carried on corbels.

Tegg's Readiest Wages Reckoner; calculated on the Basis of Nine Hours per Day. By WILLIAM A. STONE. London: Tegg.

This timely Reckoner of Wages will have to be substituted for the previous reckoners in establishments where the nine-hours movement has been successful. The author is one of the firm of James, Edwards, Cash, & Stone, well known and experienced London accountants. The work cannot but be useful to all engaged in skilled labour. The calculations being extended to 108 hours, adapts it for use when the wages are paid fortnightly, as well as weekly. The tables enable the wages due for any given number of hours, or the fractions of any hour, to be read off speedily, and without complication. A table at 45s. has been added by special request of an experienced wages clerk, with relation to halving the amounts, as well as taking them of a whole.

VARIORUM.

"A HANDBOOK OF Sewage Utilisation" (Spon, Charing-cross) gives, in a very condensed shape, reference to the principal systems that have been tried in England, and appears to be exempt from bias. The author is Mr. Ulrick Ralph Burke, Barrister-at-Law.—"Cassell's Illustrated History of the War between France and Germany," which has now reached its fifteenth part, gives a remarkably clear and interesting account of this momentous enterprise. The engravings with which it is filled are really illustrations, and serve to convey to the reader a vivid idea of the persons and places mentioned.—"The new story in Cassell's Magazine, titled "The Doctor's Dilemma," by Hiesba Stretton, promises well. The first five chapters in the April number make us long for May.—The principal paper in *Temple Bar*, "Good-bye, Sweetheart," also by a lady, is coming to an end, to the sorrow of the readers of that periodical.—*The Argosy* gives us more woman's work, and very agreeable work. The story "Within the Maze," by Mrs. Henry Wood, who edits the periodical, will interest a large circle of readers.—The sketch of the Boat Race by George Cruikshank, Jun., in *London Society*, is remarkably funny and clever; it needs a glass for its due appreciation.—"Little Polly Piker-ton" is also a very good illustration of its class.—*The Art Journal*, offering a plea for practical female education, says,—"If it were not a fact of daily occurrence, it would seem absurd to state that we have no right to expect women to do by instinct that for which men give years of patient toil. But until we secure for girls the same kind of apprenticeship given to boys, we have surely no cause for wonder that similar work should not be done as well by women as by men. If we allow that women may undertake certain branches of work, it must follow that we grant also a system of regular training or apprenticeship for girls. For boys this is a matter

of course. Society practically endorses for them the old Hebrew proverb, "He who brings his son up without a trade brings him up to steal," and no toleration would be given to the man who brought up a family of sons without giving them either fortune, profession, or trade. There are hundreds of girls with a pure passion for knowledge and a love of study, as intense as any other power of love with which women are universally credited, who have yet to stand aside, watching an education of which no share comes to them; and, later in life, to sit idle at home, envying the activity which is denied to them, until, under some sudden pressure of necessity, they find themselves rudely jostled out of their quiet corners, and breathless in the midst of a crowd of eager bread-seekers."—*The People's Magazine*, speaking of the enormous view taken by some people of the work of others, says,—"In a trades' procession a few years ago, a wonderful piece of glass-blowing, the result of much time and labour,—a ship in full sail, made entirely of glass,—was carried in triumph as the masterpiece of the craft. 'Ah,' said one of the exultant glass-blowers, 'it would be a long time before Derby or Dizzy could do a real piece of work like that.' The thing was utterly useless: it was in the worst possible taste (for glass is not suitable for such work); and therefore it must have been irredeemably ugly; and yet, because it had cost much time and labour,—hard labour,—therefore it was to be preferred to all the brain-work and moral and physical labours of the then leaders of the respective Houses of Parliament. This notion is an old as well as a widespread one; it is embedded in the word 'school,' where we flatter ourselves that a good deal of work is done, and which yet is nothing but 'schol'd,' the old Greek for 'leisure.' So that school hours are, according to the original sense of the term, leisure hours; and, contradictory as it may appear, this sense is fully recognised at the present day; for how many hundreds of boys are every day, for a time, or for ever, taken away from school in order that they may go to work."—"Concerning Sewage and its Economical Disposal. By Frederick Hahn Danchell. C.E. London: Simpkin, Marshall, & Co. 1872." The purpose of this pamphlet is to advocate the cause of charcoal,—in particular peat charcoal,—as the great panacea and solution of the sewage question. Peat charcoal is, no doubt, a very good thing in some cases,—especially for those interested in peat charcoal; but for the practical, efficient, and economical settlement of the great question of the best possible disposal of the sewage of towns, and the cleansing of rivers, we have very little faith in its prospects or its practical efficacy. The author very truly says, in the preface, that, "to attend a meeting of sewage doctors, and hear them wrangle and explode each other's doctrines, is enough to bewilder any unscientific auditor. In the matter of sewage there is really little help to be had from authority; and a plain man must be content to trust his own judgment." Now, although the author is a C.E., he is here also an S.D., or sewage doctor, and wonder whether he is likely to "bewilder the unscientific auditor" when he says in the summary of his case, with reference to the alleged result of the charcoal process,— "The advocates of sewage irrigation profess to accomplish the same result, but with what success let the evidence of numerous commissions of inquiry testify!" This is highly significant, no doubt, but it is more like a pleading for the plaintiff,—in re Peat Charcoal versus Sewage Farm,—than anything else. Still, we watch the progress of the experiments in peat charcoal with interest; and we think that, in special cases, and for special utility, though not for general use, it may be recommended.—"On the Cleansing of Rivers. By C. E. Austin, C.E. London: Mitchell, Parliament-street." On this question Mr. Austin says,—"It is evident that the process which extracts in the most economical manner the largest proportion of the organic matter of sulliage must be found the most efficacious; and that will be sometimes filtration, often irrigation, and most often both filtration and irrigation combined. Irrigation appears to be a very effective process for the purification of sulliage water and for the utilisation of the contents of the sewers; but it is a very inconvenient one to depend on solely; because, when the population of a town increases, the means of procuring additional land for irrigation diminish. The improvement can only be made by the introduction of filtration, if not already practised."

Miscellaneous.

The Artizans', Labourers', and General Dwellings Company (Limited).—The fifth annual social gathering or *soirée* of the shareholders and friends of this undertaking has been held in the Westminster Palace Hotel. After the very large party of ladies and gentlemen who met on the occasion had partaken of a substantial and varied repast, the chair was taken by the Earl of Shaftesbury, who was supported by Archbishop Manning, Sir Curtis Lampson, Dr. Baxter Langley, and others. Mr. William Swindlehurst, the secretary, read an elaborate report of the past year's operations, showing that the company have estates in Liverpool, Birmingham, Bradford, Salford, and other large towns, besides one in the neighbourhood of the metropolis, atrixton, New-cross, and Hornsey. The houses at up are let at 5s. 6d., 4s. 6d., and 4s. 3d. per week. The share capital now amounts to £12,580., presenting an increase of 12,580. over that it was in 1870. The uncalled capital is £1,000. For the past year the directors were enabled to declare a dividend of 6 per cent. on the share capital, and to pay 5 per cent. on deposits. Mr. Swindlehurst spoke of the great advantages the company were conferring upon the industrial population, by inculcating habits of thrift, temperance, and economy. All those happy results were brought about through the principle of making capital constantly reproductive. There were 1,600 working men holding shares in the undertaking, varying from 50l. to 1l., and the list also included the names of the highest nobles of the land, dignitaries of the Church, lawyers, artists, and scientific men, who sympathized with a movement the direct effect of which was to make people more conservative in their love of country. Several addresses were given, one being specially devoted to the advocacy of the co-operative principle generally, and at intervals the proceedings were pleasantly diversified with music and song.

Exeter Cathedral.—The Lady Chapel has been issued out of the hands of the decorators (Messrs. Clayton & Bell), and nothing remains to be done except the revedos and the rearing down the eucastus tiles and marbles of which the floor will be composed. Some difficulty has been experienced with regard to the revedos. It has at length been decided to fill the central panel with a piece of alto-relievo stonework, illustrating the following scripture, "The seed of the woman shall bruise the serpent's head." The side-panels will be filled in with appropriate work. The massive rheck pillars in the choir are being thoroughly repaired, all the defective parts being removed, and replaced by freshly-quarried marble. In a work 100 tons of marble have already been used, and it is calculated that 60 tons more will be required. The carving of the woodwork for choir-stalls, &c., which has been entrusted to eminent London firm, is in an advanced state, and will be finished by October. A marble pit, the gift of the chapter-clerk, will replace the old wooden structure.

Music for the Blind.—The normal college and Academy of Music for the Blind, at the Crystal Palace, is a most remarkable venture, says the *Echo*, in reference to a subject for behoof of the blind, promoted by Mr. Armitage and Mr. Campbell, and referred in our columns some time ago. "The blind are taught by blind teachers under a blind principal and general director—an American gentleman, Mr. F. J. Campbell. Mr. Campbell has secured himself that in America he has frequently made from 800l. to 900l. per annum by exercise of his musical powers as pianist and instructor. The success of his system has prompted him to transplant a branch to England, and he has already sent a number of blind teachers from America. The education is a thorough sound general course of instruction, with the special addition of music—in art in which the blind peculiarly excel. Among the presidents we notice the names of Lord Chelmsford and the Marquis of Westmorland, and among the musical committee those of Sir Sterndale Bennett and Mr. Henry Leslie."

Her Majesty's Opera.—Messrs. Bracher & Under the superintendence of Messrs. Nelson Harvey, the architects to the theatre, are again converting old Drury into an opera-house, for Mapleson. The works have to be finished by the opening night, April 6th.

Improvements in Bedford-street, Plymouth.—Two houses, with shops, just erected for Mr. Matthews, are considered an acquisition to the street architecture of Plymouth. The style is a somewhat freely-treated description of French Classic. The material is Southampton bricks of a warm red colour, relieved sparingly by hands of the same material of a lighter tone. The dressings—which are of an ornate description—are of Portland stone. The shops are divided, and supported on either side by massive pilasters of polished granite, from Messrs. Freeman's works at Penryn. The building is from the designs of Mr. J. H. Keats, of Plymouth, who has personally superintended its construction; and Mr. Finch is the builder. Mr. Harry Hems, who for the last twelve months has had the carving of the new Guildhall in hand, has executed, with his assistants, the whole of the stone carving.

New Theatre for Darlington.—Plans for a new theatre which Mr. Scouson intends to build in Northgate, Darlington, on the site of the present building, are described by the local *Times*. It is proposed to considerably widen the theatre, to add several feet to its length, and to raise it by two stories. A new stone front is to be built into the edifice, uniform with the Bridge Inn, which will also be altered; and the whole façade, it is proposed, shall be relieved by a handsome portico, forming an arcade extending the whole length of the united buildings. The plans of the internal arrangements of the theatre provide for every accommodation in the way of cloak-rooms and lobbies. The dress-circle will be constructed on the horse-shoe principle, and there will be separate entrances for the dress-circle and the pit and gallery. The architect is Mr. Wm. Hodgson, of Darlington.

Steel Tools.—Mr. La Breche-Viger, of Montreal, has obtained a patent for a method of manufacturing axes, hammers, and other implements, by first making them of wrought iron and then converting them into steel. The nature of the invention consists in manufacturing the articles to be treated under the process of and with wrought iron first, and immersing them in a bath of molten cast-iron free from sulphur and phosphorus, and carburized to its utmost capacity. The best for that purpose is spiegelstein, but in default thereof such cast-iron may be made by melting good malleable iron or blister steel in a cupola furnace with charcoal, or the best anthracite coal, or bituminous coal, or coke, as fuel. The articles are left in this bath a space of time which must vary with the degree of hardness desired to be imparted to the metal and with the size of the articles.

Excavations in Cornwall.—Mr. W. C. Burchas, of Castle Horneck, Ponzance, is making excavations near St. Colomb, Cornwall. He has uncovered a sunken kist-van, consisting of a vault sunk in the slate-rock surface, lined with slabs, which support a fine cap-stone of an apparently foreign origin. This cap-stone is 10 ft. 6 in. long, 5 ft. 6 in. broad, and nearly 2 ft. thick. The kist, which contained a human skull and other osseous matter, was covered with a pile of stones, blackened apparently by the action of fire, and near the outer edge of a huge mound of burnt earth, the whole forming a barrow, the outer edge of which had evidently been once enclosed within a revêtement of disintegrated slate fragments. This barrow forms one of twin barrows some 30 yards apart, between which is the remnant of a bank, which, it is suggested, may have formed either a rampart or enclosure around the two barrows.

Sheep in Boots: a Sheepshank Legacy?—R. T. writes,—"The foot-and-mouth disease, so disastrous to sheep and cattle, is said to arise through standing in wet pastures and muck. Is this so? (for I am no sheep or cow-herd). Let us seek a remedy, and bestow a comforting gutta-percha boot (it would be no novelty, for puss of yore was thus equipped), and gutta-percha ribbon wound round; a few turns extra at foot; flame it, and squeeze gently to unite and shape. It would last their lifetime, and protect their trotters when travelling to that hour when no sheep return!"

The Cotswold Hunt Kennels.—At a recent meeting of subscribers to the Cotswold Hunt at Cheltenham, to consider a scheme for removing the kennels from their present site to a more central point, at Andversford, it was stated that the cost of erecting new kennels would be about 2,500l. The proposal was to establish a limited liability company.

The Proposed Tunnel under the Mersey.—The Mersey Railway Company, who have obtained powers to make a railway tunnel under the Mersey, have commenced the preliminary operation of sinking a shaft on a piece of land in Shore-road, near Woodside Ferry. The ground has been enclosed, and the intention is to sink to a depth of 70 ft. below the bed of the river, at which point the cutting of the tunnel will begin. The tunnelling will be performed with two machines, each of which will make a cutting 15 ft. in diameter, under a pressure of 30 horse-power engines. Two other shafts will be sunk at Birkenhead, one of which will be near the gas-works. In the tunnel there will be space for a double line of rails, and it is expected that the work will be completed in two years. The contractor is Mr. John Dickson, of Whitby, Yorkshire.

The Antiquity of Mankind further extended.—An important discovery bearing on the antiquity of man has just occurred, Mr. Edward Charlesworth, F.G.S., having discovered in the Suffolk craze, or old Pliocene beds, in the very heart of the tertiary era and long before the close of the glacial in the post-tertiary, teeth of the extinct shark (*Carcharodon*), apparently perforated by human agency, as well as many concretionary nodules with longitudinal perforations unlike those produced by the action of boring mollusca. The specimens will be exhibited and described at the meeting of the Anthropological Institute on the 8th of April: so says the *Pall Mall Gazette*. If this discovery be verified, it will carry back the existence of man in England to a period coeval with the Mastodon arvernensis, and far more ancient than the "mammoth age."

The Salt Library.—The obstacle which has so long stood in the way of the acquisition of this collection by the county of Stafford has, at last, been removed. Including the donation of 3,000l. from Mr. T. Salt, M.P. for Stafford, the 6,000l. required by Mrs. William Salt, of London, has been subscribed, and the collection, together with a building in the Market-square, Stafford, for its reception, will be handed over to the county. Mrs. W. Salt has given 3,000l. for the building, and the remaining 3,000l. will constitute a fund for providing the requisite fittings and endowing a librarian. The estimated value of the collection is 30,000l., but many of the books and manuscripts it contains are regarded as literary and historic treasures almost priceless. Among other rarities are the autographs of almost every English monarch.

The Space in Front of St. Paul's.—We may now expect that steps will at once be taken to throw open to the public the area at the west end of the cathedral. The Dean and Chapter are to receive from the Metropolitan Board of Works 15,000l. as compensation; 5,000l. of this, it is stated, will be spent by the Chapter to the arrangement of the paving and other works, and the rest will go towards the decoration of the cathedral inside. It may be hoped that some space will be given up to the roads and pathways on the north and south sides of the building. In connexion with this improvement, the City Lands Committee has agreed to purchase, for the sum of 10,500l., the freehold interest of Messrs. Newbery in the premises No. 44, St. Paul's Churchyard.

Value of Land at South Kensington.—We understand that a plot of building land a short distance from the Horticultural Grounds has lately been sold by private contract to an eminent London builder, through Messrs. Powell, estate agents, of Bayswater-terrace. The extent is five acres in one block, and the price 60,000l., or 12,000l. an acre. This affords a wonderful contrast to the value of such a property in the early days of many persons still only middle-aged, had since the first Exhibition of 1851 so great an area of South Kensington has been covered with ranges of private mansions that any remaining land is now sought after with eagerness, and obtains terms which would have appeared fabulous to our fathers.

Utilisation of Waste Sailing Force.—A screw-propeller fitted to a sailing-ship would turn round whenever the vessel moved forward. It has been suggested that the power thus gained might be used to give motion to an electro-magnetic apparatus which would produce an electric light of great brilliancy, far more serviceable for signalling and other purposes than oil-lamps.

Flexible Marble.—Mr. A. J. Holliday, of Wheeling, describes a flexible marble slab, which is procured from the Portland Quarries, Vermont. Professor Hay, of the Western University, of Pennsylvania, describes its constitution as:—carbonate of lime, 97.50; magnesia, a trace; silica, 2.05; water, .45; = 100. The above composition and its crystalline character together proclaim it to be a true marble, and, at the same time, a pretty pure specimen of that mineral. The indubitable flexibility of the slab is its most remarkable feature. Dana states that "some of the West Stockbridge marble is flexible in thin pieces when first taken out." The slab in the possession of Mr. Holliday is about 2 in. thick, and is nearly as flexible as an equal thickness of vulcanised india-rubber.

The Colony of Victoria.—The rapidity with which settlement is proceeding is shown by reference to a decennial return of the land occupied and cultivated. In 1862, the number of holders was 14,960; the extent of land occupied, 4,090,781 acres, and the extent of land cultivated, 439,895 acres. In the year ending the 31st of March, 1871, the number of holders was 31,812; the extent of land occupied, 9,530,638 acres; and the quantity of land cultivated, 900,015 acres. Machinery upon farms during the year ending the 31st of March, 1871, is put down at 1,102,863l., and the approximate value of the improvements effected, which include buildings of all descriptions, fencing, dikes, wells, dams, &c., but not the cost of clearing, 8,777,548l.

Trapping and Ventilating Soil-pipes and Water-closets.—The Birkenhead Improvement Commissioners have issued a printed circular as to trapping and ventilating private sewers, drains, soil-pipes, and water-closets, in new buildings, or in connexion with the alterations of houses where water-closets are introduced. The observations point out the more general defects of the present arrangements. Drawings, showing the existing and proposed mode of the connexion of water-closets, &c., with soil-pipes and drains, and for the ventilation of the same, are appended to the circular.

Roman Remains.—An interesting discovery of Roman remains has been made at Milton-next-Sittingbourne, Kent. *Urnæ*, in which the Romans were accustomed to place the ashes of the dead, were turned up. Large masses of concrete, evidently the bed of a furnace; masonry, which bore evidences of exposure to intense heat; lumps of "clinker," and iron nails were found, as well as fragments of funeral urns and calcined bones.

The Railway Bridge in Ludgate-hill.—Sir: What do you say to covering this ugly bridge, all over its entire height and length on both sides, with rich mirrors? The *coup d'œil* would be magnificent and grand in the extreme. These sheets of glass could be easily cleaned, and could be insured against accidental and wilful damage.—J. B.

Chelsea Old Church.—The incumbent of this quaint old structure is seeking aid to enable him to put it into a decent condition. It has many interesting associations, and with its two side chapels, built by Sir Thomas More and Sir Thomas Lawrence, and monuments to the ancestors of the Duke of Northumberland, Lord Derby, Lord Dacre, Lady Chyney, and others, makes a strong claim for proper sustentation.

Sewers in Kensington.—The Kensington vestry have considered the following tenders for the construction of 260 ft. of 3 ft. 9 in. by 2 ft. 6 in. sewer, air-shaft, &c., in Pembroke-gardens, Kensington. Messrs. Thirst & Co., Norman-street, Chelsea (accepted), 199l.; Mr. Geo. George, Cambridge-road, Kilburn, 210l. 10s.; Mr. Wigmore, Wallham-green, 199l. 10s.; Messrs. J. & S. Williams, Shepherd's-bush, 210l.

Proposed Monument for India.—A monument to the late Lord Mayo is to be erected in Calcutta, and 20,000l. have already been subscribed for the purpose. It is to be hoped proper care and knowledge will be brought to bear on the selection of the artist and the design. We spend large sums on monuments; on how many of them will posterity concern itself.

Architectural and Antiquarian Books.—The library of the Rev. Robert Willis, F.R.S., is to be sold by Messrs. Hodgson, commencing on Monday, the 8th instant. It includes books interesting to the majority of our readers.

Cost of Steam Rollers.—Messrs. Aveling & Porter, of Rochester, in answer to an inquiry from the Kensington vestry, whether they allowed discount for ready cash for the steam-roller lately supplied by them, state their inability to do so, adding that the rise in iron had necessitated an increase of 10 per cent. They added, further, that they were now quoting 605l. for the rollers sold at 530l., and observed that this increase in price did not cover the increase of cost to them. The vestry referred the question to the Finance Committee.

TENDERS

For the erection of warehouse, &c., in Charterhouse-street, for Messrs. Reynolds & Son. Mr. L. H. Isaacs, architect. Quantities by Mr. Riddett:—
 Patman & Fotheringham.....£11,995 0 0
 Rider.....11,850 0 0
 Macey.....11,750 0 0
 Axford.....11,675 0 0
 Browne & Robinson.....11,365 0 0
 King & Son.....11,250 0 0
 Scrivener & White.....10,978 0 0
 Kilby.....10,932 0 0

For alterations and additions to Tower House, Wandsworth, for Mr. Seaman. (Second estimate.) Mr. T. H. Vernon, architect. Quantities supplied by Messrs. Mann & Saunders:—
 Parsons.....£3,523 0 0
 Fish.....3,395 0 0
 Sprake.....3,353 0 0
 Scrivener & White.....3,296 0 0
 Stimpson & Co.....3,286 0 0
 Adamson.....3,078 0 0

For the erection of warehouse in Monkwell-street. Mr. B. Tabberer, architect:—
 Palmer & Son.....£3,065 0 0
 Ashby & Son.....2,997 0 0
 Robinson.....2,984 0 0
 Turner & Sons.....2,970 0 0
 Brass.....2,933 0 0
 Pritchard.....2,834 0 0
 Browne & Robinson.....2,746 0 0
 Perry, Brothers.....2,737 0 0
 Henshaw & Co.....2,680 0 0
 Mark.....2,600 0 0
 Merritt & Ashby.....2,570 0 0

For new Baptist Chapel, at Barnet. Mr. W. A. Dixon, architect. Quantities supplied:—
 High.....£2,320 0 0
 Wood.....2,250 0 0
 Carter.....2,255 0 0
 Eston & Chapman.....2,500 0 0
 Dove, Brothers.....2,149 0 0
 Scrivener & White.....2,310 0 0
 Wicks, Bangs & Co.....2,416 0 0
 Mann.....2,345 0 0
 Manley & Rogers.....2,343 0 0

For a new villa, at Hornsey, for Mr. S. W. Francis, Messrs. Lander & Bedells, architects. Quantities supplied:—
 Hill & Son.....£2,720 0 0
 Richards.....2,650 0 0
 Henshaw.....2,629 0 0
 Macy.....2,520 0 0
 Patman & Fotheringham.....2,575 0 0
 Browne & Robinson.....2,576 0 0
 Brown.....2,567 0 0
 Williams & Son.....2,447 0 0
 Mann.....2,543 0 0
 Axford.....2,540 0 0
 Scrivener & White.....2,548 0 0
 Groter.....2,475 0 0

For main sewerage works, at Sale. Contracts 8, 9, and 10. Mr. A. G. McBeath, engineer:—
 Jeffreys.....£2,404 0 0
 Reunison & Spencer.....2,366 12 0
 W. & J. Worthington.....2,369 0 6
 Carlisle.....2,350 0 6
 Hannett (accepted).....2,221 9 0

For the erection of house and school, at Lydiard-ty-wan, in the parish of Llandinam, Montgomeryshire, for the Llandinam School Board. Messrs. Powell & Sweetenham, architects:—
 Thomas.....£1,500 0 0
 Turner.....1,368 18 1
 Trow & Son.....1,300 0 0
 Atkinson & Mason.....1,229 0 0
 Davies & Son (accepted).....897 10 0
 Williams (withdrawn).....880 0 0

For erection of new vicarage-house, at Newhams, Barrow-in-Furness, for the Building Committee. Messrs. E. Habershon & Brock, architects:—
 Woodhouse & Son.....£2,000 0 0
 Garden.....1,900 0 0
 Gradwell.....1,850 0 0

For Wesleyan Methodist School Chapel, Latham-street, Little Bolton. Mr. Thos. Ormrod, architect. Quantities not supplied:—
 Townson (revised estimate accepted) 2530 0 0

For dwelling-house and boarding-school, Bradford-street, Haugh-Bolton. Mr. Thos. Ormrod, architect. Quantities supplied:—
 Ellis.....£11,258 10 0
 Statham & Son.....1,143 0 0
 Townson.....1,120 0 0
 Thompson.....1,073 0 0
 Barrow & Son (accepted).....1,033 0 0

For farm buildings at Wemham Farm, near Marlborough, for the Marquis of Ailesbury. Mr. S. Overton, architect:—
 Dyer.....£2,965 0 0
 Hoeking.....2,881 0 0
 Nightingale.....913 0 0

For alterations to "Gothic Villa," Plumstead, Kent, for Mr. William Jackson. Mr. John Jeffkins, architect:—
 Blake.....£576 0 0
 Vaughan.....632 0 0
 Longergan.....465 0 0

For entrance-lodge, Little Hevers Wood, Brasted, Kent, for Mr. A. Thorne. Mr. John Jeffkins, architect:—
 Longergan.....£250 0 0
 Gorrin.....245 0 0
 Durnell.....520 0 0

For alterations to the Boys' National Schools, Abergavenny:—
 Moreland.....£401 0 0
 White.....384 0 0
 Foster, Brothers.....380 0 0

For sundry alterations and additions to premises, St. King's-road, Chelsea, for Mr. Humphrey. Mr. J. Brackbury, architect. Quantities supplied:—
 Whitlock.....£329 0 0
 Sawyer.....318 0 0

For additions to house, at Caterham, Surrey. Mr. I. Martin, architect. Quantities supplied by Mr. Frederic Sparrow:—
 Langmead & Way.....£1,125 0 0
 Briggman, Nathal, & West.....1,112 0 0
 Ward.....1,053 0 0
 Jarrett.....1,020 0 0
 Symons (too late).....1,015 0 0
 Smeeth.....1,001 0 0
 Taylor & Son.....951 2 3

For the erection of a drill-hall, at Windsor, for Mr. Wilson. Mr. P. J. Byrne, architect:—
 Nightingale.....£329 0 0
 Burgess.....303 0 0
 Dover & Co.....503 0 0
 Reavel.....395 0 0

* Accepted, in conjunction with Messrs. Braby & Co. For additions to china manufactory, Eastwood, for Mr. Wm. Stubbs. Messrs. R. Scrivener & Son, architects. Quantities supplied:—
 Macken.....£2,050 0 0
 Bailey.....1,994 0 0
 Ogden.....1,855 0 0
 Matthews.....1,830 0 0
 Barlow.....1,810 0 0
 Cooke (accepted).....1,754 0 0
 Reiden, Brothers.....1,590 0 0

For china works, Eastwood, Hanley, for Messrs. Powell & Bishop. Messrs. R. Scrivener & Son, architects. Quantities supplied:—
 Bradbury.....£2,055 0 0
 Bowden.....1,975 0 0
 Bailey.....1,925 0 0
 Barlow.....1,805 0 0
 Cooke.....1,838 0 0
 Matthews (accepted).....1,793 0 0

For additions to Kingsbury House, for Mr. H. D. Rolings. Mr. E. Roberts, architect. Quantities by Mr. S. Thacker:—
 Lawrence & Sons.....£1,914 0 0
 Scrivener & White.....1,778 0 0
 Little.....1,698 0 0
 Sunwell.....1,670 0 0
 Bhus & Sons.....1,457 0 0
 Haynes.....1,343 0 0

For repairs, alterations, and additions to No. 9, Rat-bone-place, for Mr. J. B. Siv. Mr. J. Liddiard, architect:—
 Thomas.....£450 0 0
 Williams.....431 0 0
 Wood.....390 0 0
 Temple & Foster.....385 0 0
 Lord.....351 0 0

For new shop front and alterations at 22, South-street, for Mr. Conibere:—
 Ingram (accepted).....£183 10 0

For alterations and repairs at 34, George-street, for Mr. James:—
 Ingram (accepted).....£109 10 0

For alterations, &c. to the "Volunteer" tavern, Upper Baker-street. Messrs. Bird & Wallers, architects:—
 Fox.....£1,494 0 0
 Scrivener & White.....1,463 0 0
 Batchelder.....1,443 0 0
 Williamson & Son.....1,429 0 0
 Brown.....1,317 0 0
 Nightingale.....1,277 0 0
 Higgs & Son.....1,275 0 0
 Pary.....1,174 0 0

For building two warehouses at Wilderness-row. Mr. Collier, architect:—
 Hart.....£2,686 0 0
 Crabb.....6,589 0 0
 Moore & Granger.....6,525 0 0
 Nightingale.....6,484 0 0
 Perry, Brothers.....6,245 0 0
 Merritt & Ashby.....6,227 0 0
 Sewell & Son.....6,210 0 0
 Morter.....6,150 0 0
 Elkington.....6,005 0 0
 Henshaw.....5,975 0 0

For the erection of factory chimney-shaft, &c. in Commercial-road, E., for Messrs. Frost, Brothers. Mr. Andrew Wilson, architect. Quantities supplied:—
 Warkitt.....£2,919 0 0
 Jacobs.....5,575 0 0
 Whillier.....5,683 0 0
 Wicks, Bangs, & Co.....5,640 0 0
 Wood.....5,629 0 0
 Perry & Co.....5,572 0 0
 Morter.....5,545 0 0
 Ennor.....5,474 0 0
 Onthwaite.....5,387 0 0
 Kilby.....4,902 0 0

TO CORRESPONDENTS.

EVERY.—A long article on Avery... To all statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

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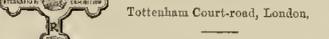
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BOROUGH of OLDHAM.—The Gas and Water Works Committee REQUIRE the Services of a CLERK

to be employed to superintend the erection of the buildings in connection with extensive gas works. Salary, 30 per week.—Applications, with testimonials and references, marked on the outside "Clerk of Works," to be sent to the undersigned, not later than MONDAY, the 16th day of APRIL, 1872.—By order, J. F. FOSNABY, Town Clerk, Oldham, March 28th, 1872.

ST. MARY, ISLINGTON.—HIGHWAYS DEPARTMENT.

The Highways Committee being about to appoint a FOREMAN of ROADS for the South-Eastern District of the Parish, at the weekly wages of 20s. will meet at the Vestry Office, Upper-street, on MONDAY, the 16th instant, at SEVEN o'clock in the Evening, to receive APPLICATIONS from CANDIDATES. Applications in the applicants' hand writing, together with testimonials, to be sent to the Vestry Office, not later than TWELVE o'clock at noon on the said 16th inst. Information as to the duties may be obtained at this Office (Mr. H. CORMACK) from TEN till ELEVEN o'clock a.m. Candidates to be in attendance at the meeting of the Committee. No travelling or other expenses will be allowed.

JOHN LAYTON, Vestry Clerk, Vestry Office, Upper-street, Islington, N. 3rd April, 1872.

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Must be quick and correct accountant, and write a good hand. Hours same as workmen.—Address, stating age, salary required, and where last engaged, to ALFRED ESPEY, Builder, High-street, Brixton.

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of CARPENTERS and JOINERS to take the entire charge of a shop of iron. Must be well up in setting out work, and understand drawings; also must have a thorough knowledge of, and be able to superintend machinery, and be in every respect thoroughly acquainted with the business.—Address, by letter, to ALFRED ESPEY, Builder, High-street, Brixton.

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DRAUGHTSMAN and COLOURIST, by an ARCHITECT in London, U.S. America. To go out there for three or four years.—Apply, with testimonials, specimens of drawing and colouring, and salary required, to J. K. C. 156, Hampden-road, N.W.

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Must have a good knowledge of brickwork. Will be required to estimate both stone and brickwork; understand working drawings, &c. 4s. per week. State age, experience, and give references.—Address, W. M. 11, Belle Isle-place, Worlington.

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Office, a JUNIOR ASSISTANT, who can trace neatly. Apply, in own handwriting, stating salary required, and references, to No. 855, Office of "The Builder."

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SAWYER. Must be a competent bench man and planning-machine worker.—Address, TAYLOR & JESSUP, Manufacturing, Essex.

WANTED, in a Land Agent's Office in the

Country, a competent SURVEYOR and LEVY CLERK. Will be able and willing to superintend the erection of buildings if required. Address, stating salary, LAND AGENT, Post-office, Essex.

WANTED, in an Iron Merchant's Office, a

JUNIOR ASSISTANT. Salary to commence at 40s. per annum. One accustomed to builders' goods preferred.—Address, stating age and experience, to H. H. Office of "The Builder."

WANTED, a thoroughly good practical

FOREMAN of BRICKLAYERS. One experienced in vaulting and freight work preferred. None whose character for ability and sobriety will not bear the strictest investigation need apply.—Application to be made in writing, with references and wages required, to GEORGE DEW, Builder and Contractor, Cladford, Gloucestershire.

WANTED, in a RETAIL TIMBER YARD,

a respectable Man, who can take charge of the yard, and spend his spare time in travelling.—Apply by letter, to A. J. Aylford-street, Pimlico, S.W.

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The Builder.

VOL. XXX.—No. 1523.

Pressure on Foundations.

EFFICIENCY of foundations, it is almost needless to say, is ever the first source of anxiety to the architect and builder. Nor is that anxiety unjustifiable. When it is required, as so often happens at the present day, to erect gigantic edifices on weak and treacherous soils, it may well tax the highest constructive skill to supplement the weakness of the natural foundation by such artificial preparations as shall enable it to sustain its massive and costly burden with safety.

Even in constructions of an ordinary character, the same remarks apply, though in less degree. The safety of a structure may be imperilled, or its cost unduly increased, according as its foundations are laid with insufficient stability, or with provision for security in excess of its requirements. When it is considered, therefore, that the precise conditions of safety are generally capable of being calculated with as much practical accuracy in this as in any other part of a construction, it is unpardonable that any liability to danger or loss should exist from the imperfect comprehension of a subject of such vital importance.

Yet it cannot be denied that there appears in many instances, much deficiency in the knowledge of the first principles which regulate this branch of the constructive art. The practice, not only of the workman, but of the otherwise educated architect, is often based upon empirical, rather than upon exact and scientific principles, so far as the laying of foundations is concerned. It may therefore be advisable to attempt to classify these principles in a somewhat systematic manner, so as to be available for convenient reference in the majority of cases occurring in practice.

The nature of the soil to be built upon is evidently the first object for consideration; and it is scarcely necessary to say, that soils vary in their strength or bearing-power as much as in their geological formation. They range from a soft or semi-fluid condition,—such as that of marsh, mud, or silt,—through all intermediate stages, to the condition of the hardest rock. The inherent strength of the soil itself, and the load to be sustained upon a given unit of its surface (which is usually taken in practice as a square foot), has accordingly in the first place to be considered.

Where the soil is incapable, from its inherent capacity of resistance to pressure, of sustaining the incumbent load of the structure to be placed directly above it, it is then the duty of the constructor either to increase its bearing power by artificial applications, which shall augment the strength of the bearing surface immediately under the superstructure to the required extent; or else, by widening the area of the foundations, to extend and enlarge the bearing surface to such a degree, that that surface shall contain within it the necessary resistance to pressure which the circumstances of the case require. The means by which these results are arrived at will form the second branch of the inquiry.

The materials commonly used for these purposes and the amount of bearing-power obtained by their use, will also require to be described.

Soils of a soft and even semi-fluid character are capable of being treated with great success, as regards the improvement of their capacity for sustaining structural weights. The well-known instance of carrying the original Liverpool and Manchester Railway over the Chat Moss is one of the most remarkable cases of this nature. The fluid moss along the intended line of railway was first thickened by throwing into it a quantity of earth, just as water is thickened into paste by the addition of flour. When the soil was thus improved, though still in a partial state of fluidity, it was covered by a broad and thick layer of fascines, which floated on the viscous soil like a raft upon water. Upon this the railway was formed; and the result amply justified the marvellous foresight of the great engineer who introduced the railway system into England.

On reviewing this operation, it will be seen that a double process contributed to the successful result. As the original soil nearly approached to the fluidity of water, it might be assumed to be incapable (or nearly so) of carrying any superstructural weight. The first operation, therefore, was to increase the solidity of the soil by the addition of a more solid material, which, commingled with it, should impart to it a certain amount of sustaining power. This having been effected, the next operation was to cover the improved soil with layers of fascines of such a breadth that the surface which they covered should contain an inherent bearing-power sufficient to sustain the weight of the railway and the trains. It then became a safe operation to lay the railway on the fascines.

This leads us to the principle on which the bearing-power of all soils should be calculated. Every soil is capable, as above mentioned, of sustaining a certain weight upon each unit of its surface, which varies in a scale proportionate to the solidity of the soil. The bearing-power of a soil approaching in fluidity to water itself may be assumed, as above mentioned, at zero, or the lowest point in the scale; and the bearing-power of the hard rocks may be assumed as the highest; and if these bearing-powers be taken at from 0 to 30 tons per square foot, it will be sufficiently accurate for practical purposes. Between these extremes lie all the intermediate soils of weak rocks, shale, gravel, sand, clay, loam, silt, &c.; with the varying degrees of bearing-power inherent in each. Supposing, therefore, that the soil is capable of bearing a pressure of three tons per square foot with security, it follows, of course, that either one square foot of foundation must be provided for each three tons weight in the entire structure; or, if this be impracticable, that the bearing-power of the soil must be increased by such means (piling, for instance), as will bring it to the requisite standard of sustaining force.

The first operation, therefore, is to ascertain the weight of the structure. This is done, it is hardly needed to say, by calculating the cubical quantities of the whole of the various materials in the structure, and ascertaining from thence the exact weights which will come upon the foundation. If these weights be not equally distributed, care must, of course, be taken to ascertain the proportion that weight carried on each part of the foundations, and of proportioning the area of that part accordingly. Suppose, for instance, that in a warehouse the floor-joists run from back to front; it is then evident that the back and front walls only will carry the weight of the floors and of the goods placed upon them, which will render it necessary to strengthen correspondingly the foundations of the front and back walls above those of the sides. Again, suppose a shop-front to be carried on an arch, or a girder having its bearings on piers at each

end of the building, it is manifest that the weight of the whole superincumbent structure, instead of being distributed equally along the front wall, will be carried on the end piers only, the foundations of which should be made of a suitable capacity.

The weight on the foundations, so calculated, should also include all extraneous loading which may be incidental to the structure. Thus, in a bridge, the foundations of the piers should include, not only the weight of the materials of the pier itself, but that of the girder or arch, with all the supplemental parts which compose the superstructure of the bridge; and also the extraneous loading which comes upon the bridge; the whole being, of course, ultimately supported on the pier foundations. This extraneous loading varies in amount according to the nature of the structure, and can generally be ascertained beforehand with tolerable accuracy. Thus in a railway-bridge it is usual to calculate the weight of the trains at from 1 ton to 1½ ton per foot run, for each single line of railway. On a road bridge, the usual load assumed is from one half cwt. to one cwt. per superficial foot; the load of a crowd of persons standing as close together as practicable having been ascertained by many experiments to be a little more than three-quarters of a hundred weight per square foot. In a warehouse the weight on the floors should be ascertained in each case, as it varies according to the nature and quantity of the goods which it is required to store; about four or five cwt. per square foot, being, perhaps, an average amount. In ordinary floors, the weight may be safely assumed as similar to that on a road bridge; it being understood in both these cases, that the effect of a crowd of persons in motion considerably increases the strain on the structure, for which reason a load of 1 cwt. per square foot is more frequently assumed in practice as a safe amount.

The weights on the foundations having been thus ascertained, and proportioned to each part of the structure, it is then necessary for the constructor to determine the number of tons pressure per square foot, which he will put upon the soil on which the building is erected. In this respect it is curious to observe what great variety appears to exist in the practice of the most eminent engineers. Take, for instance, the pressure of foundations in solid London clay, which possesses, perhaps, a greater amount of uniformity of bearing-power than any other soil ordinarily met with; and it is on record that the greatest engineers of the present day have varied no less than from 1 to 8 tons per square foot in the pressure which they allowed to be placed on the foundations of structures of the highest importance on London clay. In general, however, it may be stated that this soil will compress to a considerable extent, though with tolerable uniformity, under greater pressures than 6 tons, and about 4 tons per square foot is recommended in practice as a safe pressure upon stiff clay; the foundations being presumed to be laid at such a depth as to be unaffected by the weather, or by any external cause, such as that of water settling in them which will soften the soil on which they rest; or of deep excavations being made in their immediate vicinity, which will allow the clay under pressure to escape or ooze away from beneath the building.

The weaker descriptions of clay soils, such as loam, for instance, and also the stronger description, such as indurated clay or shale, as well as soils of similar strength, such as chalk, &c., vary in bearing-power in degrees which it is impossible here to indicate, and the practical judgment of the constructor will determine in each case the amount of pressure they can be trusted to sustain.

The beds of solid gravel which overlie the London clay in many places, and are of common occurrence elsewhere, form, when of sufficient

thickness and uniformity, one of the firmest and most unyielding of the ordinary soils. They may safely, under these circumstances, be loaded with double the pressure which can be put upon London clay with safety. Where they occur but casually, however, or in thin and partial beds, it is preferable to carry the foundations through them till a uniform soil is reached; as otherwise they may give rise to unequal settlement and to damage to the structure in consequence. The soils of sand will be next considered. They vary from a compact close sand with a clayey hind perfectly impervious to water (which is found in the bed of the Thames and else where), through all conceivable varieties of coarseness, looseness, and porosity. Porous sand soils, as a rule, are unaffected by stagnant water, but easily capable of removal by water in motion, and they require extreme care at the constructor's hands where there is any probability of the latter occurring. In this case, the only course is to lay the foundations so deep that there shall be no probability of their being laid bare by the scouring power of the current. Perhaps the most difficult of all engineering work is the foundation of bridge piers in a deep soil of this nature which is subject to the action of running water in a river; and the contrivances adopted in such cases for securing the foundations present the most interesting examples known to us of modern engineering resources.

Up to a comparatively recent date, the means adopted in cases of this kind have been usually the erection of coffer-dams round the space to be occupied by the foundation of the pier; and if a solid soil could thus be reached within a moderate depth, the operation, though costly, became one of tolerable certainty. The piles forming the coffer-dam being driven into the solid soil, the inside was pumped dry and the loose material within the dam was removed, when the foundations were laid as on dry land. Where, however, from the porosity of the subsoil it was impracticable to remove all water from the interior of the dam, concrete made with hydraulic lime or cement was deposited in the bottom and raised till it reached the level of the lowest water-surface, when the building of the pier was continued upwards in masonry or brickwork till the level of the bearing of the superstructure was attained. It sometimes happened, however, that a solid bottom was unattainable by any of these means; in which case the usual course was to drive long piles all over the foundation surface, over which the concrete or masonry foundations (as the case might be) were laid; this process increasing to a large extent the bearing powers of the soil, even in cases where the piling failed to reach more solid strata. The piles forming the coffer-dam were cut off below the lowest water-level, instead of being wholly removed; the underground portion of them thus forming an additional protection to the pier foundations against the effects of the current.

It is evident that in this case the natural sustaining force of the lowest soil reached must be the measure of the pressure to be allowed on the foundation area of the structure; except in the case of piling as above mentioned, where the friction on the sides of the piles, as well as the resistance of their points or lower ends to sinking under the superincumbent weight, increased the sustaining power of the soil. We will carry on the subject in our next.

THE WARWICKSHIRE MOVEMENT.

A NOVEL feature has recently appeared in the developments of our social progress. For good or for evil, a certain disintegration of classes, or rather of class organisations, has for some time attracted the attention of thoughtful men, as one of the most significant characteristics of the day. The number of trade-unions, strictly so called, has within the past few weeks been augmented by a union of agricultural laborers. The fact is one of no ordinary importance. We do not propose to follow the lead of some of our contemporaries, and read to the rural labourer a homily on the blessedness of his lot, and the crying sin of ingratitude. Still less do we mean to excite the working population by expectations that can never be fulfilled. We wish to look at a great national phenomenon in the clear light of historic impartiality. A great evil in all political discussions is the absence of dispassionate investigation. Public speakers and public writers are but too apt to treat imperial questions from the very narrowest standpoint of class or of party views. A certain balance may result from

the pitting of advocate against advocate. But that result rather resembles the oscillations of the pendulum than the stability of a well-poised structure. When all are more or less advocates, the tenure of the scales of justice is committed to blind chance, or to the no-less blind decision of an ephemeral majority of voices. Unless more of the judicial spirit, and less of that of the special pleader become developed among our public men, we cannot but anticipate bad consequences.

Great organic changes in national condition may be effected in two very different ways. They are either the natural consequences of growth, whether in number, extent of territory, or the physical or intellectual improvement of a people, or they are the result of legislation; or it may be said, they are either the causes or the consequences of a change of laws. In the former case, this change is gradual, often almost imperceptible,—always irresistible. Such, for instance, was the gradual change with regard to the right to dispose of property by will that developed itself in the history of Rome. Very often, in such cases, the letter of the ancient law if indeed it be written, remains intact, while the spirit of the innovation has deprived that venerable form of its original efficacy. At other times, a law, admitted to be *efete*, is by common consent removed from the statute-book. This silent and necessary change in the laws of a people, a phenomenon resembling the organic growth and change of a living being, is that which accompanies the vigorous growth and full maturity of races. It is uninitiated by party or personal selfishness; and as it is the result of actual change, and not the effect of a mere vague wish to better matters, it is unattended by convulsion or misfortune. In the ancient world, and to this hour, among Semitic and Turanian races, the hatred of innovation is the strongest bond of the social system.

On the other hand, we see, especially among the Aryan nations, and most notably in France during the past century, the rapid and gigantic development of the opposite method,—a development that has had a prodigious influence on our own national condition. This method may be called the attempted application of the logical principle to politics. But, unfortunately, it is applied after the fashion of the scholastics and commentators of the Middle Ages, rather than after that of the earlier inductive philosophers.

It has been impossible for any writer whose thoughts are occupied with the political future of this country (using the word in its high and proper sense), to doubt that the time must come when the agricultural labourer would experience the influences of that great revolution which is stirring the very framework of society. It was a point on which, however, wisdom and patriotism prescribed a watchful silence. It is easy to fire a rick; it is very hard to put out the flame. The rural population has been almost left out of all calculation by party legislators. The rustic was thought to be *adscriptus globo*.

The old-fashioned farmhouse, where the hinds congregated at night-fall in the capacious kitchen, where the farmer headed the board and his wife regulated the sufficient food, drink, and lodging of the humbler members of one great family, is no more. The labourer is driven to his cot, and told to live on his wages. Hence, as a natural consequence, he marries before he is well out of his teens. Poverty comes on him armed, with his rapidly increasing family. Boys and girls are over-weighted with more boys and girls not a score years their junior. Nor is poverty the worst of it. All the genetic influences of unconscious education, whether of the ploughboy by the farmer's children, of the men by their masters, of the women and girls by their mistresses, of the youth or maiden of gentle blood by the nobleman's castle, are passed, gone out of date. Hence the yearly increasing savageness that marks the manners of many. Hence, in some measure, the want of earnestness and of realism often evinced by the higher classes. Hence the spread, to our remotest villages, of the pestilential fashions set by the *demi-monde* of Paris; and the disappearance from our island of our once unrivalled domestic servants.

The question now arising in Warwickshire is but one of the natural results of this state of things. Society has left each class to take care of itself. Volunteer teachers have loudly insisted on the inauguration of the reign of what the Americans call the almighty dollar. The farmer, the tradesman, the artisan, is each a different man from his grandfather. Luxury of living, of

which the latter would have been ashamed, is now an every-day thing. The bond with the labourer is loosed; and the labourer is looking at the matter, at last, from his own point of view. He may not exactly appreciate the position, but who is to blame for forcing him into it? The state of the matter is this. That which the opponents of all education, all culture, all change, predicted, is coming to pass. It was inevitable that such should be the case unless due precaution were taken. The hands of the clock cannot be stopped without stopping the entire mechanism. That a rural labourer, if educated, will not be content to remain in the position of an uneducated rural labourer, is obvious to the sleepiest capacity. The natural remedy suggested by the blind—"Don't educate," is out of the question. We need not discuss its absurdity, because it is one of the things that are at an end. We have to see how the new state of things must be dealt with. The social movement, by virtue of which each class or craft of Englishmen is now seeking how to benefit itself, as a class, has at last reached the agricultural labourer. Rightly or wrongly (we are forced to say rightly), they are discontented with their condition. They have heard what is going on elsewhere, and they are attempting a movement of their own. It will be remarked that this movement originates, not among the most helpless and abject, but among the best paid and most comfortable of this class of peasantry. It must further be remarked, that the movement originates—not in consequence of, but at the same time with, the introduction of a great revolution in our entire agricultural system. The ploughman now may be regarded as in a position similar to that held by the scribe, or copyist, at the date of the invention of printing; to that of the weaver at the time of the invention of the power-loom; to that of the stage-coach proprietor at the time of the invention of the railways.

This coincidence has a double effect. On the one hand, the substitution of steam power for manual labour may be looked on as a means of making the farmer, to a certain extent, independent of the labourer. On the other hand, all experience leads us to anticipate that the performance of a large quantity of heavy work by steam power, will not only set free a certain amount of rude labour, but will further cause a demand for a much larger amount of labour of a more skilled kind. For one man who is no longer required to thrash, to winnow, or to pitch trusses of hay or straw, three men will be required for the performance of those duties which no machine can discharge. Brute power is no longer looked for from the labourer. Three times as much of skilled labour will be asked at his hands.

Such, then, we take to be the actual state of things, regarded from that point of view which will, hereafter, be taken by the historian. What is the practical outcome? A word of counsel to both farmer and labourer.

We would ask the farmer to put a home question or two to himself. Does he remember his grandfather's time? How is he, himself, now dressed, and mounted, and fed, and amused, in comparison with his father in his boyish days? How do the occupations of his wife and daughters compare with those of his mother and aunts? And, at the same time, what is the change in the condition of his labourer? Let those to whom such a comparison suggests disagreeable ideas remember how far they are accountable, in the court of conscience, for dealing between man and man. Any progress that is marked by an increasing divergence in the comfort and welfare of classes that are really interdependent, is, disguise it as we may, only progress to destruction.

Again, from a low, but yet solid, point of view, let the money question be regarded. Science now offers to the agriculturist the means of increasing his returns to an extent altogether disproportionate to that increase of outlay which she counsels him to incur. We stated some time ago,* that the average return of the cultivated land in the kingdom is taken at 75s. per acre. From poor land at Thytres, Mr. Mechi has raised crops, in animal and vegetable produce, to the value of 250s. per acre. The average amount spent in labour throughout the country is stated at 15s. per acre. Mr. Mechi's outlay is, including interest on money sunk in improvements, 56s. per acre. If we take the total acreage under all kinds of crops in Great Britain (which have increased by half a million of acres in the past

* See *Builder*, No. 1499, p. 837, and No. 1490, p. 460.

year), we then find the actual outlay on agricultural labour to amount to about 35,000,000 sterling, while there is room for an application of labour to the amount of 130,000,000 sterling, with the result of trebling, not the outlay, but the income! This is what lies before the farmer; but it is to be attained, not by killing the goose—not by compelling labour to emigrate—but by such an intelligent and kindly combination of machinery and labour—of steam power and human agency—as is impossible in the absence of a well-housed, well-fed, thriving, happy peasantry.

To the farmer, then, we say,—As a man of sense, meet the wants of your labourers as far as you can; and, whatever else you do, meet them at all events as a Man. Let the kindly feeling that should exist between the elder and the younger sons of the same soil not be allowed to disappear.

To the labourer, on the other hand, we have a word of advice. All good men, all wise men, all your true friends, wish to see your position improved,—nay, more, they will most rejoice if this improvement is your own work. But do not be misled by extravagant statements. You can only live and thrive, in England, as part of one great agricultural family. You cannot extort, at the point of the pitchfork, more than the farmer can actually afford to pay. Discuss the matter fairly and moderately. Wages are not matters of taste or of fancy; they are elements of the cost of production. It is only by making it worth the while of the farmer to throw capital, energy, and whole-hearted industry into his pursuit, that either you or he can thrive. True, there are backwoods enough to which you may emigrate,—broad forests, damp swamps, rocky mountains, and the like, which, some time or other, by the intelligent application of immense labour, will be laughing fields of plenty. But hard labour is necessary there, as well as here. There is great question how far any of you can better yourselves by trying an unknown country, soil, and climate. One thing is pretty sure, you will get on nowhere without industry, good conduct, and intelligence. Let these be your characteristics at home. Let whatever the schoolmaster brings be added to the sterling qualities in her sons that have made Old England what she is; and your new country will be found at home,—found in such a paradise as earth would never excel, if the agriculturists of England would only do justice to her soil.

LEASES v. YEARLY AGREEMENTS.*

It may seem, at first sight, that I am to some extent retreading the ground already traversed by Mr. Squarey, in his paper read before this institution two years ago, entitled "Farming Covenants." Mr. Squarey limited his remarks on that occasion to "the consideration (to quote his own words) of the principles which should govern farming covenants;" and although, in the resulting discussion, I am aware that reference was made incidentally to the relative advantages of leases and yearly agreements, the question which I venture to bring under your notice to-night was not touched upon in the paper itself.

My attention has, for some years past, been more or less directed, in its own practice, to the question of leases and agreements, but especially so in connexion with an essay written by me for the Royal Agricultural Society, and to which I need not more particularly refer.

I may candidly admit, in starting, that I am a convert to the opinion that an annual tenancy, regulated by a wise and liberal agreement, unembarrassed by numerous or vexatious conditions, is to be preferred to a lease, whether regard be had to the interest of the landlord or of the tenant. This conviction, however, will not influence me, I trust, in my endeavour to set forth with fairness the advantages and disadvantages, as I conceive them, of both leases and yearly agreements; nor lead me into any of those involuntary misrepresentations of fact into which the most impartial person may fall, when under the influence of strong convictions either in one direction or the other.

I may premise that I shall not venture in this paper—neither do I think it possible to do so—to lay down any fixed rule for the determination of the kind of tenancy which shall be the best in all cases. Peculiarities of soil, the different cir-

cumstances under which farms are let, the personal habits and dispositions of both owners and occupiers, are so various that no general principle can be asserted as the best in all cases. It will be sufficient for my purpose if I can pave the way, by a careful setting forth of *pro and con*, for the determination by others more able than myself of some rule which will serve to regulate a *majority* of cases.

It may assist us in arriving at a just conclusion if we consider for a moment the true position of landlord and tenant, as such.

The landlord has land which he cannot or does not wish to farm himself; the tenant, on the other hand, has no land, but is endowed with certain capital and skill which he is ready to employ in its cultivation. The requirements of both parties, therefore, induce to an arrangement of the basis of mutual benefit. So far the matter is clear; but in proceeding to make an arrangement of the kind, we are at once confronted by the fact that the interests of the two are not on all points identical, and hence arises the necessity for an agreement.

Abstractedly considered, the tenant is, in the very outset, in a position of some disadvantage, being in many cases compelled, by the competition for holdings, to accept conditions from the landlord under his agreement which, were the position of the two parties to the transaction absolutely similar, he might decline. The landlord practically dictates his own terms, which the tenant accepts or not, as he chooses,—the only restriction upon the landlord, in this respect, being the necessity for letting his land and living by his rents, a restriction which, under a system of excessive competition for holdings, is nearly inoperative.

This inequality of conditions may, in years gone by, when the processes of agriculture were very much less complex, have operated without any particular detriment to the interests of either party.

In those days the system of farming was very different. There were no artificial manures, cake, and corn used,—or, at all events, very little,—and the landlord had to stipulate that his land should not be injured by the unnecessary removal of its mineral or staple constituents,—the guiding principle of farming being, not the improvement, but the maintenance of the land in its then present condition.

Under the modern system of agriculture, all this is changed. The tenant, no longer a maintainer but an improver,—and having, since the restrictions on the import trade were abolished, to compete with the world,—is compelled to leave the beaten track, and avail himself of all the aids to increased production which modern science has placed at his command. It is natural, under these circumstances, that he should seek some form of arrangement less hazardous to his interests than was formerly sufficient.

The landlord, moreover, perceiving the probable benefit to his land, may be conceived as being, on his part, desirous of meeting with an improving tenant; and thus the inequality of the conditions under which the parties treat, and to which I have before alluded, may be to some extent redressed. The landlord, however, is anxious to decide to what extent he can, in justice to his own interest, meet the tenant's wishes. In endeavouring to decide this question, it is necessary to look at both interests, and determine, if we can, the exact relation in which they stand to each other.

Before I proceed to do so, I may premise that, in modern farming, the land may be considered a mere manufactory for the conversion of the water and the gases of the atmosphere into corn and meat; and it is to these sources that the farmer must look mainly for his profit,—having to return to the land more mineral constituents than he takes from it, and often, in the case of corn, at a higher price than he sells it at.

The land, according to this view, is a machine which it is necessary to keep oiled and in the best possible state by draining, manuring, and—a fact of primary importance—in such a mechanical condition as to admit of the free penetration of the air, without which both water and manure will fall to act.

This being so, we, as land agents, are looked to by landlords to protect their interests, and shall do so most effectively by giving the tenants every facility for managing the land according to the principles of husbandry which modern science has proved to be the best.

While on this branch of my subject, I may venture to observe that the difference between a good and a bad farmer is rarely, if ever, fully

appreciated. Regard is seldom had to the fact that, in the case of a good farmer, who uses a great deal of corn and manure every year, the producing power of the land increases annually at something like the rate of compound interest.

Suppose, for instance, that the good tenant in question grows the first year, by the use of manure, an extra 10 cwt. of straw, or 10 tons of roots; the next year he has the manure made up from these extra crops (provided, of course, that they are not sold off the farm) in addition to the manure he may purchase. He has thus the means of obtaining a still larger crop the next year, without an increased rate of outlay.

This rate of increase is maintained year by year, to the manifest advantage, not only of the tenant, but ultimately of the landlord also.

The bad tenant, on the contrary, who farms from hand to mouth, as it were, does nothing more than maintain his land in its then condition, whatever that may happen to be, and not infrequently fails in doing even that.

I will now proceed to lay before you, as concisely as I can, what I conceive to be the advantages and disadvantages of a lease to the landlord and the tenant, adding thereto such remarks as may occur to me under each head.

The following order of consideration will be most convenient:—

- 1st. A lease: its advantages to the landlord.
- 2nd. " its advantages to the tenant.
- 3rd. " its disadvantages to the landlord.
- 4th. " its disadvantages to the tenant.

The Advantages of a Lease to the Landlord.

1. It secures a good tenant for a term of years. Every one will agree that this is a most desirable object, and that no trifles should be suffered to stand in the way of its attainment.

2. It generally insures an increased rental at the commencement of a term. This fact has sometimes been overlooked in the discussions of this question which have taken place here and elsewhere. My experience seems to show me that leases, whether for short or long periods, are upon renewal accompanied by an increased rental,—a circumstance explained by the fact that the tenant is in the position of an applicant for a continuance of the occupation.

3. It saves the investment of the landlord's capital in improvements; while it often happens that he resumes possession, from some cause or other, before the end of the lease, and reaps the benefit of the tenant's improvements. Many estates are so embarrassed that leases are granted for the express purpose of inducing tenants with capital at their command to improve the land. This case is met, no doubt, to some extent, by the Land Improvement Act, as well as by several private Acts of Parliament in the hands of companies, but it is not of infrequent occurrence.

4. It is a means of inducing tenants with capital to invest their money freely. Very few men of capital care to take a farm out of condition without security of some kind to enable them to recover their outlay upon improvements.

5. It saves the landlord, who does not employ an agent, the trouble of repairs and other matters incidental to yearly tenancies. I have met with many instances where leases of detached farms were granted with this object.

These are, as far as I am aware, the leading features of advantage attaching to a lease, as regards the landlord.

I will now advert to

The Advantages of a Lease to the Tenant.

1. It is a security that he will have an opportunity of getting back the money he may invest in improving the land.

2. It secures him a farm for a fixed number of years,—a great consideration, if the farm be a good one and the rent moderate.

3. It enables him to do anything he may require in the way of improvements,—a fact of great importance to a tenant with capital which he is willing to expend in that way, and under a non-improving landlord.

4. It secures him in his farming operations from undue interference on the part of the landlord, and affords him more general independence.

In many cases owners, having let their farms on lease, trouble themselves no more about them until the expiration of the term (a circumstance of some importance to a tenant who is disposed to try improved methods of cultivation, which might otherwise be resisted by the landlord).

Now let us turn to the reverse of the question, and summarise, as briefly as possible, the leading

* By Mr. Clement Cadie, Read at the Ordinary General Meeting of the Society of Surveyors, April 8th, 1872, Mr. Richard Hall, President, in the chair.

objections to a lease, as far as the landlord's interest is concerned.

The Disadvantages of a Lease to the Landlord.

1. *It alienates the land from his possession for a number of years.* With many landlords this is an important consideration, especially in cases where they reside on the estate.

2. *It hampers him if he wishes to sell, effect an exchange, or carry out improvements.* This is often an inconvenience of a serious kind to the landlord, who not infrequently, having once experienced a difficulty of the kind, becomes unreasonably adverse to all leases.

3. *It prevents him from getting rid of a bad or unprofitable tenant.* This is probably the most serious of all the drawbacks to a lease. Of course, in the great majority of cases the force of the objection lies in the incompetence or the poverty of the tenant; but instances are not rare in which tenants have been known to take farms for the express purpose of rendering themselves so obnoxious to the landlord as to induce him to buy them out on their own terms. Others, from some disagreement with the landlord or his agent, deliberately set themselves to oppose his wishes and interests in every possible way.

4. *It lessens to a certain extent the general or local importance which land confirms upon its possessor, by diminishing his power and influence over his tenancy.* The social value of this influence is very fairly measured by the low rate of interest which many persons who purchase land are willing to make out of their money.

I will now set forth

The Disadvantages of a Lease to the Tenant.

1. *It invariably results in an increased rent when the time comes for its renewal.* This rule is almost without exception; and it will be found, I believe, that in districts where leases are customary, the rental of the land ranges higher than where annual tenancies prevail.

2. *It precludes him from getting rid of a farm which he may find too dear, or which may prove to be unprofitable.* I have known instances in which tenants have actually sought a declaration of bankruptcy, and have gone to prison, in order to get rid of a lease.

3. *It often involves, in case of death, the loss to his family of the money expended in improvements, from the inability of the survivors to carry on the lease.* Many leases contain, as you are aware, a provision that a tenant is not to part with possession, or that in case of death the lease is void. In such a case a lease, so far from being an advantage to the tenant and his family, is often a downright misfortune.

4. *It often induces a tenant to spend money upon improvements which should more properly fall upon the landlord.* Instances are numerous where tenants, with a very imperfect knowledge of the capabilities of their farms, commence at once to spend money on improvements which, with a few years' experience of their holdings, they would leave to the landlord, as requiring a longer period than that included in the lease to give an adequate return for the outlay.

Thus far I have summarised the advantages and disadvantages to both landlord and tenant arising from ordinary leases and agreements.

I will now venture to place before you, for the purpose of discussion, the question of compensation, or, as it is ordinarily called (I think erroneously) "tenant-right," submitting it to your judgment to decide what amount of advantage, or the contrary, to both parties, the adoption of the principle would entail.

I take exception to the term "tenant-right," on the ground that it is not clear whether such compensation is not really more in favour of the landlord than the tenant. The tenant who feels that, whenever he leaves his farm, he will be fully compensated for the unexhausted improvements, has no hesitation in continuing to spend his money in effecting them.

We have to bear in mind that while a tenant continues in a farm he is every year (in effect) an outgoing and incoming tenant, and that whatever improvements he makes he does so in the expectation of reaping benefit in the future. His position in this respect is the same if at the end of any particular year another man is incomer instead of himself, and hence it is far better (in the interest of all parties) for the new tenant to pay in money for the unexhausted improvements of his predecessor than for the outgoing to have the trouble of exhausting the land, while his successor, in the end, probably expends a much larger sum in bringing the land back into condition than would represent a fair compensation to the outgoing in the first instance.

I have seen many instances in point, and it is difficult for any one, without experience of the kind, to realise the trouble and expense of restoring to a proper state a farm which has been left in a foul and bad condition, to say nothing of the loss in rent and profit in the meantime. My experience teaches me that it is far better for a tenant to take a farm in good condition, no matter what (in reason) may be the cost of doing so, in the shape of compensation to his predecessor.

Let us look at it from a landlord's point of view. Under present circumstances the landlord, with a farm to let, finds it (even at the end of a lease), in its worst possible appearance, and sends his valuer to look at it when it is in that state. Now, it is patent to every gentleman present, who is a valuer, that it requires considerable knowledge and experience to determine whether a farm is naturally poor, or has been made so by over-cropping. We know that it is not every one who values a farm who is possessed of that nice tact and discrimination necessary for the estimation within 1s. per acre of what a tenant should pay. It is manifest, therefore, that the better the condition of the land at the expiration of the tenancy the better will it be for the landlord.

For this reason (and owing to the periodical running down of the land before alluded to), I have no hesitation in saying that the landlord is more interested in a good system of compensation than the tenant. The latter does, no doubt, in some cases, obtain his farm cheaper under such circumstances, and manage to get what is commonly called "his pull" out of the land before he leaves. Nevertheless, I maintain, as I have before shown, that a system of compensation for improvements would, in its results, have better answered the purpose of the tenant also.

A system of farming which had regard simply to the present crop, would neither be practicable nor remunerative. No one would think of putting on his land the manure necessary for one crop only; his husbandry of that kind would be in direct defiance of every rule of modern agriculture. Thus the benefit of "bonns" applied to the land is not fully exhausted for eight or ten years; farmyard manure for three or four years; consumption of corn and oil cake for two or three years (and often much more, especially on the pasture lands), and other things in proportion.

Is it likely, then, that the tenant will leave years of this unexhausted benefit to his successor without an effort to recover it in some way or other in defiance of agreements?

Agreements, no doubt, have their uses; but it is undeniable that an instance of perfect compliance with every clause, which an agreement may contain, might be looked for in vain. Personally, I have never met with an instance. Restriction clauses are made for bad tenants not for good ones, and are useful, in as far as they enable the landlords to restrain tenants who are disposed to use the land improperly. I am convinced that the adoption of a well-considered system of compensating agreements would operate more beneficially in all directions than the most elaborate network of covenants and restriction clauses.

Under such a system the yearly tenant would enjoy much of the security of a lease, and expend his money freely in the improvement of the land; the property of the landlord would be maintained in continuously good condition; much of the spirit of scheming and evasion which is provoked under the present system, by a not unnatural desire on the part of the tenant to reap the fruit of his own enterprise, would be obliterated, and a general feeling of confidence and mutual interest would be established.

I have endeavoured to show that a system of compensation is beneficial to both landlord and tenant, as applied to yearly tenancies; but I feel that it might also be introduced into leases; for the same arguments apply to the end of a lease as to the determination of a yearly tenancy; and, my opinion is, that this compensation should extend not merely to barely recouping the tenant his outlay, but to making it his interest to farm the land best at the end of the lease.

Before leaving this part of the subject, I will allude, for the sake of discussion, to the system (advocated by many) of giving two years' notice to quit. The only advantage of that system appears to be that, in the absence of a desire to run the farm out, the tenant thus secures a longer time in which to look out for another farm.

A NEW THEATRE IN SOUTH LONDON.

A new theatre, of large dimensions, to be called the "Imperial," is about to be erected on the Surrey side of the river, the locality being Newington Causeway, about midway between the Elephant and Castle and the Borough-road Stations of the London, Chatham, and Dover Railway. The principal entrance to the building, which has been designed by Mr. Albert Bridge-man, will adjoin the large wheelworks of Mr. E. H. Bayley. Architecturally, the new structure will be an ornamental feature amongst the surrounding buildings. The style of architecture adopted is an admixture of the French and Italian, the principal façade being about 40 ft. in width and 70 ft. in height, the elevation consisting of six stories. The materials used in the construction of the lower portion of the building will be polished granite, a colonnade extending across the entire width of the structure. The upper portions of the elevation will be of stone, with polished granite facings, surmounted by an ornamental pediment. The structure, from front to back, will be of great depth, extending to a distance of 300 ft. from the front to the rear, which will be in the Borough-road, where the stage will be approached. The interior of the building will mainly be appropriated to the auditorium and stage; but a considerable portion will be set apart for saloons and restaurants. These saloons will be in the front part of the building, each saloon being about 30 ft. by 50 ft., and connected with the pit and the several tiers of boxes, four in number. The auditorium sweep,—horse-shoe in form,—will be 75 ft. in length from the extreme back to the proscenium, and 66 ft. in width. A special feature in the auditorium arrangements is that the pit, as well as the boxes and gallery, will have an unusual fall in the direction of the stage, thus enabling the whole of the audience, in every part of the house, to have an easy and commanding view of the performances. The stage will be of large dimensions, occupying an area of 84 ft. in depth, by 30 ft. in width, and being 40 ft. in height. The stage and business arrangements will be on a comprehensive scale, if, as we learn, there are to be thirty dressing-rooms, in addition to a spacious green-room, manager's room, property room, painting-room, and scene-dock. In his plans for the construction of the building, the architect has produced a novel design for the roof. It will be formed of zinc, and is so arranged that for the purposes of renovating or redecoration it can be taken down without the necessity of scaffolding. It is stated that nothing but performances of a high class and sterling character will take place at the "Imperial," and it is confidently expected that the extensive facilities which now exist for reaching the theatre from every part of the largely-populated suburban portions of South London, will secure for the new establishment an ample amount of support. The ground is now being cleared, and in the course of a week or two the contractors, Messrs. W. & B. Lacey, of Clapham, will commence the building.

SOCIETY OF BRITISH ARTISTS,
SUFFOLK STREET.

If the quality of pictures now on exhibition, or preparing for exhibition, in London were at all commensurate with the quantity, we should have great occasion for jubilation. Twelve exhibitions, we think, are now open; many more will be inviting visitors in another week or two. Were all as good as we could wish, it is evident that we could devote but small space to each. Nor do we hold that the absence of goodness, unless in the case of any flagrant outrage on taste, is a justification for departing from a scanty measure of space. As far as the paintings are concerned, it would often be more easy for the critic, as well as more amusing for his readers, to point out faults, than to praise non-evident merit. But the thought of the artist who may have done his best,—poor though the best may be,—often checks the bitter word on the very nib of the pen.

The forty-ninth Exhibition of the Society of British Artists opened on the 8th of April, with the respectable number of 529 oil-paintings, 316 water-colour drawings, and thirteen specimens described as "Sculpture, &c." Of the members and associates of the Royal Academy, the president contributes one production; Mr. Leighton, two studies; Mr. Marks, two pictures; and Mr. Redgrave and Mr. Watts, each one. Of these, the portrait of an anonymous subject, by

Mr. Watts, is perhaps the most striking thing on the walls. The most original productions, we take to be two water-colour landscape drawings, Nos. 825 and 836, by E. A. Pettit. They represent scenes in Cumberland, "Honeister Crag," and "Sly Head Pass,"—striking little bits of our wilder lake scenery; but the remarkable part of them is the manner in which some blue body-colour,—cobalt, we take it to be,—boldly, not to say coarsely, thrown on, produces a very happy effect. Still, no such drawing would have attracted more admiration than two. A new effect may be either a stroke of genius or a happy accident. In the former case it is dangerous to repeat it; in the latter, fatal. "Evening" (79), by A. Cluitt, is a bright, clear bit of landscape, although it wants atmosphere. "Dolly Varden" (86), by W. H. Weatherhead, is a subject very pleasing in its motive. The sprightly maiden is attired in a charming yellow brocade, and leans against a style. Mr. F. T. Lott gives the "Pandvortje, Bruges," a peep at this semi-deserted capital of old Flemish industry that is bright with a light we never saw gild the brickwork of its towers. This is a picture that will mellow by time. There is a want of scale, not to say of perspective, in the home-scene by Mr. J. Tennant (143); but the ray of light that bursts on the rocks to the left has been caught from nature. So has the colour of the angry waves, but not the apparent texture. A pretty little domestic scene is "Not Sleepy," by G. F. Hicks (spelt G. E. Hicks in the catalogue), a sturdy little fellow being washed by a bixom nunsmaid as a preliminary for being put to bed. He throws back his head as he utters the remonstrance, of which his face bears witness to the truth. A bright gleam of light falls on the rocks in No. 161, by E. Hayes, "Fishing-boats off Staithes, near Whitby." This is a picture that could be very well copied by photography,—an element of excellence which painters would do well specially to study. There is much that is pleasing in "Expectation" (168), by J. J. Hill: a pretty girl with a pitcher, waiting for her lover by the spring. But the mouth has been idealised, or conventionalised,—whichever may be the best term,—out of the rough truth of nature.

"Love leads the Way," by E. S. Kennedy, is the highest compliment we have yet seen paid to Mr. Calderon; for it announces him to be the head of a school,—the picture being evidently inspired by admiration of his style. We cannot say much as to execution; but the helpless wrath of the old gentleman, who is left perched on a stone in the middle of a water-course, while a gallant aids his daughter, or young wife, farther down the ravine, is very droll. "Morwell Rocks, on the Tamar, Devon" (216), by G. Cole, is another picture in which we have noted a happy effect of light. The most finished portrait, a little paughty, perhaps, but giving a good idea of a man of no little note, is that of His Imperial Highness the Prince Imperial of Japan, by J. Edgar Williams (265). The name of the prince is spelt "Hiigashi Fushimi, No Miya." On his head he wears a nondescript ornament, only awarded to high dignitaries as a part of their court dress, which somewhat resembles a lantern. His face might be taken for that of a European, and evinces no ordinary intelligence. We note No. 275, "A Happy Mood," by E. G. Girardot; "A Waterfall, Pont-y-Monach" (323), by J. B. Smith, in which the foam and spray are rendered with rare fidelity to nature; "An Evening Landscape on a Sussex Heath," with sheep and figures (324), by Mr. G. Cole; "Solitude by the Sea: a Dead Calm in Early Morning" (451), by J. Tennant; and "Quimper, Brittany" (508), by L. J. Wood. Mr. H. H. Coudery's "Nursery" (377) is extremely ill attended to; for the pet-dogs of the family have got into the cradle, and are making mince-meat of the dolls. But they are two beautiful little dogs, notwithstanding. Why Mr. Wyke Bayliss calls La Sainte Chapelle, of which he gives a very highly-coloured interior, "The Lily of France" we should be glad to know. In the "Sculpture, &c.," Mr. A. Chesnoa's "Street Arab" is a little terra-cotta sketch of much merit.

St. Luke's Chapel, Norwich.—Messrs. Arrowsmith & Co. have manufactured a carved oak communion-table and a handsome chair for the Dean of Norwich, Norman in style. The table would be all the better if the jointings in the spandrels of the arches introduced to make it an imitation of a stone arcade, were removed forthwith.

ARCHITECTURAL WRITING.

ARCHITECTURAL ASSOCIATION.

The usual meeting was held on Friday, the 5th inst. A gift of about a dozen valuable books to the lending library, by Mr. Wyatt Papworth, was announced;—a piece of judicious liberality worthy of imitation.

A paper was read by Mr. T. Roger Smith, entitled "Architectural Writing," being instructions to students of architecture as to their use of the pen:—

1. In writing for themselves,—in digests of studies, notes, and other processes for amassing valuable information.

2. In writing done in the course of business, addressed to clients, tradesmen, other professional men, &c.; such as correspondence, documents of various kinds, specifications, reports.

3. In writing for the public.

For all a single maxim would be found of much value, if well apprehended, and always instinctively attended to, lodged in the simple phrase,—“Remember the reader.”

The following is a condensed statement of Mr. Smith's recommendations, under the several divisions of his subject:—

I. For students' notes, &c., the requisites,—accurate information noted as completely as possible when first obtained, and means of ready reference; a commonplace book for extracts or condensed results (always append edition, volume, and page of any book); a journal for regular or occasional travels: of course, in addition to the usual sketch-books, and so on. A chronological order uniformly adhered to will bring everything into sequence; mere paging and a slight index of principal subjects should be ordinarily sufficient: too elaborate a system will mostly be abandoned, and never renewed. The journal would contain a general plan, &c., with the principal dimensions of any building studied, notes as to materials, and the effect,—the impression made on the student by the whole or parts: whether quiet, grand, overdone, or apparently perfect; particulars as to such matters as the height above the eye of any details observed or measured; the surface of lighting area, its relation to the whole area, and the result. To describe a building well and briefly requires much practice, and, above all, a power of seizing at once the main distinctive features. Mr. Smith pointed out as models, in his opinion,—the late Mr. Pettit's books; the descriptive articles in M. Viollet-le-Duc's Dictionary; Mr. G. E. Street's books on Italy, Spain, and paper R.L.B.A. on "Lo Puy" (January, 1861). Failures, how manifested,—their causes, remedies if any; success, and analysis of real or apparent causes; miscellanea, as sizes of objects, carriages, animals, machinery, musical instruments,—all the details, in fact, that may at leisure be easily got together, but perhaps with difficulty when suddenly wanted, would thus find their proper places for use hereafter, if need be. Collections of cubical contents of buildings, costs, and the circumstances influencing the same, are very useful; in all these, and similar things, however, it cannot be often enough said that the training in terse, direct statement, made at the same time as full as necessary, was perhaps really, after all, the most valuable thing obtained.

II. Of business writing: the object is to convey information in such a way as to render mistake impossible. The requisites for letters,—legible handwriting, date, address, and a very readable signature (printed name at head, if the usual signing is likely to be beyond the ordinary record), press copy, posting entered in a book. The memorandum now in some use among tradesmen does not seem properly professional (and must not be accepted in any case in lieu of a letter, as it is not usually signed, and therefore might possibly be repudiated in some instances). The official method of recapitulating all the contents of the letter answered may be useful at times, and prevent mistakes by correspondents who do not keep copies of their letters; for ordinary use it will, however, be found practically sufficient to refer to the letter answered. Letters received should be acknowledged usually by return of post, even if the expected answer cannot be sent; but letters that stir the temper should always be passed by for a day at least, and may be, would often be better treated of at an interview (*littera scripta manet*). In case of instructions from clients, mutual good understanding will be often promoted by a copy of the architect's memorandum being sent to him; a dissent or a fresh direction by letter may in such

case prevent difficulty thereafter. Notes agreed to by both parties on the spot, very full and explicit, should always be made after a long interview involving a distinct arrangement; as in the case of a reduction of builder's tender by agreement before commencing pressing work, where, perhaps, many items have been subject to revision, &c. Specifications should have a uniform character throughout,—either full and even minute from beginning to end; or general—touching only on the important points, and leaving the drawings and dimensions, scantlings, &c., thereon to explain the rest: either (supposing the drawings prepared accordingly) will be found efficient. For reports state your results; omit your reasons: give the facts, the advice, and an estimate. Models may be found in Sir C. Wren's reports in the "Parentalia;" or Sir G. Barry's, given in his *Life* by his son.

III. Of architectural literature,—as other special class literature now a matter of necessity, owing in part to the small leisure, in part to the few intimacies,—the press takes to many the place of society. There are some who ought to engage in this, and some who ought to leave it alone. Long and well-directed study of some sort for the acquisition of a distinct, or, at any rate, a serviceable style, composition being an acquired art, like penmanship only occasionally well acquired; something of importance to say, either as the outcome of special gifts or of special education. These may warrant the attempt, either sustained or occasional, to mould or to influence public thought, or to supply the materials of knowledge. Sketching at some length the influence of writers on art matters in recent times, commencing with Sir Walter Scott, especially with reference to the Gothic Renaissance, instancing Mr. Rickman and M. Viollet-le-Duc as influencing architecture through architects, and other writers as acting at first hand on their employers,—Mr. Smith stated that there seemed to him many divisions of architectural literature as yet only partially treated. While it might safely be said that the writing of distinct treatises for the stimulation of art-feeling had best be left (like poetry) to those who are unable to refrain; and while we are almost overdone with hospitals and houses, good and thorough books, with full illustrations on theatres, railway stations, markets, warehouses, factories of various kinds, &c., would advance the standpoint from which such works in the future should start. Some buildings also deserve a monograph after the manner of Captain D. Galton's "Herbert Hospital." In conclusion, the paper dealt with the advantage to architects themselves, and to their profession, as well as to the public, of papers carefully written at intervals on matters that have been well studied. By such exertions some useful faculties are kept in activity, and as becomes the members of a liberal profession, the information that education, opportunity, or fortune may have placed in the way of one man is shared generously with others. In all cases he would reiterate his text,—advise the writer to be sure that he is well in advance, but not out of sight,—to "remember the reader."

IMPROVEMENTS FOR KENSINGTON.

CHANGED from the appearance it bore some thirty years back, of a quiet suburban village, Kensington has become the most important district of outlying London, being the main western arterial line to and through the metropolis. Bordering Hyde Park, and enjoying the singular advantage of another park and baronial hall, together with the Royal Palace at a short distance, and the unrivalled Kensington woods and gardens, its position and south aspect must always give it a preference before any other suburban quarter.

On approaching, the Albert Hall and Monument give dignity to the roadway, which has been to some extent enlarged and divested of old unsightly brick walls; and just on entering the town, the winding of Gloucester-road has been rectified and opened by Messrs. Cubitt, who have erected several important mansions just opposite to Kensington Gardens. On the north side, the gardens have been tastefully planted and decorated, where some fifteen years back stood a hideous old cowley stable, which, on the repeated instances of the writer, through the *Builder*, was removed.

Within two years immense improvement has been effected through the local authorities, in widening the thoroughfare opposite the church,

and by the erection of a commanding structure upon the site of the old sacred pile; but still there remains to be done a work that most of all would tend to the easement, the appearance, and the prosperity of this royal town.

We all know that there are two great leading routes,—one leading west from Piccadilly, and another, the Bayswater line, from Oxford-street, in a parallel direction for several miles; but few, excepting those who feel the want, notice the fact that there is no direct traverse road or street between Park-lane and Addison-road, a distance of over two miles.

On the south side there are numerous roads and streets of respectable width; but these lead to Chelsea, Fulham, or nowhere.

On the north side there is a winding narrow way, not inappropriately called Church-lane: this meanders through antiquated tenements, built without order or regard to the causeway, up to the elevation of Campden-hill, where the character of road, as well as the structures, is of a more modern type, but descending again to Notting-hill, by Silver-street, the line is little better.

On turning northwards by the church the road-caravets round the churchyard railings, which obtrude some 30 ft., and here the causeway varies in width from 13 ft. to 17 ft. Now in order to give effect to Mr. Gilbert Scott's fine architectural achievement, the churchyard railing should be drawn inwards to alignments, or nearly so, with the continuation up hill; and between Holland-street and Dako's-lane, a range of ten paltry one-story shops advances in a curve from 10 ft. to 25 ft. on the line of causeway. Then, again, an old, dreary-looking house, now used as a monastery, advances about one-third of its frontage upon the line of any proposed modernised way.

In making a new street, the purchase of such valueless property as this ought to offer no barrier to improvement, for the wayside building plots would probably indemnify any such purchases, to be made of course by valuation jury. The Campden Grove Cathedral impinges a little on the line, but the withdrawal of the railing at the upper end, similar to its construction at the lower, might perhaps suffice, seeing that no portion of the structure could be removed without prejudice to its integrity.

The parochial authorities have work enough on their hands in relation to the police-station, just now under consideration; that subject I avoid, as it is under discussion, only expressing the wish of many residents "that no niggardly dealing may prevent the erection of a building that may be a lasting credit to the town."

As to the opening of Church-lane, that is also under consideration. The traffic-way of that line is wholly inadequate to its growing requirements; in fact, St. Martin's or Chancery lane is not more used by carriages, carts, and vans; and, if taken up with spirit and purpose, it would not only repay the outlay, but embellish the neighbourhood, adding at the same time to general prosperity and comfort. T. H. H.

CONDITION OF AN IRISH COURT-HOUSE.

At the Queen's County Spring Assizes, after the judge took his seat, he said that he hoped some improvements had been made in the Court. One of the counsel replied to his lordship that matters remained *in statu quo*, and that nothing had been done either for the bar or the jury, with the exception of the dock having been removed. The foreman of the grand jury came before his lordship, accompanied by the county surveyor, and both gentlemen said that the matter was brought by them before the road sessions, but the presentment that resulted from the previous advice of his lordship had been thrown out. Hereupon his lordship soundly rated all concerned in the neglect in the following fashion:—

"The presentment sessions have nothing whatever to do with the Court-house. There was a small thing I requested to be done in the King's County Court-house, and it was done by the grand jury, at an expense of about 20*l*. The gentleman who has been addressing the jury here before you came in had to sit upon a bench there, and I am put here in a pit I will not continue to sit in. The jury have no cushions on their seats. I would not think of asking the jurors in the Court of Queen's Bench to sit on such seats. It would be most disrespectful to gentlemen to compel them for

hours to sit on such seats. This building is an antediluvian one, and it could not be arranged as a court of justice ought to be, but the work should be altered. *The room is a filthy one.*" Here the foreman interposed by saying the grand jury were under the impression that the matter should come before the road sessions. Instantly his lordship, with increased warmth, continued:—"Ask the Chief Justice of the Common Pleas, who is the county judge here, and if he says the grand jury have not the power to improve the court-house, of course it need not be done. I was in a third-rate court-house in Scotland, and the arrangements were most perfect and beautiful, because the people of Scotland have a regard for the proper administration of the law. This court-house is like an old barn, and a very bad barn. It is a shabby court-house, as shabby as any court you could find in the whole of the three kingdoms. A court of conscience,—a forty-shilling court in England,—would not be so shabby."

SOME ROUGH-HEWN SANITARY MAXIMS FOR THE PEOPLE.

The bath is a blessing.
A lover of flowers,
A hater of filth.
A stagnant drain
Bodes death and pain.
In labour there's health.
Badly-built dwellings are often hospitals, but seldom houses of recovery.
Care for the infant.
Training for the boy.
Occupation for the man.
Rest for old age.
Neither overcome sleep,
Nor be overcome by it.
A cultivated garden is a floral Eden,
A happy and healthy home a moral one.
Preserve thy health in early youth,
Or physic in old age will avail thee little.
Good draught, no choke;
Better fire, no smoke.
A thorough drainage and pure water-supply are the prime essentials of public health.
Extremes, though distant,
Will join issue still;
And heat or cold
Can cure or kill.
In choosing a house for health,
Look below the foundation.
In choosing a house for strength,
Look to the workmanship and materials.
In choosing a house for beauty and utility,
Please yourself, and strive to please those who know better.
Draughts bring doctors
(And doctors send them).
When gas is escaping find the leak with an extinguished candle.
Sloth and dirt grow apace,—with long nails.
Foul smells have fouler causes.
With rats comes rot.
With mice comes mischief.
The mother is the fittest nurse.
The parent should be the first educator.

RABBIT, RABBIT, OR REBATE?

I HAVE been often disposed to put some queries to my brethren in the building crafts respecting the correctness of the terms used by them as to methods common to their workmanship. Among building operatives the word I have selected as a first example is generally used, spoken, sounded, and written in the two first forms, and the second form appears to be greatly in the ascendant.

Having had an intimate acquaintance with building matters and building operatives in many parts of the British Islands, I have noticed the variations that occur in the technical terms used by workmen to distinguish the same or similar methods of work.

The same operation by a mason or stone-cutter, bricklayer, cabinet-maker, or iron-worker as that performed by the carpenter or joiner, is often called by another name; the sole difference being very often only the material on which the operation is performed. Many terms used among building operatives in the North of

England are quite unknown in the South; and the same holds true in relation to Glasgow, Edinburgh, and Dublin, in all which places the English language has been common for centuries, and intercourse with the workmen of other parts of the kingdom frequent.

Yet workmen are often puzzled and confused when they are strangers when they get a job in any of these places, when directions are given by the foremen or masters to do so and so, the words employed being quite new to them, and which, if expressed in their proper building or architectural form, would be thoroughly understood.

To return. The words under notice are, however, easily understood, no matter in what way they may be pronounced or written. My purpose is to arrive at the correct reading. I believe, myself, that the proper form of the word is "rebate," and so I find it in all old building treatises. Its derivation is obvious to my mind, as I deduce it from the primal word, "bate," or "abate," to lessen or reduce; hence "re-bate," to reduce still lower.

A piece of wood or stone when "squared,"—that is, reduced or planed down to its required form,—is lessened in size; so when a rabbit, or rebate, is sunk in any part of its surface, it is, consequently abated lower, or, in other words, re-bated. This, I submit, is clear enough.

I find the French word for the process is *rebattre*, which is identical with the old English term in derivation. From the same root we have several words,—bate, bated, abate, abatement, rebate, rebated, &c.

With masons, the term for rebated is "joggled," whether the stones are fitted into others externally or internally, as in architraves or lintels, voussoirs, &c. The word "joggle" is also used by carpenters, joiners, and cabinet-makers, but not in the same sense. It is used to denote those over-lengths of wood left on the sides of pieces of framing, for security's sake, before the process of mortising, tenoning, or halving takes place, and are afterwards cut off when the work is finished.

A rebate, we see, then, is a joggle in one form, and a joggle a rebate, but not in all forms. I venture to say that in architectural and building matters we need badly a revised dictionary of technical building terms. I will show on another occasion many words most wrongly used, and repeated again and again by our *semi-distant* technical guides and educators, who are misleading our workmen in many ways, instead of instructing them. Technical knowledge can only be taught by practical professional men; and many of those who assume the office of teachers ought as a preliminary to "read up" for their own information.

In speaking of the word "rebate" above, the carpenter's or joiner's "rabbit-plane" might have been instanced, and the query may be put, Why is a sash-rebating plane termed a "filister"? Again, is a rebate a groove, or a groove a rebate, or to constitute a groove in joinery, must the channel or sinking have two sides in contradistinction to the common rebate on the angle? Again, why is another joiner's tool used for making grooves called a "plough"? Is it from any similarity to the agricultural implement? A CRAFTSMAN.

* * * There is more to be said in favour of "rabbit" than some think. The French word from which we are said to derive it is *rabotter* (to put down, to abate), not "*rebattre*" (which has an entirely different meaning), though our correspondent is not alone in using the latter; see, for example, the glossary in Gwillt's "Encyclopaedia." Again, it need not be forgotten that *raboter* in French is the verb "to plane"; and *raboteur* is a planer. Moreover, *rabotter* is "to join by the ends."

THE TRADES MOVEMENT.

Ipswich.—At a meeting of twenty master builders several resolutions were agreed to. The first is rather indefinite, as it begins by disclaiming the existence of a league, and ends by establishing one. It runs thus:—

"That we do not acknowledge the existence of any league; but whatever alteration is made in the rate of wages the same shall be communicated by the masters to their men, and that each shall be at liberty to make any arrangement he chooses, provided only that this meeting shall fix the maximum rate of wages to be given to skilled workmen, which rate shall be acted upon by us all."

The next is:—

"That for the future the men be paid by the hour, and that the maximum rate of wages for skilled carpenters,

joiners, and bricklayers shall be 5d. per hour; and for good labourers 3d. per hour; and that ten hours is to constitute a day's work."

Leicester.—The strike of joiners and carpenters at Leicester continues. The master builders adhere to their resolution to grant an advance of three-eighths of a penny per hour only, and not to employ any men on strike.

Bedlitch.—The agitation which has been going on for some time among the carpenters, bricklayers, and painters, came to a termination on Monday. The demands of the men were an increase of wages, and a reduction in the hours of labour by leaving off work on Saturdays at one o'clock. The carpenters and bricklayers demanded a rise of 1s. per week, and the painters 2s. a week, with the diminished hours on Saturday. On Wednesday the men resumed work, the rise in wages and reduction in the hours of labour having been conceded by the masters. Instead of the masters, however, paying by the week, as has hitherto been the custom, it is arranged between the masters and men that the latter shall be paid by the hour, at the rate of 5d.

Bewdley.—A meeting of the employers in the building trade at Bewdley has been held, to consider what steps should be taken as regards adopting less hours of labour, and asking for a higher rate of wages. There was a good attendance, and after some discussion it was resolved that the time of labour for bricklayers, carpenters, and painters, for the first five days of the week, should be from six o'clock in the morning till 5.30 in the evening, deducting one hour and a half for meals; and for Saturday, from six in the morning till two in the afternoon, allowing half an hour for breakfast; that the wages for the above time for bricklayers and carpenters be 27s. per week, and that an advance of 3s. per week on their present rate of wages be paid to painters. A copy of this resolution has been sent to all the masters of the town, asking them to call a meeting at their earliest convenience to take the matter into their consideration. The men propose that the above concessions be made to them in the week ending 4th May next.

Coventry.—Some time since the masters were served with a notice demanding a rise of wages from 5d. to 6d. per hour for carpenters and joiners; for the bricklayers, from 6d. to 6½d.; labourers, 3½d. to 4d. This advance, with the restrictions demanded for overtime, the masters felt they could not accede to. Various meetings were held without any practical result, and at last it was resolved to submit the whole affair to arbitration. The carpenters and joiners asked the mayor, Mr. W. H. Hill, to act for them, and the bricklayers and labourers, Mr. J. Gulson. These gentlemen have now given in their award, which is as follows:—The carpenters and joiners to have 6½d. per hour, being a rise of 2s. 11d. per week of 56½ hours; that is, from 27s. 1d. to 30s. The bricklayers, 6½d. per hour, being a rise of 1s. 9d. per week, from 28s. 3d. to 30s.; and the labourers, 4d. per hour, being a rise of 1s. 2d. per week, from 17s. 8d. to 18s. 10d.; and all overtime made at the request of the master between eight o'clock in the evening and six o'clock in the morning to be paid for at the rate of time and a half, and on Sundays at double the ordinary rate. Overtime for labourers to commence at four o'clock on Saturdays as before. This new arrangement has just come into operation. The labourers, however, have declined to recognise the decision of the arbiter (Mr. Gulson), and such of them as are unionists are now out on strike.

Cockermouth.—The master joiners have held a meeting for the purpose of considering the propositions of their workmen, which were submitted to them a short time ago, for a reduction in the hours of labour, and an advance of wages. Mr. Joseph Boll presided. It was decided by the meeting to concede the demand of the men for the adoption of the nine-hours system, but no action was taken with regard to the other proposals.

Edinburgh.—At a general meeting of the joiners it was agreed that copies of the by-laws as adopted should be sent out to all the employers in the city for their signature, and that a cessation of work should take place on Monday in those shops and among those squads where the by-laws are not signed. At another meeting the secretary read a list containing the names of seventy-eight employers who had signed the by-laws. The names of some small employers who had not signed them were then read, and the list was remitted to the joint com-

mittee, with powers to take steps to obtain the signatures of all the employers.

Glasgow.—A section of the Glasgow brick-makers have struck work for an increase of wages.

THE PUBLIC HEALTH BILL.

A DEPUTATION from the Social Science and British Medical Associations have waited upon the president of the local Government Board, relative to this Bill, to ask for amendments to it. The deputation was introduced by Mr. Corrance, M.P., who mentioned that three associations were represented, namely, the Social Science, British Medical, and Medical Officers' Associations. The main points were the question of arrears; of local authorities; and of suitable and proper authorities. They thought that the success of the Bill must be of greater importance than its passing; but they could scarcely look with satisfaction on it without some alteration. A memorial was then read, which set forth at great length the various points which needed alteration, and concluded by requesting an assurance from the president that the sanitary work of other departments of central administration might be consolidated in the local Government Board; that the constitution of the Board for sanitary purposes might be revised and strengthened, and that a measure might be introduced by her Majesty's Government in next session for the consolidation of the existing sanitary laws; and also that he would consent to introduce several amendments in the Bill now before Parliament, the chief points being that there should be one authority instead of a division of authority, in whom should be vested the power of directing the administration of medical relief, who should appoint officers of health, &c., and that a moiety of the expense of medical and scientific officers, and of sickness returns, should be borne by the national exchequer. Several members of the deputation having spoken, Mr. Stansfeld, in reply, said he could not affect to agree with the views which had been propounded, because he adopted the views of the Sanitary Commission. He did not think the time had come for consolidation. After several points were discussed, Mr. Stansfeld said, with regard to the power he proposed to take, if they read the clause they would find it was unlimited, for he did not mean to tie his hands in that respect, but to proceed tentatively, and he really thought as practical men that ought to be some satisfaction to them. As to the medical officers of health, the Bill had been misunderstood. They only said that they might be medical officers. When the Bill came into operation the whole of England and Wales would be mapped out into districts. The points in dispute were so complicated that, as Mr. Stansfeld said, it was very easy to misunderstand them.

COLOURING VENEERS.

SOME manufacturers of Germany, who had been supplied from Paris with veneers coloured throughout their mass, were necessitated by the late war to produce them themselves. Experiments in this direction gave in the beginning colours fixed only on the outside, while the inside was untouched, until the veneers were soaked for twenty-four hours in a solution of caustic soda, containing 10 per cent. of soda, and boiled therein for half an hour. After washing them with sufficient water to remove the alkali, they may be dyed throughout their mass. This treatment with soda effects a general disintegration of the wood, whereby it becomes in the moist state elastic and leather-like, and ready to absorb the colour. It must then, after dyeing, be dried between sheets of paper, and subjected to pressure, to retain its shape. According to the *Society of Arts Journal*, veneers treated in this way, and left for twenty-four hours in a hot decoction of log-wood (one part of log-wood to three of decoction), removing them after the lapse of that time, and, after drying them superficially, putting them into a hot solution of coppers (one part of coppers to thirty of water), will, after twenty-four hours, become beautifully and completely dyed black.

A solution of one part of picric acid in sixty of water, with the addition of so much ammonia as to become perceptible to the nose, dyes the veneers yellow, which colour is not in the least affected by subsequent varnishing.

Coralline dissolved in hot water, to which a little caustic soda and one-fifth of its volume of

soluble glass has been added, produces rose colours of different shades, dependent on the amount of coralline taken.

IN PARLIAMENT.

The Thames Embankment Bill.—Colonel Wilson-Patten brought up a report from the Standing Orders Committee, stating that in the case of the Thames Embankment Bill those orders which had not been complied with might be dispensed with, but that the Bill should not be read a second time before the 7th of May, and that fresh notices should be given in the *London Gazette*.

Dwellings for the Poor.—Lord J. Manners asked the hon. member for Truro whether the Metropolitan Board of Works had directed his attention to providing dwellings for the poorer classes, in place of those cleared away to effect metropolitan improvements. Colonel Hogg replied that the Board were considering this question. It had been referred to the Parliamentary Committee, and the solicitor had been instructed to draft a clause which he trusted would meet the requirements.

BUILDERS' CLERKS' BENEVOLENT INSTITUTION.

THE fifth annual meeting of this Institution was held on the 27th ult., at 165, Aldersgate-street, Mr. George Plucknett (Messrs. Gubbitt & Co.), president for the ensuing year, in the chair.

The balance-sheet showed an increase in the amount of annual subscriptions for the past year of 137. 13s., and in the interest received on invested funds of 47. 7s., but a decrease in the amount of donations of 24. 18s. The whole income was 273. 15s. 3d., the amount granted in relief 93. 6s. 8d., and the cost of management 61. 1s. 3d. An addition of 200l. to the invested funds during the year had brought them up to 1,000l., of which 600l. belong to the relief fund, and 400l. to the orphan fund. Two widows and one incapacitated clerk had been added to the list of pensioners, but the latter had died shortly after his election; the committee, acting under rule 5, allowing his widow one-half her husband's pension until her election for the full amount.

Mr. Plucknett, in moving that the report and balance-sheet be received and adopted, said he wished to congratulate the Institution on the progress made during the last four years. He trusted this might become a much larger institution, and be able to relieve all the applications made to it, and mentioned the fact that in looking over some very early papers connected with the Builders' Benevolent Institution, he observed that their expectations were very small, being at first confined to the hope of relieving three applicants, then six,—now they annually assisted forty or fifty, and possessed large invested funds. It required men earnest in the work to carry on such an institution, and such men they had in the present officers, who he thought deserved much praise for the economical way in which the society was worked, and for the zeal and perseverance shown in an unselfish cause, the Institution being not for subscribers only, but for all builders' clerks. Being a class matter the area in which to look for support was limited; but although the same persons were applied to over and over again, yet the large builders of London could be fairly appealed to, as the employers depended upon the clerks and *vice versa*. He should be glad to see more of the clerks become subscribers, as it would show their appreciation of a cause for the benefit of their class, and a constancy of income from annual subscriptions was the best.

Mr. Benjamin Hanneu (of Messrs. Holland & Hannen) followed with an expression of the pleasure and satisfaction it had given him to have been connected with this young institution as president during last year. Having been a builder's clerk himself, he sympathised with those who had established and worked it so successfully. It had derived great advantage from the previous presidencies of Messrs. Heusshaw and Strling. He knew no one who had such a thorough knowledge of the working of such institutions as Mr. Plucknett, and he heartily congratulated the committee upon the prospect of being under such good direction for the ensuing year.

Mr. G. S. Fritchard proposed a vote of thanks to the retiring officers, which was seconded by Mr. Matthew Hall.

The election of fresh officers for the current year and other formal business occupied the remainder of the meeting, which concluded with a cordial vote of thanks to Mr. Plucknett.

BILSTON TOWN HALL AND FREE LIBRARY.

THE foundation stones of the new town-hall and free library for Bilston, now in progress, have been laid. The site is that of the old post-office, and once adjacent buildings, at the junction of Church-street and Wolverhampton new road. The new building will have a frontage to the Wolverhampton-road of 95 ft., and on the return front of 74 ft. They will be erected with brick, stone-faced. The town-hall will afford accommodation on the ground-floor for the Town Com-

missions, committee-rooms, with waiting-room, town-clerk's, surveyor's, and collector's offices. On the first-floor will be a large room, 70 ft. by 43 ft., for public meetings, with orchestra-gallery in the west end, and several retiring-rooms. The public entrance to the town-hall will be carried up as a tower, forming a prominent feature on approaching the buildings from Oxford-street. The free library buildings, although uniform in frontage with the town-hall, will be distinct therefrom. The entrance will be from the Wolverhampton-road, and the accommodation on the ground-floor will be—reading-room, 36 ft. by 20 ft. 10 in., and library, 20 ft. by 17 ft. 6 in.; and on the first and second floors will be class-rooms. There will also be in the town-hall a porter's residence. The total cost of the buildings is 5,000*l.*, of which 1,300*l.* is the portion of the free library. Mr. Bidlake, of Wolverhampton, is the architect; and Mr. Nelson, of Dudley, the builder.

SILVER WORK.

Messrs. ELKINGTON & Co. have recently produced a remarkable work, in *repoussé* silver, relieved by steel damascened with gold, allegorical of Music and Poetry. It is of large size, and includes a vase in the Renaissance style, upon a long plateau: upon one side of the vase, are four of the Muses, and upon the obverse the other five. The summit of this vase bears two Genii. At the sides of the vase, seated in recumbent attitudes, are placed draped female figures, who represent Music and Poetry. Bas-reliefs,—Pegasus occupying one; the other, a winged Griffin, carrying the Genius of Imagination; masks, and other fanciful emblems and trophies, complete the work. When we say that it has occupied the artist, M. Morel Ladeuil, for several years, and is valued at 6,000*l.*, our readers will have some idea of its importance, especially if they remember the Milton shield, the work of the same artist. We must go further, however, and point to it as the most important work of its kind produced in this country, exhibiting artistic genius as well as skill of the highest order.

THE WORKS OF HERR GULDENPFENNIG.

At a meeting of the Royal Institute of British Architects, held on Monday, April 8th, Herr Guldenpfennig, diocesan architect to the Bishop of Paderborn, was elected an honorary corresponding member of that body. Attention has been previously called to the works of Herr Guldenpfennig in this journal, as well as in a paper read last November, before the Institute, by Mr. H. W. Brewer. In a future number we shall give illustrations of buildings carried out from this gentleman's designs. Mr. Guldenpfennig's works are in the Gothic style; and the principal buildings upon which he has been, or is now engaged, are the following:—The restoration of Paderborn Cathedral; new seminary at Paderborn; house for Herr Mallinkrodt; grange and chapel for the Baron von Brenkin; dwelling-houses at Paderborn, Dortmund, &c.; churches at Paderborn, Ruthen, Ochsersleben, Buderich, Hoerde, Wattenschied, and Warbourg. The churches at Paderborn, Hoerde, Buderich, and Wattenschied, are important cruciform buildings.

GAS FROM WOOD.

Sir,—Will any of the readers of the *Builder* give me any information, through the medium of your journal, on the subject of making gas from wood? I believe it is manufactured thus in some parts of Germany, and am desirous of gaining all the knowledge in the matter I can obtain.

ALBERT MORSE.

FALLS OF STANDS.

At the Bridgenorth Steeplechases the grand stand suddenly gave way, and about 150 of its occupants were more or less hurt.

At the Lurgan steeplechases, which took place close to Belfast, in the presence of from 15,000 to 20,000 people, a stand had been erected by the council of the races, and a second by a private speculation, to which admission was at the cheapest rate. At the most interesting part of the day's proceedings, the start for the Brownlow Cup, the latter stand gave way, and all the people upon it were pitched among the *d'bris*. Between twenty-five and thirty persons are known to be injured, eight or nine seriously,

and in two cases, at least, it is believed the result will be fatal.

As mentioned by us last week, a stand erected to witness the laying of the chief stone of a Wesleyan Chapel in Kenilworth Town gave way under the weight of the crowd upon it, and several of those precipitated sustained serious injuries.

SCHOOL BOARDS.

London.—The following architects have been invited to compete for the schools at Old Castle-street, Whitechapel, for the London School Board:—Messrs. T. W. Aldwinckle, Edward Biron, Francis Chambers, Habershon & Brock, Edward C. Robins, and John Turring & Son.

Conisborough, Yorkshire.—Mr. William Watson, of Wakefield and Doncaster, has been appointed architect; and schools for 600 children, with master's house, are to be built.

CAUTION TO BUILDERS.

An adjourned case, at Worship-street, under the Buildings Act, came on for hearing before Mr. Hannay, on Wednesday, the 27th ult., in which the District Surveyor for West Hackney summoned Mr. Wm. Townshend, of Greenwood-road, for the penalty, for neglect in giving notice before the commencement of works.

The magistrate, after hearing the evidence, fined the defendant in the penalty of 5*l.*, and costs.

THE NEW BUILDINGS FOR THE CITY OF LONDON UNION.

THE new offices and premises in Bartholomew-close, which have for some time been in course of erection, for the City of London Union, are now almost finished. The building, which is in the Elizabethan style of architecture, is in three blocks, namely, the office block, the Board-room block, and the recess or centre block. The first two stories of the office block are of Portland stone, the remainder being of brick, with Portland stone dressings; and the recess block is similarly constructed, but finished with a pavement, upon which appears the City arms. The Board-room is gained from the central hall by a moulded spirally staircase of stone, and there is a similar staircase from the Board-room to the committee-rooms. Mr. W. Hudson is the architect; the builders being Messrs. Hill & Sons.

THE KEEP OF MIDDLEHAM CASTLE.

ALTHOUGH the size and extent of Middleham Castle are but moderate for the figure it has made in local story, and the rank and power of the succession of great barons who built, augmented, and have inhabited it, it is in itself a remarkable building, and presents much of antiquarian interest. It is placed on the southern edge of the town of Middleham, and a little above it. Its immediate position presents no great natural advantages, but for the general defence of Wensley Dale it is not ill chosen, standing between the Yore and the Cover, about a mile and a half above the junction of the two streams.

In plan Middleham is rectangular, composed of a keep about 100 ft. north and south, by 80 ft. east and west, and to the base of its parapet about 55 ft. high, which is placed in the centre of an *encinte*, also rectangular, 240 ft. north and south by 190 ft. east and west, so that the area of its only ward is but limited. The *encinte* is a curtain wall, about 30 ft. high. At its north-west and south-east angles it has rectangular towers of slight external projection, which rise above the curtain. Its south-west angle is capped by a drum tower of three stages, and on the north face, but at its north-east angle, is the gatehouse, rectangular, of slight projection, but four stages high, basement included. The east curtain has been destroyed. Upon the south and west curtains are many exterior projections, battresses, and near the centre of each a rectangular tower. The domestic buildings were chiefly placed against the curtains on the north, west, and south sides, and thus the ward is reduced to a mere passage between these buildings and the keep.

The gatehouse is about 25 ft. deep by 50 ft. broad. It has in its exterior front a central portal, round-headed, beneath a pointed arch of relief. This is flanked by buttresses, 2 ft. high by 1 ft. deep, and the adjacent angles of the

building are supported by similar buttresses, two being set on each. At the first story these pass into a single buttress, which caps the angle,—a pleasing arrangement, giving variety to the outline. The entrance vault, like the gateway, is round-headed, with ribs for doors, and it has a single porteuilis groove at its inner end. It is all of one date, and in the Decorated style. This gatehouse, and the buildings of the ward generally, are Decorated, and require far more examination than the writer has been able to bestow upon them.

The Keep is reinforced at the four angles by broad, flat capping buttresses, of variable breadth and projection, and which, no doubt, rose above the battlement into rectangular turrets. The buttress on the north-east angle has a breadth of 26 ft. on the north and a projection of 7 ft., and to the east a breadth of 16 ft., and a projection of 1 ft. It contains the chamber communicating with the battlement of the outer gate of the barbican, and below is solid. The buttress on the north-west angle has to the north a breadth of 22 ft. and a projection of 3 ft., and to the west a breadth of 12 ft. and depth of 1 ft. On the south-west angle the breadth of the west face is 14 ft., and of the south 11 ft., and the depth of each is 1 ft.

The south-east angle, as at Rochester, contains the staircase. It has no projection on the east face, being covered by the barbican. On the south its breadth is 20 ft., and its depth 6 ft. This alone preserves the remains of a turret above the battlements. Excepting the stair-turret, the angles of the keep seem solid below, though worked into chambers on the first floor.

There are also projections on the west and south wall. That on the west has a depth of 12 ft., and a breadth of 18 ft. The lower story is broken away; it was hollow, and looks as though meant for a gigantic cespit. The upper part hangs unsupported save by the cohesion of its cement, and greatly needs conservation. This turret is about 51 ft. from the north end, and 31 ft. from the south. The projection on the south wall is 12 ft. broad, and 8 ft. deep. It is placed 24 ft. from the west, and 44 ft. from the east angle, coinciding with the partition-wall within. This turret is hollow, and forms a great shaft for garbierobes in the upper stories. In its face, at the ground level is a round-headed arch, of 3 ft. opening, and 4 ft. high, the outlet of the sewer, but above ground. These two turrets at present cease at the level of the parapet, but probably rose sufficiently above it to cover a garbierob. The keep has a plinth on the north, west, and south sides. The east face is covered by the barbican. The walls are about 9 ft. thick.

The keep has a basement floor at the ground level, and a first or state floor, and on the east side an upper floor. It is divided by a wall 9 ft. thick into two unequal parts, that to the east being 29 ft., and that to the west 24 ft. broad, each being about 84 ft. long. A well stair 12 ft. diameter, ascended in the south-east angle from the basement to the battlements. Lighted by loops, and with doors to each floor.

The east chamber into which this stair opens by a large and apparently round-headed door, now broken, was vaulted in two lines, resting upon five cylindrical piers, about 3 ft. 6 in. each in diameter, and averaging 14 ft. from centre to centre. The vault seems to have been a barrel, groined. At each end were two square-headed loops, high above the floor with stepped recesses. The east wall contains only three square lockers, and the door of the staircase. The west or partition-wall side is pierced by five openings, about 4 ft. broad, and round-headed, three to the north, and two to the south of the thick solid central part. Probably these were introduced to lighten the work, and all but one or two thinly walled up. One must have been a doorway, as from the eastern bay the only communication with the western chamber.

The western chamber seems to have been spanned by a single vault, apparently slightly pointed and groined in six bays. In each end is a single square-headed loop. On the west side are seven loops, the central part being occupied by the unpierced rear wall of the turret already described.

First floor, east side. This was evidently the hall. It is very lofty, and in its north end is a round-headed window of 2 ft. opening, and 7 ft. high to the springing. In the south end are two similar windows, but about 14 ft. long, and a curious water-drain between them and the door. This, the door from the stair, is plain round-headed, and of 6 ft. opening. Close north of it is a similar door, of 7 ft. opening, quite plain, and

without a portcullis. This is the main entrance, and opens from the barbican tower. Beyond this is a short window, and then three long ones, like those at the north end, so arranged as to open clear of the exterior barbican stair. The west wall has an opening at each end, the bulk of the wall being solid. The northern of the two openings was probably the great door of passage between the rooms; the southern communicated with the garderobe in the south wall. In the north-east angle is a very curious mural chamber, 12 ft. cast and west, by 9 ft. north and south, vaulted in a single groined bay, round-headed, and springing from half-octagonal brackets in the angles, each the cap of a detached shaft, now removed. In the north wall are two, and in the east one loop. A door in the south wall opens into the north end of the hall, and one in the east wall passes obliquely through the wall, and evidently led to the battlements of the outer gate of the barbican, over the foot of its staircase. This room is much broken, but its fittings are original, and late Norman. If the hall had a fireplace in masonry, it was in the west wall, at a part recently repaired. It is not clear how the hall was roofed; possibly the original covering was a high-pitched roof, with the battlements above, but at present the side walls carry a table, with corbels of a plain billet moulding, on which an upper wall, about 12 ft. high, is advanced 6 in. In these walls are large window openings, with segmental arches, three on each side, which must have opened clear of the roof of the west chamber, and upon the battlements on the east side. In the south end, above the two narrow windows mentioned, is a third smaller one, as though to light a roof of high pitch. There are no corbels for principals, and no holes for main beams, but above the corbel table on each side is a range of holes, about 9 in. square, and as much apart, neatly stopped with ashlar, as though an original flat roof had been removed, and a roof of high pitch introduced. However this may have been, the windows of the side walls are clearly additional, and belonged to a second floor. Altogether the history of this roof is very obscure, and demands a close local investigation. The upper door in the west stair is not at a level to suit a second floor, nor consistent with a high-pitched roof.

First floor, west side. In the north end is a round-headed window, 2 ft. opening, by 7 ft. high, and a door into a now inaccessible mural chamber in the north-west angle. At the south end are two similar windows, and a door into a chamber in the south-west angle. In the east wall are the two broken doorways already mentioned, and the broken shafts of which, much broken, still rise clear of the roof. The fire-places are gone, and the wall has been much patched recently to give it support. There are two rather curious lockets in this wall. In the west wall there seem to have been four round-headed windows of 2 ft. opening, and 7 ft. high, and near the middle is a door opening into the middle buttress tower, which contains two chambers of unequal size. These are not accessible, but one was probably a large garderobe, and the other may have been the way to a small drawbridge, opening from the keep upon a rectangular tower in the ward, not 12 ft. distant, so as to give direct passage from the keep to the outer walls. In the keep wall, north of this tower, is a large segmental-arched window, evidently an insertion, probably the work of Rich. III. In the north-west and south-west angles, as already mentioned, are mural chambers, not accessible. There do not appear to be any galleries in the wall.

This west chamber was probably divided by a battice, and the north part used as a withdrawing-room from the hall. There does not appear to have been a second floor on this side. It is, however, curious that there should be no corbels, nor any of the usual indications of the principals of an ordinary open roof. In each side wall, high up, is a row of holes, about 9 in. square and 18 in. from centre to centre, so that probably the roof was flat, or, at any rate, was composed of heavy rafters, without principals.

The east face of the keep was occupied by the barbican or tower of entrance, and which, as was not uncommon, contained the chapel.

The approach seems to have been, as at Rochester, Scarborough, and elsewhere, by a flight of stone steps built against the wall, commencing, in this case, about 10 ft. from its northern end, and rising about 20 ft. to a vestibule, upon which opened, right and left, the great door of the keep, and that of the

chapel. The staircase was about 9 ft. broad, and 45 ft. or 50 ft. long to the vestibule. It seems to have been protected by a side wall, reducing the actual stair-breadth to (say) 5 ft. or 6 ft., and to have been either vaulted or roofed with timber. Its lower gate must have opened beneath a small tower, the battlements of which were reached from the chamber in the north-east angle of the keep. About half-way up the wall, seems to have been the appearance of the staircase, past what, from the appearance of the wall, seems to have been a second gate, in the keep wall is a large cavity capable of holding comfortably twenty men, evidently as a guard in case the entrance should be forced. Higher up, where the staircase landed on the vestibule, there seems to have been a third door.

The vestibule is part of the second floor of the usual rectangular barbican tower built against the keep, about 12 ft. from the south end of the east face. This tower measures about 33 ft. north and south, and about 48 ft. east and west. It rose about two-thirds of the height of the keep, and is divided into a basement or sub-crypt, an upper crypt, and a chapel and vestibule floor.

The basement is at the ground level. Next the keep, or, rather, next the solid mass of masonry which supports the stairs and vestibule, is the sub-crypt, 20 ft. north and south, by 24 ft. east and west. Beyond that is east of it, a passage runs right through the building, 5 ft. broad, with a door at each end; and beyond this are the ruins of a small chamber, which probably reached to the outer curtain wall. The passage gave a communication between the north and south parts of the ward, otherwise divided, on this side, by the barbican tower, and from this passage a door led into the sub-crypt. This room was vaulted in two bays in eight bays, springing from a central line of three columns now gone. The arch gables show that the vault was round-headed. In the south wall at the west end is a well-stair leading to the upper crypt, and the only way to it. The sub-crypt is lighted by two small round-headed Norman windows in each of the two open faces, one on each side of an exterior plain pilaster buttress, 3 ft. broad by 3 ft. deep.

The first floor, or upper crypt, extended eastward over the passage the whole length of the barbican, and was 20 ft. broad, and probably 40 ft. long inside. This also was vaulted, but the vault spanned the whole breadth, and formed two bays only. The ribs of the groining sprang from half-round mural pilasters. In the north wall, near the east end, is a fireplace. This floor had no communication with that above it. It was not uncommon for the basement of the barbican to be quite independent of the keep, and to be entered, as here, by an outer door of its own.

The second floor of the barbican contained the chapel and the vestibule, this floor being on the level of the great entrance to the keep. Whether the vestibule was vaulted is uncertain, probably it was. It is about 20 ft. north and south, by 9 ft. east and west, the entrance stair arriving at the north end, the keep door being on the west, and the chapel door on the east side. The chapel was loftier and vaulted in a lighter style than the crypts below. Its walls were 7 ft. thick, and its area about 20 ft. by 40 ft. It was vaulted in two bays in a light style, probably Early English. The great door of the keep was plain Norman, but chamfered round the head and jambs. There are traces of caps, and probably there were two flanking shafts, but no mouldings or drip-stone. The walls of the barbican are, no doubt, mainly original, though the vaulting of the sub-crypt and crypt may have been renewed. The chapel probably replaces an earlier building.

Middleham seems never to have had any works beyond the *enceinte* wall, save a slight ditch, of which traces remain on the south side only. On the east, a field road has superseded the ditch, as have some modern buildings on the west side. There is no present trace of either ditch or drawbridge on the north or town front.

The keep is built of coursed rubble, with ashlar groins and dressings. The discoloured and later work is mostly of excellent ashlar.

As regards the age of the several parts of the castle, the keep is plainly late Norman, and, likely enough, the work of Robert Fitz-Ranulph, Lord of Middleham, in 1190; and to his immediate descendants are certainly due the earlier alterations, especially the chapel, before the extinction of the family, in 1251.

No doubt the exterior ward is built on the side of a Norman *enceinte*, and some of the original

work may remain; but this part of the fortress was completely recast by the Nevilles, who married the Fitz-Ranulph heiress, and, no doubt, either by Robert, called the Peacock of the North, who had Middleham, &c., from his grandmother, and who died before 5 Ed. II., 1331, or by Ralph, Lord Neville of Raby, his brother and successor, who died 41 Ed. III., 1367.

Of the later residence of Richard, Duke of York (Rich. III.) the traces are the large window opening on the west face of the keep, and perhaps the upper story on the east side of the same building, and certain details added to the ward.

Middleham was a part of the broad territory granted by the Conqueror to Alan Fitz-Gaunt, the founder of Richmond Castle, and lord of that extensive honour, stepping thus into the seat of the English Earl Edwin, which he stultified from the adjacent Gilling. His younger son, Ribald, had Middleham for his especial lordship, by the gift of the second Alan, his brother. Ribald was followed by Ralph, his son, and he by Robert Fitz-Ralph, or Ranulph, who married Berta, niece of Ranulph de Glouville, and is the reputed builder of Middleham keep in 1191, 2 and 3 Rich. I.

Ranulph Fitz-Robert was the founder of Coverham Abbey, "Near his manor-house of Middleham," and was there buried in 1251 (31 Hen. III.), leaving Ralph Fitz-Ranulph, his son, who appears to have been lord of Middleham Manor in an inquisition for the partition of his lands (55 Hen. III.), the year of his death. He left three daughters co-heirs, of whom, Mary, the eldest, married Robert de Neville, and had Middleham. Ralph died (55 Hen. III.) 1271. It appears, by an inquisition under the name of Peter of Savoy, that Middleham was a fee owing suit of court to the honour of Richmond. 18 Ed. I., Maria de Nevile is styled Domina de Middleham, and 13 Ed. II. she had the manor. She lived till 14 Ed. II. (1320), having held Middleham for life.

Their son was Ralph Neville, who died 5 Ed. III. (1331), and who appears in an inquisition (1 Ed. III.) as holding Middleham Manor and Castle. His son, Robert Neville, the Peacock of the North, had from his grandfather the castle and manor of Middleham. He died, without issue, before his father, leaving Ralph his brother and heir, who died 41 Ed. III. This Ralph, Lord Neville of Raby, took a very active part in all the public transactions of his time, both in war and peace. He died seized of the castle and manor of Middleham, and was the first layman buried in the Cathedral of Durham.

The next lord was John, his son, also a great soldier and diplomatist. He died 12 Rich. II., 1388, leaving Ralph, his son and heir, who added to the wealth and power of the family, and also held the castle, manor, and lordship of Middleham at his death in 4 Hen. VI., 1425. John, son of Ralph, died before his father, 1123, who was succeeded by his grandson, Ralph, Earl of Westmoreland, who died 2 Rich. III. Middleham, however, had passed to Richard Neville, Earl of Salisbury, son of Earl Ralph, who died 4 Hen. VI., by his second wife, a daughter of John of Gaunt. The Earl of Salisbury, by an inquisition of 12 Rich. II., had then Middleham. This is the earl who, in 37 Hen. VI., marched with 4,000 men from Middleham into Lancashire on his way to London, to obtain redress from the King and Queen for injuries done to his son. On this earl's forfeiture, before 38 Hen. VI., his Lancastrian kinsman, Sir John Neville, was made constable of Middleham Castle, then in the Crown. Sir John fell at Towton, 1 Ed. IV., and his son Ralph became Earl of Westmoreland. But Middleham remained in the Crown.

At Middleham, then in charge of Neville, Archbishop of York, Edward IV. was confined by Richard, Earl of Warwick, the prelate's brother. Edward escaped when hunting in the park. After Barnet the castle was granted to Richard Duke of Gloucester, to the exclusion of the male heirs of the Marquis Montagu, Warwick's brother. Richard was much here; raised the rectory to a deanery, with a view to the foundation of a college; and here his son Edward, Prince of Wales, was born. After Richard's death, Middleham fell to the Crown, and was leased to various persons. Finally it was sold to Mr. Wood, of Littleton, ancestor of the present owner, General Wood. Recently the keep has been partially cleared of rubbish, and some of the most dangerous portions have been underpinned; but a little more assistance of the same character is much needed, to save some of the most prominent features of the ruin from destruction. G. T. C.

CONGREGATIONAL CHAPEL AND SCHOOL, THAME.

This building was opened for public worship at the end of last year. It is in the Geometric style, and the materials of construction are local stone, with Bath stone supplied by Messrs. Randall & Saunders for the dressings.

The internal dimensions of the chapel are 32 ft. 10 in. by 62 ft. 9 in., in addition to the organ recess at the back.

The accommodation, inclusive of an end gallery, is for 450 adults. The minister's desk is on a raised semicircular platform in front of the organ. The two seats immediately near the platform follow its curve. The ceiling line is about one-third down the roof. In the centre the height is 34 ft. 9 in., and at the sides 22 ft. The roof principals are visible below the ceiling line, and they, as well as all other visible woodwork, are stained and varnished. Simple dis-temper enrichments are introduced round the window-heads, organ recess, and ceiling panels. The lighting is by ten gas pendants.

The space under the chapel is appropriated to a school, 32 ft. 10 in. by 51 ft. 6 in.; a class-room, 13 ft. 4 in. by 17 ft.; a minister's vestry, 9 ft. 4 in. by 11 ft. 9 in.; and the vault for heating apparatus. The chapel floor being 6 ft. above the ground level, every part of the basement is light and well ventilated.

The heating is effected by Haden's warm-air system.

The total cost of chapel and school, exclusive of site, but including heating, lighting, and fencing, will be about 1,500l.

The architect is Mr. W. F. Poulton.

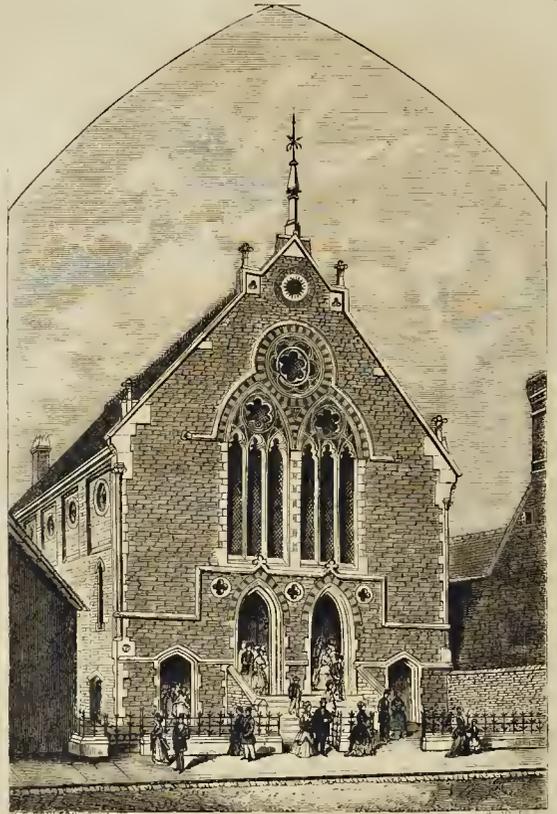
CAMBERWELL NEW VESTRY HALL.

We publish in our present number a view and plan of the ground-floor of proposed Vestry Hall for Camberwell. This design was selected in open competition. The style is French Italian, and the principal front facing the Peckham High-road will be executed in stone. The building throughout will be of fireproof construction. On the first floor are arranged two committee-rooms in the front. The Vestry Hall, 47 ft. by 12 ft., is placed at the rear, and lighted by means of a skylight and side windows.

The awkward nature of the site, and the specific requirements of the Vestry, are urged as reasons for the shape of some of the rooms: we seriously recommend a revision notwithstanding.

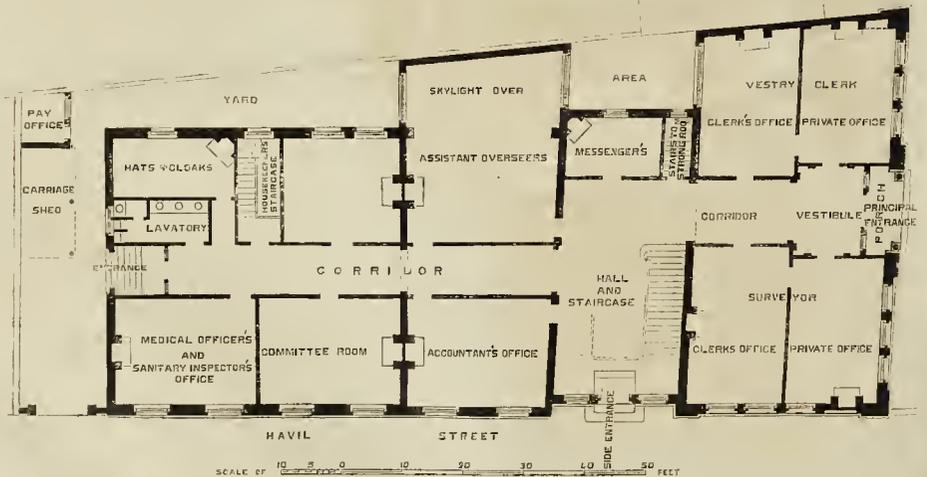
The estimated cost is 8,000l.; tenders for the works are about to be sent in.

The architect is Mr. Edward Power.

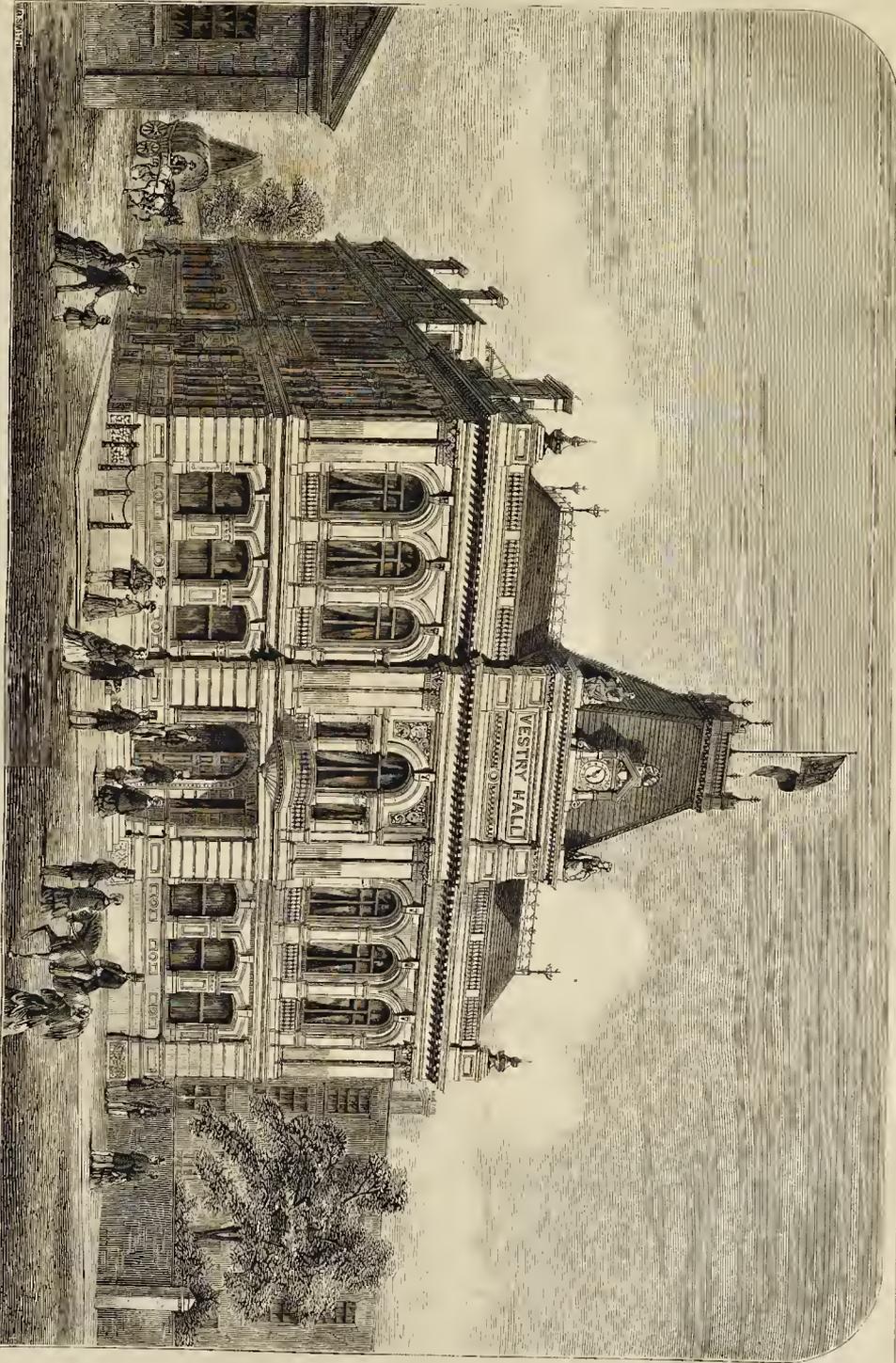


CONGREGATIONAL CHURCH AND SCHOOLS, THAME.

MR. POULTON, ARCHITECT.



CAMBERWELL NEW VESTRY HALL.—Plan of Ground Floor.



CAMBERWELL VESTRY HALL.—MR. EDWARD POWER, ARCHITECT.



REDEDOS IN PIEDMONT CHURCH, NEAR STOURBRIDGE.

This church, which has recently been rebuilt, has just now received a reredos, after a design by Mr. F. Preedy, of London, architect. The principal part of the reredos is of a light-coloured alabaster, which material forms the background above the level of the table, and in which is worked a series of canopies, supported by coloured Irish marble shafts, and containing sculptured figures of the four Evangelists, the latter being of a whiter tint than the ground-work. The central and most conspicuous object is the *Agnus Dei* standing on the Mount of Paradise, and from beneath his feet issue the four mystic streams; this panel, and one on either side of it, containing the Alpha and Omega, and other symbolic ornaments, are worked in Venetian mosaic, on gold grounds of the same material; as are also other smaller panels in the sides of the reredos, representing the sacred monograms, and other emblems, on blue and red grounds. The lower part at the sides of the table is hewn in bands of Caen stone and alabaster, the stone inlaid in ornamental patterns, with coloured marbles and cements.

The carving, inlay, stone, and alabaster work has been successfully executed by Mr. Boulton, of Cheltenham, carver. The mosaic work is from the architect's studio. The reredos (as explained on a brass plate placed in the side wall of the chancel) has been erected by Miss Hunt, a former parishioner, but now of Brookfield, Bellbroughton.

THE THEORY OF THE BEAUTIFUL.

A LECTURE was lately delivered in the lecture hall of Trinity College on the above subject, during which the lecturer, Professor Todhunter gave expression to the following, seeming to prove that the Beautiful was merely a theory, without any defined or known laws to govern its action,—a theory very disputable:—

"To some extent" (said the Professor) "each man has his own ideas of beauty, and there is no recognised authority to which we can refer for guidance. We find, however, an approach to unanimity in all ethical judgments, and in aesthetic judgment there is still a greater approach to it. The aesthetic conscience may be awakened and convicted of sin, just as the ethical conscience is; and the more aesthetic men are, the more unanimous in their judgment will they become. It would appear that there is a certain catholicity in ideas of beauty, and that an unsophisticated mind may appreciate the beautiful when fairly confronted with it. Two categories might be made of the beautiful,—first that of form and colour; second, that of rhythm and sound. The phenomena produced in us by a beautiful object might be summed up in one word,—Joy. The emotion of the beautiful has something of a sympathetic character. It is contemplative instead of worshipful, and underlying the delight an element of melancholy. We yearn to absorb things useful into our personality; we yearn to be absorbed into the beautiful in what way?"

The beautiful is the revelation of the divine purpose of creation; the ugly, the revelation of the chaotic disorder of things, the disorder which tends to the decay of all loveliness, the production of lower and lower types of life, a revelation of the Kingdom of darkness of Satan. The beautiful and the sublime express different ideas in the comital order of things,—the beautiful may be regarded as the resolution of discord; the sublime, as discord unresolved, but suggesting its resolution. The pretty and the grotesque are derived respectively from the beautiful and the sublime."

The Professor reminded his hearers in the beginning that the subject was one of the deepest questions in metaphysics, and at the conclusion he gave his audience an instance of the difference between the sublime and the grotesque by painting to a portion from the Book of Job, and comparing it with a passage from Goethe's "Faust." As an abstract theory or series of ideas about the beautiful in nature, the passage we quote, of the lecturer may be good enough, accepting the old and common belief that "every eye forms its own beauty," but in the matter of art the theory of the Professor would be an unsafe theory. And in answer to him, we submit that there is a recognised authority or authorities for guidance in the matter of the beautiful in relation to art. For instance, without proportion in architecture there can be no true harmony, and without harmony there is very little real beauty. A very intelligent and even learned man in many ways may have a joy excited within him at beholding a supposed work of art: it may be a painting or it may be an actual building. In common parlance, his joy may only be another name for the emotion the supposed grandeur of the edifice awakens to his senses. Yet the building or the painting may

have little or nothing of art in its composition. The same object or objects to a professional eye instead of creating joy, might produce disgust. Joy is not the consequence of beholding the beautiful, except in a conditional or limited sense. If joy is experienced by the true artistic and professional eye, the work may be assumed to be a work of merit or art, but if otherwise the emotion is felt, it cannot be said to be due to the phenomenon that is said to arise on beholding the object of one's admiration or joyousness. A knowledge of the laws, the proportions, the harmony, and the composition, is necessary before we can pronounce an object artistically beautiful at least.

CHORLEY NEW TOWN HALL COMPETITION.

NOTHING has yet been decided about these plans. The Improvement Commissioners have devoted some time in the examination of the drawings, and have held several meetings respecting them; but they have been unable to come to a decision upon the merits of the plans, and have at length determined upon calling in the assistance of an architect, so that it is expected an award will very shortly be made.

COMPETITIONS.

Trent Bridge Cricket Ground.—In the competition for the new Cricket Pavilion for the Trent Bridge Cricket Ground (the famous Nottingham Cricket Club's home), the design submitted by Mr. S. Dutton Walker has been selected.

Tiverton Land Company.—The Directors of the Tiverton Land and Building Company having advertised for plans for laying out their estate, at an adjourned meeting held on Tuesday, at the Town-hall, under the chairmanship of Mr. J. H. Amory, M.P., awarded the first premium of 20*l.* to Mr. C. J. Phipps, of Mecklenburgh-square, London; and the second, of 5*l.*, to Mr. J. Chudleigh, jun., of Newton Albot. They have also appointed Mr. Phipps architect to the company, and instructed him to proceed with the erection of four pairs of semi-detached villas.

The Kereham Villas Competition.—The competition for villas at Fardham, Hants, has been decided by the selection of a design prepared by Mr. D. J. Brooks, of Kennington-road.

LEEDS UNION INFIRMARY.

THE foundation-stone of a new infirmary for the accommodation of the sick inmates of the Leeds Union Workhouse has been laid by Mrs. Middleton, the wife of the chairman of the Board of Guardians. The erection of this building has become necessary owing to the existing infirmary having, by reason of the increase of population, and the formation of the Leeds Union, ceased to be adequate to the necessities of the union.

About two years ago the guardians issued a general invitation to architects, by advertisement, to compete for the erection of a new Union Hospital, the conditions being that the structure should be designed upon the Pavilion principle, and with an allowance of not less than 1,200 cubic feet of space per bed. Twenty-seven sets of designs were sent in, and that of Mr. Henry Walker, of East Parade, Leeds, was chosen from amongst them for execution. The selected design, however, met with disapproval on being submitted to Dr. Smith, the medical officer of the Poor-Law Board, who saw no necessity for isolation in a workhouse hospital, or for an allowance of more than 800 cubic feet of space per bed; and after several interviews and much correspondence and delay, the guardians have been obliged, though very reluctantly, to abandon the Pavilion principle (upon what grounds we should like to know), and to submit to a modification of the design in other respects, in order to obtain the sanction of the Poor-Law Board. The design now being carried out, prepared by Mr. Walker, in accordance with the requirements of the Poor-Law Board, is based on the block system, and the main building comprises separate suites of wards for male and female patients, with administrative departments between. The hospital is three stories in height, and has a frontage of 342 ft. It is arranged for 216 beds, exclusive of attendants. The central portion contains accommodation for nurses, chaplain, and dispenser, and also includes ward sculleries, hoists, and separate staircases and conveniences

to the wards. The kitchens, &c., are built at the rear, and connected on the ground-floor to the main building by corridors. The wards for each sex are alike, those on either side consisting of nine compartments, arranged in suites of three on each floor, and the compartments of each suite communicating with each other, as well as with a day-room at the end, by means of large doors. Each compartment will have a double stove, with descending flue in the centre; and Pettit's system of ventilation is to be adopted. Each day-room has separate conveniences immediately attached. The beds are ranged on each side, in pairs, between the windows. The design is of a Gothic character, in agreement with the architecture of the surrounding buildings, and will be executed in brick, with sandstone dressings; and the contractors are—Messrs. Thos. Whiteley, mason and bricklayer; Thos. Hall & Co., joiners and carpenters; Thos. Storey, plumber; Hoops & Robinson, ironfounders; Wm. Pycock & Son, slaters; H. Orange, plasterer. The contracts amount altogether to about 14,000*l.*, not including furnishings, &c. The Poor-law Board have sanctioned the expenditure on the new edifice of the sum of 17,000*l.*

OUR NEW ORGANS.

Sir,—Can you do anything towards improving modern organs? What are they made of? Not the sonorous Baltic timber, but spruce and American pine, full of knots and shakes, glued inside to fill the cracks; mouths, one-fourth, and some one-third, of the width; so that nothing short of a pair of bellows such as are fit for a blacksmith, could fetch a groan out of them. And the public think this music. Why? Because they know not the rich and beautiful tones that are only to be heard in the very few existing instruments worthy of the name of an organ. What about the modern metal pipes? This, I am sorry to say, is (next to the tuning) the most abominable part of these instruments,—organs I cannot call them. Instead of tin and lead with the silver, it is lead without the silver, with little or no tin, and—listen—antimony, to make the metal hard. There is still the execrable system of equal temperament to be spoken about, and the erroneously formed bellows.

AN ORGANIST.

THE SURREY GARDENS RE-CONSTRUCTION AND THE MAGISTRATES.

WE have already noticed in the *Builder* the extensive alterations and new buildings now in progress at the Surrey Gardens with the view of their shortly being opened to the public. These new works include, amongst others, the conversion of the large music-hall into a spacious theatre, the erection of a menagerie, and other buildings. Mr. Strange, the new proprietor, has just applied to the magistrates for a licence, and they last week refused it, on the opposition of Mr. Spurgeon (who formerly preached there before the erection of his Tabernacle) and a number of the inhabitants of the neighbourhood. Within the last few days the decision of the magistrates appears to have created a considerable amount of dissatisfaction amongst a portion of the residents in the district, who complain that it is somewhat harsh, considering the large amount of money which Mr. Strange is expending in the new buildings.

RE-OPENING OF ST. GILES'S CHURCH, SHREWSBURY.

THIS church, which has been closed for some time past, in consequence of the carrying out of extensive alterations and additions, which have become necessary from the increasing population of the district, has been reopened for divine service. The chancel being old and in a dilapidated state, it has been taken down and rebuilt at the cost of a resident in the parish; a chancel aisle containing a vestry and space for an organ has also been built; and the nave and north aisle has been lengthened by one bay. These alterations give 130 additional sittings, and they improve the appearance of the church. The architect employed was Mr. J. Lawrence Randal, of this town; and the work has been carried out by Messrs. Everall & Morris. The masonry was executed by Mr. J. Maddock. A stained glass window, which was erected a few years back, by O'Conner, in memory of the late Mr. W. W. How, has been removed from the west end of the aisle

and re-fixed in the east window of the new chancel; and the glass from the east windows of the old chancel has been re-arranged and incorporated in other windows. A two-light window on the south side of the chancel has been filled with stained glass, by Ward & Hughes, as a memorial of the late Mr. Thomas Howells, of Highfields, and the old window containing the figure of St. Giles has been placed in the north side of the new chancel. In the west end of the nave two new windows have been inserted, and it is anticipated that a stained-glass window will, before long, be placed in the aisle in memory of the late Mr. R. Bryan Smith. The chancel and sanctuary are laid with tiles from the manufactory of Messrs. Minton, Hollins, & Co., of Stoke-upon-Trent. The wood and stone carving are the work of Mr. G. Landucci. The windows have been glazed by Messrs. Dore & Davies; and the chancel will be heated with hot-air stoves, erected by Mr. Dodwell; so that the whole of the work, as far as possible, has been executed by tradesmen of the town. Owing to the strike which has recently taken place among the builders of the town and some other causes, the work in the interior of the church is not yet altogether completed.

BRITISH AND BELGIAN MARBLES.

SIR,—Without reference to any particular work, or desire to say anything that might seem captious, I wish to ask a few questions in the interest of our native materials:—

1. Can the Belgian black marble be got in sufficiently large sizes, free from treacherous, almost invisible, rents, to warrant any architect using it for decorative purposes in an important building?

2. Are there not marbles in Devonshire, the Midland Counties, Ireland, and another place at the edge of the world, viz., Wales, which far surpass the ordinary Belgian specimens for strength and beauty?

3. Cannot these British marbles be worked in Great Britain at 20 per cent. less in cost than marbles can be by Belgian or French masons?

4. Are the Government and our architects sufficiently alive to the interests of the masons of Great Britain?

5. Cannot the master masons of London give their men 9d. per hour and nine hours per day, and accomplish my question No. 3?

If some one will kindly answer these few plain questions, he will oblige a twenty years' master mason from the

BANKER.

SUN DIALS.

PREFACING some notes on Sun Dials in Derbyshire, Mr. George Roberts, of Lofthouse, Wakefield, says:—The materials for the history of the sun-dial are somewhat scanty. Ashur, King of Judah, who lived about 740 B.C., had a dial (Isaiah xxxviii.). The Greeks had dials 550 years B.C., and Pliny says that Anaximander, the Greek philosopher, was the inventor. The Romans had both the dial and the clepsidra, an instrument by which time was marked by the running of water or sand from one vessel to another: they erected dials in their public squares and walks and their temples, and most probably introduced them into Britain. I cannot discover that the Druids had any sun-dials. The ancient inhabitants of Mexico and Peru had a sort of rude-dial, by which they ascertained the hour of the day and period of the solstices. The different kinds of sun-dials were the only astronomical instruments which the Aztecs and Incas possessed. The clepsidra, the sand-glass, and subsequently the clock, succeeded the dial, which was inconvenient as it only marked time in sunny weather. The Romans had a motto expressive of this inefficiency—"I only count the hours of sunshine." The venerable instrument is now so rapidly going out of use, especially on churches, that in another century it will be as rare as are the May-poles. Though not now commonly useful, it is worthy of respect as antiquity, and ought to be looked upon as a superannuated servant, grey with age and full of honour, for assuredly it was more faithful and certain than many of the complex instruments which have succeeded it.

Exhibitions.—The private view both of the "Society of Painters in Water-colours" and the "Institute of Painters in Water-colours" will take place on Saturday, the 20th inst.

CHURCH-BUILDING NEWS.

Onestry.—It has been resolved to employ Mr. Street in restoring the parish church. A sum of 3,325*l.*, out of a total of 7,586*l.*, as the estimated cost, has already been subscribed at one meeting. Mr. Street's report of the necessary alterations, renewals, and restorations gives the following items:—Nave—new roofs, 1,815*l.*; new columns, arches, &c., 1,200*l.*; new oak seats, 1,275*l.*; new vestry, 250*l.*; new floors, 400*l.*; sundries, 260*l.*; warming and lighting, 400*l.* Interior of nave—Repairs of stonework, new windows, copings, crossings, openings, lower stage of tower, drainage, and new south porch, &c., 780*l.* Chancel and chancel aisles—ceilings, 240*l.*; floors and steps, 201*l.*; chancel seats and screens, 420*l.*; children's seats, 112*l.*; repairs of windows and walls, new south door, &c., 230*l.*—total, 7,586*l.* Some of these items were capable of reduction, if necessary.

Limpsfield.—The parish church has been reopened, after having undergone a restoration. Previously, the whole of the external walls were covered with plaster, which has now been removed, and the rubble work has been pointed. The interior was completely blocked with large pews, whilst a gallery stretched along the west side projecting far into the church and obscuring the windows. The whole of the inside fittings have now been taken down, and in place of them open sittings of oak have been erected throughout the church. The tower, which is massive, rests upon three arches; the belfry windows which had been in part built up, have now been restored to their original length; the brickwork which blocked up the northern and western arches has been removed; a new window inserted in the south wall, and the whole thrown into the church. The chancel, at the east end, in place of a late three-light Perpendicular window, has now a triple lancet, two jambs of which were found in the wall. The north chancel was restored in 1870, at the expense of the Lord of the Manor; it has at the east end a triple lancet window, exactly similar to that in the principal chancel, the old jambs here also having been found bedded in the wall. The lights are filled with stained glass, the subjects the twelve Apostles. It is a memorial window, presented by Mrs. Lereson-Gower. The church is capable of yet further improvement. Mr. J. L. Pearson was the architect employed.

Darlaston.—The new church of All Saints, Darlaston (the Mills Memorial Church), has been consecrated by the Bishop of Lichfield. The church has been erected solely at the cost of the Mills family, in memory of the late Samuel Mills, ironmaster, of Darlaston. The edifice occupies 3,364 square yards of land, near the high road. It is in the Early English style, and is built of red brick, with Bromsgrove stone dressings. The roof is covered with Broseley tiles, and the western doorway is surmounted with a bell-turret, containing two bells. The interior arrangements consist of a nave and two aisles, a chancel and chancel aisle, and a vestry; and an arcade of pointed arches, separating each aisle from the nave. The Bromsgrove stone pillars, from which the arch springs, bear carved foliated capitals, the work of Mr. Earp, of London. The roof is open-timbered. The chancel seats are of English oak, and those in the body of the church, all being free, are of pitch pine. The pulpit is of Bromsgrove stone, octagonal in form, with open panels, and the outer angles bear the heads of the four Evangelists. The chancel and nave are inlaid with Godwin's encaustic tiles. A series of two-light windows in keeping with the general design give light by day, while by night the building will be lighted with gas. The gas-fittings were supplied by Messrs. Pater & Son, of London; the heating apparatus by Messrs. Haden, of Trowbridge. Accommodation is provided for about 520 persons. The cost of the edifice amounted to 5,000*l.* The architect was Mr. G. Street, R.A., London; the builder, Mr. H. Lovatt, Wolverhampton; and the clerk of works, Mr. W. H. Williams.

Crewe.—The new chancel of St. Paul's Church, which, with an organ-chamber and organ, has been lately added to this edifice, has been consecrated by the Bishop of Chester. The organ is new, having been recently built by Messrs. Wadsworth, of Manchester. The chancel is built in the Gothic style, in accordance with the rest of the building, and the floor is paved with Milton tiles. The supports to the roof, which is of wood, are carved, the ends of the buttresses having figures of angels bearing shields, on the

face of which are various ecclesiastical devices. The walls behind and around the communion-table are inlaid with tessellated work; and at the entrance to the chancel the choir is situated. A stained window has also been placed at the east end of the church. It consists of five lights, the centre containing a representation of the Crucifixion; and in this work of art the distance views of Jerusalem and the Mount of Olives are prominent features. The lights at the right hand contain pictures of the Nativity and Baptism of Christ, and the left hand shows the Entombment, and the discovery by the woman of the departure of Christ. In a circular light, at the top of the window, the Ascension is the subject treated.

Amersham.—The parish church of St. Mary, Amersham, has been re-opened by the Bishop of the diocese, after a restoration of the interior and the erection of a new chancel aisle. The restoration has been carried out from the designs of Mr. Preeley, architect; and the cost has amounted to about 3,800*l.*, exclusive of the cost of font, altar-cloth, reredos, pulpit, and lectern, which were presented to the church. The completion of the work thus far is mainly due to Mrs. Tyrwhitt Drake. The church is supposed to be built on a Norman foundation, as fragments of late Norman work have been found. The style of architecture is of the Perpendicular character; the greater part is fourteenth-century work, but the piers, arches, &c., date from a period a century earlier. The east window has been raised nearly 4 ft., and deepened about 2 ft., and the floor of the sanctuary has been raised about 18 in. The chancel arch and roof have been raised, and the plaster ceiling replaced by a wooden groined roof. The organ has been removed from the old west gallery, and placed in the chancel aisle, and the choir are seated in the chancel. All the galleries have been taken away, and the plaster removed from the roof of nave, transepts, and aisles; the old principals are left, and the ancient boarding under the rafters shown; the decayed corbels have been renewed and carved. Two tilted arches of peculiar shape were accidentally discovered and opened out. The piers on the south side appear to be of earlier date than those on the north, and are of more elegant shape; all have been taken out, and the stone re-worked or replaced by new material. The clearstory windows had no tracery, but the original tracery was found, and copied in the present windows. All the windows have been taken out, and with very few exceptions the present windows have been copied from the tracery found during the restoration. The church is heated by hot water apparatus, furnished by Mr. Skinner, of Bristol. The stone-work has been carried out by Messrs. Whitehead, of Aylesbury; the stone carving by Mr. Edward Whitehead; the wood carvings by Mr. Bromfield, of London. The contractor for the whole of the work is Mr. Cooper, of Aylesbury. The architect employed is Mr. Preeley, of London. Further restorations of the exterior and of the tower are proposed, for which an additional sum of 1,000*l.* is required.

Bedlington.—A temporary wooden church at Baudon-hill has been opened by the Bishop of Winchester. The church, which is built from a design of Mr. Richard Martin, of Caterham, is 100 ft. long, by 24 ft. wide; the nave is 60 ft. in length, the north and south transepts 10 ft. by 20 ft., and the vestry and organ-chamber each 10 ft. by 10 ft. The roofs are 32 ft. high, surmounted by a spire 60 ft. high from the ground line. The chancel is apsidal, and contains a large five-light stained window, by Clayton & Bell; the floors are laid with Maw's tessellated pavement, and it is calculated that the building will accommodate 350 persons. Messrs. Taylor & Son, of Bromley, have carried out the work, the cost of which has been defrayed by the rector, the Rev. A. H. Bridges.

Thorne and Hatfield.—A meeting of the seat-holders in the parish church has been held, to consider the report of Mr. Jackson, of London, on the question of taking down the west gallery of the church, and opening out the old arches at the west end of the edifice now bricked up, &c. The projected improvements are estimated to cost 230*l.* Ultimately, the architect's plan was adopted, and a committee appointed to confer with the seat-holders in the west gallery, who will have new seats provided for them under the tower, to collect subscriptions, and afterwards to see to the efficient carrying out of the work. **Ainstable.**—The old parish church of Ainstable was given up last April to the architect and

builders to be pulled down and completely rebuilt. The new church was finished in the February of this year, and has now been consecrated by the Bishop of the diocese. The church consists of nave, 41 ft. by 26 ft., and chancel, 26 ft. by 20 ft. A tower, 6½ ft. in height, is placed with its south-east angle coinciding with the north-west angle of the nave. The lower stage of the tower, having a doorway in its south side, forms an open porch to the church; and an inner closed porch connects the tower with the nave and vestry, thus affording a sheltered entrance to the church, the situation being elevated and exposed to storm. The roof is open-timbered, ceiled to the diagonals above the rafters. The seats in the nave are of pitch-pine, stained and varnished. The pulpit and prayer-desk are of carved oak; the lectern of polished brass. The chancel is completely fitted with oak left unstained and simply rubbed with oil. A short south transept forms an organ-chamber, and affords accommodation for school children. The chancel being occupied by private seats, a small choir has been arranged by placing seats in the east end of the nave facing north and south. The church is warmed by a slow-combustion stove (Muggrave Brothers, Belfast), placed in a chamber under the floor in the choir, and covered with an open grating. The architecture is Early English; the accommodation for 211; and the total cost about 1,400l., raised by voluntary contribution. The architect was Mr. C. Watson, Penrith; the contractors were Messrs. Sprout, Talkin, for masonry; Mr. John Richardson, Penrith, for joinery; Mr. George Bailey, Penrith, for slating; Mr. Porter, Penrith, for plumbing, &c.

Clent.—A new clock, striking hours and quarters, has been placed in the parish church of Clent, Worcestershire. It was supplied from the manufactory of Mr. Smith, of Derby.

Fishponds (Bristol).—The reopening of the parish church of St. Mary's, Fishponds, has been arranged for the 4th of April. During the time it has been closed extensive alterations and improvements have been made. The former chancel, most unsuitable for its size and general character for the purposes of divine worship, has given place to an apse-chancel, more than 30 ft. in length, and having on either side convenient aisles, the intervening wall being carried on arches springing from pillars of blue Pennant stones, surmounted by capitals of carved Bath stone. The interior of the church has been cleared of the pews and seats, which have been replaced by open sittings, with carved finials. The gallery at the west end of the church has been taken away, and the organ is now being erected in the north aisle of the chancel. The south porch has been removed, as also the entrance to the church on that side. The nave, however, remains, with this exception, in the same state as before the alterations were undertaken; but it is hoped that the parishioners will, at no distant period, rebuild this portion of the church, and place it in harmony with the chancel. The cost of the present restoration will amount to about 1,700l. The plans have been supplied by Mr. Seddon, of London, architect, and the works have been carried out by Messrs. Yalland & Foster. It is proposed to fill in the seven lancet windows in the chancel with stained glass, from the architect's designs, which are illustrative of the seven gifts of the Holy Spirit. Four of these windows have already been contributed, and will be placed in position prior to the reopening of the church. In addition, Mr. R. L. G. Vassall, Oldbury-court, has promised three windows of stained glass for the south aisle of the church. The organ is in the hands of Mr. Vowles, who is re-erecting it and supplying it with new stops and pedals, and introducing many of the most recent improvements.

Wolverton.—The church has been re-opened. Previously to the alterations the tower was separated entirely, and could not be entered from the body of the church, the intervening space being filled up with arcades of massive brickwork, which formed the ringing-floor. In front of this ringing-floor, but separated by two large doors, which may still be seen within the precincts of the God's-acre, was a gallery, which stretched nearly 12 ft. into the nave. These, the ringing-floor, the gallery, and all the brick-work, have now been removed, and the tower has been thrown open. The length of the church is it is now is 67½ ft., and the breadth is 18 ft. This, of course, does not include the transept. The tower, with its lofty arch, and series of round-headed niches and corbels, is a singular specimen of the era of Sir Christopher Wren.

Underneath the arch of the tower stands a new font. The tower has been furnished with new open seats, which, with the improved seating of the nave and transepts, are the work of Messrs. Garrett & Son, Kingsclere. All the carving in the church is the work of Grinling Gibbons or his pupils, and the old oak of that and the pews, now it is renewed and refreshed, is very striking. The windows, instead of being plain with wooden frames, are now divided with red brick mullions. The east window is the work of Messrs. Barraud & Westlake. The chancel side-windows are from Horwood & Sons, Frome. The remaining windows are by Messrs. Powell & Sons, the transept and west windows being quarries, the others cathedral glass. The general carrying out of the work has been completed by Messrs. Wheeler, Brothers, under the supervision of Mr. C. Smith, of Reading.

DISSENTING CHURCH-BUILDING NEWS.

Jarrow.—A church, which has just been completed at Jarrow for the use of the United Presbyterians of that town, has been formally opened for public worship. The structure stands a short distance from the railway station at Jarrow; but from its proportions and its spire it is seen from distant places in the surrounding country. It has been built in the Gothic style of architecture, from the designs of Mr. Joseph John Lish, architect, Newcastle. The plan of the building comprises a nave and two side aisles, with entrance porches and vestibule, there being at the west end a sessions-house, ministers' vestry, lavatory, and heating chamber. The nave roof, which is lofty, is divided by a light arcade, carried on ornamental cast-iron columns, whilst the nave ceiling, which is "coved" its full length, is divided into panel spaces by the roof timbers of the longitudinal ribs, each of the latter being enriched by a perforated wooden cornice. Ventilators are placed continuously along the length of the ceiling, to give exit to the vitiated air and allow of the introduction of fresh air without draught and annoyance; and these, from their design and position, form a feature in the decorative treatment of the interior. The galleries are placed over the side aisles and across the west end, and are approached by rooney stone staircases, each gallery having a separate approach. Provision has been made for the rapid clearance of the church, there being six different exit-doors, all so arranged that the congregation from each division can pass out without intermingling with each other till the outside is reached. The whole of the internal wood-work is pitch pine, varnished, the sittings being without doors. The pulpit, which is placed on a raised platform at the east end of the edifice, is composed of Yorkshire stone, with a moulded string-course and cornice, columns of red stone supporting carved capitals, and the whole being relieved with incised and carved work. Over the pulpit in the east gable there is a three-light window of ornate design, filled in with stained glass. The lower part of the window contains figures illustrating three periods in the life of David, who is represented as a shepherd, as a psalmist, and as a king. The west window and the heads of the side windows are also filled with stained glass. The whole of the glazing has been done by Mr. W. J. Boer, of Leeds. The gas-fittings, which are of brass and iron, have been designed to harmonise with the architecture of the church. The building has been heated by hot-water apparatus, put in by Messrs. Dinning & Co., Newcastle. The total height of the spire is 135 ft., its junction with the tower being marked with a moulded cornice, having at each angle a carved grotesque of the lizard type. The edifice gives accommodation for 900 adults. It has been erected at a cost of about 3,200l., a large proportion of which sum has already been obtained. The contractor for the work was Mr. Richard Wylan, of Jarrow, and the architect, Mr. Lish. The sub-contractors were:—for slating, Mr. J. Place, North Shields; for iron-founders' work, Messrs. Abbot & Co., Gateshead; for plumbers' and gas-fitters' work, Mr. Thomas Grieve, North Shields; and for painting and staining work, Messrs. Cooper, of Newcastle.

Utley.—A new Independent chapel has been opened at Utley. The edifice stands on the roadside, in the pastoral district, about midway between Keighley and Stoston. There has been no attempt at elaborate ornamentation or striking architectural effects. The edifice is Gothic. The front view shows a doorway, with a two-light

window on each side, and a four-light tracery window over. One side has six two-light windows, and the other five, and the whole are glazed with cathedral tinted quarry-glass, with coloured borders. The angle to the right of the entrance is occupied by a tower, which rises a few feet above the apex of the roof. The ground-floor pews have bench-ends and framed doors. A small gallery is placed across the end of the chapel, above the vestibule. The choir is accommodated in a pew which projects from the organ recess, and the front is decorated. A staircase which opens below the pulpit leads to the school underneath, which occupies the whole of the lower portion of the structure; but, on account of the formation of the site upon which it stands, the school is entirely above the level of the surface of the ground. The school consists of one large apartment and three class-rooms, the entire edifice being heated by hot-water pipes. The chapel will accommodate 400 persons, and the school upwards of 250 children. The original estimate was about 2,300l., but the original plan having been extended in its details, this estimate has been exceeded by several hundred pounds. The architect of the building was Mr. George Smith, of Bradford and Keighley.

Luxulyan, Cornwall.—Rosemelling Wesleyan Chapel, in this parish, recently reopened, has undergone internal rearrangement from the designs and under the superintendence of Mr. Silvanus Treval, of Bodmin; Messrs. Phillips & Sons, Luxulyan, being the contractors. The upper surface of the seats is concave, and the backs are inclined. A rostrum takes the place of the former pulpit.

Basford.—The foundation stone of a Baptist Chapel for New Basford, has been laid. The site chosen is a large piece of ground in Chapel-street, and the design will be Gothic, with a principal entrance in front, above which will be a window with traced ornaments and a Gothic arch. There will be a small lobby immediately within the entrance, with lights on either side. The side and front entrances give access into a lobby and staircase leading to the gallery. The roof will be built upon timbered semi-circular principals, and the seats will have stall-ends and leaning backs. The platform for the ministers, and the communion pews will be surrounded by railings, and there is to be a vestry on both sides of the chapel, which will be heated with hot-water apparatus, and lighted with starlight pendants and ventilated. The cost will be between 900l. and 1,000l. Mr. Thomas Horsfield, of Halifax, is the architect; and Mr. Ellis, of Nottingham, the contractor.

Manchester.—The Welsh Presbyterian congregation, formerly of Oak-street, have opened their new chapel in Igrwood-street, Cheadam. The chapel is built of brick, with stone dressings, the style of architecture being principally Gothic, from plans by Mr. Richard Owens, of Liverpool. The builder was Mr. Thompson, of Cheadam Hill-road. The grounds are laid out with shrubs and trees. The pulpit, pews, and general fittings of the interior are pitch pine. The chapel is seated for about 400 persons. Behind are a school-room, vestries, and bouse. The cost of the whole has amounted to 3,000l. The organ, which has been erected by Mr. Watson, was presented to the congregation by Mr. Evan Thomas, of Cheadam.

STAINED GLASS.

Ripon Cathedral.—A window, to the memory of the late Hon. and Very Rev. B.D. Erskine, D.D., dean of Ripon, and has been inserted in the south aisle of the nave of this cathedral. The window contains two scenes from the life of Christ. The "Nunc Dimittis" occupies the upper part, the centre light representing Simon with the child Jesus, and on the right and left the Virgin Mary and Joseph. In the lower compartment the Nativity is represented; in the centre light, the Virgin seated with the infant Saviour; and on the right and left are portrayed the wise men and the shepherds. The window, which is of the style of the fifteenth century, was done by Messrs. Clayton & Bell, and is erected at the cost of one of the dean's daughters.

Bath Abbey Church.—There is at length some prospect of the east window of this church being filled in a manner becoming the character of the edifice itself. The matter has been taken up by the Bath Literary Club, and several conferences have been held. It appears to be necessary that the work should be accomplished separately from the general restoration, and the cost of the glass

alone is estimated at 1,000l., apart from the stone work, which the rector has undertaken to provide for.

St. Paul's Church, Cambridge.—A new east window has been placed in this church, as the result of subscriptions among the parishioners. The church being dedicated to St. Paul, the artist has chosen subjects taken from incidents in the life of the patron-saint. The upper-tier openings of the window represent St. Paul's conversion, his first miracle, his conversion of Lydia, the burning of the books at Ephesus; and the lower ones, St. Paul preaching at Athens, his imprisonment, his being brought before Agrippa, and the casting of the viper from his hand after the shipwreck. The centre lights display the Last Supper and the Ascension. The tracery of the window is filled in with the emblems of the four Evangelists, and the "mystic passion" or crucifixion of our Lord. The work has been executed by Mr. W. H. Constable.

Birkdale Church.—A window of stained glass has just been put into the five long lights of the east window in this church. In the centre is a figure of St. James, after whom the church is named. It is nearly of life size, with a shepherd's crook in the right hand. The other four lights are fitted with geometrical patterns. Messrs. Edmondson, of Manchester, were the artists.

Workshop Abbey Church.—A memorial window has been placed in the north aisle of this church, to the memory of Robert John Gainsford, formerly of Darnall Hall, by the members of his family. The artist was Mr. Westlake. The subject is St. John's advice to little children:—"Little children, love one another." The design has been executed by Messrs. Lavers, Barrand, & Co.

Berkeley Church.—It is proposed to place a stained window in this church, in memory of Dr. Edward Jenner, the discoverer of vaccination, who was born at Berkeley, lived and died there, and was buried in the chancel of the parish church. The subject of the window, which will cost 600l., of which 100l. have been subscribed, is to be "Christ healing the sick."

St. Barnabas's Church, Hengoed, Wales.—A stained-glass window has recently been placed in the north transept of St. Barnabas's Church, Hengoed, by Captain Hasband, of Manchester, in remembrance of the late Mrs. C. A. Lloyd, M.A., rector of Whittington. The window was executed by Mr. Ashwin, of Great Russell-street, London.

Mark Church, Glastonbury.—This church has just received its last stained-glass window. Most of the churches in that neighbourhood were originally built during the period from the fifth to the twelfth century, out of funds which accumulated from the revenues, &c., of Glastonbury Abbey, and they were of the simplest form and character. They were rebuilt from the thirteenth to the fifteenth century on the same sites. At first the churches were so small that, on rebuilding, the former site was occupied by the chancel alone. Moreover, they were not rebuilt at once, but added on to from time to time, according to the state of the abbey funds, generally finishing with the tower and the north aisle. In Mark Church these successive steps are easily traced. But what distinguishes Mark Church is the accurate geometrical proportions of all its parts.

County Asylum Chapel, Lincoln.—A stained glass window has just been presented to the chapel of the County Asylum, by Mr. G. K. Jarvis, chairman of the visitors, in commemoration of the recovery of H.R.H. the Prince of Wales. It is in the Norman style, by Messrs. Wailes, of Newcastle, and represents in the chief compartment our Saviour stilling the tempest, with a medallion cross overhead, and the figure of an angel beneath, holding a scroll.

Christow Church, near Exeter.—Messrs. Ballantine & Sons, of Edinburgh, have prepared a stained-glass window to be erected in this church, in memory of the late Hon. E. Pelew, formerly vicar of the parish. There are three upright compartments, and these contain illustrations of the 6th, 11th, and 15th verses of Revelation six. This portion of Scripture was selected by the late Lady Exmouth, as suggesting the subjects for illustration in the window. The dexter compartment illustrates the 6th verse, showing an angel flying through the heavens, bearing the everlasting gospel to those that dwell on the earth. The central compartment illustrates the 11th verse, and shows, seated on a white cloud, the Son of Man, having on His head a golden crown, and in

His hand a sharp sickle. The sinister compartment illustrates the 15th verse: an angel is seen leaving the Temple, as if crying to Him who sits on the cloud,—"Thrust in thy sickle and reap, for the time is come for thee to reap, for the harvest of the earth is ripe." This text is inscribed on the base of the window, and in the top tracery are angels with harps, as if engaged in singing the new song before the throne. The central figure of Christ seated on the white cloud is surrounded and surmounted by an emanation of benedictive rays of golden hue, contrasting with His under-garment of silvery white and His robe of ruby. The upper part of the sky is of a light cerulean blue, while towards the earth it assumes a deeper and less ethereal tone.

SCHOOL-BUILDING NEWS.

Blackburn.—St. Peter's Schools, commenced about twelve months ago, have been formally opened by the Bishop of Manchester. The cost is something like 2,800l., and provision is made for 550 children. The architect was Mr. Simpson. The wall, to the height of about 1 yard, displays red bricks pointed; the remainder, to the roof, is painted of a lightish hue; and the ceiling is formed into panels bearing devices, which much enhance the general appearance of the place. Chandeliers are suspended from the centre, to supply artificial light. Mr. Canliffe, decorative artist, did the paneling and painting. The walls, too, are relieved by mottoes and devices.—The Bishop of Manchester has also taken part in the opening ceremonial of St. Thomas's Schools. In all, extra accommodation has been provided for 2,400 children. St. Thomas's new schools have cost 3,000l., and will accommodate 1,000 children.

Leeds.—The foundation stone of a new school in connexion with the Hanslet Union Workhouse has been laid. The site of the building is contiguous to the workhouse. In the year 1866 the then infirmary was converted into a school-room; but in the latter part of 1870 Mr. Farnall, Poor-law Board inspector, having reported that the building was ill-contrived and unhealthy, it was determined to erect a new school. The plans, which have been approved by the local Government Board, have been prepared by Messrs. Hill & Swann, architects, Leeds. The building will accommodate 100 children, and will be of two stories, with apartments for the school-mistress attached. There will also be provided for the girls a washhouse and laundry, and for the boys a workshop. The contractors for the whole work are Messrs. George Onkes & Son, Hanslet. The total cost is estimated at 2,500l.

Chapel Allerton.—The foundation stone of a church school has been laid at Chapel Allerton. The site of the new building is in Back-lane, behind Queen's-place. The school, which will be surmounted by a bell-gable and cross, will consist of two departments, one for girls, which will be 45 ft. by 18 ft.; and the other, for infants, 66 ft. by 18 ft., the two together accommodating about 300 children. Attached to each department will be a playground with out-offices. The plan also includes a mistress's residence. The style of architecture will be modern domestic Gothic. Sir Thomas Beckett has presented the site, which consists of half an acre of ground. The estimated cost of the building is 1,500l. Messrs. W. Perkin & Sons, Leeds, are the architects, and the contractors are as follow:—Brick and masons' work, Messrs. John Garland & Son; carpenter and joiners' work, Messrs. Wm. Shires & Son; slaters' work, Messrs. Wm. Pycock & Son; plasterers' work, Mr. John Franks; plumber and glaziers' work, Mr. John Edward Bedford; and painters' work, Messrs. Chas. Wales & Son. The school desks and benches will be supplied by Mr. Ward, of New Wortley.

Wolstanton.—A bazaar, in aid of the completion of the new National School buildings, is to be held. The buildings, in point of style, are a novelty in the neighbourhood. They are from the designs of Mr. Brooks, of London, and are in brick, in the style of the thirteenth century—domestic Gothic. The plan is three sides of a parallelogram, having the infant-school and class-room on the north, girls' class-room and school on the east, and boys' school and classrooms on the south and south-west. The windows have flat stone heads, supported by a small column, which divides the lights into two parts. They are all of the same character; but a variety is got by some of the windows having six, some three, but most four lights. The roof

is covered with red tiles, the eastern ridge being surmounted by a *flèche*, covered with blue slate, containing a bell, under which is the principal entrance-doorway. A master's house is built at the boundary of the playground. Mr. N. Bennett, of Burslem, is the builder. The total cost, including furnishing, is, we are informed, expected to be about 2,800l., of which about 700l. are still deficient.

Kilburne (Leicestershire).—New National Schools have been opened in this populous village. These schools will be an auxiliary to Horsley Schools, and are intended for the education of girls and infants only, the boys continuing to attend Horsley as heretofore. The building was designed by Mr. Knight, of Nottingham, architect, and was built by Messrs. John Berrford and James Knifton, of Kilburne.

Folkestone.—New national schools are in course of erection. The buildings include a master's house, and infants', girls', and boys' rooms, and class-rooms, with accommodation for 290 children, and are being carried out from the designs and under the superintendence of Mr. S. S. Stallwood, of Folkestone.

Miscellaneous.

The New Invention in the Iron Manufacture.—A number of gentlemen connected with the Iron and Steel Institute and from most of the leading works in the north of England, assembled at the Deeside Works, Middlesbrough, to inspect the new American machine of Mr. Danks, which supercedes puddling by hand. The machine has just been erected, and worked admirably. Mr. Danks was present, and explained the nature of the machine to inquirers. The charge when put into the furnace is carried round in a revolving cylinder, whereby it is worked sufficiently in about three-quarters of an hour, and then withdrawn by mechanical contrivances. Between 600 lb. and 700 lb. was generally the weight of the charge, but it has been in most cases greatly enlarged. The trials were mostly made with molten metal,—pig iron taking a considerably longer time, generally about an hour and a half. The quality of the iron produced, which was from Cleveland pig, was highly spoken of by practical men. Six ironmasters of the United Kingdom combined together and arranged to give Mr. Danks 50,000l. for the right to erect and have the full use of 200 of his machines, but some doubt as to the force of the patent is said to have prevented the completion of the arrangement in the meantime.

The Brighton Sewers.—At the usual monthly meeting of the Brighton Intercepting and Outfall Sewers Board, the engineer's report showed that the total length of brickwork which had been put in the 5 ft. diameter sewer was 9,100 lineal feet, or, including the portion between Hove-street and St. Anby's-villas, 9,800 ft. In the 7 ft. diameter sewer the total length of heading that had been driven was 10,200 lineal feet, of which 5,800 lineal feet had been lined with brickwork. The ironwork and machinery for the penstocks were on the site of the works at Portiello, as was also the dressed granite for the penstocks and outfall chambers, and the brickwork had just been commenced in the penstock chamber. In the course of a discussion as to the advisability of appointing a committee to inspect the works during their progress, it was remarked that if the Board were to take upon themselves the duty of inspecting the sewer it would take away the responsibility from Mr. Hawkshaw.

Proposed New Workhouse for Rochdale. The local guardians intend to build a large workhouse at Dearnley, and by one concentrated staff reduce their expenditure. The workhouse, when complete, will accommodate 784 inmates, but it is only intended at present to provide for 630. The cost of the erection and furnishing is estimated at 50l. per head for each inmate. The adopted design has been prepared by Messrs. Woodhouse & Potts, architects, Bolton.

The Megaliths at Avebury.—The danger which seemed to threaten the megalithic remains at Avebury has been averted by the intervention of Sir John Lubbock, who has purchased the ground on which building operations were about to be commenced. Grateful thanks are due to Sir John for coming forward to the rescue at the critical moment, when a few years' or even months' delay might have resulted in the complete destruction of the remaining stones.

The Horton Infirmary.—The Horton Infirmary at Banbury was built at a cost of 10,000*l.* by the late Miss Horton, of Middleton Cheney, Northamptonshire, and Highbury, London, and intended by her to be a gift to the town. The building stands in its own grounds in the Oxford-road, and is Domestic Gothic in style. It consists of a centre block, with tower, containing the executive portion or establishment and two wings, in which are the wards for patients. The wards are constructed on the pavilion system. The operating-room is large, and the students' gallery is lighted by four windows and a lantern. There are convalescent wards, dispensing, and consulting rooms. The floors are wainscot and wainscot over, and the dressings to doors and windows and the walls of the wards are plastered with Parisian cement, thus providing as far as possible against the absorption of foul matter into the plastering of the walls, a fruitful source of ill in many old infirmaries. Mr. Charles H. Driver was the architect.

Society of Arts Endowment Fund.—The Committee of the Society of Arts are seeking to raise an endowment for the Society of Arts of at least 100,000*l.*, to enable it to carry on its work with increased advantage to the community. The Council have a belief that it could render further public service if it had adequate funds placed at its disposal for the attainment of objects for which there are now no public trusts, and are willing to become trustees for the administration of any moneys which private individuals may choose to devote for any special public purpose coming within the scope of the Society's objects. Their desire is to establish permanent departments, with competent officers, who may investigate and report on the progress of new discoveries calculated to promote new industries in connexion with chemistry, electricity, mechanics, agriculture, and raw produce generally, thereby affording increased advantage to the people generally.

Conservative Land Society.—At the seventy-eighth quarterly meeting, held at the offices, in Norfolk-street, on the 9th inst., Viscount Ranleigh in the chair, the receipts for the quarter, ending Lady-day last, were declared to be 26,215*l.* 19*s.* 6*d.*, and the grand totals to the same date, 1,770,428*l.* 10*s.* 9*d.* The total withdrawals amounted to 466,803*l.* 6*s.* 10*d.* The number of the last share issued was 37,194. The reserve fund, exclusive of office premises, &c., amounts to 10,500*l.* The rate of interest remains at 5 per cent. on shares, and 4 per cent. on deposits. Among the gentlemen present, besides Viscount Ranleigh, were Col. B. Knox, the Hon. and Rev. W. Talbot, Col. Meyrick, Mr. Goodson, Mr. Holmes, Mr. N. W. J. Stode, Mr. N. Winstanley, Mr. C. L. Grneisen (secretary), Mr. J. Ashdown, Mr. P. Basall, Mr. W. Poole, Mr. G. F. Talbot, Mr. J. Hugh Thomson, &c.

Destruction of Property at Oldham.—Early on Sunday morning an accident resulting in considerable damage to property, occurred at the Hartford New Ironworks, Oldham, belonging to Messrs. Platt, Brothers, & Co. Connected with these extensive works are storerooms, in which are placed finished machinery. The floors rested upon beams of considerable strength, and were otherwise supported with stout iron pillars. About the time indicated, the whole fell in with a tremendous crash, rendering the carefully-finished and valuable machinery a heap of almost worthless *debris*, and causing a damage roughly estimated at from 3,000*l.* to 4,000*l.* Fortunately, no one was near at the time, and no injury to human life resulted. The accident is said to have been brought about by the large quantity of machinery in store.

A Dispute as to Four Inches of Land.—The case of Rayner v. Snelson, in the Nisi Prius Court at Chester, before Mr. Baron Chammell, was one in which the plaintiff, in accordance with the defendant, took down a wall on which the defendant's roof-tree rested, and rebuilt the wall 4 in. within the extreme limits of plaintiff's own property. Defendant then made use of the new wall as a party-wall, and plaintiff allowed his builder, or his sons, to cut the connections with defendant's property. This was settled by arbitration in defendant's favour, but the present action against defendant followed, on the ground that defendant had built upon the 4 in. of space adjoining plaintiff's wall. The judge said the action had been unadvisedly and imprudently brought; and the jury returned a verdict for defendant, a poor widow.

Cheap Churches.—The Bishop of Manchester at the annual meeting of the Diocesan Church Building Society at Preston, expressed a hope that the society would see to it that the new churches which were being built should be "substantial" churches. He had been rather alarmed at the unsubstantial character of some of these new churches. A friend had told him that there was hardly a new church in Manchester that would live for fifty years. The Bishop hoped that was an exaggerated way of putting the case, but there was a foundation of truth in the saying. He observed that roof-timbers sometimes were slender, and in some instances churches which had been built only two or three years ago were giving way in the roof. Everybody knew that a cheap article proved often the dearest article in the end. If they would forego in the building of churches the use of frittering ornament, which was often an excuse for veiling an architect's inability to comprehend the laws of architectural proportion, and be content with solid substantial outlines with good proportions, the results would be more satisfactory. Very good advice.

Charge against Mr. E. B. Smith, the Surveyor to Shrewsbury Local Board.—Mr. E. Jones moved, at a recent meeting of the town council as a local Board, that the surveyor be requested to resign. He regretted to do so, because personally he had no objection to Mr. Smith; but he had felt, long before he (Mr. Jones) became a member of that Board, that the business of the town belonging to the surveyor was not well done, or likely to be economically managed. For business, whether private or public, to be successful, those who had to manage it must be thorough masters of it, and had to tend to it closely. The duties of the surveyor were, no doubt, multifarious, and required great watchfulness and attention. After entering a good deal into detail, a discussion of five hours ensued, and Mr. E. Jones then replied, and said he would withdraw his motion, not that he was satisfied with the explanations of the surveyor, but because he saw that the feeling of the Board was against him (Mr. E. Jones). The motion was then withdrawn.

Co-operative Congress at Bolton.—The fourth annual congress of the members of the co-operative societies of England has been held in the Co-operative Hall, Bolton. There was a large attendance of delegates. After some preliminary remarks from the Bishop of Manchester, Mr. Hughes, M.P., delivered an address. A discussion took place on the desirability of establishing a co-operative bank. It was resolved "that the Congress fully recognises the imperative necessity of establishing a central office and appointing a permanent secretary, earnestly recommending the central board to take immediate steps to secure the accomplishment of these objects." The following were appointed the London section of the Board:—Messrs. Thomas Hughes, Q.C., M.P.,—Morrison, M.P., E. Neale, J. M. Ludlow, D. Pare, Hon. A. Herbert, M.P., Lloyd Jones, H. Pratt, G. I. Holyoake, E. O. Greening, G. Howell, Captain Maxse, R.A., Dr. H. Travis, Mr. Applegarth, and J. B. Huntington.

The Removal of Christ's Hospital.—The governors of Christ's Hospital have resolved to accept the offer made by the Mid-London Railway Co. for the purchase of the buildings and 4 acres of ground on which the institution stands, the company's Bill having passed its second reading in the House of Commons by a majority of 27. The sum of 600,000*l.* was offered for the land, hall, and buildings. A thousand boys will be transferred to new buildings in some healthy country district, and half a million of money will remain for planting day-schools in various parts of London. The company are to pay at once 10 per cent. deposit, and the officers of the hospital are directed to take all necessary steps for completing the transfer of the property.

The New Peabody Buildings in Bermondsey.—The Peabody trustees have decided to erect several blocks of buildings in Bermondsey, similar to those in the Blackfriars-road, and are just about to proceed with the erection of the first block, the site for which is in East-street, near New Church-street; and in connexion with the intended building, the Bermondsey local authorities are endeavouring to secure the making of a new and improved thoroughfare between East-street and New Church-street.

Relief to Crowded Footways.—It is said of the Chinese and other Eastern nations that they do many things in a way the reverse of that of the Western. The out-and-out Westerns,—the Trans-Atlanticers,—seem disposed to make the extremes of East and West meet, and to do things in a way quite out of the ordinary run of us semi-Westerns. It is seriously proposed in New York to relieve the passenger-traffic of Broadway by a "travelling side-walk" on a line with the second stories of the houses, mounted on pillars, and worked through these pillars by shafts of stationary engines, which will cause the travelling side-walk to run along one side of the streets and back along the other, in united sections, like an endless band, with curiously-contrived local ears, to fasten on and shove off with passengers, at corner stair-ways, so that the side-walk never stops, and the cars never move on, along the route. The inventor of this odd scheme is a Mr. Spear, and we hope he may succeed with his "Rapid Transit Sidewalk Company." He has patented his invention in America, and is about to do so in Europe.

The English Church in Rome.—The church proposed to be built in Rome is calculated for 800 persons. A covered corridor connects it with the house, the basement of which will contain a large room for the library now existing, and an ample sacristy where meetings and classes can be held. Mr. Street has chosen the Pointed style proper to Italy, and for his materials those most available in Rome, brick, with the mullions and tracery of stone. The dimensions of the church will be 160 ft. by 56 ft. externally, 37 ft. in height internally, and 79 ft. to the battlement of the campanile, which will carry a peal of bells. For these purposes it is desired to raise 15,000*l.*, including the cost of a site, for which some favourable and healthy spot within the city will be chosen.

The New Market Hall, Knutsford.—The memorial stone of the new Town-hall, now nearly completed, has just been laid. The inhabitants, according to their ancient custom at festive times, made various devices in sand on the ground fronting their houses; from many windows flags were flying; and the church bells were rung. Lord Egerton of Tatton, with a desire to meet the necessities of the town, is building a Gothic Market Hall, with Assembly and Committee Rooms, where, not only can his Lordship's court gather, but the inhabitants of the town generally, not simply for business in the Market House, but for public meetings, concerts, and entertainments, in the Assembly Room over the Market House. Mr. Waterhouse is the architect.

Portraits.—Mr. Samuel A. Walker, of Margaret-street, Cavendish-square, has sent us some admirable photographs of the late and present Viceroy of India, Lord Mayo and Lord Northbrooke, which will doubtless interest a number of persons just now. Lord Mayo's portrait has that aspect of sadness, at a moment when no cause for sorrow seemed to exist, which has been so often remarked in the case of other persons who have afterwards suffered. Mr. Walker has made the clergy a specialty, and prints a remarkable list of portraits for sale. He is also issuing an interesting series of photographs of the interiors of churches.

Startling Phenomenon at Pontypool.—On Saturday before last the inhabitants of Pontypool were alarmed by a peculiar noise, resembling the falling of planks and stones, and, under the impression that some houses had fallen close at hand, there was a general rush to the doors, but as they got there the sounds deepened into the unmistakable roll of a prolonged clap of thunder. The lightning, it turned out, struck the chimney-pots of houses in Maxwell-street, and, descending the flues, fortunately passed out of doors without doing any serious damage. The escapes, however, were miraculous.

Reading Architectural Society.—At the general meeting of the Reading Architectural and Archeological Society, held on Wednesday evening, the 3rd inst., at the Athenaeum, the Hon. Sec. (Mr. E. J. Shrewsbury) read a paper "On the Ecclesiastical Architecture of England," being a continuation of the subject of a former paper, and comprising a general historical review of the rise and fall of Gothic architecture from the First Pointed period, with a concise sketch of the revival in the present century. A discussion, opened by Mr. Morris, ensued.

Utilisation of Slag.—Further uses for slag are noted in the monthly scientific article of *Chambers's Journal*. An ingenious inventor in Philadelphia has devised a way of blowing a jet of steam through a current of liquid slag; and thereby he produces fine threads of slag from 2 ft. to 3 ft. in length, and more or less elastic. To this material (which gives one a hint as to the nature of the process whereby asbestos is made) he gives the name "mineral cotton," and as it is found to be an admirable non-conductor of heat, it is to be manufactured in quantities, and tried as padding for pipes and steam-boilers, and in places where escape of heat is to be prevented. A specimen of this thread or fibre has been exhibited at the Manchester Philosophical Society. It has a lustrous white fibre, singularly like cotton-wool from the pod. Its cost is trifling; and it can be used as a coating for refrigerators as well as for steam-boilers. Small quantities of similar wool, it is said, are sometimes produced while the blast is on, in the Bessemer steel converters. Near Osanbrick, in Hanover, in imitation of shot-making, molten slag is let fall from a height of about 8 ft. into water, where it forms into "large bean-shaped gravel," which is used in great quantities for the metalling of railways. At some of our English works slag is now broken up by Blake's stone-breaker, and sold for road-making; and we are told that the Bessemer slags, from hematite, make excellent concrete, because of the large quantity of lime they contain; for which reason, and for the silica which they also contain, they make excellent manure for potatoes and barley. In the fields, the broken slag crumbles to powder.

Royal Italian Opera.—An admirable performance of "Fra Diavolo," was given at Covent Garden, on Monday night last, Mlle. Pauline Lucca making her first appearance, and filling the theatre with an air of gladness. Mlle. Lucca has made the part of *Zerlina* her own; both as regards acting and singing the representation is perfect. Signor Nauvin is an exceedingly good *Fra Diavolo*, as all opera-goers know; and the other characters were effectively supported. Mr. Gye is fortunate in his new venture, Mlle. Albani: her *Adina* ("Somanbula") gave great pleasure and much promise.

The Royal Academy.—Some erroneous reports as to the opening of the Exhibition having been circulated, it may be useful to say that the ordinary arrangement is not to be departed from. It will be opened to the public as usual on the first Monday in May (the 6th), and the private view will be given on the preceding Friday, May 3rd.

Fall of a Building in Manchester.—In Brook-street, Old Garratt, a large portion of the back part of the shops, Nos. 103, 105, and 107, has fallen into the River Medlock. At the time, the river, which runs under the street at this point, was flooded by excessive rain to a height of something like 16 ft., or 12 ft. above the ordinary level, but it subsided very shortly, leaving the mass of rubbish, which almost blocks the stream, fully exposed to view.

The Institution of Civil Engineers.—There are now on the books of the Institution 11 honorary members, 745 members, 1,109 Associates, and 235 students, together 2,105, as against 1,995 at the same time last year.

Exhibition Palace, Dublin.—The decorator engaged is Mr. Bell, not Mr. Buer, as printed last week.

TENDERS

For the erection of a fever hospital, at Barming, near Maidstone, Kent. Mr. George Livingstone, architect. Quantities supplied:—

Carey & Bulmar	£2,229 12 4
Grested	3,500 0 0
Wright & Co.	3,415 0 0
Lacy & Torkington	3,307 0 0
Dover & Co.	3,253 0 0
Ansonbie	3,275 0 0
Almetts	3,250 0 0
Walls	3,240 0 6
Arad	3,157 0 0
Addock & Rees	3,101 0 0
Stephenson	3,124 0 0
Bridge	3,100 0 0
Cox & Brothers	2,870 0 0
Davis	2,547 11 2

For new school-room, &c., at Abbot's School, Guildford. Mr. Edward Ward Lower, architect:—

Swayne & Sons	£319 10 0
Burdett	327 10 0
Mason	325 0 0
Strudwick (accepted)	318 0 0

For new buildings in Lane-street and Cullum-street, City, for the houses of the late Mr. Samuel Williams. Mr. George Elkington, architect:—

Axford & Whillier	£10,182 0 0
Little	9,770 0 0
Maggs	9,768 0 0
Comber	9,673 0 0
Coleman	9,240 0 0
Browne & Robinson	9,147 0 0
Henshaw & Co. (accepted)	8,957 0 0

For a new church at Parwich, Aishbourne, Derbyshire. Messrs. Stevens & Robinson, architects:—

Buxton	£3,414 1 0
Pritchlow & Ward	3,382 0 0
Slater	3,208 0 0

For rebuilding the Cannon Brewery, Watford, Herts, for Mr. Joseph Ruskin. Messrs. J. & A. E. Bull, architects:—

G. & J. Waterman	£2,559 0 0
Chadwick	2,630 0 0
Hadley	2,341 0 0
Allen	2,250 0 0
Holland	2,167 0 0
J. & W. Savage (accepted)	2,094 0 0

For the erection of premises, No. 7, Bucklersbury. Mr. Edmund Woodthorpe, architect. Quantities supplied by Messrs. Welch & Atkinson:—

	Deduct for
	Plat-glass
Garnon	£2,098 0 0
Conder	1,970 0 0
Killey	1,832 0 0
Woodward	1,815 0 0
Turner & Sons	1,855 0 0
Perry, Brothers	1,835 0 0
Browne & Robinson	1,735 0 0
	11 0 0
	29 0 0
	23 0 0
	22 0 0

For warehouse, George-street, Mile-end New-town, for Mr. Ludus. Mr. William Mundy, architect:—

Brown	£1,790 0 0
Evapor	1,691 0 0
Peters	1,649 0 0
Murle	1,638 0 0
Russell	1,487 0 0
McLean	1,468 0 0
Emor (accepted)	1,392 0 0

For the enlargement of the Methodist Free Church, at Feckham. Mr. E. Borcham, architect:—

Thompson	£1,217 0 0
Richards	1,131 0 0
Waterer	1,020 15 0
Tarrant	1,000 0 0
King	853 0 0
Howard	8 15 0

For the erection of chimney-shaft, &c. for Messrs. Forbes & Abbot, Old Ford. Mr. Andrew Wilson, architect. Quantities supplied:—

Outwaste	£736 0 0
Warkitt	688 0 0
Morter	630 0 0
Hearle	595 0 0
Killey	593 0 0
Emor	591 0 0
Wicks, Bangs, & Co.	570 0 0

For erection of a small factory and residence, at Sudbury, Suffolk:—

Grimwood (accepted)	£664 0 0
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For alterations and additions to parsonage-house, Ashford, Middlesex, for the Rev. G. W. Seppings. Mr. John M. Hooker, architect:—

Norris	£1,612 0 0
Longmore	1,539 0 0
Collings	1,491 10 0
Knight & Sons	1,484 0 0
Lodge	1,470 10 0
Wright and Goodchild	1,451 0 0
Nightingale	1,443 0 0
Revell	1,419 0 0
Gibson, Brothers	1,395 0 0
Brunden	1,251 0 0

For the erection of two semi-detached houses and stables, in Harold-road, Hastings. Mr. W. L. Vernon, architect:—

Wood & Geary	£1,385 0 0
Parks	1,378 0 0
Reece	1,365 0 0
Sillar	1,353 0 0
Vidler	1,326 0 0
Budda	1,296 0 0
Hunkley (accepted)	1,255 15 6

For refreshment saloon, at Dulston Junction Station, for the North London Railway Company. Mr. T. Matthews, architect:—

Vaughan	£1,359 0 0
Axford	1,365 0 0
Fatman & Fotheringham	1,357 0 0
Abraham	1,330 0 0
Watts	1,289 0 0
Wicks, Bangs, & Co. (accepted)	1,275 0 0
Cardus	1,290 0 0

For Calvinistic Methodist Chapel, at Llanidloes, Montgomeryshire. Messrs. Szlamper & Aldwinckle, architects:—

E. H. Williams	£2,660 0 0
Morgan	2,350 0 0
J. Williams	1,850 0 0
Woolley (accepted)	1,720 0 0

For completing two villas at Colley-road, Gipsy-hill, for Mr. R. May:—

Kemp	£1,000 0 0
Phillips	968 0 0
Riley	970 0 0
Spencer	835 0 0
Dezman	823 0 0
Wright	890 0 0
Ellis	860 0 0

For decorative repairs at 15, Mornington-terrace, Hampstead-road, Mr. J. H. Rowley, architect:—

Reeps	£178 0 0
Newman & Mann	148 0 0
Vaughan	124 0 0
Crabb (accepted)	115 0 0

For works to the north wing of Euston Hall, Suffolk (contract No. 1), for the Duke of Grafton. Mr. Norton, architect. Quantities by Mr. Thacker:—

Cubitt & Co.	£2,550 0 0
Smith & Co.	2,720 0 0
Holland & Haugen (accepted)	2,376 0 0

For villa residence at Sydenham, for Mr. Benjamin Staudring. Mr. Norton, architect. Quantities by Mr. Thacker:—

Holland & Haugen	£3,420 0 0
Moore & Grainger	3,240 0 0
Perry	3,188 0 0
Hughesdon (accepted)	2,711 0 0

For alterations to the Baptist Chapel, Upper Holloway. Mr. W. A. Dixon, architect. Quantities supplied:—

Manley & Rogers	£1,847 0 0
Wicks, Bangs, & Co.	1,820 0 0
Manly (accepted)	1,765 0 0

For rattledown schools and teacher's residence, Suffolk. Mr. George Barnes, architect:—

Smith	£989 0 0
Cumford	896 0 0
Girling	899 0 0
Tooley	899 0 0
Gilbons	886 0 0
Smith	880 0 0
Luff	875 0 0
Pearson	777 0 0

For new shop-front, alterations, and repairs, at No. 28, Salisbury-street, Lisson-grove, for Messrs. Hanford, Brothers:—

Ingram (accepted)	£320 0 0
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For alterations and fittings to the "Cricketers," Newington-butts. Quantities not supplied:—

Badeock	£159 0 0
Hill	119 0 0
Bridgman, Smith, & West	347 0 0

For rebuilding premises in New North-road, Islington. Mr. Nunn, architect. Quantities not supplied:—

Sieal	£2,045 0 0
Bridgman, Nuthall, & West	1,797 0 0
Langmaid & Way	1,780 0 0
Amley	1,688 0 0
Cole	1,637 0 0
Jacobs	1,574 0 0

Albion-house, Beth-el-street, St. Luke's.—Mr. Cohen's tender was 3,000, not 5,000.

Thirty-nine Houses, Edgware-road 1.—We are asked to say that "Mr. J. Nicholson was associated with the surveyors already named in preparing the estimate."

TO CORRESPONDENTS.

E. J. F. A. E. T. M. J. G. C. G. E. R. C. E. V. M. H. W. T. W. H. H. T. R. M. J. L. T. W. A. J. D. R. T. E. K. T. & R. C. F. H. J. D. B. D. W. R. B. S. G. L. J. N. H. E. H. C. N. C. J. P. M. I. D. J. R. M. E. C. P. T. P. (not suited for printing)—Look-to-hill Bridge (next week)—R. E. (next week)—Mace (next week)
We are compelled to decline pointing out books and giving addresses.
All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.
None.—The responsibility of signed articles, and papers read at public meetings, rests of course with the authors.

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The Builder.

VOL. XXX.—No. 1524.

Pressure on Foundations, and Strength of Materials.

For late years, the methods of forming foundations mentioned in our last,* have been generally superseded by that of sinking into the bed of the river long upright cylinders, formed of rings of iron plates bolted together, by which means much greater depths of foundation can be attained at (in most cases) a mere fraction of the cost required for the expensive system of coffer-dams. These cylinders are usually sunk in the following manner. A frame or stage

of timber piles is first erected around the head of the cylinder, and a sufficient length of cylinder is then lowered from a platform on top of the stage, to rest on the head of the river. The cylinder is kept in its precise position, as well as kept truly upright, by cross-embers laid horizontally from pile to pile of the stage, at two or three different levels above the water-surface, which prevent all lateral movement in the cylinder, though they do not impede its vertical descent. The soil is then excavated from the interior of the cylinder, either by workmen in diving-dresses or by machinery specially provided for the purpose; and the cylinder itself is weighted heavily by "rings" of iron or other convenient loading being placed temporarily around its inner circumference. The result of this operation is, that as the soil is removed from the inside of the cylinder, its lower edge forces or cuts its way downwards from the influence of the heavy loading, and the cylinder gradually descends through the soil till the required depth is reached. As this takes place, fresh rings of iron plates are added on the top, so that the upper portion of the cylinder is always kept above water, and is retained by the timber guides above mentioned in a vertical position. The outer surface of the cylinder, which is in contact with the guides and with the soil below, is dressed to present always a smooth surface; and the flanges or projections by which the several rings are bolted together are kept on the inside of the cylinder, and serve also the double purpose of carrying the pig-iron loading for assisting the sinking of the cylinder.

By this method cylinders have been carried down to 100 ft. below water-level, and to even greater depths occasionally; and the cases are comparatively rare where a solid bottom cannot be reached.

It is then usual to fill the cylinders with concrete, made of hydraulic lime or cement, and to render them suitable for supporting the superstructure of the bridge. In some cases the upper rings of the cylinders above the level of the lowest water are removed, and the portion of the pier above that level is built up in masonry,

so as to present the appearance above water of an ordinary brick or stone pier.

The pressure on the foundations in this case is evidently caused not only by the weight of the superstructure, but by that of the cylinder itself, and of the concrete which fills it. When the depth of the cylinder is considerable, the weight of the concrete makes so large an addition to the pressure on the foundations, that it is frequently very difficult to so apportion the size of the cylinder that the area of ground on which it rests shall have sufficient bearing-power for sustaining the load which it has to carry. In such a case every contrivance is used to lighten this pressure, both by diminishing the size of the cylinder above the river-bed, and by making the superstructure as light as is consistent with stability. The friction of the soil on the sides of the cylinder (especially in the case of clay, which has a tendency to swell when cut into), is also useful in aiding to prevent the cylinder from sinking further when the weight of the superstructure comes upon it.

It is also generally found that ordinary soils will bear more weight at great depths than nearer to the surface. This is mainly owing to their becoming more condensed from the superincumbent weight; and also (especially in clay soils), to the increased difficulty of displacing laterally the soil under pressure. This may be understood by considering the action of an ordinary pointed pile, which, as it is driven into the ground, displaces the original material which is forced outwards or sideways, and renders the soil more condensed in its immediate vicinity. A somewhat similar effect takes place in clay under the pressure of superincumbent weight, which causes the soil to yield or ooze away sideways in consequence; and this movement is found to take place with less facility at great depths. An example of this is found in the railway bridge over the Thames at Charing-cross, the pier cylinders of which are stated to exert a pressure of 8 tons to the square foot on their foundations on the London clay; a pressure to which the same soil could not be exposed at a less depth from the surface without causing some risk of undue subsidence.

When sand of good quality, however, is protected from being washed away by running water or heavy rains, it forms an excellent foundation. It is firm and compact in its nature, and when in beds of sufficient thickness, it may be loaded in practice, with pressures of 6 to 8 tons per square foot with perfect safety.

Before proceeding farther, however, some practical considerations must be alluded to which modify the question of the amount of pressure which may safely be put upon a given soil.

Suppose, for instance, a solid block of masonry, 20 ft. square and 20 ft. high, and a thin wall of the same material, also 20 ft. high, were placed upon the same soil. On this supposition, the conditions both of soil and of pressure upon each square foot of the foundations would be alike in each case; and yet the thin wall, as regards the stability of its foundation, would be far less advantageously situated than the square block. A much slighter inequality in the bearing-power of the soil would disturb its equilibrium, or throw it out of the perpendicular; and it would also be more liable to damage from external causes affecting the ground on which it stood. Again, if the construction were a tall shaft or column instead of a wall, and therefore capable of being easily deflected sideways in any direction, these liabilities to injury would be still further increased. To place the two structures, therefore, on an equal standing, it is necessary to reduce considerably the pressure on the foundations of the weaker one; and this is generally done in practice. It is customary to extend the foundation courses of a wall or column to a considerable width beyond the face of the superstructure; and

various contrivances are used for effecting this purpose. The most usual of these is to extend the width of the foundation by means of footing courses, which, if properly constructed, have the effect not only of diminishing the pressure on the soil, but of otherwise increasing the stability of the structure, by augmenting the leverage with which the foundation resists the force of the wind or other external causes acting on the building above and tending to overturn it.

Where it is desirable from the weakness of the soil or otherwise, to extend the foundation still more than can be conveniently effected by footings, it is usual to place a layer of concrete of still greater width beneath the footings, or to prepare a foundation of timber piling or cross planking upon which the superstructure can be erected.

In this way it generally occurs in practice, that the foundations of thin walls on the weaker soils are compressed to about half the above-mentioned amounts only. But in the piers and abutments of bridges, and in other structures covering a large space in proportion to their height, the pressures indicated above may be generally adopted with security.

The rocky soils, which vary from the hardness of granite, to that of soft crumbling stone easily worn by exposure to the weather or to running water, may be considered in the same category of bearing-power as masonry itself, which will be subsequently treated of. In fact, it scarcely ever occurs in practice that such soils are loaded with the full amount of weight which they are capable of sustaining; the extent of base necessary for the stability of the structure being, in almost all cases, sufficient to ensure a sufficient area of foundation on rock and the harder soils.

The weight of the structure having been calculated, the pressure per square foot on the soil determined, and the area of the foundations deduced therefrom as above described; the base of the structure must be extended, either by footings, concrete, or otherwise, so as to cover that area and transmit the pressure equally and uniformly over it.

Great care is of course required when sudden changes or variations in the soil take place, to ensure that the settlement of the structure, if any occur, shall be uniform over its whole extent.

It now remains to consider the pressures which may be safely adopted on the materials themselves used in foundations, as distinguished from the soil on which they rest.

Good ordinary brickwork will crush with a load of about thirty tons, and may be loaded safely in practice up to ten tons per square foot. Brickwork of the best description, set in Portland cement, can be loaded in practice with double this quantity, although this should be considered an extreme amount; and it is more advisable to keep well within it, especially in thin walls and columns, which are liable to deflection under such heavy pressures; the latter cause of failure being quite independent of the inherent resistance of the material to crushing weights.

The limit of load which should be put upon stonework depends upon the nature and quality of the workmanship as well as upon the hardness of the stone itself. Thus, rubble walls with thick and irregular joints of mortar are weaker than even inferior brickwork for the support of heavy superincumbent weights, while well-headed ashlar masonry will bear loading to an immense extent. In general, from eight to thirty tons per square foot may be taken as the practical limits of such loading; but so much depends in each case on the quality of the materials and workmanship, that it is impossible to specify more precisely what limit should be adopted in each case, which must be left in a great degree to the judgment of the constructor.

The bearing-powers of concrete may be taken at from six to twenty tons per square foot

* See p. 277, ante.

according to the goodness of the materials of which it is composed, and the proportions of lime or cement used in mixing it.

The bearing-power of timber piles is an important feature in foundations, and varies according to the nature of the soil and the size and length of pile driven. The more ordinary application of piles is to drive them through a loose or weak material to a firm stratum underlying it; in which case they may be considered as columns or pillars supporting the superstructure, and stayed or steadied along their length by the contact of the soil through which they are driven. In this case, and under ordinary circumstances, long piles of whole timber driven to the usual extent (as, for instance, that a ton hammer with a 15-ft. fall should not drive the pile more than a quarter of an inch), may be trusted to carry a load of from ten to fifteen tons. Where the soil is very loose or fluid, however, this load should be diminished; as such a soil affords insufficient lateral support to the length of the pile, and allows it to deflect sideways, which materially diminishes its strength. In this case, a greater number of piles is generally used, which has the double advantage of both condensing the soil and of diminishing the loading upon each pile.

Piling is also frequently used in semifluid soils of great depth, where no firm bottom stratum is attainable. In Holland this takes place to a great extent, the large houses in that country being universally built upon a foundation of this description. In the swampy lands of America also, the same foundation is in very general use for engineering works. The bearing-power of the piles in this case consists mainly of the friction or adhesion of the soil to their surface, and this amount varies greatly, according to the nature of the soil. In fine sand, which is a very adhesive material, it has been found by experiment to be fully one ton per superficial foot of the pile surface (the piles being long and fully driven); but this amount of resistance is seldom attained. The load which piles in this condition will sustain may be ascertained with facility by using one of the undriven piles as a horizontal lever to withdraw a pile already driven; the lever having, of course, its short arm attached by a chain to the pile which is to be drawn, and its long arm loaded; the measure of the weight required to draw it will be of course the friction of the ground upon the surface of the pile. The pile should not be loaded in practice, however, with more than one-sixth of the weight sufficient to draw it, when the soil is throughout of a weak and fluid character.

When foundations of planking are adopted (which, though liable to rapid decay in a dry situation or in one where the timber is wet and dry alternately, may be used with a tolerable amount of safety in wet soils), the planks are usually cut in short lengths and laid crossways to the wall; and tied longitudinally together by longitudinal planking under the superstructure, of the full width of the footing course. The longitudinal and cross planks are spiked together and are found to make an excellent foundation. Good timber may be loaded in this position up to eight or ten tons per square foot, and affords an excellent means for distributing the superincumbent pressure over a large surface, which is especially valuable in the case of the weaker soils.

The above remarks show the general principles upon which foundations can be laid with security in the cases most ordinarily occurring in practice. They are, however, necessarily subject to modification in the endless variety of circumstances met with by the practical architect and engineer in the exercise of their profession.

AS TO THE USE AND ABUSE OF ARCHITECTURAL ORNAMENT.

WHAT is "ornament," as used in reference to architectural design? Perhaps it may be defined broadly as including all features, and all treatment or arrangement of material, the introduction of which does not add to the real stability of the structure. But in ornament, as thus defined, there is an important subdivision; and we may recognise two main branches of architectural ornament, viz., that which has for its main object to emphasize and illustrate the functions of various parts of the construction, and which we may call constructive ornament; and, secondly, that which adds nothing to the constructive expression of the building, but is introduced merely to relieve the design, and give it

more interest for the eye, and which might be called (to borrow a phrase from the plasterers), "enrichment," or surface adornment. The value of these two classes of architectural ornament is very different, as also are the degree and manner in which they may respectively be employed with advantage; and perhaps a suggestion or two on these points may not be superfluous.

Constructive ornament, when truthful and expressive (and when it is not this it will fail to be recognised at all as ornament, can hardly be too generally admitted in a design; indeed, any important feature destitute of such treatment would give as a sense of bareness and incompleteness, a feeling that the architect had altogether fallen short in his duties. As a typical specimen of what is included under this head, perhaps nothing better could be mentioned than the two or three forms of the Greek column, with its striated or "fluted" shaft, its cap and base. The column being a feature for resisting vertical pressure, the strong vertical lines of the fluting, which add nothing to its strength, nevertheless, emphasize this object, giving sense so to speak, to what would otherwise be a nerveless rounded mass, and directing the eye to the vertical line of force in which the column acts. No large column can lose this feature in its design without losing some of its characteristic expression; and the frequent omission of it by the Romans is one of the many instances of their want of perception of the meaning and value of ornament in this description. Such vertical markings on a long Gothic shaft, on the other hand, would be a superfluity, the vertical tendency being sufficiently indicated by the proportions of the shaft, which does not require to have this tendency and expression further exaggerated. The abacus in its simple form is a purely constructive feature, but its ability to take the weight of the architrave and transmit it to the column is emphasized by the ovolo moulding of the Doric capital, which gathers the pressure of the abacus and concentrates it on the column. The lighter Corinthian capital is a less sincere feature in this respect, and, indeed, so far as the foliage which makes its chief glory is concerned, oversteps the line of constructive ornament and becomes enrichment, being, in fact, a forecast of the principle which ruled the Gothic architect; that of using constructive ornament not to emphasize resistance to weight, but to conceal the fact of there being any weight to be resisted. The Greek architect could not achieve this, for he had still the palpable dead weight of his architrave over the column; and in consequence the stability and unity of expression which characterised the Doric style were here weakened, and the Corinthian architect had to pay for the elegance of his foliated capital by the loss of the monumental grandeur belonging to the older and sterner style; no actual magnitude of scale sufficing to restore the grandeur of expression which this one feature had impaired.

An excellent instance of constructive ornament, again, is the use of rustication in masonry, where the junctions of the horizontal layers of masonry which form the wall are marked and emphasized to us to increase the appearance of stability and "bond" between the various parts which make up the mass. This very artifice, when applied to a column, becomes, on the contrary, in most cases a fault and a contradiction, giving a built up and disconnected appearance to a feature which is always best as a monolith, or in as few pieces as possible, and destroying the vertical expression of the column by a series of strongly marked horizontal divisions. The archi-volt of the Classic arch, the moulding of the Gothic arch, are equally examples of the true and correct employment of constructive ornament in emphasizing and giving strength to an important feature in the architectural design; and in some cases, as in the set-offs and drip of the Gothic buttress, we find the construction and design so identified that it is almost impossible to discriminate them, and the best form for expressing the functions of the feature becomes also the strongest and most sensible and durable method of constructing it.

It is most with regard to enrichment, however, that caution and judgment on the part of the designer are so necessary. Constructive ornament, being merely the treatment of features which are necessary portions of the building, so as to emphasize their constructive value, imposes its own limits on the architect, and cannot be extended too far without destroying its own object. But in regard to mere enrichment there is no such natural check on the designer, and the views, practical and theoretical, as to the extent

and manner in which this class of ornamentation may be used, are various indeed: "Where you can rest, there decorate," said a well-known critic on art and on some other things. A distinguished architect, the late Sir Charles Barry, on the other hand, left on record, in his handwriting on the wall as well as on paper, his opinion that a building could never be too much decorated, provided that all parts of it were treated with equal or proportionate richness. We are inclined to think this a dangerous maxim, and that the truth lies more near the former canon, when adequately interpreted. Surface enrichment of an elaborate description should not, as it seems to us, be applied to features which, like columns, are manifestly doing the heavy work of the construction; indeed, such features admit advantageously of no ornament except that before described, that which emphasizes and helps their constructive expression. Anything which is quite independent of this, tends to weaken the expression and character of the design, by obscuring the real function of the column,—that of supporting weight. In this view the Egyptian column, with its elaborate and varied painted ornament; the Hindoo, with its ragged outline and incrustation of irregular carving; many types of Renaissance columns, rusticated and wreathed, are alike mistakes in treatment. An exception to this rule may be, when the structure in which columns are employed is on a very small scale where lightness and piquant effect are mainly sought, and where the supports really have not much work to do: in such a case the expression sought may sometimes be very much assisted by enriching those portions which in a larger structure should be left plain. In decoration on a wall surface, the portions of the wall which form piers would naturally claim a plain and solid treatment, and surface decoration would be applied to spandrels and intermediate spaces where the principal mass of the structure did not press. It may be said, on Sir C. Barry's principle, that where the pier portions are decorated in a simpler manner, and the richer decoration reserved for the other portions of the surface, there is then no objection to a universal application of enrichment to all parts of the surface. There may be cases in which such treatment might be suitable, and, when carried out with great care and judgment, successful; but, as a rule, we believe architecture requires perfectly unadorned wall space, more or less, to give the necessary dignity of expression to a large building, and the full value to the portions which are decorated. We can scarcely believe that a building entirely encrusted with decoration can look otherwise than somewhat weak; and such a treatment is likely to defeat its own object, by confusing the eye of the spectator, and leaving him nothing sufficiently marked or definite to rest upon; besides obscuring and overlaying the architectural motive of the design. The Houses of Parliament themselves, however great a work in many respects, furnish, we cannot but think, an instance of over-decoration, leaving an effect of fritter on the eye; and we can feel little doubt that the river front, impressive as it is, would have been far more so had a certain amount of broad untouched wall space been left, to give massiveness to the whole, and greater value by contrast to the decoration of the rest. Internally too, where richness is more allowable and to be expected, this has been overdone. There is this to be said, too, about very extensive surface decoration, that in such a case both design and execution are likely, in a majority of instances, to suffer. In few cases can the architect have time to give for really considering and designing ornament enough to cover a building; in few cases either can money or time enough be spared to have it executed in a first-rate manner. A little original, effective, well-considered ornament, though the rest of the building be left plain, is surely better than a quantity of mere repetition of ornament for the sake of a certain richness of effect, which, after all, is by no means one of the highest aims or results in architectural design; and which, in fact, has a tendency to give to a building a semi-barbaric character, like that of the elaborately decorated Japanese cabinets we were referring to a few days ago.

A glance at the styles of architecture now recognised as the greatest seems to bear us out in this view. The Greek architecture certainly was not overdone with the enrichment; but what there was of the highest and most intellectual interest possible; being, in fact, nothing less than sculpture of the very noblest school. This, perhaps, hardly comes under the term "ornament," or "enrichment," except in

so far as it answers to our previous definition of this, as decoration applied independently of construction, to relieve and add interest to the building. But in the Mediaeval style we see the full force of the distinction drawn here. The early modern users of this style among us worshipped the panelling and fretwork of the fifteenth-century builders; but as our knowledge and appreciation of the works of the great age of building proceeded, we went back, chronologically, step by step, in our admiration, which is now, for the most part, centred, and rightly so, upon the earlier works of the earliest branch of the Pointed style. And we find here ornament, for the most part, very sparingly applied, but generally very effective in treatment and design, and only placed just where the eye seems to require a point of interest to attract it; a hand of carved ornament meeting the eye at the point which separates one style of the design from another, and coming out with a sparkle by contrast with the plain masses of masonry adjoining it. A single line of panelling or diaper over a broad expanse of unbroken wall will often have a most piquant effect, doubling the value of the wall as giving mass to the composition, doubling also its own value by the contrast. When we speak of enrichment, however, as ornament "independent of the construction," we mean this only in a qualified sense. The ornament must be so placed as to fall in with the main lines and sections of the construction, not to cross and contradict them; nor must it contradict, or appear as an excrescence on, the nature of construction employed. In masonry, for instance, a row of small panels, as remarked, along a single course of the masonry, is a legitimate treatment: it is, in fact, treating one course ornamentally (a suggestion which might be extensively adopted and improved upon); but to panel a stone wall over in panels independent of the courses is to ornament it in a manner which contradicts construction; which represents, in fact, the outer aspect of a form of construction only suited to another material. The use of carving, too, in its more elaborate forms needs to be very much checked; the object now, in many of our new buildings, seems to be to carve as much stone-vegetation over them as can possibly be had for the money, and many blocks of offices have nearly as much carving distributed over them as would have served a whole cathedral in the "Transitional" period. This is not only vulgarising what, rightly employed, is a very beautiful source of decoration, but in towns it is often practically the very worst kind of decoration to employ, as likely to be so quickly worn away and choked up, as to its edges and hollows, by the combined influence of soot and dust.

In fact, we would see architectural ornament suited to the material it is worked in, expressive of or harmonising with the construction, and only introduced where it will really be effective and add value and point to the design. To employ a little ornament according to these requisitions will be found, we think, to demand more time and thought on the part of the designer than at present is often bestowed on the incrustation of a whole façade, turned over to the devices of that amphibious person, the art-workman, who is too often allowed to do, after his own fashion, what should be the result of the care and thought of the architect himself.

AMALGAMATION OR STATE RAILWAYS.

RAILWAY amalgamations are not a novelty, although the subject is at present exciting an unusual degree of interest. For more than a score of years past the process of amalgamation by actual purchase or lease has been steadily progressing, and the great systems, as they are called, are composed of dozens of small, originally independent companies. The larger and more powerful company, like the Octopus, concerning the nature of which naturalists have of late been so much exercised, stretches out its tentacle, and for the smaller and weaker company there is no escape. Each fresh acquisition adds to the power of the railway Octopus, and increases the number of its tentacles; and we find accordingly that some single companies of the present day, if resolved into their primitive elements, would furnish a goodly roll of some dozens of titles of companies that came into existence with their own distinctive local designations, that are now merged in titles indicating extensive territories; as the London and North Western, at first Liverpool and Manchester,

London and Birmingham, joined by the Grand Junction; the Midland, the Great Northern, the Great Western, the South Western, the South Eastern, the North Eastern, &c., all of which had originally in their germs their restricted local titles. Many more railway amalgamations have been effected, "not with observation," but not the less really. The amalgamations now on foot, which have led to the appointment of a joint committee of members of the Houses of Lords and Commons, to inquire into the whole question of the policy of amalgamation, and, incidentally, into the desirability or otherwise of the acquisition of railways by the State, are of another character.

A few months since the railway amalgamations on a large scale, proposed by companies, were four in number. 1. The amalgamation of the Caledonian and the North British Companies, which for the last fifteen years have carried on a ruinous competition and intestine strife with each other. Of late friends of peace in the companies have urged the attempt to arrive at the terms that might be accepted by both as the basis of "a Parliamentary peace," either by an equitable division of competing traffic or by amalgamation. Certain terms were laid down and proposed; but, unhappily, acquiescence of the shareholders of both companies could not be obtained, negotiations were broken off, and the draft Bill consigned to the waste-paper basket. 2. The proposed amalgamation of the London and North-Western and the Lancashire and Yorkshire Companies that would together constitute a corporation of great wealth and power, the united capital amounting to 105,000,000. For this amalgamation there is a Bill before Parliament in the present session. 3. The proposed amalgamation of the Midland and the Glasgow and South-Western Companies, which would give a third continuous route between London and Scotland. For this amalgamation also there is a Bill before Parliament. 4. A Bill now before Parliament to authorise traffic arrangements between the Great Western, the London and South-Western, the Bristol and Exeter, and the South Devon Companies. Mr. Grierson, the general manager of the Great Western Company, in explaining the provisions of the Bill, stated that it was not in any sense an Amalgamation Bill. If will, if sanctioned, be for all practical purposes, as regards rates and charges, and as its provisions will affect the public, an Act amalgamating the companies having railways to the west of a line drawn from Worcester to Oxford, and from Oxford to Portsmouth. The four companies engage to procure the consent to the agreement of the smaller companies in Somerset, Devon, and Cornwall, and the arrangement is to be in perpetuity, subject only to such changes as the contracting parties may agree upon.

It seems surprising that there should be so much divergence of opinion among eminent railway officers, and among men of large experience, as to the policy of amalgamation, and the principles of railway management, as has been displayed in the evidence given before the joint committee presided over by Mr. Chichester Fortescue, president of the Board of Trade. Mr. Cawkwell, manager of the London and North-Western, was called in support of the Amalgamation Bill in which his company is concerned. He admitted that the public should have security in the event of amalgamation, and stated that they would have it in the competition that would still exist. As regarded running powers, it was impossible to give other companies running powers over their line between Liverpool and Manchester, as both the line and the stations were inadequate to accommodate their own traffic, although their stations in Liverpool had cost $\frac{1}{2}$ millions sterling.

Mr. Allport, general manager of the Midland Company, on the other hand, in supporting the Amalgamation Bill in which his company is interested, said that the Midland must oppose the proposed amalgamation of the London and North-Western and Lancashire and Yorkshire, unless the Midland had running powers conceded to them over the amalgamated lines. Mr. Allport expressed himself as favourable, in general terms, to amalgamation, but with the essential condition of running powers to other companies over amalgamated lines. Such running powers Mr. Cawkwell showed to be impracticable, and the railways in and near London furnish many similar illustrations. Running powers to "foreign" companies over such lines as the Charing Cross, the Metropolitan, the North London, and the metropolitan extensions of other companies could never be more than a name.

A large number of witnesses have been, or are ready to be, examined in opposition to the proposed amalgamations. The opposition has been, in some instances, more nominal than real; and witnesses that have come to hand have remained to bless: instead of opposing, they have approved of the proposal. From the conflicting opinions that have been expressed by the presidents of chambers of commerce, mayors, aldermen, and others, who have been examined, it is evident that these gentlemen have not agreed among themselves either as to the policy of railway amalgamation, or as to the principles of purchasing the railways, or as to the principles of railway management. It is certain that they have not come before the committee with any complete predetermined theory. On certain points there is agreement: that goods' rates, as well as passenger fares between stations should be published by the companies, and that the amount of fares should be printed upon passengers' tickets. On the subject of equal mileage rates there is no agreement. One witness urges that there should be equal charges for equal service over the whole of a railway system. Another witness declares that a rigid system of equal mileage rates would be unwise and impolitic; another pronounces such a system impracticable, inasmuch as there are many instances of more than one railway route between the same points, the one route longer than the other. An equal mileage rate would throw one of the lines out of use for traffic between the two places, unless the rates were reduced over the whole system of the Company owning the longer line. Again, liberal rates were frequently necessary to develop the resources, and to nurse into a state of prosperity, a new mineral or manufacturing district. This had been the case with the Cleveland Iron District. The Government authorities that ought to be appointed over railways, and their functions and powers, are other points on which the opinions of witnesses were widely divergent. One asks for a Board of Control and a Board of Arbitration; another for a Board of Appeal, but without power to determine a matter. One witness was of opinion that it would be of the utmost advantage to the public that the State should purchase the railways. Another witness deprecated the idea of Government taking over the railways, which could not be better managed than they are managed now.

Whatever may be the finding of the joint committee, it seems certain that a great change in railway affairs is impending, and that the tendency is towards concentration either by traffic arrangements, by amalgamation, or by the purchase of the railways by the State.

The time is opportune for recalling some past Acts of the legislature in relation to railways.

In 1844 an Act of Parliament was passed for the purpose of enabling Government to purchase, on certain specified terms, all railways in the United Kingdom from that time forward to be constructed. Under that Act, Government took power to purchase the railways that came under its operation at the end of twenty-one years, which expired in 1865, when five-sixths of the railways of the United Kingdom became subject to its provisions. Government had then the option of purchasing the railways, and a Royal Commission was appointed in the following year, 1866, to determine whether and, if any, what action was to be taken under the Act of 1844. The Commission was also to inquire, *inter alia*, into the economical question connected with our railway system; that is, the cost of conveyance on railways, and into the charges which are made by railway companies to the public. The Commission, consisting of divers "right entirely beloved," "right well beloved," and "trustworthy and well beloved" cousins and councillors, took a large amount of interesting and valuable evidence, but deterred, possibly, by the magnitude and gravity of the responsibility, did not recommend any very sweeping change in the railway system of the country. On the contrary, the Commissioners reported "that it is not expedient at present to subvert the policy which has hitherto been adopted of leaving the construction and management of railways to the enterprise of the people, under such conditions as Parliament may think fit to impose for the general welfare of the public." The Commission made numerous recommendations as to improvement in Private Bill legislation, conveyance of mails, interchange of traffic, conveyance of merchandise and minerals, &c. The Commissioners deprecated interference on the part of the Government with the freedom of those who have provided the capital to fix the rates and

charges at which they may perform their services to the public, and the Commissioners expressly say that it would not be expedient, even if it were practicable, to adopt any legislation which would abolish the freedom railway companies enjoy of charging what sums they deem expedient within their maximum rates when properly defined.

The Report of the Commission cannot be said to point in the direction of a State railway system; but the great amalgamations now proposed, and the certainty that, if these are sanctioned, they will lead to others, until the whole of the railways of Great Britain are consolidated into four or five great companies, will doubtless incite to renewed attention and fresh discussion of the subject. In connexion with this important topic there is a prevalent fallacy in the assumption that the purchase of railways by the State involves their management by the State. The one thing is not by any means a necessary corollary of the other. Provided that the public, the shareholders, and the Government are agreed, there is nothing to prevent the conversion of railway stock into a new species of Government stock; nor is there anything to prevent Government from leasing the working and management of the lines to competent men.

The proprietors of the telegraphs received a bonus of a few millions more than the value of their property; the proprietors of railways are well entitled to as liberal treatment. If the railways can be acquired by Government upon equitable terms, and the difficulties can be avoided of throwing immense power and patronage into the hands of Government, in connexion with the acquisition; if the management of railways can be retained, for the greater part, in present hands; it may scarcely be doubted that a homogeneous railway system might be worked in a manner to confer immense advantages on the community. Under such a system equal mileage rates would present no difficulties. The plethora of the rich and populous districts would be available for the nourishment of those that are poorer and more sparsely peopled. Experiments could be made unhesitatingly in the direction of reduction of fares and charges, and the important problem could be solved with absolute certainty as to the minimum rates and charges that would yield maximum profits.

The time may not be yet come, but it will come, when the prediction of a writer in the *Quarterly Review* nearly thirty years since will be realised:—"It is impossible not to see that the system is developing itself to such an extent, penetrating all districts, superseding all other communications, affecting every species of public and private interests, and acting as the life blood arteries of the empire, as to render it probable almost to certainty, that the time must come when this great public trust can no longer be left to the management of private companies scattered over the face of the country. In truth, it seems only a question of time; railways must be made subject to some unity of management, and through whatever intermediate process it may pass, that management must finally be vested in the Government of the country."

PUMPS AND DRINKING FOUNTAINS.

Our whole confraternity of working people have a good deal to do and to hear with. Their hours of labour are long, and their work, for the most part, monotonous and unremitting. It is very difficult, if not impossible, for any one who has not had a trial of it to realise to himself what it is to get out of a warm bed at five o'clock on a cold winter's morning to begin some dull, mechanical, and totally uninteresting work; to plod at it all day long, till the nine, or the ten, or the twelve hours are over and gone; and then to find your way to a cold, cheerless room, or, still worse, a dirty coffee-house, of the universal English type. We say it is impossible to realise all this till you have tried it. It is the working man's lot in almost an infinite number of cases; and, what is more, there is at the present moment no escape from it, or the like of it, but the dangerous "public-house,"—a perfect harbour of refuge to such by the side of the aforesaid British coffee-shop. To many, many thousands of single working men does this apply with painful force. Letting this pass, we want to say a word or two about water, *i.e.*, spring-water; common cistern water, as supplied by the water companies; and our public drinking-fountains?

In the first place, it is in the recollection of

most that not many years ago there was every here and there in London streets an old-fashioned pump, tall and gaunt enough, with convenient strong handle and iron ladle, from which the coolest and pleasantest of spring-water was to be had by the thirsty for the mere trouble of pumping for it, and as often as not without, for there seemed to be always ready and eager for the work of pumping some small mortar or other close by to pump for you. For the fault of some of those antiquated pumps, they have been either altogether removed or their strong handles are tightly chained to their strong bodies, so that pumping is impossible either to great or to little people. Science stepped in, and reported against them and their doings; and all of them, not those only in bad or suspicious places, were condemned. There was one, for instance, in the Regent's Park, far from impurities, and from which the water was always delightfully clear, and cool and pure to the taste; but it suffered with the rest of them. A not a little curious history would be that of the London pumps; even a list of them would be interesting to see. Some of them have been right down famous. There was and is "Aldgate Pump," a queer-looking monolithic stone structure it was in times of yore, but it had to make way for Sir William Tite's more architectural structure. But even that improvement, but a year or two back, was doomed to destruction, and now there is another "design," by we know not whom, with a small attempt at a scientific and improved way of holding up a pail or water-can. But the famous pump is still there, luckily. There is another pump not far from it, and it is worth noting, for it is almost hidden among the slaughter-houses, but wherein the water, we are bound to say, is as good and clear as water needs be; and for this simple and plain reason, that the well or source of the water is so far from the surface, where the pipes and drainage abound, that it does not suffer from either of them. Go through some 100 ft. or 200 ft. of sand, gravel, and closely-pressed earth and stones, and almost any amount of impurity is taken away from the water passing through it. It is simply a gigantic filter, and does its work thoroughly and completely, and beyond any power of imitation by any mere human contrivance, as may be sufficiently proved by a comparison between the water from a natural well, and the water as it comes to the Londoner from the scientific apparatus of the water companies. It would be difficult to instance a more useful public work than the "restoration" of a few of the old London pumps, deepening the wells from which they are supplied, so as to be beyond the reach of any contaminating influence. No water is like *spring* water, and from a natural well only it is to be got. There is another curious remnant of Old London water supply in the Strand, the well-known Roman Bath and Well, as it is called. It dates from the days of the Roman occupation, and is, indeed, a natural well of the purest and clearest water. It is a plungo bath, and the water is constantly changing. We will mention but one other of the London pumps, though we could name not a few which have given place to the mean little dribbling drinking-fountains, shut up half the year round, with their little stream of semi-warm bad-tasting water and dirty mouth-pieces. The one we refer to is a right celebrated one,—almost, if not quite, classical. We refer to the one in the Dean's-yard, Westminster. Quite a story might be told of this famous little pump, and its varied fortunes. Two or three years ago it was a most unpretending iron structure, without ornamental details of any sort or kind; but happily for those who lived near it, and for St. Peter's College, and the clerical surroundings, it was always ready with its hest of spring water. But alas! consequent on the startling fact of the great railway works then going on at the "Willesden Junction" of the North-Western Railway,—and nothing less did it take to upset this sturdy little hydraulic apparatus—it suddenly (who would have thought it?) ran dry, and there was no more water from it, spite of all the pumping. So much did this grieve those who lived near,—and well it might, for it was the only *protected* pump for miles round,—that the non-supply of the water formed the subject of the "prologue" to the Westminster Latin play of that year, and the learned public were informed in good scholastic Latin verso that the scholars sighed for water, and that their pump was dry! But science was not to be beaten; for now, though you cannot draw spring-water, you may pump up common cistern-water from a slate tank sunk some foot or two beneath the ground, supplied as in an ordinary

cistern, with the nearest company's water. The learned scholars still call it a well and a pump, though the pump is a superfluity and a sham, and the water is *not spring* water, nor from a well. What a pity it is that the Dean and Chapter do not here, in their snug and comfortable precincts, sink a little and comfortably deep, and bring up from below a real well of pure spring-water, always drinkable, constructing an open marble or stone tank, as well as a pump, if that, indeed, be necessary,—the water to be visible. Thus may they set a good example to the rest of London; for what an infinite advantage it would be to have water,—spring-water,—overflowing, fresh and clear, for the thirsty wayfarer. The common cistern-water, as supplied by the water companies, is hardly drinkable, so that few can avoid the public house, even if they wished it ever so much. And here we connect the subject with our opening observations.

Notwithstanding the many, many evils resulting as we know from intemperance in this country, it is not a little to be wondered at, considering the temptations, how very little there is, comparatively speaking, of downright "drunkenness." You may go through on a Saturday night, where everything is favourable, miles on miles of low East-end streets, look into every comfortably-warmed and lighted "house," and see absolutely nothing of the intemperance so often cited. And, at the same time, you would be compelled to ask, Where else are to be found the passing comforts of light, warmth, and drinkables? Not in the open streets, certainly; for in no city in the world are the streets so entirely empty of every kind and species of comfort and accommodation. There is, in truth, in this tight little island no *public life*, no open air and street life, such as there was in the great antique cities of days gone by, or such as is yet to be seen in Oriental cities. John Bull is as a home mortal, and it is his weakness as well as his strength that he lives and enjoys himself, after a fashion, in his own house, almost unconsciously that there is a street on the other side of his own street-door. But though he knows it not, there is; and there are those who almost literally live in them, night as well as day. It is a curious subject, well worth a little thought and a few words, but not now.

METROPOLITAN TRAMWAYS.

ON Monday last, the joint committee of the members of Lords and Commons met in one of the Lords' committee-rooms, to take evidence for a report on the reference committed to them. This reference, it may be remembered, embraces the points,—whether it is desirable to increase the number of tramways in the metropolis; whether limits should be fixed to the metropolitan tramway area; what such limits should be; under what authority tramways should be constructed and managed; through what streets or thoroughfares additional tramways, if any, should be authorised, and under what restrictions. The committee consists of Earl Beauchamp, the Earl of Longford, the Earl of Arkle, Viscount Eversley, and Lord Clinton; with the following members of the Lower House:—Mr. Selator-Booth, Sir Ed. Colebrooke, Mr. Arthur Peel (of the Board of Trade), and Messrs. Arthur Guest and James White. Viscount Eversley, late Speaker of the House of Commons, presided, and conducted the proceedings with his characteristic urbanity.

The witnesses examined at the sitting were Messrs. C. Hopkins, engineer, of the London Street Tramways Company; Mr. Rowbotham, manager of the South London Tramways; Mr. Sheldon, who has been extensively engaged in tramway promotion at home and abroad; and Mr. John Morris, of the firm of Ashurst, Morris, & Co. The most important evidence presented to the committee was eloquent and interesting, although silent; it consisted of a very large diagram, showing in distinctive colours, the tramways in the metropolitan district already constructed and opened, or authorised; the additional lines proposed, with which the promoters intend to persevere in the current session; and the additional lines that have been proposed, that they are ready to give up, if the joint committee, or the private Bill committees to which the projects may be referred, are so minded.

The authorised lines show, as yet, a very partial system of tramway accommodation to the metropolis. They are almost exclusively to the east of a line drawn north and south intersecting

Charing-cross, and afford communication to north, south, north-east, and south-east, on the proposed line, and from Charing-cross as a centre, but do not touch the populous districts to the north-west and south-west, excepting only some lines, inconsiderable in extent, in the neighbourhood of Camden-town, and an irregular triangular communication between Vauxhall and Lambeth Bridges and Victoria Station.

The chief thoroughfares now or to be traversed by the tramway-cars are,—on the south side, running mainly east and west, from Victoria Station across Vauxhall Bridge, west of Kennington, past the Oval, Camberwell, Peckham, Hatcham, New Cross, Deptford, and Greenwich, to Woolwich Arsenal. A loop is formed that passes from Victoria Station along Lambeth Bridge, and along Lambeth-road to Blackfriars-road, and along that road to the south end at Blackfriars Bridge. At the junction of Lambeth-road and Blackfriars-road another authorised tramway reaches to Westminster Bridge on the Surrey side. It may be here convenient to say that the extensions in this locality that are to be persevered with include a short length to pass along Westminster Bridge and along the Victoria Embankment to the end of Whitehall-place; the promoters being willing to surrender a short length to Whitehall.

Another short length in this locality that they propose to persevere with is a continuation of the tramway communication from Victoria Station to the end of Victoria-street, leaving there a short gap between the point indicated and Westminster Bridge.

Other important extensions to the South of London are from the Strand, along Waterloo Bridge and Waterloo-road, to the junction already referred to, from which the authorised lines will afford continuous communication with Clapham, Brixton, Camberwell, and from Camberwell with all the localities east and west of that point on the original Pimlico and Peckham and Greenwich lines. From New Cross a tramway is already authorised to Westminster Bridge, passing along the Old Kent-road, and past the Elephant and Castle. The additional links, however, requiring to be filled in are from along the Kennington Park-road, past the Elephant and Castle, to the end of Backman-street, Borough; and from a junction there a new line continuing the communication into the Old Kent-road. It is not proposed to traverse High-street, Borough by tramway, but it is designed to lay a line from Stamford-street, along Southwark-street, to the London Bridge station. The proposed line to cross London Bridge is also surrendered, and the line along Southwark-road and Southwark Bridge; and the authorised crossings by tramways over Thames bridges, it will thus be seen, are by Vauxhall and Lambeth, and the additional crossings for which powers are to be asked are by Westminster, Waterloo, and Blackfriars Bridges. The proposed surrenders on the Surrey side of the Thames, in addition to those already indicated, are from Battersea Park to Wandsworth-road, and along that road, by Kennington-lane, to Newington, with a fork from Vauxhall Station, along the Thames Embankment to Westminster Bridge.

In the City the chief surrenders are a proposed line from Holborn to Ludgate-circus; a line from Blackfriars Bridge, and along Queen Victoria-street, to the Mansion House, with another from Aldersgate, *via* St. Martin's-le-Grand, to the east end of St. Paul's; thence along Cannon-street to King William-street; and the continuation from Moorgate-street, past the Bank of England, and along King William-street, intended to have been continued along London Bridge, is also given up.

Turning now to the tramways proposed or relinquished in the north and west, it would appear that the great area bounded by Paddington, Marylebone-road, Tottenham Court-road, Holborn, and New Bridge-street, Blackfriars, with the Thames for its southern boundary, is, for the present, to be left untraversed by tramways. The lines surrendered in this area include one from Kennington, *via* High-street and Knightsbridge, to Hyde Park Corner, and another from Notting-hill, Uxbridge-road, and Oxford-street, to the junction of that street with Tottenham-court-road. It is also proposed to give up proposed lines between Camden-town, and two short lengths, one from the Marble Arch along part of Edgware-road, the other from Praed-street into the Uxbridge-road.

The new lines in the north and north-west, for which powers are to be asked, are very important, and include,—Holborn, Oxford-street (as

far as Tottenham-court-road), Tottenham-court-road, Harrow-road, Edgware-road, Finchley-road, Caledonian-road, and King's-cross-road; with a connexion east and west between Islington and Bayswater, by the Pentonville, Easton, and Marylebone roads. The proposed lines are intended to join up numerous defective links in the metropolitan tramway system, and provide continuous tramway communication from Upper Holloway on the north to Camberwell, Brixton, Clapham, and numerous other localities in the south, with "correspondence" lines radiating in almost all directions, excepting to the west.

The Committee, at its rising, adjourned to Friday, the 19th instant.

HINDRANCES TO THE PROGRESS OF APPLIED ART.

In the course of a paper under this title read at the Society of Arts, Dr. Dresser said.—One of the chief hindrances to the advancement of decorative art is to be found in designers themselves, for there are many pattern-drawers who are a disgrace to the profession, inasmuch as the works which they produce manifest only gross ignorance, and are, therefore, altogether unworthy of notice. Of these I will not speak, but I desire that they should understand that whatever is produced which is of debasing character tends to the extermination of decorative art, for who would not prefer a plain article to one covered with graceless forms and inharmonious colours?

Passing from these men, to whom the name of "artist" cannot be applied, to those designers who have a certain amount of art-ability, we notice that the works produced by these latter are often inconvenient to use while they are beautiful in form, and are thus of a character calculated to bring art into disrepute. An art object should be useful as well as beautiful, if it is intended to fulfil a utilitarian purpose; yet not one poker out of a hundred is so formed that it can be used with comfort, nor is one tea-pot out of fifty so made that it will admit of the tea being poured from it without an expenditure of force greater than is necessary in order to the support of the weight which has to be lifted. By leverage a pound may balance a hundred-weight, as in the steel-yard; so in the case of a tea-pot, by leverage that which weighs four pounds may be as heavy to lift as that which weighs eight. Although the law which regulates the placing of handle and spout on all vessels from which liquids are poured is thoroughly understood, yet it does not appear to be known to one designer in a hundred, judging from the vessels which we see offered for sale in our shops. In like manner, pokers have become so inconvenient to use that it is impossible to break coal or even poke the fire with one without hurting the hand; hence, ladies have begun to regard fire-irons as mere ornaments, and to keep a little second poker and tongs for use, which latter are hidden in some corner, as objects unfit to be seen. There is nothing which tends to retard the progress of applied art more than the production by designers of objects which are inconvenient to use; and he assured that the most perfect beauty may be combined with the most complete utility; in other words, that which is most beautiful may be perfectly useful. How is it, I ask, that designers will not inform themselves upon subjects which, to them, are all important, and without a knowledge of which they cannot produce acceptable works? I am often amazed at the ignorance of my fellow ornamentists upon subjects which they ought perfectly to understand; and yet many of these men can draw well, and combine forms in a truly artistic manner, but their works, through not being adapted to answer the end of their creation, only tend to bring the beautiful into disrepute, by leading persons to suppose that if a work is graceful and lovable it cannot be used with comfort.

Our worst enemies are those of our own household; so, in like manner, the worst enemies to the progress of applied art are ignorant designers. If we, as designers, will but educate ourselves, we shall thereby remove one of the chief hindrances that impede the progress of applied art.

It is a strange thing that to this hour the great majority of the designers, or pattern-drawers, employed in our manufactories are men almost wholly without education, and chiefly from comparatively low life. The son of a weaver in a carpet-works or lace-factory, if he manifests any taste for drawing, is put in the

designing-room and is trained to draw patterns; but as he is placed there at the age of from ten to twelve years, and is the son of parents who could not afford to have him educated beyond being taught to read and write, he has but little knowledge when he commences his art-training; and as, in the great majority of designing-rooms, he never sees a work on ornament, nor a good example of true art-work, he gains simply a technical knowledge of the manufacture, and acquires no insight into the character of true art. A man cannot help his origin, neither is he to be despised for being the child of poor parents; but if he remains in ignorance he cannot be expected to produce noble works, nor to exalt the manufacture which he strives to adorn with forms and colours. While a man is not to be blamed for being born of poor parents, he is open to censure if he does not strive to gain whatever knowledge is placed within his reach. Nearly every town in the Kingdom has now its drawing-school, where a certain amount of art-knowledge may be gained, and connected with these schools there are frequently art-libraries. That youth who is worthy to be called an art-student will avail himself of whatever means are open to him, and even if he be employed for long hours in the factory, he will strive by reading, sketching, and, beyond all things, by thinking; and by the study of nature, to gain such knowledge as will lead him to draw patterns such as will please persons of education, by revealing to them the fact that he who addresses himself to them through the agency of form and colour is also a man of education.

If it is any consolation to you, my fellow-students of applied art, let me say that I, with you, have felt the want of education, and have known the poverty of small means, but by foregoing for a time the pleasures which others enjoyed, and by continued close application to the study of our beloved art, I gained the victory over that poverty, and that niter want of education under which I for a time suffered; and now I can say that I sit at the tables of rich men, and that men of learning honour my table with their presence. I would not for a moment say what I do were it not for the thought that these words may encourage some poor student to work on till he rises through his poverty to that position in which he can present his works fairly before our notice, and charm us with his knowledge.

Certain manufacturers may truly be regarded as hindrances to art progress. Some men are honourable, others are dishonourable; some men are noble, others are ignoble; some men are pioneers of progress, others retard all onward movements. It is curious that there are many men who would not rob another of a farthing, and yet who eagerly look for every new pattern which more honourable manufacturers than themselves produce, with the view of copying them if they be good and are not protected by registration, or of producing others as nearly like them as they can if they be registered. Such men I regard as not only hindrances to the progress of art (for who likes paying a high price for a well-considered design if immediately it is issued others copy the idea, if not the actual design, and by saving the cost of the pattern are enabled to undersell the original producer?), but as nothing more nor less than thieves, who should be engaged on the tread-wheel with others of their kind. This detestable piracy of new patterns, which is constantly carried on by those who are truly little men, is one of the great hindrances to art progress. Did it ever strike these detestable rogues, I wonder, that by every piracy they commit they not only degrade themselves but exalt both the manufacturer and the designer of the pattern which is stolen? The very theft acknowledges the want of power to produce what is of equal merit. To those noble men who continue to produce what is new and what is beautiful, while they constantly suffer from theft, I would say,—Persevere, for the tribute which the mean pay to your nobleness and enterprise is sufficient in itself to build up in time your worthy reputation.

Much has been said respecting the unwillingness of manufacturers to issue designs of an art character, and to pay such prices for patterns as will fairly compensate the designer for producing a carefully-considered work. I have had as much to do with manufacturers, I think, as most artists, and perhaps more, and I am bound to say that I have found most of them both willing to try new things and to pay handsomely for well-considered designs; but as the object of

business is, in a sense, money-making, the manufacturer cannot be expected to produce many patterns such as will not sell when placed on the manufactured article. Some men I could name who nobly contribute towards the education of the people by yearly producing a few works in good art which do not command a large sale, owing to their being too advanced for the public taste; but these men are few in number, yet they do exist amongst us. However, with the exception of a few mean hounds, such as we find in every class of society, I exonerate manufacturers from the charge of being hindrances to the progress of a true decorative art.

The public, in some instances, impedes the progress of art. The public is of two classes,—the educated and the uneducated. The educated, in many instances, seek better art than is to be found on the goods procurable at most of our shops; but the utterly ignorant, having no art knowledge, are pleased with whatever is "loud" and showy. These latter undoubtedly retard the progress of art, as some manufacturers will cater for the patronage of the most vulgar; but this hindrance will disappear with the increase of art knowledge.

Whatever is bad in art tends to vitiate taste. If a person whose taste is highly cultivated, and who is sensitive to every deformity both in colour and form, is obliged to contemplate what is ugly, he, after a time ceases to feel the hideousness of what he views; thus, if he takes his abode by the sea-side, and the walls of the room in which he sits are covered by a hideous paper, and the floor by an obtrusive carpet, and if every piece of furniture is uncomely, and every so-called ornament in the room a mere offence to good taste, however repulsive all this may be when first seen, it will become less and less offensive as he dwells upon it, until finally it ceases to impress the sense as that which is uncomely at all; and in order that its true nature be understood the judgment has to be appealed to: thus the sense which leads us to discriminate between the beautiful and the uncomely becomes deadened. This leads us to perceive the necessity for surrounding ourselves with beautiful objects, if we would keep alive within us a quick perception of the beautiful, and to see that whatever is presented before us which is beautiful tends to exalt our taste and sharpen our perception of the beautiful. But we also perceive that whatever around us is not excellent tends to degrade our taste and to deaden our perception of the refined and graceful. This brings me to consider the effect which museum objects have upon the taste of the country.

The Chairman (Sir Digby Wyatt), at the close of a discussion which followed the reading of the paper, said success in certain technical directions was of the utmost consequence, and, to a great extent, the museums which had been most useful in foreign countries in instructing the workmen, were those in which elegance of design was the first consideration, and the illustration of the historical arts of the country the second. He was far from desiring to see an academy for applied design in one place, and one for imitative design in another. The proper thing would be to amalgamate the two, and make one great central institute, and then some good might be done. He should like to see more attention paid to applied art in the Royal Academy, and considered it a disgrace that Mr. Owen Jones was not an associate of it. With regard to schools, it must be remembered that the first essential was to teach a person to see with his eyes, and to work or imitate with his hands,—to make those two organs so tractable that the student might, in the first place, so distinguish tints as to imitate colours accurately. Until he had learned the whole gamut of colour he could not produce a pattern or design, however clever he might be. The reason why, as Dr. Dresser had said, students from South Kensington were not found to be of much use in designing-rooms in manufactories was, that the student becoming learned, imitative art went where it was not required. A manufacturer might send for a student, thinking he would be a treasure, and find when he came that he could not design the branch of manufacture which he wanted, though no doubt he could do something else very well. In truth, he wanted that practical element in education which should really be the life's labour of every man. The common error with regard to education was to suppose that, having been taught up to the age of twenty, we are then to cease learning, and only practise what we know. Education was then in reality only beginning. When a student had been thoroughly taught form and colour, and

was then set to master the practical requirements which he had to meet, he would become a much more valuable artist than one who had been simply dragged up, step by step, in the manufacturer's designing-room. Elementary knowledge and correct principles should be taught in schools, but the same results must not be expected from a youth as from a man with life-long experience.

LIVERPOOL WATER-COLOUR SOCIETY.

This society, at present, we believe, the only water-colour society in the provinces, has been formed with the laudable object of promoting and extending the taste for this branch of art in Liverpool and the neighbourhood. The promoters are chiefly local artists, and the inaugural Exhibition was opened on the 15th inst. The collection numbers somewhat over 200 drawings, among which are included contributions from eminent English water-colour artists,—Branwhite, Newton, Absolon, J. M. Jopling, and others; most of whom figure in the catalogue as "honorary members." With the exception of these works with well-known names (and they are not very numerous), the standard of merit is not high. Mr. R. T. Pritchett, a non-resident member, is an extensive contributor of drawings, all showing more or less ability, of which a little "Sunset on Esher Heath" is the best. Among local names challenging attention are those of Messrs. Bond, Norbury, and Sullivan; the works of the last-named being, however, more ambitious than successful. Mr. Clark Stanton, of Edinburgh (a name not familiar to us), contributes, among other things, a slightly finished drawing under the title "A Rest by the Way," a young lady resting on a bank by the roadside, which indicates, in colour and general treatment, no ordinary degree of refinement and artistic feeling.

While welcoming with pleasure all signs of a revival of art-interest in an important town where it has long been dormant, we cannot but regret the want of judgment shown in regard to the work admitted into this first exhibition of a new Society. A considerable proportion of the drawings hung are poor and commonplace to the last degree; some are solidly bad that they can only have been hung with a view to cover the walls. This is not the way to advance art. Better confine an exhibition to fifty drawings, and have those good, than cover the walls with productions which can only have a deteriorating influence (if any) on public taste. We hope the Society will manage these things better in future.

FALL OF IRON ROOF, SARATOGA SPRINGS, U.S.

SOME short time ago the roof of the new passenger depot at Saratoga Springs fell.

The roof was arched, of 30 ft. span, and made of corrugated iron, with wrought-iron tie-rods, five-eighths of an inch in diameter, and was supported by round columns, 4 in. diameter, 15 ft. distant from centres. On the inside of each column, about 5 ft. distant down from its top, was attached one end of a wrought-iron tie-rod, supporting the roof; and on the opposite side was a bracket, extending out 10 ft., whose bottom exerted a diagonal transverse strain in the same direction as the tie-rod. These brackets supported a roof, forming a shed over the gangway beyond the arched roof, making, with the 30 ft. span of roof, an entire width of 50 ft. Mr. P. H. Jackson, inspector of iron construction, New York, writes,—

I have been induced to go into a calculation of the strains on the weakest part of this man-trap, namely, the columns and tie-rods.

The weight of snow and ice upon the roof, in accordance with the leading authorities, is considered at 40 lb. per superficial foot as a maximum load in our climate. On the day of the falling of this structure, there had been a light fall of snow, and the ground was frozen. I question if the weight on the roof at the time exceeded 20 lb. per foot, as snow is ordinarily light. What causes it to become heavy is a subsequent fall of rain, then freezing, and snow again. Forty pounds per foot is considered a maximum load under the most unfavourable circumstances.

The column was 4 in. in diameter, and, say, 1 in. in thickness, and about 18 ft. long. Its proportion of vertical pressure would be the

weight coming upon half the roof of 30 ft. by 15 ft. distance from centre to centre of columns. Taking the weight of roof alone, exclusive of any contingent weight, at 12 lb. per foot, we have 32 lb. per foot for the weight of roof and load upon it.

The following is a summary of the strains on the column:—

Vertical pressure, weight of roof, 6.15 net tons; unnecessary transverse strain of tie to break the column across, 11 net tons; diagonal transverse strain at the bottom of the bracket, in the same direction as that exerted by the tie, 2½ net tons.

Taking these spindle columns, whose dimensions are about suitable for a summer-house or verandah, at a safe weight of one-fifth the breaking weight, when subject to a vertical load, and then only when the ends are at planes with their axes, we have the safe weight at 8½ tons. Noting less than one-fifth the breaking weight will do, as at one-fourth the breaking weight it was found, by experiment, that incipient crushing took place. This safe weight allows nothing for a lateral blow caused by merchandise falling, in transmission, against the column. For calculation should be made in accordance with the formula for strength of beams, as well as that for the columns.

In regard to the tie-rods, they were not nearly up to the standard required for safety; a ½-in. round rod is equal to about 3.10 lbs square inch of cross section. The working strain should not exceed the limit of its elasticity, which is about 8 tons per square inch. The Board of Trade of Great Britain permits, as a maximum working strain, but 5 gross tons per square inch of cross section. In this case, the tie-rods should have been at least 1½ in. in diameter to resist the thrust of the arch; and the columns 7 in. in diameter, and 1 in. thick, providing the tie-rod was not attached to it.

"UNDERGROUND JERUSALEM."

MR. WILLIAM SIMPSON, who has made himself known by many illustrations produced under difficulties, and especially by his pictures of India, Cashmere, and Russia, which he visited on the occasion of the marriage of the Princess Dagmar, has plunged into the cisterns, vaults, and drains opened by Captain Warren in Jerusalem, and has recorded, with faithful, and in most cases effective, brush, all that was to be seen. Many of these excavations have since been filled up again, thus making the drawings additionally valuable.

The Church of the Sisters of Zion, of which he gives a view, although not underground now, was so until very lately. The arch behind the altar was recently laid bare, and this is the first drawing of it since. One side of this church is formed by a wall of rock cut in past times; and underneath the convent are two tunnels, one of which is represented in the collection. They are of some importance, as bearing on the water supply of the Temple. The Tomb of Joseph of Arimathea, almost unknown, is given. The entrance to the Royal Quarries was only discovered a few years ago, and may be said to be entirely new as a subject for pictures.

The drawings are on view at 48, Pall-mall, and will reward a visit.

At the next meeting of the Society of Biblical Archaeology, Mr. Simpson is to read a paper on "Underground Jerusalem, more particularly the Plateau of the Haram es Sherief," when some interesting information will probably be added by members of that society.

HOSTILE OCCUPATION OF REGENT-STREET.

THE demon that presides over the local government of London seems to delight, not in evolving order out of chaos, but in blending the elements of order in inextricable confusion. The London season being at its height, the time has naturally been selected for the occupation of Regent-street by a hostile force of "navvies." We pause to describe the scene, now under our eyes. Trestles are placed in the very centre of the roadway; veritable barricades they prove, whatever might be their fate at Paris. Under shelter of this *l'été de pont*, a small gang of sturdy labourers proceeds to break up the surface of the road with pick-axes. New stones,

rudely broken into blocks of some eight to ten cubic inches each, are laid in a thick stratum along part of the street. Close by this stratum of destruction to horse and to carriage, one or two of the biggest "navvies" are, as we write, coolly scattering shovelfuls of stones that have once formed part of the "metal," scattering them with that peculiar sweep and fling of the arm by which the obnoxious missiles can be spread over the widest surface, and all thus rendered at once most useless and most dangerous. A horse-roller is at hand,—as if to make the mockery of the patient public more keen. After pausing to watch the whole process for some time, we came to the conclusion that it would be difficult to suggest any alteration of plan that could increase its danger, its costly wastefulness, or its cool insult to the public; or that could render the work of the road surveyor at once more inefficient and more expensive.

Where are the officers of the Society for Prevention of Cruelty to Animals? No owner of a fine horse can now ride or drive without imminent danger of laming the animal. No carriage can go along this main West-end thoroughfare without having at least a month's durability shaken out of its future existence. It is difficult to account for the procedure. Is it done with the idea, like regulations made in the time of James I., of keeping strangers out of London? Unless the most unfit time must be selected for re-metalling Regent-street, the operation could and should be effected between the hours of midnight and six in the morning, by an adequate force of men, who should strip, cover, and properly level a portion of the street at a time; consolidate it by the steam roller, leaving it perfectly fit for traffic; and disappear, like good people, before the London cockerow.

THE PENTATEUCH.

A COMMITTEE of Rabbis and doctors, at the request of the Society of Biblical Archaeology, have met at the Soane Museum, to examine the sacred roll of the Pentateuch sent over from Aden by Lieut. Prideman, and presented by him to the Society. Rabbi Hermann Adler; Rabbi and Professor Marks; Rabbi Schiller Sinsinsky; the Rev. George Small; Rev. Dr. Currey, Master of the Charterhouse; Itudus T. Pritchard; S. M. Drach; Joseph Bonomi, Curator of the Museum; and W. R. Cooper, Secretary of the Society, were present; and Professor Donaldson, Ph.D., as Secretary for Foreign Correspondence, and one of the trustees of the Soane Museum, was in the chair. The examination was very minute, and occupied to considerable time; and with the intelligent explanations of the Cambridge Professor of Hebrew, and the other Rabbis, brought to light many important peculiarities. The most ancient part dates from the tenth century. A full report will be read at the meeting of the Society on the 7th of May.

THE TRADES MOVEMENT.

Cambridge.—A deputation appointed by the building operatives has been received by the representatives of the Builders' Association. The chair was occupied by Mr. Bell; the other members of the Builders' Association being Messrs. A. Gray, T. Bradwell, Thoday, Kett, jun. (secretary), and Tompkins. The deputation from the building operatives consisted of Messrs. F. Bowick, J. H. Cooke, W. Cooke, Hyson, Loenes, W. Scott, and R. Riddle (secretary). The deputation said they wished to know whether the masters would accede to fifty-four hours, so as to employ the men summer and winter. They also wanted an increase of wage of 6d. a day. The average wages of the men in Cambridge were 21s. In other places, the men were receiving as much as 27s., 28s., 29s., and 30s. One of the deputations said that (as a labourer) he was receiving 15s., out of which he had to pay 8s. 4d. per week for board and four, 2s. 2d. per week for rent, and 1s. 2d. for 1 cwt. of coal; and he had eight months to feed. Some of the deputation complained that they were unable sufficiently to support themselves on their wages. Others wished for more time for recreation or amusement. On the part of the masters, it was remarked by the Chairman and Mr. Gray that the employers were perfectly willing to make an alteration if it could be done satisfactorily. They denied, however, that Cambridge was paying less than other places; on the contrary, the

chairman produced evidence to show that the wages were quite as high as in Huntingdon, St. Neot's, Diss, Bury St. Edmund's, Ely, Lynn, Norwich, or, in fact, anywhere in the Eastern or surrounding counties. After a long and desultory discussion, in which various points *pro* and *con.* were argued, the chairman said the matter would be laid before the Builders' Association, and the result duly reported to the operatives.

Sittingbourne.—About 100 brickmakers at Sittingbourne were engaged at 3s. 6d. per thousand, and lately the masters gave an advance of a penny. The gangs demanded 2d. more, which the masters conceded conditionally on the market remaining at its present height, and the men leaving 6d. in hand as "pence-money." This was refused, and the men have struck.

Dumfries.—The masons in the employment of Messrs. John Edgar & Son, Dumfries, have struck work. It appears that the firm had employed two plasterers, to point the interstices in the freestone courses in a range of dwellings they had contracted to erect. To employ plasterers at such work has hitherto been a common practice; but a meeting of the trade-union was held, at which it was resolved, that unless the plasterers were dismissed, Messrs. Edgar's workmen were to strike, and a deputation was appointed to wait on their employers. At breakfast-time next day the deputation saw Mr. Edgar, sen., who, on being told the object of the deputation, said that he had engaged the plasterers for the job, and was determined they should finish it, whether there was a strike or not, upon which the whole of the workmen left, but did not remove their tools.

Hawick.—Some time ago the journeymen connected with the building trades in Hawick,—masons, joiners, and plasterers, resolved to ask for the adoption of the fifty-one hours system, with an advance of 3d. per hour on wages, from the 8th of April. The present rates are,—masons, 6d.; joiners, 5 1/2d. per hour; and plasterers, 2 1/2s. per week. The master masons declined compliance with any of their demands, and no further action has followed. The master plasterers agreed to give 5 1/2d. per hour, and left it to the option of the men to work either nine or ten hours daily, after the 8th of April. The operative joiners have refused the offer of the masters to advance wages 3d. per hour, and another farthing on the 1st of June, with the option of working nine or ten hours, and resolved to stand out for their full demand of 3 1/2d. per hour advance. As the employers declined to concede these terms, a number of the men, but not all, struck work.

THE COVERED MARKET, PRESTON.

The Preston Covered Market question, to which we have already alluded, is, we regret to say, far from being settled. The new contractors, Messrs. Bennett & Co., of West Bromwich, engineers of good repute, have refused to proceed with the work, on the ground of radical defects in the design, which they allege preclude the possibility of a safe structure being erected from Mr. Garrick's plans. The Messrs. Bennett say that having investigated the principles of construction of the proposed roof of the Covered Market, they have discovered that "it is utterly impracticable to construct, with safety, a roof in accordance with the details shown on the plans;" and they speak of "certain fatal defects in the structure that render the safe construction of the roof impossible." The Markets Committee, as we have already mentioned, resolved to call upon Messrs. Bennett to execute their contract, and the Council has now confirmed the resolution of the committee. The contractors urge the Council to refer the plans to some disinterested engineer of high standing.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.

On the 6th inst., the members and friends of this Society paid a visit to the works of the Native Guano Company (by permission of the directors), situated within the grounds of the Crossness Pumping-station of the Southern Main Drainage system.

The system of sewage conversion about to be tried is that known as the "A B C" process, and will soon be in full operation, it having already been experimentally tried here on a small scale. The *modus operandi* was fully explained to the members, and some samples of sewage

were treated for their information. After fully inspecting all the works, they were shown some samples of dried sewage, which when ground is sold as manure (native guano), and was said to be much sought for by farmers who had once tried it. The members then, by permission of Mr. Bazalgette, visited the engine-house and works of the Crossness pumping-station, where the four engines required to pump the sewage up into the reservoirs were examined and explained to them. These engines caused much interest on account of their great size and power. Two are continually kept working, each making six strokes per minute, and pumping 2,000 gallons at each stroke. The other two are kept as reserve engines, in case of a storm occurring in the London district, in which case the united power of all four engines, pumping 48,000 gallons per minute, is not more than sufficient to keep under the storm-water pouring down.

SCHOOL BOARDS.

Ipswich.—At a meeting of this Board the clerk stated that, in accordance with the directions of the Board, he had written a letter to the Education Department, the reply to which says,—

"There should be sufficient space in the general room and class-room together to accommodate all the children. If the general room is of itself large enough to accommodate all, and is then subdivided into class-rooms, it will not be necessary to provide additional class-rooms; but if the general room is not large enough, and the accommodation should be calculated at nearly ten superficial feet per child, then it will be necessary to furnish class-room for the deficiency.

Supposing that the aggregate area is about 10 ft. per child, it will be sufficient if, in the general room, accommodation is provided at the rate of 4 ft. per child for the whole number of children provided in the school and class room.

There should be not less than two class-rooms for each school; each class-room should be about 20 ft. by 16 ft.

In reply to your final inquiry, I am directed to state that an additional class-room allowed to a drawing-class may be used alternately by boys and girls, provided it is so placed as to be conveniently accessible for each school."

Some conversation then took place with reference to the kind of division the Education Department would require between class-rooms in a large school-room divisible into class-rooms.

Aberystwyth.—The following architects were a short time ago invited to send competitive designs for the new schools at Aberystwyth, providing accommodation for 600 children:—Mr. J. P. Seddon, Messrs. George Jones & Son, Mr. R. Owens, Mr. Sherwin, and Messrs. Szlumper & Aldwinckle. The Board have selected the designs submitted by the last-named gentleman, and the buildings will be commenced at once.

Great Driffield.—Mr. H. J. Pail has been appointed architect to the School Board of Great Driffield, in the East Riding of Yorkshire. A block of school buildings is to be erected forthwith for 700 children, on a site on the Bridlington-road, in the outskirts of the town. The same gentleman holds the appointment of architect to the Hope School Board, near Wrexham, and plans are passed and tendered for to accommodate 600 children for that Board in two blocks of buildings, viz., 250 at Ffrith, and 350 at Hope.

ARBITRATION IN THE BUILDING TRADE.

MR. RUPERT KETTLE has been sitting in Birmingham as arbitrator over a conference of masters and representatives of working men in the building trade. The carpenters, labourers, and plasterers were represented. Notice had been given by the men, under the rules agreed upon in 1867, for a reduction of the hours of work to 50 1/2 per week. After the conference had lasted some hours, the employers proposed that the hours should be fixed at 54. On the other side, a proposition was made that the hours should be 53. On this difference there was a split, all the masters' representatives voting on the one side, and all the men's representatives on the other. The matter was left to the decision of Mr. Kettle, who, in giving his award on the general question of time, said:—

"In deciding this question, I have not only to consider the desires of the parties in contention before me, but the combined interest of both, so as not to disturb their trade, and check the desire for building. I have come to the conclusion that, although from what has happened in this town and elsewhere, customers may be disposed to accept the result of what is called the nine-hours movement, they could not at present willingly enter into bargains based on still shorter hours. I therefore, as much in the interest of workmen as of the employers, decide that an average of nine hours a day,—that is, fifty-four hours,—be the working week. This does not apply to the three winter months."

The deputations then made a vain effort to arrange the hours for beginning and leaving off work. These deputations then withdrew, leaving the question in dispute to be settled by each branch for itself. The plasterers' deputation next took their place at the table, and the question which had just been debated by their predecessors was again discussed. The time for beginning and leaving off work could not be agreed upon, and the Empire said he would prefer not to decide that question by itself, but to take the whole case together. The question of wages was then discussed. The present rate of wages in the plasterers' trade is 6½d. per hour, and the men's demand was for 7½d. Mr. Briggs made an offer on the part of the employers of a rise per hour equivalent to the reduction of time, namely, a farthing per hour. The Empire observed that it was five years since there had been a rise of wages in this trade in Birmingham, and that was a long time, as things were going now. He would ask the representative of the employers to consider whether their proposal to give a rise equivalent to the reduction of time was equal to the increase of wages which the nine-hours settlement had practically amounted to in other trades and other places. After some discussion and a short adjournment, Mr. Holmes proposed that the payment should be 7d. per hour, as a settlement for two years. This proposition was seconded and discussed without result, and the Board proceeded to consider the question of overtime, but no conclusion was arrived at. It was agreed that 2s. should be allowed for lodging-money on out-town jobs, and that payment of railway-fare should be left for arrangement between the parties. The Court shortly afterwards adjourned.

HEIGHTS OF BUILDINGS AND ANGLES.

A "LEVEL AND ANGLE INDICATOR" has been brought out by Messrs. Fletcher & Sinclair, of Liverpool, including, in a compact case, a compass and sun dial. It is described by the inventors as being a simple form of theodolite, there being a sight hole and horizontal wire at the base, and its price is within the means of most mechanics. It strikes us that the instrument will need great practice before it can be used with anything approaching accuracy, and then it must of necessity be placed on some steady support. All who use the theodolite know the care and the anxiety required to sight and adjust the instrument by means of finely-cut screws, and standing on a stiff stand. The Angle Indicator may be of service for taking approximate angles in the case of those who will master it.

NEWGATE AND THE SESSIONS-HOUSE.

HAVING read in your paper that the Mid-London Railway Company have purchased the Christ-Church or Blue-coat School buildings, with four acres of land, for 600,000l., the governors of the school intending to erect schools in different quarters of London, and one in the country for 1,000 scholars, it appears that land in the locality of Newgate-street must be of enormous value; and an excellent opportunity offers itself for the pulling down of that melancholy building called Newgate and the adjoining Sessions-house, disposing of the sites, and with the proceeds erecting a new gaol and sessions-house on the confines of the county of Middlesex.

It has always occurred to me that it was unjust that the county of Middlesex should have the odium and expense of finding a sessions-house and a gaol, for the trial of the offenders (in addition to their own) for the counties of Surrey, Essex, and Kent, according to a certain radius from the centre of London, which the Act establishing the Central Criminal Court has enacted; for it gives the world an exaggerated idea of the state of crime in the county of Middlesex, although, no doubt, the present position of the Central Criminal Court is very convenient for the barristers who have chambers in the Temple, Lincoln's Inn, and Gray's Inn, to attend; but in consequence of the facilities for travelling now offered by the railways, it is no longer necessary for gaols to be fixed in the heart of populous cities.

The surroundings of the melancholy Old Bailey are very different at the present time from what they were twenty years since. It had not then the terminus of the London, Chatham, and Dover Railway on Ludgate-hill, the Metropolitan

Railway terminus in Farringdon-street, and the forthcoming Mid-London Railway Terminus, in Newgate-street. Let the citizens take into consideration the changes time has made in their City, and what a great improvement would be effected by the pulling down of Newgate Gaol and the Sessions-house, and making a communication from Farringdon-street, crossing the Old Bailey to Paternoster-row, leading to Cheapside, which every one must consider a great and necessary improvement, and one that could be made, from the high price of land in the locality, profitable to the City of London.

I have abstained from suggesting on what part of Middlesex the new gaol of Newgate and the Sessions-house should be built. Middlesex is a large county, and a suitable spot could be selected, with railway facilities; so that, as county gaols are now conducted, only the smallest amount of inconvenience to the particular neighbourhood would be experienced.

MARCO.

THE RAILWAY BRIDGE IN LUDGATE-HILL.

WHY must this be always called "the ugly bridge," as, for instance, by "J. B.," at p. 274 of the *Builder* for April 6th, in introducing his novel suggestion? The bad habit of sticking on handles, used as certainly as any "Aldon" or "Sir," grows upon people sadly:—

"In all debates where critics bear a part,
No one but nois, and talks of Jonson's art,
Of Shakespeare's nature, and of Cowley's wit," &c.

Yet even when you can call a man "the judicious Hooker," or "the vivid Frodoe," or a building "the majestic St. Paul's," or "the elegant Travellers' Club," it is well at times to treat the reader to an omission of the appellation, sanctioned though it may be by usage. Further, "ugly," in its usual sense of "offensive," "deformed," "of very disagreeable aspect," seems not quite happy in this case. The bridge has of course marred the aspect of the street and of the neighbourhood; the railway so near upon the thoroughfare has all the effect of a Temple-bar of an extremely determined kind on the view up the hill, and in descending absolutely destroys the perspective. The proportion of height to width,—the headway being so small and the street fairly wide,—has never been pleasing in an opening of any kind. The necessity of making use of every inch of height has not allowed any show of constructive purpose in the soffit; the beams and filling-in have been kept rigorously to the same level.

It is from this pretty clear that, on general grounds, the bridge ought never to have existed; a remark that might be made of lots of other triumphs of science, did not one recognise the wisdom of silence in the face of imperious destiny (at any rate, the level of the line should have been at least 15 ft. higher). The greatest efforts and skill would be as likely to be productive of perfect grace or dignity, as they would be in a dance by an artist bound for the rope-trick, or in a State reception by a princess under the conditions that struck Apollodorus as uncomfortable for goddesses in Hadrian's Temple of Venus and Rome. But, the conditions taken for granted, the treatment of the bridge with bracketed sides may be pronounced ingenious and not ineffective; the open-work parapets introduce a satisfactory variety, and the design and execution of the ornamentation are certainly not contemptible. Of course no one would expect the iron images of the City wild beasts,—rampant after their manner,—to be more beautiful than is their wont.

All this amounts to wishing that buildings (and other things) shall be praised or blamed for their obvious and acknowledged defects, and not by rote or by epithets that are at best misfits.

The fountains in Trafalgar-square are good standing instances of the force of habit,—being almost invariably described as "the ugly fountains." Mr. Helps has furnished what will be taken by the diligent antiquaries of posterity as the opinion of our own time about them: yet I doubt whether many people who have made a real examination would eagerly maintain its correctness. The fountains may be too small, the parts of the square may be out of scale (the Nelson column would ruin any place on this head), the water may be a little scanty, and may have been still scantier when they were christened; the reservoirs may have contained dirty water and have leaked enough to make their surroundings sloppier than lovers of monumental

architecture looked for. But this ought not to have led men well out of the blues to denounce the artistic design of the fountains themselves.

Without indulging in all Mr. Walter Shandy's enthusiasm, perhaps one may be allowed to interpose so much on "that mysterious influence of naming which determines so much of mortal choice," inasmuch as often "the right word is a power and communicates its definiteness to our actions." (G. Eliot, *Middlemarch*, book iii.)

S. F. C.

MERCY FOR MASONS.

THE bright sun has at last taken its place with a promise to last, bringing comfort to many. The exceptions I wish to name are the masons, whom you see working in the open with the full glare of the sun upon the white stone at which they labour, with the result, as one expressed himself, that when he "turned his head aside he could see nothing." And naturally so, the glare affecting the eyes. Why do they not work in the shade when possible? If not possible, why do they not wear coloured glasses, and so preserve the eyesight for future years? I should like to know the average of injured eyesights among masons in comparison with other trades. A light respirator also, I should imagine, could be contrived to preserve their lungs, which would lessen the number of deaths from consumption and asthma considerably. If a few were to start such appliances, and prove the beneficial results, rest assured the many would not be backward in resorting to a present remedy for the prevention of a future injury. Y.

ADULT INDUSTRIAL SOCIETIES.

SIR,—May I be permitted to call attention, through your columns, to a section of the working community who, however willing to earn an honest livelihood, are unable to do so from the fact of their being brought up to an industry which has been superseded by the introduction of machinery, or which they cannot follow profitably from accident having deprived them of the means of so doing.

Some years ago a lady, well known for her deeds of practical charity, assisted those of her own sex who suffered from a similar cause. Will any gentleman come forward and help to provide an institution where men of good character may learn a new calling, earn enough to keep their homes together, and get together a few tools, if required, till proficient enough in their new form of work to be able to earn a decent living and become more useful members of the community?

Boys in our reformatories, and convicts in our gaols, are taught some useful craft, to enable them to live honestly, if so minded. Give honest men, who equally deserve our care, the same chance of preventing themselves or their children drifting into such poverty as would tempt them to despair, to intemperance, and to crime.

J. J. A.

THE WESTWOOD TOMB, LITTLE HORKSLEY, COLCHESTER.

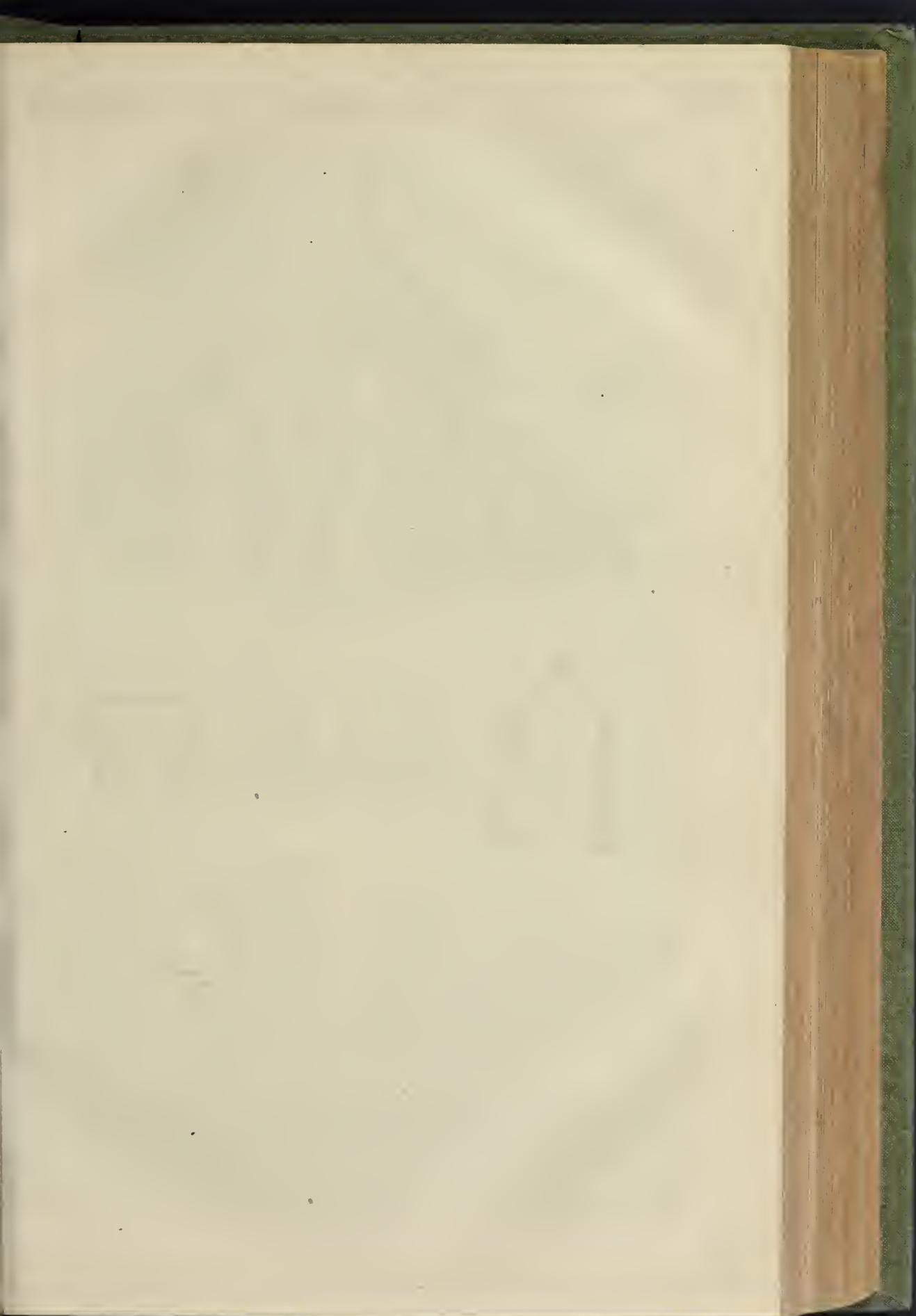
THE building of which we give an illustration in our present number has recently been erected as a family mausoleum for Mr. Wm. Macandrew, J.P., of Westwood House, Colchester.

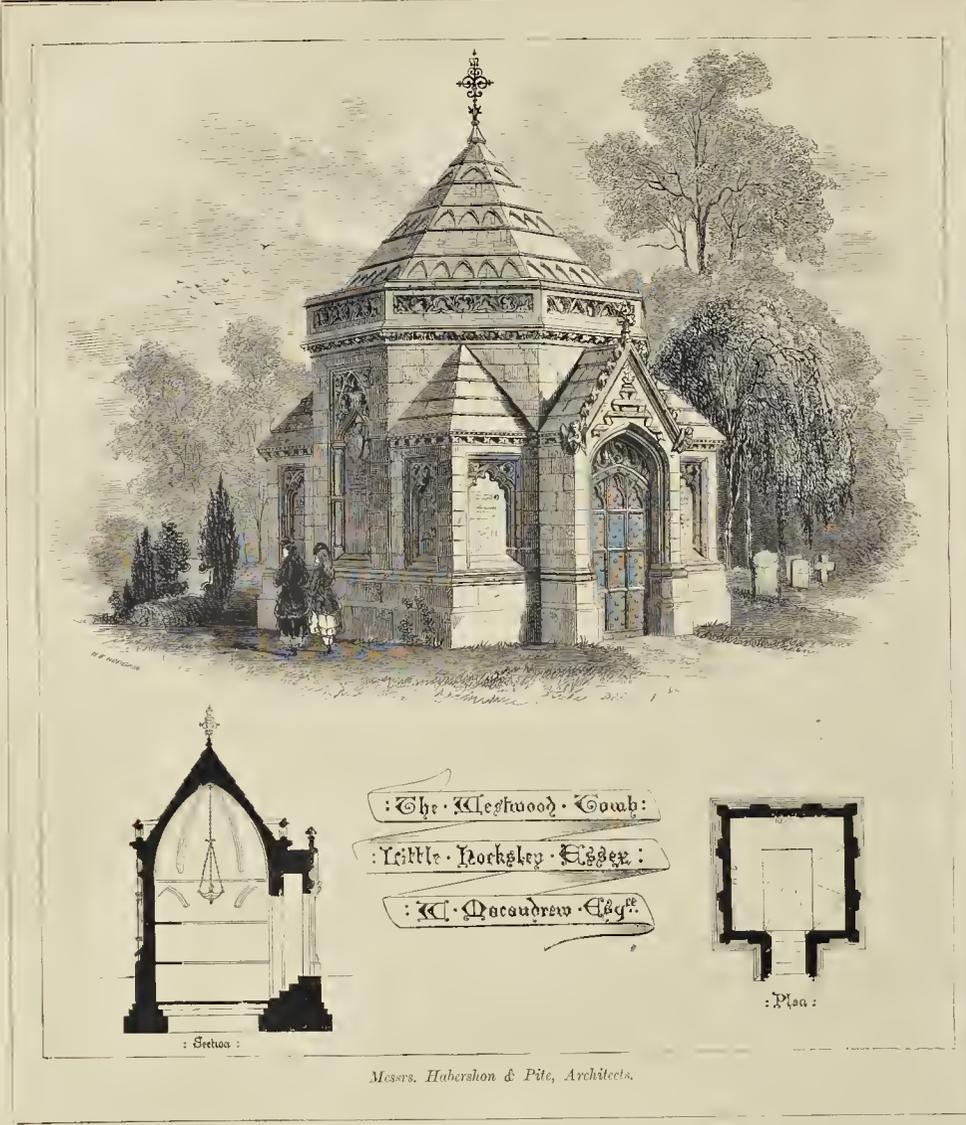
The octagon form adopted by the architect is based upon a simple quadrangle, so as to cover the actual ground at their disposal, having sufficient depth for a lower story, and carrying two ranges of shelving round the space at equal heights, the upper portion being broken up into an octagon, carrying an upper range of shelves, and the whole space being covered with stone vaulting, having moulded ribs at intersections. The floor is laid with encaustic tiles, with a monogram in the centre.

Externally, the Decorated style is adopted. The whole of the work was contracted for by Mr. McCullo, of Victoria-street, Westminster, and all the art finishings were supplied by London workmen.

The stone used throughout was obtained from the Confans quarry in France. The masonry and carving were executed by Birtchnell, of Clapham. The slate shelving was from Magnus, of Pimlico. The iron doors and fittings were supplied by Hobbs, Hart, & Co.; and the ornamental ironwork is from Hart, Peard, & Co.

The total cost was 600l.; and the works have been carried out under the direction of Messrs. W. G. Habershon & Pite, architects, of Bloomsbury-square.





UNION BANK OF LONDON: CHARING CROSS BRANCH.

We illustrate in our present number the structure which has been erected at the corner of Spring-gardens, Charing-cross, as a branch-office of the Union Bank of London, from the designs and under the superintendence of Mr. Frederick W. Porter, architect. It is of considerable size. The length of the Charing-cross front (north) is 42 ft. 6 in.; the flank in Spring-gardens (west), 73 ft.; and the hack (south), 61 ft. The height, from pavement to the top of main cornice, is 50 ft. 6 in.; and from the main cornice to the top of roof, 17 ft. The clear height of the various stories is as follows:—Double basement, 16 ft.; bank, 17 ft. 6 in.; first floor, 12 ft.; second floor, 11 ft.; and third floor, 9 ft. The columns, pilasters, dado, and pedestals of the ground story are of grey granite, from the De Lank quarries, near Bodmin. The columns and pilasters of the upper stories are of polished red granite. The whole of the columns and pilasters are monoliths, with the exception of the pilasters of the two upper stories, which are

in two stones each. All the other masonry is of Portland stone. The clustered chimney-stacks at the angles of the building, also the terminal vases on the attic story, are of terra cotta.

All the balcony-railings, and the bank entrance-gates, are of wrought iron, executed by Mr. Winstanley. The latter are excellent specimens of ironwork, and received a premium from the Society of Arts. The curved roofs are covered with plates of embossed copper, from the manufactory of Messrs. Tyler.

Entering the building, we find that the bank-room is 47 ft. by 26 ft. 6 in., the manager's room adjoining, and separated from the latter by a glazed screen, is 17 ft. 6 in. by 17 ft. 6 in. The walls are lined with woodwork, in the form of pilasters, pedestals, &c., principally wainscot, with teak panels; the doors, window-frames, and bank fittings are of Spanish mahogany. On the same floor are also waiting-rooms, and private room for manager.

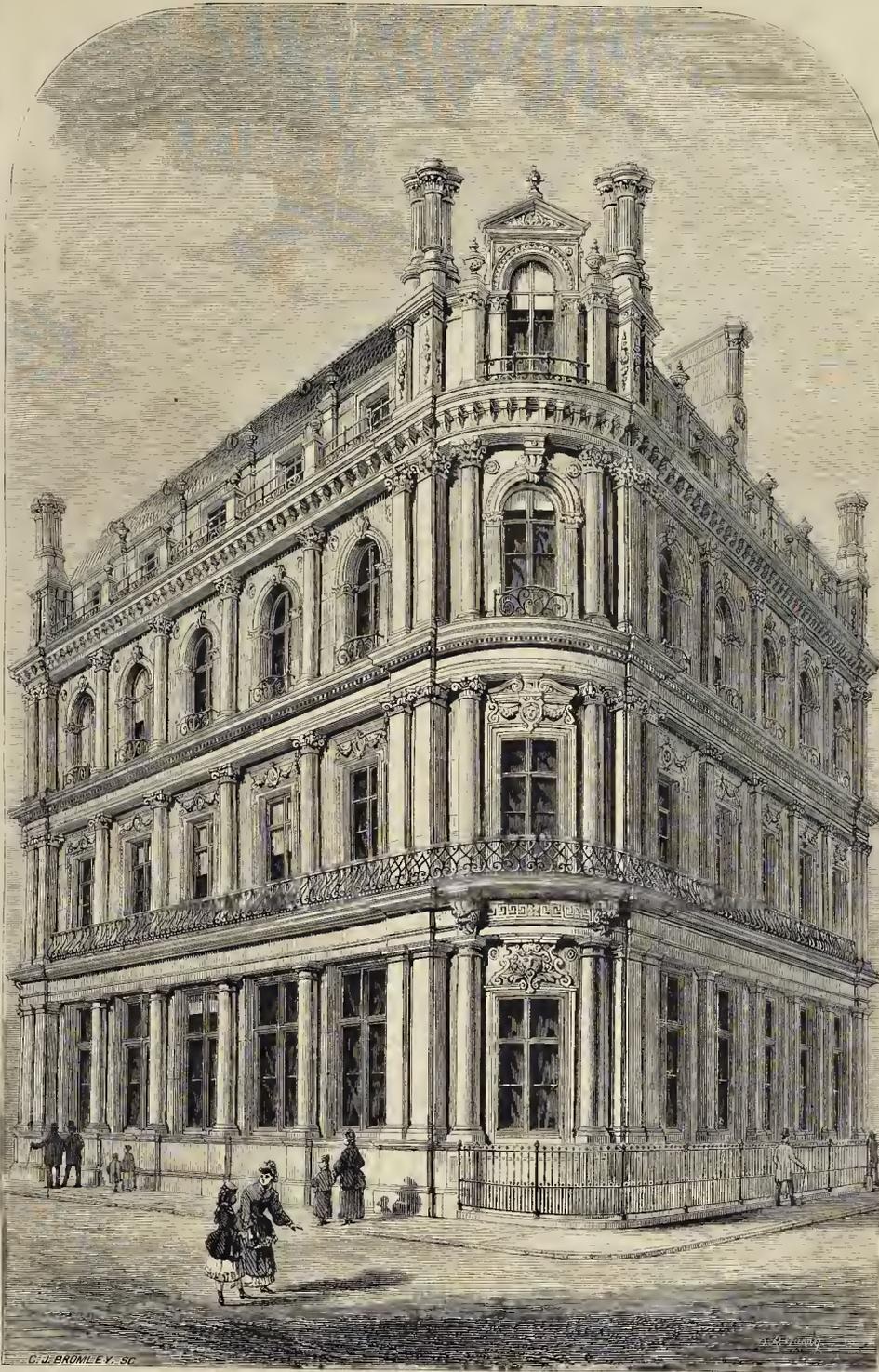
The ventilation of the bank-room is effected by means of a ventilating engine, worked by hydraulic power, placed in a small room over the bank entrance-lobby, with drawing the air through

a perforated ornamental frieze below the cornice of the ceiling, while fresh air is supplied through openings under the counter, and other parts of the room.

There are two stories of strong rooms in the basement, having a total area of 3,660 ft. superficial. The intermediate floor is, to a great extent, formed of cast-iron perforated plates, resting on wrought-iron bearers, and the height from lowest floor to floor of bank, 18 ft. The remaining portions of the basement stories are used as porters' living-rooms, clerks' lavatories, and store-rooms.

The first, second, and third stories are divided into sets of apartments, each consisting of a sitting-room, bedroom, and bath-room; access to these is by an entrance in the south front next Spring-gardens.

The manager's apartments consist of rooms on the south or Spring-gardens side of the building. The wrought-iron tanks in the roof, holding 4,760 gallons, supply water to lift, ventilating engine, and baths. We have only to add, that the builders were Messrs. Perry & Co., Stratford, and the amount of their contract was 28,473l.



UNION BANK OF LONDON: CHARING CROSS BRANCH.—MR. FREDERICK W. PORTER, ARCHITECT.

SEVENOAKS WEALD CHURCH, KENT.

This church was re-opened on the 10th inst. by the Suffragan Bishop of Dover after enlargement by the addition of a new chancel and organ-chamber, from the designs of Mr. T. G. Jackson, of London.

The new building is of Kentish rag stone, with dressings of Tunbridge sandstone; the roofs of Baltic timber, covered with Penmoyle green slating. The window traceries are founded upon what is known as the Kentish type, of which the chancel at Clarendon, near Canterbury, affords the finest instances.

The ceiling is polygonal in section, hoarded below the rafters, and divided by moulded ribs into panels, which are decorated with an arabesque design in simple colours at the intersection of the ribs. The choir seats are of oak, with carved elbows and turned shafts of walnut wood, and their front hook-hoards, as well as the altar-rail, are carried on wrought ironwork parcel gilt.

The east window is filled with painted glass, which has been executed by Messrs. Powell, of Whitford, from the cartoons and under the superintendence of the architect. The general tone of the window is light, and the colouring restrained in tone; the arrangement consisting in a field of silvery glass painted *en grisaille*, across which a band of colour is formed by the figure subjects in medallions which occupy the central part of each light.

The central part of the chancel floor is laid with a rather elaborate mosaic pavement, executed by Messrs. Powell in their new opaque glass.

The contractor for the general work was Mr. Wiltshire, of Sevenoaks. The warming apparatus was supplied by Messrs. Fraser, of London; the floor tiling by Mr. Godwin, of Lurgwardine; the wrought ironwork by Messrs. Gibson, of Stamford; the organ is now being built by Mr. Henry Willis, of London; and the carving is by Messrs. Farmer & Brindley.

THE SAFETY OF SASH-FASTENERS.

As I left myself open to a challenge by a sentence in a former communication, I will not shrink from holding my own, while expressing thanks for each new bit of information that may come in the way. With all respect for Mr. Fletcher, I am forced to say that his communication, as far as it relates to my remarks, leaves the subject exactly where I left it.

Before making a few more observations on sash-fasteners and their safety, let me say that I spoke not as an amateur, but as one who had long practical experience of almost every form of sash construction and fastening throughout the three kingdoms, and in part of the Continent, and that the matter in discussion has engaged my attention for many years. I am, therefore, equally interested on behalf of the building profession with Mr. Fletcher in seeing some practical remedy applied, and will be ever anxious to assist in the endeavour.

In advocating rebated meeting-rails to sashes, I did not necessarily argue the adoption of either the spring fastener or the one in present use. I proposed the rebate as an additional security, no matter of what kind the fastener might be. Of course, if servants or others neglect to adjust the fastener on a sash, there can be no security in any form of sashes that work in halves like the present. Now, as to the objections to the rebate, which was intended by me for all new sashes, it does not need either a section or a model to see at a glance its action. Its sufficiency depends, as every architect and builder knows, on the thickness of the parting slip. It might be put as a little sum to a school-boy in this fashion:—"If the groove in the sash frame or the parting slip in that groove is $\frac{1}{2}$ in., what will be the breadth of the rebate he?" The answer is obvious. Surely, then, $\frac{1}{2}$ in. or $\frac{3}{4}$ in. rebate is quite sufficient when both sashes are well fitted and the fastener is tightened.

If it were even required to alter present made sashes, having a $\frac{1}{2}$ in. parting slip, I see no difficulty in the way, though I do not advocate it as a rule. Yet it might be done with advantage to the windows in the lower stories of houses.

If that would be required would be to plane off the present splay or hooking and joint and screw slips of hard wood to form the new rebates.

Mr. Fletcher must admit that with a rebate to be present ordinarily made sash, and the fastener tightened, the thief could not push back the

catch with a pocket-knife, or a steel blade of any kind; but with the majority of the present sashes, there would be little difficulty indeed. He remarks that it is foreign to the subject to say that if the thief cannot get in he will resort to other modes, and he thinks that men would be afraid to carry drills, jemmys, centre-hits, diamonds, &c., and that the finding of them on their person would insure conviction. He seems to forget that there are dishonest carpenters, bricklayers, house-smiths, bell-hangers, plumbers, painters (Ishmaels of the trades), who, in carrying the above-named tools, would only be carrying the instruments of their craft, and that the finding of them in their possession by the police would not afford even circumstantial evidence of their guilty intentions. A CRAFTSMAN.

Sir,—Your correspondents in their letters seem to have overlooked three essential conditions required in a good sash-fastener.

1st. To force the top sash up towards the head of the sash frame.

2nd. To force the bottom sash down towards the sill.

3rd. To draw the meeting-rails together and prevent rattling during high winds.

"Craftsmen's" screw fastener does only one of these, and I have had experience of many of this kind rendered useless by a coat or two of paint raising the bottom sash and lowering the top and causing the screw and nut not to meet.

I have given much attention to this subject and believe that nothing at present made equals the quadrant sash-fastener, and after many attempts and failures I believe I have at last succeeded in making an improved quadrant sash-fastener that will not only fulfill the conditions I have mentioned, but will also prove a safety and partly a thief-proof one; but I feel convinced no sash-fastener will answer except it fulfills these conditions.

ROBERT PHILLIPS.

SITE FOR BARRACKS.

Sir,—It is possible that those who have the selection of sites for barracks may have omitted in their inspection one part of the Kent coast at present undefended except by troops from Dover or Canterbury,—namely, Romney.

In the early part of this century there were barracks at Tenterden, a town situated about seven miles from Appledore Station, on the South-Eastern Railway, through which runs the Military Canal from Hythe to Rye. Tenterden has many local advantages for troops, but Romney would, with the prospect of Dungeness Harbour, be an admirable spot for such a purpose. Some years ago, the War Office were willing to grant the Military Canal to a celebrated engineer for a railroad from Hythe to Rye, especially for the conveyance of troops.

Perhaps a word of suggestion at this moment may avail. A MAN OF KENT.

LORD DERBY ON SANITARY ADMINISTRATION.

NEARLY two years ago Lord Derby, whose family have for generations been large owners of land in the neighbourhood, laid the foundation-stone of an hospital in the borough of Bootle, which was recently only a suburb of Liverpool. Lord Derby gave a valuable site for the building, and contributed in money besides. The hospital is now complete, and has just been opened by Lord Derby, accompanied by the countess. The event was observed as a *fete* in Bootle, and after the opening ceremony the mayor entertained the earl and countess and a large party to lunch in the Bootle Town-hall, or Assembly-room. In the evening there was a *soiree* at the hospital. The customary formalities concluded.

Lord Derby said: I congratulate the inhabitants of Bootle on the completion and opening of this hospital. We are, though not one of the smallest, yet one of the very youngest of English boroughs; but I hope we shall not be found behind our neighbours either in public spirit or in thoughtful care for the welfare of those on whose labour our prosperity depends. It is just a week since an eminent public man, speaking at Manchester on all the subjects of the day, referred to the sanitary question as that which lies at the bottom of all national well-being and greatness. Thirty years ago—perhaps even a dozen years ago—language of that kind from a political leader would have been thought eccentric and paradoxical; now it is accepted as a fair expression of the feelings and wants of the time. That is a remarkable change: let the credit of it be given where it is due. It is owing to the collective labour of many individuals, personally for the most part obscure, but who have worked in a spirit of unselfish devotion to a great and useful cause. I am not going into questions of sanitary

legislation. But let me just observe this—that the conviction which sanitary knowledge brings with it as to the preventibility in general of disease is one of quite incalculable importance. Men are very slow to learn the extent to which their destinies are in their own power. They are apt to be astonished if you point out to them that nine-tenths of the calamities that have afflicted the human race are directly and obviously the work of men's own hands. They are inclined to confound that feeling which we all respect, that of cheerful acceptance of the inevitable, with that other kind of resignation to evils which are not inevitable, which is mostly laziness and apathy, and the prevalence of which is one of the most characteristic distinctions between the savage and the civilised man. And why do I say this? Because I am deeply convinced that no sanitary improvement worth the name will be effected, whatever acts you pass, or whatever powers you confer upon public officers, unless you can create a real and intelligent interest in the matter among the people at large. It is very comforting to those who have worked long years in this direction to hear how our governing men now talk, and how they are praised for it too!

WATER SUPPLY PIPES.

Sir,—Allow me to suggest to "Expertus" the only way I have found to keep water free from sewage gas; at the same time I keep the pipes empty to prevent their bursting. I do away with ball-taps, and prevent any pressure being put on the pipes after the water enters the house, and I reduce the waste of water to a minimum.

I have just finished the re-arranging of water supply to a large house, and have had the fittings fitted up as follows:—The service-pipe enters the kitchen from water company's main and passes through an apparatus (which forms a kitchen trough), and has a tap attached to the supply-pipe above the apparatus for kitchen use; the pipe then passes up into the upper cistern (without ball-tap), and after filling the cistern the overflow water runs down the waste-pipe and supplies the cisterns at lower levels; when the lowest cistern is full, one quart of water runs down its waste-pipe into the apparatus, which shuts off the supply to the upper cistern. The water is procured by lifting a lever (which cannot be tied open). This apparatus does not require any attention as it is constantly in use, it being a kitchen trough, and the tap over attached to the supply-pipe. By not using ball-taps there is no pressure on the pipes after passing the apparatus. When the apparatus is shut off the water passes out of the pipes above it, whereby they become empty; therefore the frost will not burst them. In summer time this escapement can be shut off.

I think this is a good system and should be generally adopted. CHARLES PINX, Architect.

SALTING OF PARIAN.

I SHOULD be obliged if some of your readers would suggest an explanation and remedy for a very serious case of walls saltpetreing. My walls are principally built with Portland cement, floated out with Portland and sand, and set with Parian. When finished about a week we claircoiled and distempereed on some and painted on other parts, when at once began the most universal process of saltpetreing I ever saw; the greater part of distemper and paint are thrown off, and in places the efflorescence stands out three-eighths of an inch.

The sand was partly Thames and partly a very sharp pit sand dug on the premises. J. S.

FALL OF STAND.

Sir,—With reference to the notice you make in last week's issue of your paper about the falling of a stand to witness the laying of the memorial-stone at a new chapel, Kentish-town, allow us to say it was not the platform which we erected for that purpose, but an ordinary scaffold used by the bricklayers which fell, upon which a very heavy crowd stood, and insisted upon standing on after many repeated requests and cautions not to do so; and as the whole of the arrangements were entirely out of our hands for the admission of visitors on the works and platform for the occasion, we do not consider ourselves to blame, and trust to your usual fairness to give this as public a position as you have the report, that the matter may be fairly represented. The architect superintending the works, also the clerk of works, consider there is no blame attached to us. NIBLETT & SON, Builders.

STRIKES IN GERMANY.

FOR some time past the workmen have been at war with their masters in Berlin and other German towns. The Prussian correspondent of the *Times* has given some interesting details of the existing state of things. He says in their origin the strikes were not unjustifiable. Even upon the assumption that the former rate of wages was satisfactory, the workmen had a right to demand an increase. Seeing that rent and provisions had become so much dearer, why should not manual labour, too? It is admitted on all hands that the cost of living at Berlin has been doubled for large strata of the middle classes in the last six or seven years, and increased 60 or 70 per cent. even for the poor. It is nearly, though not quite, the same thing in other considerable towns. Who, then, can blame

the workmen for advancing a claim that their pay, which was certainly never excessive, should at least keep pace with what was exacted for house-rent and estates?

The strikes began by the working-men asking for an increase of wages of 25 per cent, and a reduction of hours from twelve to ten. When they obtained their terms, peace was re-established; when they had to give in, the attack was resumed a little later, and, in many cases, with better success. The result of the entire campaign is a general rise of the price of labour by 25 per cent. in a single year.

The strike of the Berlin masons began in the June of last year, and went on for six weeks. The workmen demanded an increase of their daily wages from 2s. 3d. to 3s., a reduction of hours from twelve to ten, and extra pay of 5d. for each hour overtime. Upon this 300 builders of Berlin formed a counter association, which negated the programme of the working men *à toto*. Negotiations were repeatedly resumed, but as often broken off, both parties remaining firm. At last the masters gave in upon the condition that their defeat should be concealed under some concessions of a merely formal nature. Since then the workmen have been giving their services for something like eleven hours at 3s. 6d. per day.

An even vaster operation was the joiners' strike, which broke out after that of the masons had been settled, and lasted nine weeks. Of the 3,000 joiners in the city, 5,000 struck; 2,000 went off elsewhere; while 1,000 married people, with large families, remained staunch to their work. The claims put forth were similar to those of the masons,—25 per cent. more wages, and a reduction of time to nine hours and a half. The masters, who in Berlin number no less than 1,000, with 500 wealthy contractors among them, answered these demands by the counter proposition that piecework, which had not been very general, should be made universal, after which they hoped to be able to allow higher wages. After the expiration of seven weeks, these masters who had taken contract work for builders, and who, owing to the steady increase of house-rent, were enabled to accord higher wages, began to relent. Thus an opening was made for a compromise, by which the weekly wages, formerly at from 15s. to 21s., were raised to 21s. to 25s., the number of hours remaining the same. Piecework under the new conditions yields from 30s. to 36s. per week.

A TECHNICAL DICTIONARY.

Str.—“Rabbet, *n.*, a corruption of the word rebate.” Such is the decision of the editors of the last edition of Webster's Dictionary, and, as far as I can judge, that decision is accepted.

I have long felt with your correspondent the want of a trustworthy technical dictionary of the Arts and Sciences, and I am taking every opportunity to prepare such a work; but I trust some one with more ability and more leisure will outrun me. The art dictionaries we now have are very confusing and overstocked with words of use only to the antiquary. I think if half these words were omitted, and their place occupied with the every-day terms of the studio, architect's office, and workshop, a really useful work would be the result.

GEORGE ALFRED RODERS.

LONDON WATER SUPPLY.

In the House of Commons, in reference to Professor Frankland's report, already quoted in the *Builder*, and in reply to Mr. Kay-Shuttleworth, Mr. C. Fortescue said,—Major Bolton, the water-examiner of the Board of Trade, agreed with the Royal Commission on the Supply of Water to the Metropolis in thinking that Thames water, if only properly filtered, was harmless, and formed a fit and proper supply for the use of London. That gentleman also said that during the last winter two of the companies referred to had supplied water not properly filtered; the cause of that failure being that they were at the time carrying on large works for the purpose of improving their establishments, and also owing to the heavy floods. During that time, from want of sufficient storage room, the filtration was carried on hurriedly, and the water supply was by no means what it ought to have been. Major Bolton also reported that those companies were engaged in enlarging their works in a way which, in his opinion, would

remove those evils, and would meet the requirements of the case, by making large additions to the reservoirs. If it should prove that this was not the case, it would be necessary for the Board of Trade to interfere. With respect to the last part of the question, he meant to insure, so far as the Board of Trade powers extended, careful filtration of the water supplied by those and other companies. Remedial measures were being taken, and he did not think that legal proceedings need arise at present.

HEALTHY HOUSES.

This was the title of the paper by Councillor Gowans read at the last meeting of the Edinburgh Architectural Association. The reader commenced by stating that the kind of houses we lived in was of such vital importance, not only to ourselves individually, but to the community at large, that he did not think it necessary to make any apology for introducing the subject of his paper. As he believed it was quite possible to design and construct houses so that those who lived in them might not suffer either morally or physically, he would state what, he thought, were the faults of our present mode of arrangement and construction, and what ought to be the chief requirements of a healthy home. In speaking of what he considered necessary to keep suburban dwellings from contaminating influences, he said that the subsoil upon which the houses rested should be thoroughly drained to such a depth as would secure a crust of dry soil upon which to erect the structure. The walls below the floor level, as well as the space between, should be covered over with some substance to prevent that capillary attraction which the walls of the building and the internal heat of the rooms after the house is occupied exert upon anything which would supply moisture. The external walls of the building should be of such a thickness as would allow of a house being kept at an even temperature. Gables with fireplaces could not be too thick, as thin walls, especially at the chimney-head, were sure to produce smoky vents. Bedrooms and kitchens should be of the largest dimensions compatible with the size of the structure. No drains should be allowed to pass under a building, and he held that an architect knew little of his profession if he was driven by the arrangement of his plans to carry them there. Drains should never be allowed to pass further into a house than half the thickness of the outer wall, and if such were the law, he believed much less disease would exist in the city. He did not wonder at people getting into bad health, or having their constitutions so deteriorated and made liable to the attacks of every epidemic, when he considered that most of the pretentious houses in the suburbs of the city had drains passing underneath them. Such drains, from their fanly construction, permitted the sewerage to soak the base of the building, and render it a hotbed for the generation of disease. If drains were kept outside of buildings, he held that it was quite possible to trap them so that no bad air from the main sewers could find its way into the house. He knew that the trap generally in use was not effective for this purpose, but he had himself devised a double trap which completely secured the desired end. As to the cisterns of houses, he considered they should be placed where they could be easily reached, and where they would be free from contamination of any kind. He would have a room in the house, with plenty of light, entirely devoted to the main cistern of the building—a place into which the occupant could go as freely as into any open part of his dwelling, and where he could observe that such an important element as water was pure and wholesome. There should be no limit to the number of windows, and the position of the rooms in regard to light should guide the architect in fixing the fronts of his buildings. He considered that a great mistake was made by the builders of detached villas in making the entrance to the dwelling through the principal front of the house. This arrangement, of course, could not be avoided in street houses, but in suburban villas an architect had no excuse for adopting such a course. Mr. Gowans then went on to refer to street buildings. He objected to the main drains being allowed to run along the centre of the streets, because, as the kitchens, sculleries, and water-closets were generally at the back of the buildings, it naturally followed that the drain passed under the house before it could reach the main sewer. The only cure for

this state of matters, he felt, was to have the sewer running along the back of the building, and the clean water in the front. He spoke against the system of having water-closets in the centre of buildings, and maintained that more than enough of water could not be had in order to keep drains pure.

SCHOOL-BUILDING NEWS.

Manchester.—The Bradford Memorial Schools were opened on the 1st inst. They are Gothic simple in detail, with lofty belfry for principal roof. The chief school is 80 ft. by 35 ft., with two class-rooms, each 20 ft. by 16 ft. Separate entrances are provided, with lavatories adjoining. The site is inclosed with wrought-iron railing. The whole of the works have been executed by Messrs. R. Neill & Sons, builders, at an outlay of 1,600*l.*, under the superintendence of Mr. John Lowe, architect, Manchester.

Chorlton-upon-Medlock (Manchester).—St. Paul's schools, which stand in Higher Temple-street adjoining the church, were opened on the 9th inst. The lower story was erected a few years ago, and the additions which have just been finished complete the building. It now comprises a large room (64 ft. by 30 ft.) on each floor, and five class-rooms, besides the usual offices for boys, girls, and infants, and a boiler-room and other arrangements required for tea parties. The rooms are fitted up with desks and galleries are warmed by means of open fireplaces and Haden's heating apparatus, and are provided with means of ventilation. The roof of the upper room is open to the collar-beam, and the woodwork of this and other parts of the building is stained and varnished. Access is provided to the upper floor by means of two stone staircases. The building is of brick, faced externally with white headers, and with stone dressings to doors, windows, and other openings. The gable end in Higher Temple-street has the large windows of the upper floor filled in with stone plate tracery, while the apex of the gable coping is finished with a wrought-iron finial. The elevation to Frances-street is agreeably broken up by three gables, the centre one of which also has a wrought-iron finial. The building has been erected from the design of Mr. John Lowe, architect, Manchester, by Messrs. Davies & Maudslayi; the present additions costing about 1,700*l.*

York.—St. Lawrence and New Fulford Mission Schools have been opened. The schools occupy a position in the suburbs, on a plot of ground immediately in rear of the church of St. Lawrence, and comprise a boys' school, 45 ft. by 20 ft.; girls', 50 ft. by 20 ft.; and infants', 50 ft. by 24 ft. There are also two class-rooms and out-offices, and the building has three separate entrances. The structure is of red bricks with stone dressings, surmounted by a spiral bell-tower. It is roofed with patent self-locking tiles from Hormsae. There is a high-pitched open roof, boarded; the rooms are well ventilated and lighted, fitted with gas, and heated with Gurney's stoves. The boys' school is divided from that of the girls' by an arch of stone corbels with granite shafts; and each of the schools has been erected and fitted up in accordance with the rules of the Committee of Council on Education. On the side of the schools facing the church is a Gothic window, and the only separation from the churchyard is a light palisading. The entrances to the schools are from the lane leading from Lawrence-street to Heslington-road. The playgrounds are spacious and asphalted, and are enclosed by low walls and palisading. The cost of the schools has been upwards of 2,200*l.* The fees of the parish gave the site. Mr. C. T. Newstead, of York, was the architect. Mr. J. Brown had the general contract, the various works required having been executed under his superintendence by the following firms:—Mr. Warin Taylor, brick and stone work; Mr. G. Bailey, mason's work; Messrs. Hodgson, plumbing and glazing; Mr. Arnitt, painting.

Sheffield.—St. Silas's new schools have been opened. The new building adjoins the existing school. Its exterior is remarkably plain. The building is in the shape of the letter L, and consists of a boys' and girls' school, each capable of accommodating 300 scholars. In addition to these large rooms, there are four for class purposes. The old school-room will now be used as an infant school, and it will afford accommodation for 350 children.

Parkgate.—On the 9th inst. the foundation-stone was laid by Lady Gertrude Foljambe of new Church of England Schools, at Parkgate,

near Retherham. They consist of large mixed school, with class-room; and infants' school, also with class-room attached. They will accommodate a little over 400 children, and the cost will be about 1,200l. The material will be stone from the local quarries. The style is Early English. Messrs. Tacen & Rawsen are the architects.

St. Briavels.—A new school has been opened here. It is intended also to erect a master's residence, making the total outlay 850l. The site was given by the late Mr. Peel, of Aylesmere, and the architect is Mr. W. T. Allen, of London, the vicar's son, who has given his services, and the builder is Mr. Meredith, Gloucester. There is a turret with spire. Accommodation has been provided for 170 children, with a class-room for sixty infants.

Cheadle.—The foundation stone of a new Wesleyan Sunday School, in Charles-street, has been laid. The building will be of brick, with stone dressings, its dimensions being 61 ft. by 32 ft. inside. The cost of the site and the building will be about 1,000l. The architect is Mr. Wm. Sugden, of Leek, and the builders are Messrs. Collis & Waugh, of Cheadle.

Hulme.—The new schools recently erected in connexion with St. George's Church, Hulme, and which now situate in Arundel-street, Chester-road, have been opened by the Bishop of Manchester. The schools will accommodate about 1,100 scholars, and have been built by Messrs. S. & J. Higham, contractors, Chetham, from plans and designs prepared by the architect, Mr. Ernest Bates, of Manchester, and are in the Gothic style of architecture. There are separate rooms for boys, girls, and infants, and attached to each are a class-room, and room for hats and cloaks. The principal room is 81½ ft. long and 32 ft. wide, and is fairly ventilated and well lighted, and has two large traceried windows. The rooms are lofty. The principal entrance to the boys' school is in Ellesmere-street, to the girls' school in Cawdor-street, and to the infants' school in Arundel-street. The entire length in Ellesmere-street and Cawdor-street, is 73 yards, and in Arundel-street 20 yards. The cost of the building has been 4,500l., towards which sum 1,000l. have been contributed by Lord Egerton. The site was given by the Bridgewater trustees.

Wakefield.—The new Wesleyan Sunday School buildings are designed by Mr. William Watson, of Wakefield, architect, and are intended to be built of brick, with stone dressings. They consist, on the ground-floor, of principal entrance facing South-parade, with spacious staircase; the large room, 71 ft. long, 33 ft. wide, and 20 ft. high; and a class-room, 14 ft. by 13 ft. On the first floor are planned a school-room, 33 ft. by 31 ft., and 15 ft. high; five class-rooms, each averaging 14 ft. by 13 ft. In the basement are arranged the heating apparatus-room, kitchen fitted with hoilers, &c., and other conveniences; from this floor, on the level of Graham's-terrace, is an entrance and staircase to the large room. On the ground and first floor are proper water-closets, lavatories, &c. The contracts for the various works amount to 1,481l., and the contractors are Mr. George Fawcett (who is also contractor for the restoration of the parish church), for the brick and stone work; Mr. C. F. Ryeroff, slating work; Mr. Charles Driver, plastering work; Messrs. Cruven & Lloyd, carpenter and joiners' work; Mr. W. Woodhead, plumbing and glazing work; Mr. S. Kirk, ironwork; Mr. C. Turner, and Messrs. G. Blake & Co., of Coventry, for the heating apparatus, which is on the hygienic hot-air system. The memorial stone of the new building was laid last week.

Dukinfield (near Manchester).—The foundation-stone of St. Mary's School was laid on March 30th. Accommodation is provided for 200 children. Mr. Colbeck, Ashton-under-Lyne, is builder; and Mr. Edmund Kirby, of Liverpool, architect.

Stratford.—On Wednesday, new National Schools, which are situated in the densest part of Stratford, were opened by Mr. N. Powell, J.P. They are capable of accommodating over 900 children, and consist of boys', girls', and infant schools. Mr. W. F. Meakin is the architect, and Mr. James Rivett the builder. The cost of their erection has been 4,383l. Mrs. T. Curtis gave the freehold, the value of which is estimated at 1,000l.

Rawtenstall.—The corner-stone of a church school for the district of Constablee has been laid. The school is to be a stone building, in the Gothic style of architecture. The principal room will be 81 ft. in length by 26 ft. in breadth.

Besides this there will be two class-rooms, each 15 ft. by 16 ft., with cellars underneath for heating apparatus, &c. The school will accommodate upwards of 300 children. The plans are by Mr. B. W. Jackson, of Halifax. The site is given by Mr. Taylor, who is also the largest contributor to the building fund.

Cheshunt.—The new girls' and infants' national schools, Church Fields, have been opened by the Bishop of Rochester. Mr. Barker, of London, was the architect, and Mr. Bentley, of Waltham Abbey, the contractor. The site was presented by the Rev. Alfred Preston, formerly curate of Cheshunt. The cost of the schools was 1,250l., which sum was raised by voluntary subscription. The porch was the gift by legacy of Miss R. Preston, sister of the founder of the schools. The structure is intended for the accommodation of about 250 girls and infants.

Kilnhurst.—A new school in connexion with the parish church of Kilnhurst has been opened. The plans were prepared by Mr. Blackmoor, architect, of Rotherham, and the building has been erected by Mr. Simmonds, of Kilnhurst.

Handborough.—Handborough schools, now reopened, have recently been very much enlarged, so as to meet the Government requirements. This has been effected through the liberality of various voluntary subscribers interested in the work. The additions to the schools were made in accordance with a plan furnished by Mr. Wilkinson, of Oxford, and have been carried out by Messrs. Merry & Mansell, of Handborough.

CHURCH-BUILDING NEWS.

Hull.—The plans of Messrs. Adams & Kelly, of Leeds, architects, have been selected, after a competition, for the erection of a new church in Holderness-road, to be dedicated to St. Andrew. The church will cost about 5,000l.

Folkestone.—The committee for re-peping the parish church, with Messrs. Stallwood (the architects), received the following tenders for re-peping the church, erecting a new porch, and for the enlargement of the vestry:—Dunk, 1,072l.; Webster, 948l. 2s. 10d.; Holdom, 919l. 19s.; Bowley, 825l. 10s. It was agreed to accept the lowest tender. Some discussion took place as to re-tiling the church with Minton tiles, for which a separate estimate had been given by the builders. Mr. Stock said that he objected to having the stones in the church removed, many of which contained inscriptions, to be replaced by a gaudy pavement. Mr. Woodward said it was not the intention of the committee to do this at present, although he wished it could be done, and the work be finished at once. The secretary said they had 220l. in hand, and altogether 350l., and the vicar stated that by Easter they would have 600l.—enough to commence with.

Bristol.—The little old-fashioned church in Dowry-square, used as a chapel-of-ease to Clifton parish church, is in such a sad state of dilapidation that it has been determined to take it down and rebuild it in a style more convenient and more in harmony with modern usages. All the available material of the present building will be employed in the construction of a church capable of seating 500. The old-fashioned high-backed pews will give place to open seats of pitch pine. The building will consist of a nave, side aisles, and chancel, with a tower at the south-west corner. It is proposed to divide the nave into four bays, with moulded arches, labels, and carved terminals, the last of which will extend into the chancel, and will be filled in with wrought-iron screens. The column nearest the chancel will have a carved foliated cap, from which will spring the chancel arch. The reredos will be of marble and other stone. There will be no east window, the building at that end extending to the adjoining houses, and in its place there will be a recess immediately over the reredos, filled in with geometrical tracery, and upon the panels will be painted the Lord's Prayer, the Creed, and the Ten Commandments. The outside of the building will probably be of freestone and Pennant, and the internal columns will be of blue Pennant. The church will be paved with encaustic tiles. The total cost is estimated at about 2,000l., of which a considerable portion has yet to be raised. We understand that the work will be commenced soon after Easter.—The foundation stone of St. Nathaniel's Church, which is intended to meet the wants of the population of that part of Cotham near Lovers'-walk, has been laid. The foundations of the edifice are already laid, at a

cost of nearly 900l. The church, which is intended to accommodate 700 persons, will be in the Early Gothic style, the chief material being Pennant stone, with freestone dressings. The roof will be open-timbered, and covered with slate. There will be a tower and spire, 150 ft. high to the vane, at the south-east corner of the church; and the principal entrance will be on the south, or Elm Grove-road, side of the building. Under the tower will be vestries for the clergy and choir. The chancel will be octagonal, and have a bearded reef; and on its north side will be an organ-chamber. The seats will be of red deal, stained and varnished; and the building will be warmed by one of Haden's heating apparatus. Messrs. Wilkins are the builders; Mr. Bevan is the architect. Between 3,000l. and 4,000l. have been raised towards the cost of the building.

Ruabon.—The parish church of Ruabon has been re-opened after restoration. The organ, upwards of a century old, built by Snatchley, and originally the gift of the Wynnstay family, has been entirely remodelled by Messrs. Gray & Davison, of London, at the cost of Sir W. W. Wynne, bart., M.P., who also, at his own expense, repaired and considerably beautified the chancel, and besides has subscribed the greater portion of the sum raised for the whole of the works. The restoration has altered the appearance of the interior. An entirely new roof has been put up, the stone pillars which supported the arches between the nave and side aisles have been replaced by others of a lighter character, and the pews have given way to open sittings, free and unappropriated. The gallery at the west end is to be replaced by a smaller one. The whole of the works, which, in addition to those mentioned, include others of a minor character, have been carried out by Mr. Wm. Williams, of Bangor, under the superintendence of Mr. Fervey, of London, architect.

Uppingworth.—St. Mary's Church has been closed for some months to undergo a restoration internally. In the re-arrangement of the seats, the architect has found it necessary to re-plan the area, to fit the purposes of the modern style of service, the centre aisle remaining as at present, but the side aisles will be placed immediately against the walls, thus bringing the congregation together to form two masses. The whole of the seats will be open and free, the ends and rails being in pitch pine, and the rest in deal. The organ will be placed at the south side of the communion, with the singers' stalls in oak on the north and south sides of the altar-steps. The pulpit will be placed in front of the altar-steps, at the south corner. The west gallery will be entirely filled with children's seats, and will give accommodation for about 145. The north gallery will remain as at present, except that the high doors will be taken away. The oak fronts to the galleries will be cleaned from paint and varnish, and left in their natural state. An increase will be made in the accommodation by this renovation for 37 adults and 40 children, in addition to 250 sittings which will be made available for the use of the rapidly-increasing population. The estimated cost is about 600l. Mr. J. Henry Wadsworth, of Halifax, is the architect; and the various artificers' works are let to the following contractors:—Masons' work, Mr. W. Farrar, of Holdsworth; joiners' work, Mr. T. Plant, of Halifax; plumbers' work, Mr. J. Holdsworth, of Halifax; painters' work, Mr. J. Hodgson, of Queensbury; and Messrs. W. & S. Thornton, of Huddersfield, will supply the heating apparatus.

Arnley.—The foundation-stone of a new church, to be dedicated to St. Bartholomew, has been laid at Arnley. The old church known by that name will give place to the new edifice. The site of the new church borders on the churchyard. The designs of the building have been prepared by Messrs. Walker & Athron, architects, Leeds. Its proportions will be considerably larger than the existing church. The estimated cost is 15,000l., and already subscriptions amounting to 9,600l. have either been received or promised. Mr. S. E. Wilson has contributed towards the building fund 5,000l. The plan of the building is that of a Latin cross, consisting of nave, six bays in length, transepts, and sanctuary, with roofs of equal height, and a tower at the intersection. The nave has aisles, north and south, with porches opposite the westernmost bays of the nave arcade; and the vestry is placed in the angle formed by the junction of the sanctuary with the south transept. The sanctuary is apsidal, and the tower is surmounted by a saddle-back roof; and both

sanctuary and the space under the tower are intended to be vaulted. The church is to be built of local sandstone, and faced internally with limestone from the Ancaster quarries. The design is Early English, and its symmetrical proportions and simplicity of detail, combined with the size and solidity of the structure, forcibly remind one of the architecture of our Yorkshire abbeys. The principal dimensions are as follows:—Length of church, 157 ft.; width across transepts, 65 ft.; length of nave, 98 ft. 6 in.; width of nave, 30 ft.; width of transepts and sanctuary, 27 ft.; height to wall-plate, 46 ft. 6 in.; ditto to ridge of roof, 73 ft.; ditto to summit of tower, 153 ft. The contractors are,—Mr. H. Bramly, mason; Mr. J. Hall Thorp, joiner and carpenter; Mr. W. B. Myers, plumber; Messrs. Nelson & Sons, ironfounders; Mr. Ezra Walker, painter; Mr. R. Branton, plasterer.

DISSENTING CHURCH-BUILDING NEWS.

Colnbrook, near Windsor.—A new chapel, with vestry and schoolroom adjoining, has recently been erected in this town for the Baptist denomination. The building is of the Corinthian style of architecture, with a red brick front and white stone dressings to windows, &c., the whole being executed at a cost of about 800*l*. The internal arrangements are the same as usually adopted in modern places of worship, comprising three rows of seats, with gallery immediately over the entrance, the whole being stained and varnished. The warming apparatus, on the hot-air principle, was executed by Mr. Harris, of Thame. Mr. Daniel Singer was the contractor, the brickwork and masonry being executed by Mr. Henry Mole. The work was superintended by Mr. James Wells, of Thame.

Penitance.—Mr. John Rhodes, of Penitance, has sold to the Wesleyan congregation a plot of land, upon which it is proposed to erect a new chapel, with schoolroom, class-room, &c., underneath, and minister's vestry, organ-gallery, &c., at a cost of 1,000*l*., exclusive of cost of site. The building will be in the Gothic style of architecture, from designs prepared by Mr. Moxon, of Barnsley. Accommodation will be provided in the chapel for 400 persons, and in the schoolroom for 200 scholars. It will be in the midst of a population of about 2,000 persons, and in the immediate vicinity of the extensive steel and iron works of Messrs. Charles Cammell & Co.

Hollingsworth.—The foundation-stone of a new Congregational chapel and school at Hollingsworth, near Hatfield, Cheshire, has been laid. The new edifice will be in the Gothic style of architecture, built of stone obtained from Millbrook quarry, and faced with Dunford Bridge porphyry. There will be a tower, with buttressed angles, and slated spire. The total height is 86 ft. The chapel will be lighted at the sides by pointed three-light windows, and the bays will be marked by buttresses between the windows. The total length of the chapel, measured in the centre, exclusive of the entrance, will be 62 ft. 6 in.; the width, 40 ft.; the height, from floor to ceiling, will be 36 ft. The chapel will accommodate about 500 people. The school will be under the chapel, of the same size, the floor on a level with the ground, and 14 ft. high. There will be six class-rooms, three at each end. The walls will be plastered inside, and the school will be lighted by three three-light windows on each side. The schools will accommodate about 600 children. The buildings will be warmed by means of hot air or hot water. The site will be enclosed by stone walls, with gates at the front and side entrance. Mr. Henry Pinchbeck, of Manchester, is the architect; and Messrs. Higham Brothers are the contractors.

Tunstall.—The memorial stones of the new Wesleyan Chapel, Harsisehead, have been laid. The site of the building is in a central and public position. The style is Gothic, and the materials to be used are red bricks, relieved by bands and vousoirs of blue and white bricks. The plan of the chapel, which will accommodate about 380 persons, is that of a parallelogram, 45 ft. by 35 ft. internally, and is approached from the front through a porch, 6 ft. wide, and inner vestibules. At the rear of the chapel, behind the pulpit platform, will be the orchestra, with a class-room underneath. The principal front of the building has a three-light window, the heads of which are to be filled up with tracery. The central part of the front is to be finished with buttresses on each angle, with stone terminals rising somewhat above the roof. On each side of the central

front gable will be the two circular vestibules, terminating with roofs at a somewhat lower level than the other part of the front. Each side of the chapel is divided into four bays by buttresses, with a two-light window in each bay. The ground-floor of the chapel, and the gallery across the entrance end, will be fitted up with open benches, and a number will be free. The woodwork, internally, will be partly of pitch pine, and the whole will be stained and varnished. The designs are by Mr. G. B. Ford, architect, Burslem, and are being carried out by Mr. Samuel Booth, builder, Kidsgrove. The cost of the building, exclusive of land, will be about 1,300*l*.

Finchingfield.—The Congregational chapel at Finchingfield, which has undergone extensive alterations and improvements, has been reopened. The works carried out in the restoration and improvement of the building comprise the following, viz.,—Re-flooding and reseating with benches of stained and varnished deal throughout the ground floor and gallery. A platform, containing pulpit and deacons' seat, has been constructed at the end of the chapel, with a door on each side of the pulpit to the minister's and deacons' vestries, the end of the building being relieved with a large arched recess. The gallery-front has been lowered, and new windows and doors have replaced the old throughout the building. An external loggia, the entire width of the chapel, has been erected in front, forming two lobbies to the body of the building below, and containing a staircase on each side to the gallery above. The chapel has been heated by means of hot-water circulating pipes. The walls, ceiling, &c., are distempered and painted in plain colours. The works, which have cost a sum of over 500*l*., have been carried out by Messrs. Cole, builders, of Thaxted, under the direction of Mr. C. Pertwee, architect, Chelmsford.

Fenton.—The memorial-stone of a new Wesleyan chapel at Fenton has been laid. The style adopted is Italian. The materials to be used are red bricks, with bricks of other colours sparingly introduced for relief, and Hollington stone dressings. The accommodation in the chapel will be for about 700 persons, and a portion of the sittings will be free. At the rear of the chapel will be a class-room and a minister's vestry. The central portion of the front gable will contain the two entrance-doorways and a five-light window, with tracery head. The interior woodwork will be of pitch-pine and red deal, stained and varnished. The building is to be warmed by hot air, and the front of the site is to be enclosed with iron railing and gates, with stone piers. Mr. G. B. Ford, of Burslem, is the architect; and Mr. T. Newbon, of Longton, the builder. The amount of the contract is 2,100*l*., exclusive of lighting and heating, and the total outlay will be about 2,350*l*.

Books Received.

The Elementary Education Act, 1870 (33 & 34 Vict., c. 75), and Elementary Education (Elections) Act, 1871; with Introduction, Notes, and Index. By HUGH OWEN, Jun., of the Middle Temple, Barrister-at-Law. And an Appendix. Seventh Edition. London: Knight & Co., Fleet-street.

The present edition of this work contains, in addition to the several orders of the Educational Department as to applications for and the elections of School Boards, the new code as to Parliamentary grants, the general order of the Poor Law Board, and the instructions of the Education Department as to the planning and fitting up of schools, &c. The accuracy and utility of the work are testified by the number of editions through which it has already passed.

Transactions of the Indian Engineers' Association; for the half-year ending June, 1871. Vol. I. Calcutta: Printed by H. C. Gangooly & Co., 23-24, Mangoe-lane.

This interesting association, which seems to have been started entirely by native engineers, was established on a permanent basis in January, 1871. It regularly holds monthly meetings, and the present volume contains interesting and able papers by native Indians on various subjects, and in good English, such as On the Laterites of the District of Bannoorah, by Baboo Jodu Nath Roy; Notes on Brick-making, by Baboo Khetter Molum Bose; on

the Temple of Juggernaut, by Baboo Radhica Prasad Mookerjee; a Brief History of the Steam-engine, by Baboo Madhub Chander Roy (one of the three secretaries, all natives); Memoranda on Macadamising Roads in the Province of Bengal, by Baboo Jodunath Roy. There are also an Appendix containing extracts from Professional Papers, and several plates, besides some business-like observations on the objects of the Association, and on the proceedings, by Baboo M. C. Roy, hon. sec.; besides whom there are the two other secretaries, Baboo Nilmony Mitter, and Baboo Deno Nath, sen. The president and vice-presidents are not yet elected.

VARIORUM.

The economy of heating greenhouses by means of gas has been more than questioned by some of our correspondents. It would of course depend to some extent on the mode adopted. A writer in *The Gardener* says on the subject:—"Wherever gas is to be had at a reasonable price I am convinced that it is much more economical to heat a greenhouse with it than with an ordinary boiler; and where a large greenhouse is in question it will pay any one well to make his own gas. Outside a room, 17 ft. by 10 ft., and 10 ft. high, I have a small conservatory, 7 ft. by 3 ft., just covering the opening of the window, which has been taken entirely out. Round this little greenhouse runs a 1½ in. iron pipe, communicating with a copper boiler outside on the leads. This boiler is broader and shallower, and during the last two winters I have maintained a temperature of 50 degrees, without any fire in the room, by merely lighting the gas under the boiler from eight o'clock at night until the same hour the next morning. Of course the boiler is sheltered from wind and rain. The burner, which is one of those known as a 'roarer,' is 5 in. high, and shaped like the chimney of an ordinary paraffine lamp, rising up through a globe. The gas enters the gaspipe and passes to the globular part of the burner, where the pipe is closed, except at an orifice considerably smaller than an ordinary sized pin's head. Through this hole the gas rushes upwards towards the tube or chimney, and before entering it becomes completely mixed with air in its passage through the central opening. On applying a light at the top of the chimney, the mixed gas and air unite to form an almost colorless flame, which emits intense heat, accompanied by a 'roaring' noise, which, however, paradoxical as it may appear, is very slight." If owners of greenhouses were to place the heating pipes so that they could be regularly blackened, they would find a saving in fuel of at least fifteen per cent., after all expenses attending the process were paid.—"Building Societies and Borrowers," by C. D. A. Friedlein, offers refutations of principles on which private building societies have been worked; illustrates the mutual interest and security which borrowers, investing members, and depositors should have in building societies; and the exorbitant rate of interest paid by borrowers in building societies worked upon unsound principles. Its tone is shown by the circumstance that on its first appearance an injunction in Chancery was asked for against its publication, but it was refused. Some of the building societies certainly want looking into.—Binding together the little "Shilling" books, by Mr. Edward Walford, Mr. Hardwicke has issued a most compact "Peerage, Baronetage, Knightage, and House of Commons." It makes little more than a pocket volume, and is wonderfully comprehensive.

Miscellaneous

Opening of a New Cattle-Market at Leicester.—A new cattle-market has been laid out on nearly twenty acres of land and opened in the south-western suburbs of Leicester, at a cost to the corporation of something like 30,000*l*. It is laid out in the most improved manner, and comprises not only an area of several acres for horse-fairs, but also ten slaughter-houses, in two blocks, for cattle, two for pigs, and one for condemned animals; besides offices and houses for the clerk and other officers connected with the market. The slaughter-houses are connected with the main line of the Midland Railway by a short branch line; while close to the market the Midland Company have, at a cost of about 10,000*l*., constructed cattle-docks, from which cattle have easy access to the market, and vice versa.

The Prosperity of Berlin.—Writing under this head, the correspondent of the *Manchester Guardian* in Berlin says:—"Joint-stock companies are springing up daily like mushrooms, and for every conceivable branch of industry. Mines, railway stock, breweries, gutta-percha, new streets and new suburbs, sewing-machines, chemical works, &c., offer a wide field for the choice of investors. . . . The Berlin Exchange, one of the largest and handsomest in Europe, is no longer nearly big enough for the immense increase of business, and is to receive considerable additions. . . . In the neighbourhood of Französisch Buchholtz, a few miles from Berlin, a handsome carriage stops before the door of a milkwoman's cottage, and a gentleman asks if she is the owner of the plot of ground. The woman is rather taken aback, and before she can answer, the stranger continues: 'Will you take 10,000 thalers for it?' Had he offered 500 she would probably have closed at once; but the liberality of the offer made her hesitate. 'I must first consult my son in Berlin,' was accordingly the reply. The son, who keeps a hearth-shop, is consulted, and says, 'Mother, I smell a rat. You may get twice the sum if you stick out for it.' The next day the gentleman offers 20,000 thalers. 'Well,' says the woman, 'I must consult my son once more.' The son shakes his head more wisely than before, and advises his mother to refer the intended purchaser to himself. Next day he says to the applicant, 'Ah, sir, you have come just too late. I sold the land to a company yesterday for 50,000 thalers to build a manufactory on, and am to sign the agreement to-morrow.' 'But if I give you 60,000 thalers, what then?' 'Why, then, of course you have the preference.' The bargain was struck at once."

Accident at the New Colonial Offices.—Mr. Bedford has held an inquest at Westminster Hospital on the body of Patrick Collins, aged 46, a labourer employed at the extensive range of buildings now being erected in King-street, Westminster, for the new Colonial Offices. Michael Mahony, a labourer, said that on the 8th inst. he was working with the deceased at the new Colonial Offices. They, with other labourers, were employed in moving scaffold-poles across a wall from one side to the other. They were standing on the top of the brick wall, which was 14 in. wide, and 75 ft. in height from the ground. The work had been finished, and the scaffolds taken away, all but a few of the poles and putlogs, which they were then removing. The deceased, who was standing on the top of the wall, was in the act of handing a pole across, when his foot slipped, and he becameiddy, and fell off the wall on to the ground below, striking his head in his descent against one of the putlogs. He fell more than 75 ft. Deceased and other men complained of the work being dangerous. The jury, after some deliberation, returned a verdict of accidental death, but added their opinion that the manager of the works should take precautions to prevent accidents amongst the workmen.

House Property.—At a recent sale of house property by Mr. F. Godwin, at the Auction Mart, Lothbury, the following prices were amongst those realised:—No. 107, Fulham-road, held for an unexpired term of 34 years at 15l. ground rent, 575l.; No. 8, Brompton-square, held for an unexpired term of 48 years at 7l. 10s. ground-rent, 770l.; No. 9, Brompton-square, held for an unexpired term of 48 years at 7l. 10s. ground-rent, 750l.; 54, Brompton-square, and 2, Cheval-place, held for an unexpired term of 48 years at 7l. ground-rent, 900l.; 16, Exeter-street, Chelsea, held for 14 years at 4l. 6s. ground-rent, 135l.; 12, Motcomb-street, held for an unexpired term of 29 years at 7l. ground-rent, 1,180l.; No. 13, Motcomb-street, held for an unexpired term of 51 years free of ground-rent, 1,620l.; No. 14, Motcomb-street, held for an unexpired term of 33 years free of ground-rent, 1,260l.; No. 18, Wilton-place, Belgrave-square, held for an unexpired term of 50 years at 6l. 6s. ground-rent, and let for 15 years at 140l. per annum, 2,600l.

The South Kensington Museum.—A public meeting was held at Wostbourne Hall, Paddington, in furtherance of a movement for the opening of the South Kensington Museum on Sundays. Resolutions were adopted to the effect that a petition to Parliament be submitted, praying for the opening of the Museum on Sundays, and appointing a deputation, who have since waited on Earl de Grey and Ripon and the Right Hon. W. E. Forster.

The Restoration of Croft Church.—A consistory court, says the *Darlington Times*, has been held in the parish church, at Croft, before the Right Hon. T. E. Headlam, M.P. for Newcastle, chancellor of the diocese of Ripon, to consider an application made by the Rev. Frederick Henry Law, Rector of Croft, for a faculty authorising them to take down and entirely remove the chancel of the church and vestry on the north side thereof, and the pews and sittings and other erections now in the chancel, and also the pulpit and lectern, and to rebuild and restore the said chancel and vestry, and to replace therein the pulpit, lectern, pews, and sittings, and for other purposes set forth in the citation. At the conclusion of the inquiry, the chancellor said the church ought to be restored throughout, as well as the chancel. The great difficulty was that the clergyman had submitted a clear and definite plan, while the opposition had no counter scheme to present. He thought it exceedingly desirable that the parishioners should put into a clear, definite shape what they proposed to do; therefore he proposed to delay the issue of the faculty to give them time to apply to the court, and he thought it would be wise on the part of the rector to make considerable concessions; and the court might then adjudicate. It was finally resolved that the faculty should take effect in three months, with this condition. Mr. Street and Mr. Fowler have respectively reported on the state of the church, and in favour of the rector's views.

The late Rev. W. H. Black.—We mention with exceeding great regret the death, on the 12th inst., of a remarkable man, the Rev. W. H. Black, F.S.A., the Palaeographer of the British Archaeological Association. Mr. Black died at Mill-yard, Goodman's-fields, the place of his parastate, at the age of sixty-two (according to the *Times* obituary: we should have thought him older), and will be buried at Abney Park Cemetery, on (this) Friday, the 19th, at half-past two o'clock. We have often had occasion to speak of his rare skill in rapidly mastering the contents of ancient documents, and conveying the pith of them in a popular form to a mixed audience. He was equally genial and erudite.

London Institution.—At a *conversazione*, on the 17th inst., a lecture "On Colour," by Mr. F. S. Barff, was delivered. It treated of,—Facies respecting colour—Chemical illustrations—Composition of the sulphide of mercury; action of heat upon it; action of friction on the volatilised sulphide—Changes produced by heat in certain metallic iodides, and in crystals of cobalt and copper salts—Structure of the eye; comparison of its functions with those of some other organs of sense—Pure colour—Colours viewed by different coloured lights—Illustrations with the electric light—The Spectrum—Absorption of portions of white light—The three primitive colours—Methods of testing the purity of pigments by the prism—and Fluorescence.

Fall of a Girder on the Midland Railway.—On Tuesday last, Benjamin Gamini died in the infirmary of St. Pancras Workhouse from the effects of an accident which took place by the falling of, or as it is alleged, the breaking of an iron girder on the Midland Railway. The deceased and other workmen were employed on Monday afternoon in removing a girder for some improvements which were being effected at the bridge which crosses the Midland Railway at the Camden-road. They had just succeeded in swinging the iron girder, when, it is stated, it suddenly broke in three pieces, one of which, a heavy mass, fell upon the unfortunate man Gamini, crushing him in a frightful manner.

The Proposed Covered Cab-stand at Knightsbridge.—Shopkeepers of Knightsbridge and others have memorialised the Westminster District Board of Works against the endeavour,—first proposed in the *Builder*,—to improve poor cabs' hard position, by adding a cover to his stand, and enclosing a part of it as a waiting-room. The Board, however, had already given their consent, conditionally, to the proposal, and have sent a copy of the memorial to Colonel Henderson, of the police, whose plan it is.

Imperial Theatre, Newington Causeway. We are asked to say that the dimensions we gave as the size of stage, viz., width 30 ft. and height 40ft., are the measurements of proscenium opening. The stage will be 67 ft. wide and 58 ft. high.

The Proposed New Fruit and Flower Market for the City.—The Markets Committee have reported to the Court of Common Council, recommending that the Farringdon Market should be reconstructed as proposed, at a cost not exceeding 150,000l. The rents, it is anticipated, will be increased from an average of 712l. a year to 9,592l., and the tolls and casual lettings from 507l. to 4,000l. The Council have adopted the report, and given the committee authority to apply to Parliament for the requisite powers, and to raise the necessary sum.

Hucknall Church and Byron's Grave.—A correspondent of the *Notts Guardian* states that with the view of realising a monument worthy of Byron in Hucknall Church, where his remains and those of Ada lie, a sum of 2,150l. has already been subscribed towards the reparation and enlargement of the church itself, by residents in the locality, and that aid is now further wanted from the public to promote the objects in view. The plans for the restoration have been prepared by Messrs. Evans & Jolly, architects, Nottingham.

Fixed Indian Ink.—We have received from Mr. Laurence Cowen some fluid Indian ink, which has this advantage amongst others, over ordinary Indian ink, that it will not move under colour; tint after tint may be applied without disturbing the lines. The somewhat ugly plan hitherto pursued of colouring at the back of tracing-cloth and paper may thus be superseded. It is claimed for the new material, too, that it will remain in a fluid state, and when in use does not turn ropy.

Recreation Ground at Deptford.—Mr. W. J. Evelyn has signified his willingness to allow the townspeople of Deptford to use six acres of ground for purposes of recreation, a nominal rent only being charged. The ground is to the west of Old Sayes Court Farm, and, as including the site of the house in which Peter the Great is said to have lived while learning the art of shipbuilding in this country, possesses historical interest.

The Ordnance Survey of London.—The report of the progress of the Ordnance survey for the past year has been issued. It states that the plans of London on the scale of 60 in. to a mile are now complete. They are drawn on 326 full-sized sheets of paper, and probably form the largest and most complete plan of a city ever produced. Of these plans, 144 sheets have been engraved and published, and the remainder are in progress.

Railways and Working-class Dwellings. An ardent opponent of the Mid-land Railway writes to complain that "nearly 200 families, chiefly of the labouring classes, are being turned out of their homes at a short notice," in the vicinity of the Holborn Viaduct, in order to make room for the new station of the London, Chatham, and Dover railway. He urges that families who are weekly tenants should receive compensation for being summarily ejected.

A Relic of Exeter House, Derby, has been advertised for sale. It consists of the entire lining of the "council chamber," which was wainscoted with dark oak from floor to ceiling, adorned with pilasters in the doorways and casements, and finished with heavy cornices. The wood, according to the local *Advertiser*, is in good condition.

Docks at Portlehead.—A contemporary is informed that the whole of the capital required for the completion of the docks at Portlehead has been subscribed, and refers to the fact as showing that the promoters of the scheme have the greatest confidence in the work they have undertaken. It appears that only 5,000l. of the entire sum have now to be made up.

Public Baths on the Thames.—Mr. Ayrton and the Thames Conservancy have, it appears, consented to the construction of a bath off Battersea Park, and the company which has undertaken the work intends fitting up another (provided, of course, with a filtering apparatus) close to the Embankment, between the Temple and Waterloo Bridge.

Monument in Dublin to the late Lord Mayo.—A meeting has been held in Dublin, for the purpose of making preparations to erect a monument to the late Lord Mayo.

Church at Winterton, near Brigg.—Complaints have reached us of the manner in which "restoration" is being carried on here without professional advice.

Sale of Sites in Northampton.—A number of freshhold plots of building-ground, situate in the new street leading from the Town-hall to the new Northampton and Bedford Railway Station, have been sold. Lots 1 to 8 were sold at from 3s. to 3s. 8d. per foot by private contract. Lot 9 (14,620 ft.), was sold by auction, at 2s. 6d. per foot; lot 10 (1,080 ft.), at 4s. 6d. per foot; lot 11 (2,970 ft.), at 3s. 6d. per foot; lot 12 (2,200 ft.), at 4s. 6d. per foot; lot 13 (10,408 ft.), at 3s. 6d. per foot; and lot 14 (1,040 ft.), at 3s. 1d. per foot. Lots 11 to 14 are about the centre of the east side of the new street, between Angel-lane and St. John-street. Lot 9, the most extensive piece, and which was purchased by Mr. Pickering Phipps, runs from the New-street into St. John's-street on the west side. Lot 10, bought by Mr. John Collier, forms the opposite corner.

Practice makes Perfect.—Mr. Bessemer, giving evidence before a committee of the Society of Arts, the other day, said, I have observed the sleight of hand that men acquire in various mechanical arts where they have a certain thing to do, and that only; and it is really marvellous how, in three or four weeks, a man will do with ease what would have been pronounced an utter impossibility. Take, for example, the forging of steel. A man will take a bar of steel, which has to be forged into an octagon shape, and he will pass it under a heavy hammer, striking about 300 blows a minute, and will turn it exactly one-eighth of a revolution at each stroke, and the whole of the bar is forged with the greatest exactitude, though he has to alter the angle every 300th part of a minute.

New Roman Catholic Schools at South Stockton.—The foundation-stone of new schools to be dedicated to St. Patrick has been laid here on a piece of ground between Gilmore and Westbury streets, near Mandall-road. The schools will be built of plain red brick, the architects being Messrs. Goldie & Child, of London; and the clerk of the works is Mr. Atkin, of Leeds; and the contractor for the whole of the work, Mr. J. F. Craggs. The building will accommodate 300 children; will cost about 800l.; and is expected to be finished in July.

The New Post-office, Chester.—At a recent meeting of the Town Council it was unanimously resolved, "That a communication be addressed to the proper Governmental department, expressing the hope of the council that the new post-office, proposed to be erected in St. John-street, may be so designed as to harmonise with the architectural features peculiar to the City."

The Severn Tunnel.—The Severn Tunnel Railway Bill empowers the Great Western Railway Company to provide and subscribe the whole of the spare capital of 750,000l. required for the undertaking. The opposition has been withdrawn, and the Bill will come before the chairman of Ways and Means as an unopposed Bill.

TENDERS

For mansion for Mr. R. Davies, M.P., at Treboeth, Measul Bridge. Mr. R. G. Thomas, architect.—

William Williams	£12,905 0 0
Eva Williams	11,867 0 0
Roberts & Co.	11,035 0 0
Perry	11,064 0 0
Owen	9,326 0 0
John Williams	9,132 0 0
Thomas & Son	8,760 0 0
Rowlands (accepted)	8,230 0 0

For a farmhouse at Nether Exe, near Exeter, for Mr. C. Hill. Mr. J. T. Bressy, architect.—

Stephens & Son (accepted)	£1,860 0 0
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For triple cottages and outbuildings at Noke Farm, near Islip, Oxon. Mr. James H. Moucy, architect.—

Manning Brothers	£472 0 0
W. & J. Payne	425 0 0
Selby	408 0 0
Hatwell	401 8 0
Stone	395 0 0
Horus	394 0 0
Cruse	386 17 0
Norris	383 11 9
Walters	373 0 0
Long	373 0 0
Stevens & Pullin	355 0 0
Fathers (accepted)	291 10 0

For a brick wall and the setting back of fences, for the Windsor Local Board of Health.—

Goodchild	£212 0 0
Kelly	150 0 0
Hollis	149 18 0
Sturgess	146 15 0
Dalton	146 10 0
Revell	145 0 0

For Hospital for Sick Children, Great Ormond-street. Mr. E. M. Barry, architect.—

Lucas, Brothers	£39,965 0 0
Trotter	39,834 0 0
Cubitt & Co.	39,824 0 0
Higgs	37,650 0 0
Foster	36,920 0 0
Booth	36,860 0 0
Smith & Co.	36,483 0 0
Holland & Hannen	36,223 0 0
Perry & Co. (accepted)	35,890 0 0

For rebuilding premises in Fenchurch-street. Mr. T. C. Clark, architect. Quantities supplied by Mr. King.—

Hill, Keddell, & Waldram	£3,476 0 0
Brass	8,886 0 0
Coleman	8,733 0 0
Turver & Sons	8,724 0 0
Merritt & Ashby	8,662 0 0
Pritchard	8,619 0 0
Browne & Robinson	8,449 0 0
Myers & Sons	8,273 0 0
Newman & Mann	7,696 0 0

For villa residence, at Hill-lane, Southampton. Messrs. W. & J. Jurd, architects.—

Ware	£260 0 0
Rowland & Laver	880 10 0
Stevens	876 0 0
Gambing	830 0 0
Lewis	814 0 0
Bunney	788 0 0
Martin & Son	730 0 0
Crook	729 0 0

For residence, shop, stores, and stables, at Millbrook, near Southampton. Messrs. W. & J. Jurd, architects.—

Toopgood	£470 0 0
Kimber	829 10 0
Spicer	794 10 0
Rowland & Laver	775 0 0
Lewis	765 0 0
Crook	749 0 0
Martin	714 0 0

For villa residence, at Mortlake, for Mr. C. Lee. Messrs. Pain & Clark, architects. Quantities supplied by Mr. E. Morfee.—

Henshaw	£1,230 0 0
Crab	1,198 0 0
Manley & Rogers	1,194 0 0
Cook & Green	1,109 0 0
Aries	1,090 0 0
Avis & Co. (accepted)	1,090 0 0
Sawyer (too late)	1,013 0 0

For alterations at the Albemarle Hotel, Albemarle-street, Piccadilly. Mr. J. Crawley, architect. No quantities.—

Stimpson & Son	£295 0 0
Rely	448 0 0
Paley	414 0 0
Nightingale	398 0 0
Bames	383 0 0
Emery	359 0 0
Caruody	349 0 0
Pickus	310 0 0

For new house, for Mr. H. Bigsby, at Tudhurst Farm Pulborough, Sussex. Mr. Wells, architect.—

Humphrey	£1,116 0 0
Wady & Hammond	999 0 0
Longley	970 0 0
Dowdney	938 18 0
Terry	899 0 0
Robinson	918 7 6
Baker	892 12 0
Mason & Brindley	883 0 0
Pusey & Filewood (accepted)	829 0 0
Washington	675 0 0

For boundary-walls, to enclose surplus land at the Lambeth Union Workhouse, Kennington-lane. Messrs. R. Parris & T. W. Aldwinckle, architects.—

Whitehead	£1,055 0 0
Yalks	1,049 0 0
Nightingale	977 0 0
Tyerman	868 0 0
Goff	893 0 0
Yates	893 0 0
Dover	876 10 0
Crookett	839 0 0
Prout	795 0 0

For villa residence at Bolton-Je-Sands, near Lancaster, for William Jackson, M.D. Mr. Stephen Shaw, architect.—

Masons', Wallers', Excavators', and Drainers' Departments.

Hayton (accepted)	£436 0 0
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Carpenter and Joiner's Department.

Parkinson (accepted)	£395 0 0
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Plasterers' and Slaters' Departments.

Hartley (accepted)	£232 0 0
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Plumbers', Painters', Glaziers', GASFITTERS, and Bellhangers' Departments.

Abbott (accepted)	£126 10 0
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For the extension of the Sewage Purification Works, Hertford. Mr. T. W. Grimdie, engineer. Quantities supplied by Mr. Tumms.—

Moore	£2,735 0 0
Strickson	2,700 0 0
Norris	2,580 0 0
Potter	2,566 0 0
Bugbird	2,509 0 0
Ritson	2,170 0 0
Harris (accepted)	2,245 0 0

For the front portion of the Athenaeum, Camden-road. Mr. F. R. Meeson, architect.—

Jackson & Shaw	£23,231 0 0
Henshaw	3,240 0 0
Newman & Mann	3,192 0 0
Scriveners & White	3,187 0 0
Kelly, Brothers	3,139 0 0
Mann	3,083 0 0
Perry	3,040 0 0
Manley & Rogers	2,907 0 0
Wood	2,897 0 0
Nightingale	2,790 0 0
Southcott & Co.	2,625 0 0
Greasy & Knight	2,550 0 0
Henshaw	2,183 0 0

* Understood to be withdrawn.

For the interior of the Elephant and Castle Theatre of Varieties, in the New Kent-road. Messrs. Dean, Son, & Matthews, architects.—

Cooke & Groom	£3,500 0 0
Roy	3,259 0 0

For residence, coach-house, stable, and approaches, at Sareshook, Essex, for Mr. G. F. H. Clark. Mr. W. Powell, architect.—

Parvit	£1,550 0 0
Thorpe	1,450 0 0
Hunt & Elkington	1,450 0 0
Cook & Groom	1,400 0 0
Leatherdale	1,150 0 0

* Accepted, for residence only.

For stabling for eleven horses, coach-houses, and living-rooms above, for Lord Anckland, in Buckingham-row. Mr. W. S. Chapman, architect. Quantities supplied by Messrs. Woodzell & Colouitt.—

Ennor	£1,449 0 0
Cooke & Green	1,313 0 0
Smith	1,297 0 0
Newman & Mann	1,265 0 0
Scriveners & White	1,254 0 0
Wagner (accepted)	1,120 0 0

For two houses and shops, at Leytonstone, Essex, for Mr. Cullen. Mr. J. W. Forge, architect.—

Cains	£1,450 0 0
Brown	1,250 0 0
Ingham	1,065 0 0

For repairs, painting, decorations, &c., to house at Heron-hill, Newark, for Mr. Moss Isaac. Mr. J. D. Hayton, architect.—

Pearce	£890 0 0
Blott	765 0 0
Maxwell	729 0 0
Deacon	685 0 0
Richards (accepted)	433 0 0

For enlarging the United Methodist Free Church, Mills-street, Vauxhall. Mr. S. J. Steadman, architect.—

Richards	£475 0 0
Keast	420 0 0
Mallett (accepted)	395 0 0

For additions to house, High-street, Battersea, for Mr. William Griffin.—

Baker (accepted)	£210 0 0
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For warehouse and drying-shed, Russell-street, Bermondsey, for Messrs. Axell & Co. Mr. G. Elkington, architect.—

Coleman	£1,089 0 0
Maxwell	1,067 0 0
Deavin	1,025 0 0
Preston (accepted)	895 0 0

For three warehouses in Fetter-lane, Holborn. Mr. W. S. Witherington, architect.—

Eaton & Chapman	£3,257 0 0
Mark	3,068 0 0
Little (too late)	3,075 0 0
Robbins & Co.	2,890 0 0
Elkington	2,550 0 0

For stabling, coach-house, &c., Kendall's-mews, Portman-square, for Mr. J. Taylor. Mr. W. S. Witherington, architect.—

Mark	£317 0 0
Brown	298 0 0
Eaton & Chapman	290 0 0
Cole	285 0 0
Edmondson	275 0 0
Little	235 0 0

Office, Ludgate Circus.—Messrs. Perry & Co.'s tender for Messrs. Cook & Sons' offices at Ludgate-circus, as reduced, has been accepted at 18,000l.

No. 7, Backleybury.—Mr. G. S. Pritchard says his name should be added to the list given by us, and that his tender, 1,783l., has been accepted.

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The Builder.

VOL. XXX.—No. 1525.

The Mid-London Railway: Traffic of the Streets.



HE important project of providing railway communication through London in the direction of its greatest dimensions from east to west, is not, in the current session of Parliament, a novelty.

In 1866 a scheme, the same in its essential features, was brought into Parliament, but rejected on the motion for the second reading, without inquiry into the merits of the Bill. The "incur circle," still far from completion, and not likely, indeed, ever to be completed, was then in course of construction, and it was thought desirable that further progress should be made with the works of the underground line, and that additional instalments of that system of communication should be opened to the public, before any other schemes of a similar character should receive Parliamentary sanction. The Mid-London Bill was not rejected, as has been said, on its merits, which were not inquired into.

The Mid-London railway scheme now before the public fares differently; it raises questions of vast importance as affecting removal of buildings, disturbance of business, displacement of dwellings, and especially as it may affect street traffic, railway connexions, facilities for locomotion, and the convenience of the population in its movements, in contradistinction to what may be called stationary local interests. In this session, Parliament in its wisdom has ruled that the merits and details of the project of a Mid-London railway are fit subjects for scrutiny and inquiry before a select committee, and the number, variety, and magnitude of the interests involved in the inquiry, combine to make the contest one of the most protracted and costly that Parliament has to deal with. It is certain that in the present session the Mid-London inquiry will prove the great contest of the session.

It may only be necessary to recall here the principal features of this scheme. The project is prosecuted by two Bills, the Mid-London Railway and the Mid-London Railway (Western Section). Taking the two schemes together, they are for a line of railway which will commence at Willesden Junction in the west, and will proceed in a direction nearly parallel with the Edgware-road to the Marble Arch, and from thence in a direction not far from the line of Oxford-street and Holborn to Coleman-street, and eastwards to Mile-end Old Town. The scheme embraces the formation of a new street from the angle of Giltspur-street and Newgate-street to the junction of Commercial-street, Commercial-road, and Whitechapel High-street. The proposed railways would be about nine miles in length and the estimated expenditure 4,766,616*l.*, including 1,400,000*l.* appropriated to the cost in part of making the new street. The line would have connexions, or exchange-stations, with numerous important railways.

This remarkable case was opened on the 15th of April in the Committee on Group I of Railway Bills, over which Mr. J. A. Hardcastle, member for Bury St. Edmunds, presides. Mr.

Rodwell, Q.C., opened the case for the promoters in an able address that lasted for nearly three hours. He detailed fully the particulars as to the direction of the line, the localities of the proposed stations, the estimates, and the multifarious public advantages calculated to accrue from the execution of the scheme. With Mr. Rodwell were Mr. Serjeant Sargood, the Hon. Mr. Thesiger, Mr. Gorst, and Mr. Kingsford. Mr. H. Toogood is agent for the Bill. The promoters have to face above sixty adverse petitions, many of them from powerful and influential associations, firms, and individuals. The former classes include,—the Metropolitan Board of Works, the Lord Mayor, Aldermen, and Corporation of the City of London, the Commissioners of Sewers of the City of London, the Governors of Christ's Hospital, the Governors of St. Bartholomew's Hospital, the Hon. Society of Gray's Inn, the Metropolitan Railway Company, the Metropolitan and St. John's-wood Railway Company, the Ecclesiastical Commissioners for England, the Marquis of Westminster, Lord Portman, John Neal, Daniel Neal, Lucy Fogg, and other unknown petitioners; with petitions from a large number of vestries, district boards of works, firms, owners, and occupiers. The array of counsel against the Bill is very formidable, and embraces Messrs. Venables, Q.C., Cripps, Q.C., Romd, Q.C., Clerk, Q.C., Sir Mordaunt Wells, Q.C., with about a dozen of other Queen's Counsellors and juniors.

Much of the evidence given in this *cause célèbre* is of a very interesting character. Mr. Wm. Casey, a traffic-taker, gave evidence that on the 28th March last, in Cheapside, from 8 a.m. to 12 midnight, 9,032 vehicles passed a given point, and 80,257 passengers, on foot or in omnibuses and private carriages. At the Post-office end of Newgate-street, the number of vehicles was 9,322, and of passengers 61,212. The traffic was taken at twelve stations on or near the line of the proposed railway. In Oxford-street, near Tottenham-court-road, the number of vehicles was 8,803, and of passengers 62,110. In the same thoroughfare, near Regent-circus, the number of vehicles was 9,361, and of passengers 68,872. The witness stated that it had been ascertained that 853 omnibuses passed along Oxford-street in each direction, east and west, daily. The proportions of vehicles of various kinds, and of passengers and their modes of conveyance, varied considerably at the different points of observation. For the sixteen hours, from 8 a.m. to 12 p.m., the numbers in Cheapside, near Old Jewry, were:—Omnibuses, 2,604; cabs, 3,477; four-wheeled wagons, 1,438; two-wheeled carts, 1,104; private carriages, four wheels, 326; private carriages, two wheels, 83. Passengers on foot, 54,677; in omnibuses, 21,247; in cabs, 3,307; in private carriages, 1,022; equestrians, 4.

Mr. Forbes, Managing Director of the London, Chatham, and Dover, and Metropolitan District Railways, gave very decided testimony in favour of the proposed railway, as calculated to afford great accommodation to the public, and to furnish important facilities to the passengers by other lines of railway with which it would be connected. The proposed line would provide facilities that could not be more effectively given by any other scheme that could be proposed. The traffic at Ludgate-hill Station amounted to about 8,000,000 of passengers a year, many of whom wished to get farther on, in one direction or another, which they would be able to do by means of the proposed Mid-London line. The witness was of opinion that the Metropolitan Company was now very nearly at the limit of their capacity, in regard to the traffic between east and west, from King's-cross to Bishop's-road. The Chatham Company was under contract to run eighty trains each way per day in and out of Moorgate Station, and they had got to fifty-six a day. The Mid-London line, if

made, would, he felt certain, accommodate a very large amount of traffic that at present could not be accommodated at all. It would be in communication with nine or ten of the terminal stations of large railway systems, from which it would at once collect traffic on the one hand, and deliver it on the other. The Mid-London line would have the advantage of a ready-made traffic, waiting to be carried, to enter upon at once.

Mr. Cawkwell, General Manager of the London and North-Western Railway, was called by the promoters, and stated his opinion that the line would give great accommodation to a part of London that is not at present supplied with railway communication. He believed the proposed line would very effectually relieve the streets of a large amount of traffic. Of 300,000 cabs leaving Euston Station, 237,685 were for destinations close to the line of the proposed railway.

Among other statements as to street traffic, made by Mr. Haywood, Engineer to the Commissioners of Sewers, and put in in tables, were the following:—Passengers by the Metropolitan District Railway in the seven months ending January 31st, 1872, 11,010,467; season tickets at twelve journeys per week, 203,449—total, 11,213,916. The Chatham and Dover passengers to Ludgate-hill in 1871 amounted to 8,361,595. Mr. Haywood gave evidence as to the street improvements that had been effected in the City of London during the last twenty-five years, amounting to more than 150 in number. He spoke also to the density of the population of different parts of London, and of the districts that would be accommodated by the proposed railway. St. Luke's contained a population of 159,909 to the square mile. The whole population of the City proper was 74,000. In the observations of street traffic made under directions, he had found that on different days in February last there passed in 12 hours a point in Oxford-street, between Tottenham Court-road and Regent-street, 8,236 carriages; near Great Turnstile, 10,560 carriages; at the Mansion House, east of the junction with Queen Victoria-street, 13,660 carriages. In Newgate-street, 33,000 foot-passengers passed a given point in twelve hours; and in the Poultrey, before Queen Victoria-street was opened, the foot-passengers numbered 75,100 in twelve hours. Mr. Haywood spoke in strong terms of the accommodation that would be given by the proposed new street, and the relief that it would afford to the present thoroughfares east and west, that were now so inconveniently crowded with traffic.

It may give some idea of the importance and the probable costliness of this inquiry to state that the greater part of the first fortnight has been occupied with the statement of the promoters' case, and the examination and cross-examination of their witnesses. It must be admitted that they have shown a strong case; but the hearing of the other side may alter its complexion. In addition to the witnesses already mentioned, the promoters have called numerous representatives of large trading houses in the City, and near the proposed line of railway in other parts of London, all of whom have offered testimony in favour of the scheme.

The engineering evidence in support of the line has been given by Mr. J. Hawkshaw, engineer-in-chief, Mr. Falkner, Mr. T. E. Harrison, and Mr. Jas. Fairlie Blair.

The Marquis of Westminster opposes on public grounds, as we understand, because instead of running under Edgware-road, Oxford-street, and Holborn, the line will run behind those thoroughfares, displacing thousands of houses and persons, and especially of the working-classes. We sympathise with this view, and trust some means will be devised to prevent the threatened evils in that direction.

THE KNOT OF SANITARY LEGISLATION.

We have recently called attention to the details of the Public Health Bill, as introduced by the Government into Parliament; to the criticisms offered by some of the leading advocates of sanitary reform; and to the history of sanitary legislation. We have especially pointed out the great national importance of deciding on the unity of system which it is necessary to design and adopt, at a time when it is first proposed to control the course of the functions which have been hitherto performed mainly by the unaided operations of nature. It is yet necessary, in order to attain a comprehensive grasp of the subject, to consider the influence of the special or subsidiary Acts of Parliament, now existing, on the administration of sanitary law; and to refer to the mode in which the Sanitary Commission, appointed in 1869, has advised that the subject should be dealt with.

Fifteen Acts of Parliament, as we have before noticed, deal with sanitary enactments in general; under the distinct heads of facilitating local government, of preventing the spread of disease, of removal of nuisances, of utilisation of sewage, and of raising money for any of those purposes. London, Scotland, and Ireland are chiefly regulated by special Acts. But the Acts which have a direct, although subsidiary, relation to sanitary measures proper are so numerous that they can be conveniently cited by us only in categories or groups.

The first of these groups consists of the Burial Acts, of which there are eight, without counting the special clauses introduced into Acts passed under some other title. The powers granted to the Privy Council, by the Metropolitan Interment Acts of 1850 and 1852, to close certain cemeteries, were a result of the reports of the Commission appointed in 1843, by Sir Robert Peel, to inquire into the state of large towns and populous districts. In 1853 this legislation was extended to the provinces. The general purport of these enactments was, to provide such sites and to enforce such provisions, with regard to burial, as should obviate the evil influence which neglect in this matter had been shown to exert on the health of this population.

Upwards of thirty Acts of Parliament have been passed in order to regulate the employment of children and young persons in factories and workshops. With these may be classed enactments referring to special trades or manufactures, such as those of the baker, the leecher, and the printer. An Act for the Regulation of Mines is now under the consideration of Parliament. While these Acts may be considered, so far as their sanitary character is concerned, as chiefly intended to prevent the deterioration of race caused by the over-working of the young, they also include provisions as to cleanliness, ventilation, over-crowding, and similar matters, which come naturally under the review of medical inspection; but they more properly belong to the educational, than to the sanitary, branch of administration.

Two Acts of Parliament, dated in 1846 and 1848, give facilities for the establishment of public baths and wash-houses; and there are provisions respecting bathing, in the Towns' Police Clauses Act of 1847, which are incorporated in the Local Government Act of 1858.

The question of overcrowded and unhealthy dwellings is dealt with by half a dozen Acts of Parliament, including those clauses in the Public Health Act of 1815 which enforce the registration of common lodging-houses. Notice of any contagious disease occurring in any lodging-house is required by the Acts of 1851 and 1853. There are similar provisions, especially with reference to overcrowding, in the general Acts; so that consolidation and simplification of the law as to this branch of medical police is much required.

Another class of Acts has provoked a more persistent opposition than any other detail of modern reform from persons who would resent being stigmatised as the friends of disease, misery, and crime, but whose activity actually tends to the degradation and destruction of the people. We refer, of course, to the Vaccination Acts, which were consolidated in 1867, and to the Contagious Diseases Act of 1866. The further simplification of the provisions of the law in this matter, and the exercise of such a stringent measure as might and would effectually stamp out two of the greatest scourges of humanity in modern times,—diseases of only some three hundred years' standing, and com-

municable exclusively by contagion,—is much to be desired.

Another class of Acts of Parliament is perhaps less directly to be regarded as of a sanitary character, in the first instance, than either of the preceding. This consists of measures intended to prevent the fraudulent adulteration of food, and the unregulated sale of poison. In 1860 the Act 23 and 24 Vict., c. 84, facilitated the appointment of analysts, by whom any purchaser of food may, for a small payment, have any article of food analysed; and provided penalties for adulteration. It is to be regretted that an Act of so benevolent a scope, and one which applies to the whole United Kingdom, is not generally in operation. Under the Nuisances Removal Act of 1863, already referred to, powers are given for the entry on premises to inspect food, and to destroy it if unfit for use. The regulation of the sale of poisons is under the Pharmacy Act of 1868. A striking instance of the isolated and tentative mode in which sanitary legislation has been attempted is afforded by the Alkali Works Regulation Acts of 1863 and 1868, directing the Board of Trade to appoint an inspector of all such works, which must be registered for this purpose, and carried on in an innocuous manner. The pressing nature of the nuisances arising from this particular manufacture spurred the public to seek for this special protection. A train of smoke, charged with sulphurous gas, has been traced from the mouth of the lofty chimney of one of these works till it struck the ground at a distance of nine miles, scorching and withering the vegetation on which it alighted. This Act bears a close relation to the Smoke Acts, so called. The nuisance of smoke is dealt with both in general and in local Acts. The provisions of the Towns Improvement Clauses Act of 1847, for its prevention, are incorporated into the Local Government Act of 1858, by which a penalty of 40s. *per diem* is imposed on factories the chimneys of which are improperly constructed. The Sanitary Act of 1866 classes all chimneys that emit dense and opaque smoke as nuisances. Acts also exist to prevent nuisance from the smoke of steam-vessels and of railway locomotives. The consumption of coal by the latter class of machines would appear, however, to be practically unchecked.

Finally may be cited the Quarantine Act, of 6 George IV., c. 78, which is a special sanitary measure, enforced through the Privy Council. The Sanitary Act of 1866 adds to the conditions by which vessels come under the provisions as to quarantine. In the operation of this law there is a division of responsibility between two central administrative departments, and a further confusion, in many instances, between harbour authorities and local jurisdictions. This, again, is a portion of that branch of administration which might be properly styled medical police.

The Registration of Births and Deaths, under the statute of 6 and 7 William IV., c. 86, has been already mentioned, as rather a means of collecting information of a statistical character, valuable for its sanitary nature, than as a portion of sanitary legislation, properly so termed. Thus we find eight distinct groups of laws, one of them alone containing thirty Acts of Parliament, which, as special or subsidiary measures, form more or less important portions of our present Statute Law on the subject of the Public Health; in addition to the fifteen distinct Sanitary Acts above enumerated.

We have seen that the Commission of 1869 divided, in their second report, the subjects of local government into the two branches of police and of supply. The latter, again, they divided as cleansome, or, in print of fact, the Poor law, with which they had no concern, and ordinary, or the public health. To rank sanitary legislation as a matter of ordinary supply, regulated by local government, is not a very admirable specimen of the art of classification. But let that pass, except in so far as a wrong title may often influence men to entertain a wrong conception of that which it describes. The Commission appear to have been admirers of that very easy, but often misleading, method of classification, which is familiar to logical students as dichotomising, or dividing in two, an artificial order of arrangement, long since abandoned by all serious thinkers. Passing this question of method, they speak of the duties of local government as being, in a wider sense, economical and, in a more restricted one, sanitary. But they find no reason for the division of medical from engineering functions, nor for any distinction between the

prevention of disease, or the removal of that which creates it, nor between the supply of wholesome air, water, and food, and the suppression of maladies caused by their unwholesomeness. In other words, the Commission have regarded the question of public health as a Medical Board may be supposed to do. They seem to have been unaware of the more accurate estimate of the subject which is formed by the practical publicist; and mainly or entirely ignorant of the great difficulties attendant on the engineering portion of the question, which is the very life of the matter.

Under these impressions they state local sanitary government to comprise eleven several heads. These are, the supply of water; the prevention of the pollution of water; the provision of sewers and utilisation of sewage; the regulation of streets, highways, and new buildings; the healthiness of dwellings; the removal of nuisances and refuse, and consumption of smoke; the inspection of food; the prevention of disease; burial arrangements; regulation of markets, &c.; public lighting of towns, &c.; and the registration of deaths and sickness. The result of following this view of the subject would be, that on the various and often most imperfectly informed vestries, town councils, and local Boards throughout the country, would be imposed the several distinct responsibilities which appertain to the sanitary engineer, the architect, and inspector of buildings, the medical inspector of health, the inspector of markets, of weights and of measures; the examiner of cemetery arrangements, the gas purveyor, and the Government registrar. To lump together these very different subjects is a species of consolidation which may be more properly termed confusion. We cannot wonder that Mr. Stansfeld should have demanded more time to consider the subject than would have sufficed for bringing in a Bill founded on so heterogeneous a plan. Sanitary legislation, pure and simple, is a matter of sufficient importance to have its boundary distinctly drawn. If, on the one hand, it is confused with the totally distinct subject of the reorganisation of the local administration of the country, and the determination of a new social unit, to replace the old order of Alfred the Great, which has now grown into decrepitude; and on the other hand it is sought, while omitting the engineer, to absorb the duties of the medical man, the architect, the policeman, and the public registrar, we shall find human life itself to be classed as an accident of sanitary legislation.

It is well for serious men to look this great subject boldly in the face. Two distinct principles are at issue. On the one hand the sanitary reformer, the medical reformer, the social science student, the Government, and, we may humbly add, ourselves—have one great object in view. It may be stated more or less mildly, more or less boldly. But it is not too much to say that it is this: To prevent the declination, or yet further destruction, sooner or later, of the rapidly increasing population of this country, by a pestilence generated by the results of their own neglect.

Opposed to this aim is what we may call the pocket interest. We do not wish to throw a stone at any one; or to attribute to any local committee, vestryman, or other unit of local authority in the country, any unworthy motives. Still, we can be blind neither to facts nor to human nature. There can be no denial that the objection entertained by people to tax themselves, even for the worthiest purpose, is great; and that it has a tendency to make them shut their eyes to the necessity of any reform for which they have to pay. "A Pack of Doctors who want they have to pay." Such is the emphatic summary in which Farmer Clubbshanks and Mister Cent-per-Cent will include the advocates of provisions for public health. To make way against this feeling is difficult. It is only by giving stringent power, whether legislative or administrative, to the sanitary reformer, that this dead weight can be set rolling.

Easy enough, no doubt, it would be to draw up a plan as nearly perfect as it is allotted to human theories to be. But here comes in the third difficulty. How will Parliament deal with it? The temper of assemblies like our two Houses must not be ruffled. Prepossessions—we will not call them prejudices,—must not be shocked. The minister may see clearly, not only what he wishes to do, but what, on the highest principles of statesmanship, ought to be done; but can he persuade the House of Commons to see with him?

It is on this view that we have, in our humble capacity, given to the measure now brought before Parliament an adherence which we might hardly have considered due to it on its own merits alone. The question of the consolidation of such a mass of confused legislation as we have shown to exist is not one that, according to precedent, is likely to be satisfactorily settled the first time it is brought before Parliament. Let any one look at the dates of the existing Acts, and see how enactment has been invariably followed by amendment. Ultimate, and even proximate, consolidation is the object, we believe, of all. But do not let us lose the present year in discussing a question that cannot be settled out of hand. To have to amend such a consolidating law the year after passing it would make us look ridiculous in the eyes of Europe.

We confess that, in our opinion, the main consolidation to which we look forward is the repeal, pure and simple, of the confused mass of laws above described; and, if a return to the principle of the common law on the subject,—that the committee of a nuisance can be compelled to abate it at his own cost (in which way Shakespeare's father seems to have been dealt with)—be impossible, at all events such a brief enactment as may be necessary to give force to that principle. All comes to that; and, we think, all might be said in comparatively few words.

But the real knot of the question is not this. Whether we go on for a few years more, building detail upon detail in our labyrinthine legislative structure; whether we pass a monster Act of 400 or more clauses out of hand, to amend and consolidate up to to-day; or whether such a briefer mode as we suggest should prove to be practicable, and not too stocking to legal legislation; or whether the Government Bill pass, *tal quel*, is not, after all, the most pressing question. The real knot of the matter lies in the administration. Under any circumstances, how are we to reconcile efficiency and local autonomy? How are we to insure that antonomic activity, if produced, shall do good, and not harm? We call on local authorities to act. We leave their hands, if not absolutely untied, yet at liberty to experiment to a great extent. In the course of these experiments, if carried out with all despatch, energy, and honesty, shall we not do at least as much mischief as good? And may not the mischief be irreparable, and the good lingering? So numerous, for instance, are the schemes for the utilisation of sewage, that a barrister has just published what he calls a hand-book on the subject; which is, in fact, little more than an index to some half a dozen reports of Royal Commissions, and one from the engineer of a particular undertaking. Are we to say to the local authorities, the question is so large, so important, and requires such high facilities for its successful treatment, that—we remit it to the wisdom of the vestry?

The President of the Local Government Board will have, if his Act pass, the same duty to perform in his department that the Secretary of State for war has to carry out in his own. He has to grapple with the two giant evils of poverty and disease; and we believe that he looks them resolutely in the face. On the organisation of administrative sanitary measures depends far more than on the words printed in the Statute-Book. Hitherto no one has spoken distinctly on this part of the subject. Fairly considered, it is the key to the whole. Let us, then, direct the attention of those who think and work with us rather to the administrative, than to the legislative, side of the question. Falling excellence in the former, the latter, even if it could be at once rendered perfect, would be as unimportant as are some of those excellent laws which we have above mentioned. Sanitary administration is the knot of the sanitary question. How is it to be cut? We look to the Government to propose the reply.

LAND AND RAILWAYS IN THE CITY OF LONDON.

Sir,—At a time when railways are covering the land, and the cry is "still they come," a Londoner feels perplexed as he contemplates the probability of his premises being required for some new line of railway, and generally a state of uncertainty exists among men as to fixing the locality of a business, as from the operation of a new line old and populous thoroughfares will be deserted, and the streams of traffic diverted into new channels. Take Broad-street, for instance, at present the terminus of so many lines of

railway, that for so many years was seclusion itself, the home of merchants, who required quietness to study their great commercial speculations, the effect of which was a colossal fortune or irretrievable ruin. This street is now all hustle and excitement,—vehicles and foot-passengers passing backwards and forwards. Moorgate, Farringdon-street, London, Chatham, and Dover Railway-stations; the District Railway, in Cannon-street, and soon the Mid-London, from Kilburn to the Marble Arch, along Oxford-street, to a terminus in Newgate-street, and similar scenes of hustle and noise will occur in these respective localities. My object in making these prefatory remarks is to draw attention to the evident wish of the railway companies to pass through the City of London, and it must be admitted that this is an important question, and requires careful consideration.

While on this subject I will allude to what must be considered an error on the part of the shrewd citizens of London, in reference to the waste lands within the City, a considerable amount of interest having to be paid annually on the purchase-money of this unproductive land. No doubt the reply will be that the City surveyor has not received any offers from any enterprising builder or other person for the surplus land in question; or if an offer has been made, it has been of too low an amount to be entertained. Now, in order to arrive at an impartial judgment, the market value of the land will inflexibly be the guide. I will take, for instance, the surplus land in connexion with Farringdon-street and its neighbourhood. The Holborn Viaduct, although a great public improvement, inasmuch as it reduces the labour of horses and the toiling pedestrian, also depreciates the value of the vacant land, because it takes the traffic away from the lower ground on to the higher level of the Viaduct, and therefore no shop-keeper could expect to prosper located on a spot deserted by the public, and consequently land thus situated will be covered by buildings devoted to manufacturing or other useful purposes, where it is not necessary to have shop-windows teeming with a display of fancy goods; and although the land would be valuable, a less price must be expected for it than if situated in a more attractive spot.

As this letter is devoted to City affairs, there is one that particularly demands instant attention. I believe it is a fact very well known, that the Farringdon-street Vegetable Market has proved a failure, involving a large annual pecuniary loss to the City treasury; but, notwithstanding this, in consequence of a reported misunderstanding of the fruit and flower dealers of Covent Garden Market, with the Duke of Bedford, their landlord, and an expectation that these tradesmen would leave Covent Garden Market and settle in Farringdon Market, a very expensive plan has been made by the City Surveyor, said to amount to more than 100,000*l.*, to accommodate these tradesmen; but it now turns out that the duke has come to terms with his tenants, and they have resolved to remain where they are. Fortunately this altered state of things has become known in sufficient time to warn the City authorities to hold their hand and withdraw from the contemplated unprofitable expenditure on an unsuccessful market.

RICHARD WHITTINGTON.

THE FEVER OUTBREAK AT BURBAGE, LEICESTERSHIRE.

It is now about fourteen years ago since any epidemic outbreak occurred in this village, whose population numbers less than 2,000 persons, until recently, although autumnal diarrhoea appears to have been prevalent for many years. Burbage forms part of the parish of Aston Flamville, one of the constituents of the Hinckley Union, and is situated on the Warwickshire border of Leicestershire. It presents the usual straggling form, stretching about half a mile along the Hinckley road, commencing at about a mile from that town; it then branches out to the right for about a quarter of a mile along a cross road, where it terminates.

The village has a gentle slope towards the junction of the two roads, which forms the lowest point. The occupation of the inhabitants is chiefly stocking-weaving, with agricultural and some other branches of labour. Work appears to have been abundant and wages good. The position of the village geologically seems to be on the red marl of the new red sandstone, and

overlying the lower Keuper sandstone. The subsoil is for the most part very loose, permitting the free passage of water, which lies at a depth of a few feet from the surface.

The water supply of the village (for domestic purposes) is derived from numerous wells sunk through this soil to an average depth of 20 ft., into the permanent water-bearing strata; these wells are for the most part lined with dry stones or bricks. Most of them are covered, and are supplied with pumps. Wells constructed in this manner of dry steining through a loose subsoil are always liable to contamination by surface drainage and percolation of faulty sewers and cesspools.

The water from all the pumps appeared clear and sparkling, free from smell or taste, and containing, in some instances, but a little flocculent matter in suspension when viewed through a considerable stratum. The water of a pump in Barrack-yard—the source of all the mischief in this epidemic—was an especial favourite, and no little indignation and dissent were expressed by many of the inhabitants when it was condemned and closed as unfit for human use.

The drainage of the village is such as is usually found in country districts. The central sewer receives surface water, house-slops, and the overflow of privies and middens. These drains are egg-shaped in section, constructed of earthenware-pipes longitudinally divided in two and jointed with clay, so that the system practically admits of free interchange of internal sewage and external subsoil-water varying with the circumstances of alternately wet and dry weather. The drainage arrangements are very defective; middens foul and wet, and fully exposed.

Touching the previous typhoid epidemic,—towards the end of 1857,—the complaint suddenly broke out simultaneously in a row of houses adjacent to the church, and here there were about 100 cases. The disease then rapidly spread to other parts of the village, so that finally more than 500 cases occurred.

The recent typhoid attack, with which we have now more especially to deal, seems well defined in its origin and course, for in the spring of last year an infected person arrived at the village. Some time afterwards a member of the family, a married woman, took the disease and ultimately died of it in the following June. Barrack-yard, before referred to, consists of a group of buildings, eight of which were occupied by families: one side comprises half a dozen houses, the opposite is formed by a school, the third side is not built upon, and the fourth consists of three houses partially separating the yard from the road. The central portion of the yard consists of gardens, four privies, many middens, and a pump and well. Now the privy-pit nearest to the well was always dry from leakage, and inquiry on the spot shows that this necessary was used by the first female patient. The water of this well furnished the domestic supply to the inhabitants of the yard and others; Dr. Dupré's analysis showed it to be highly charged with animal excrement, the nitrates and chlorides were present in such proportions as would be furnished by a mixture of equal parts of pure water and London sewage! In about fourteen days after the patient had had access to the yard privy a number of fever cases broke out simultaneously in Barrack-yard,—ultimately about twenty typhoid cases, fifteen of which occurred in five houses, and not a house escaped! Other inhabitants round about made use of this foul water—for it was in good repute as a beverage—and suffered from the same complaint; indeed the disease was confined entirely to those who drank of the water, some persons coming from distant parts of the village to partake of it, but the fever was always confined to those members of the family who had used the infected water. In all, about 100 persons were attacked with typhoid fever, of whom fifteen or so died.

Soon after the commencement of the epidemic, the village established a "sewer authority," and this board very properly instituted an inquiry into the condition of the waters of the public wells, and exerted themselves praiseworthily in carrying out various sanitary improvements, including the construction of new lines of sewers. Half a dozen of the public well waters were submitted to analysis: all the specimens were declared to contain sewage and animal oxidised matter, whilst the greater number contained unoxidised polluting matter, in one instance to a notable extent. Subsequently to the analyses being reported, the wells were examined and cleaned out, whilst some were closed, and with one exception, all the waters were discovered to

be polluted by percolation from sewers and cess-pools lying in immediate proximity to the wells. The exceptional well was an open one, and in close contact with a foul ditch; indeed the communication between the two was so intimate that it appears doubtful whether the well supplied the ditch or the ditch the well. In wet weather there can be no doubt that the flow is from the ditch to the well.

Condition of the various public wells examined:—

No. 1. *The Church-wall Pump.*—This well abuts upon the graveyard, and is on ground presenting the appearance of having been cut out by a curved line for the latter; in addition to the probable contamination from the burial-ground, there is the certainty of it from the intersection of the adjacent main sewer and the chief spring of the well, as before stated.

No. 2. *The Hall-lane Pump.*—Some sludge was removed from the bottom of this well. A sewer ran close by and a leakage from it into the well was ascertained.

No. 3. *Tony Lodge Pump.*—This well was in very close proximity to a cesspool, separated only by a 9-in. brick wall; the sewage ran through the joints and crevices mingling with the water. A cartload of black, stinking mud was taken out.

No. 4. *The Horse Pool Pump.*—A privy-drain was discovered at a distance of 18 in. or so from the edge of the well, and the intervening soil was saturated with filth; moreover, there remained marks of sewage trickles upon the face of the stoning.

No. 5. *The Long-street Pump.*—A disused cess-pool was found about a foot from the margin of the well; however, house-slopes and street drainings ran into it, and from there into the well. Also, two other drains from adjacent houses ran close by the well.

No. 6. *The Camberly Well.*—This is an open well about two yards deep, and contained a good deal of muddy deposit. It is in juxtaposition with a foul ditch.

The history of this typhoid epidemic at Barage is very instructive: it is another instance of many in which slops and excrements are allowed to soak into the ground and again be pumped up at a little distance, and called drinking water, thus becoming the medium of communicating pestilence and death to the consumers.

There is no reasonable doubt that these waters have been charged with sewage matter for a very long time, some of them to a remarkable extent; and beyond occasional diarrheal attacks not much inconvenience has been experienced from this practice until the virus of contagious disease is imported, when, by the agency of the domestic water supply it is spread in every direction. That the people should be allowed to poison themselves reflects discreditably upon the local health authorities whose duty it is to see that adulteration and pollution of water, air, and food are not permitted under any circumstances.

INSTITUTE OF PAINTERS IN WATER-COLOURS.

The exhibition now open in the Gallery of the Institute of Painters in Water-Colour, consisting of 243 pictures, is above the average of excellence, and the number already marked "Sold" show that the public have discovered this. If we were called on to name the case in which the greatest progress had been made, we should certainly point to the drawings contributed by Mr. Edward H. Fahey, whose early training as an architect is serving him well in the presentation of landscapes in which buildings form prominent portions. There is a great charm about the drawings he has contributed on the present occasion; we would especially point to 27, "St. Peter's and the Vatican, from the Viale di Prate, Rome," and 156, "Sta Maria Maggiore, Rome;" and we argue for this young artist a brilliant career if he continue to progress in the way he has done since the last exhibition. Mr. Edmund Warren has given up some of his hody-colour with advantage, and contributes several landscapes of considerable beauty. 35, "Banten," by Chas. Cattermole; 60, "Jonas Hanway and his Umbrella;" 195, "Richard and Kate;" H. Tiley; and 170, "The Brickfield;" C. Green, are amongst the subject pictures that will attract most attention, the last-named especially, which tells its story well, and is full of natural expression. Mr. L. Haghe contributes several elaborate interiors

displaying his well-known skill, as does Mr. Carl Werner, especially 44, "Interior of the Temple of Karnak." 81, "The Rest," Hubert Herkomer, and 103, by the same artist, will be noticed with pleasure; and it would be unjust if, even in so brief a notice as this, we did not point out with commendation 77, "Sea Roamers," H. G. Hine; 84, "The Listener," Emily Farmer; 117, "The Sacred City of Benares," T. L. Rowbotham; and 129, "Handling up Wreck after a Storm on the French Coast," by R. Beavis.

ON REREDOSSES.

ARCHITECTURAL ASSOCIATION.

The Saturday afternoon visit (13th instant) was made to the parish church, Croydon, nearly rebuilt, after the fire, and always notable for its broad fine nave and imposing western tower. Archbishop Whitgift's Hospital (almshouses), not quite robbed of all their old-worldliness by renovations, and Beddington Church, reached by the pleasant river-side bridge-path, were also visited; the latter building, not long ago added to, decorated with painting on roofs and walls, with mosaics, much stained glass, marble pavements, and other modern additions to its excellent old brasses and woodwork in screens and stalls.

At the meeting of the Association, on Friday evening, the 19th, thanks were voted to the vicar of Croydon and all who had assisted in these very successful visits. A paper was read by Mr. L. W. Ridge, "On Reredoses," of which the following is an abstract.

The term reredos is used in other senses, but for the purpose of this paper it is to be taken to mean "the wall or screen at the back of an altar or communion-table in a Christian church." Its object is to give importance to the altar, usually considered the material centre of the church, up to which all the architecture should lead, and so nearly a fixture in practice as to justify a fixed, solid, and permanent character in its accessories, and varying itself in size to so comparatively small an extent as to call for in these surroundings some adjustment to the general dimensions of the building. The original form (1.) was probably the retable, without truly architectural features, decorated only with painting and sculpture, and more or less portable. Examples at Norwich, Worstead Church, Aichen (reproduction at South Kensington), and the retable kept in the south-east aisle at Westminster. Next in the order of time (2.) is the type found in the Chapel of the Nine Altars at the east end of Durham Cathedral, adapting the arcade round the chapel. An arrangement similar in idea occurs at Chichester, a complete specimen remaining at the east of the north aisle of the nave (both illustrated in Architectural Association Sketch-book). A range of thirteen small niches (total size about 7 ft. by 2 ft.), containing standing figures of apostles, with emblems, and one in the act of blessing in the centre, remains in Bampton Church, Oxfordshire, date about 1350, built into the east wall of the north transept. Parker's "Glossary" also gives a range of ogee crocketed niches at Somerton Church, Oxfordshire, date about 1100, and eight panels, with foiled heads, probably painted originally, and with horizontal cornice occupy the whole width of the east end of the chancel of St. Thomas, Salisbury (date about 1450). At Hampton Bishop, Herefordshire, two rows of statues are found. Emstone Church, Oxfordshire, has at the east end of the south aisle a three-light window, six shallow panels, of the same total width as the window, fill the space between the altar and the sill, and canopied niches are formed in the window-jambs, which also remain at St. Ives, Cornwall. The detached screens, such as that to the high altar at Westminster, to the people's altar of the nave of St. Alban's, the Neville screen at Durham, &c., supply another type (3.), being solid altarscreens, containing also, in some instances, within their area a sort of reredos proper. These were eventually outdone in size and magnificence by the gigantic erections (4.) reaching up to the vaulting, as at the high altar at St. Alban's, at Christ Church (Hants), at St. Mary's Overy, at Winchester Cathedral, &c. A Spanish work in wood, in the South Kensington Museum, of considerable dimensions, covered with paintings of the history of St. George, may also be quoted as an example of the prominence attained by this feature. (All the great English examples suffer greatly from the destruction of the figures which formerly adorned them; their vacant

niches merely suggesting their possible effect.) The post-Reformation reredoses, with few exceptions, seem to supply no real lessons; the habit of using them mainly for long, more or less legible, inscriptions dictated a class of treatment hardly likely to have been adopted under other circumstances. Of the modern examples, without specially naming particular specimens, it may be said that the architects of the Gothic Renaissance have had to develop the reredos mainly by themselves, and have rarely done so with complete success. It is a purely ornamental feature; and, in the absence of direct practical purpose, without the guidance of precedents, it cannot be pretended that the Gothic school have been lately more successful than any other. In consequence of the thorough destruction effected at various times, very few instances, and perhaps no complete instance, of the arrangement at the high altar of a parish church remains. From a consideration, however, of specimens in other positions, some of which are named above, and of their general treatment, we may conclude that a reredos should be considered as properly a work in which architecture, sculpture, and painting, or at any rate two of the arts, should be shown; and that it should not be isolated in character, but the roof, the walls adjoining, the window-jambs, &c., should all combine with it to form a satisfactory whole. If the east window cannot be parted with for any reason, a central pier, as at St. Columba, Hackney-road, will often put the centre as least of the reredos in a better light; in all cases powerful side-lights must be had, as effective shadow in sculpture can only be obtained,—or the whole at all properly lighted,—by their means. Generally speaking, a subdued restful effect, due to strongly-marked horizontality in the composition, will be found conformable to the best precedents; this horizontality to be given by the preservation of certain fixed levels for similar features when continuity of line is interrupted, and by the absence of many raking lines. The subjects sculptured or painted should be such as may be deemed specially appropriate to this part of a church, composed of emblems, types, and a Crucifixion,—a single figure conventionally rendered.

Mr. F. T. Dollman said,—“A curious piece of information has been communicated to me by a distinguished architect (Mr. B. Ferrey), and I am at liberty to mention it again. In the work of restoration at a church, under a painting by Sir James Thornhill was found a text-inscribed surface; and on removing this latter a very splendid reredos was brought to light. This occurred only a few weeks ago. The reredos contains painted subjects, some in very good condition: a Crucifixion, figures of St. Mary and St. John, figures of founders, &c. Strange to say, however, it has been deemed advisable to cover up this work of art, to preserve it for a future generation, as it has been pretty satisfactorily concluded that it would be either impossible or unwise to trust it to the custody of this. A statement like this may appear almost improbable; yet it is quite borne out by my own experience of the disappearance by absolute destruction of many works of Medieval painting. As to the paintings on reredoses, any historical treatment seems a mistake in portions of a distinctly architectural framework.”

Mr. G. H. Birch (the chairman of the meeting) remarked on the inappropriateness, in his opinion, of a painted or mosaic conculcum as an altar-piece. On art and mystic grounds, he thought it most undesirable; and, on the score of more appropriate, a dramatic presentation of the treasury of Judas—even in Leonardo da Vinci's great work the prominent motive—would commend itself to few considerate people.

PROPERTY IN IDEAS.

It was a long, long time before the commoner and his property were at all safe, the one from the possible malignity, the other the cupidity of the barons; and it has taken several centuries to frame those laws which now render the liberty of the subject and the rights of material property less violable. As the rights of property became more respected, men turned their minds to its improvement; to the development of the material resources at their command; and mind so invested became of greater and greater value and importance,—of such value, indeed, that mental capital so invested, perhaps the only true capital, has long since been recognised as property, and a special code, the patent laws, devised for its

protection. In this direction the best order of minds, the inventive and constructive, has found its reward; and, turn which way we may, there is on every side an overwhelming wealth of material resources and appliances, whereas the political and social machinery, for the improvement of which all these superior means were said to be designed, remains pretty much *in statu quo*, or, perhaps, from an inevitable increase in bulk, clumsier than it was fifty years ago. But as the field for the application of mind to the improvement of material property becomes more restricted by the vast amount of work already accomplished, intellectual effort naturally turns towards the political and social chaos, to the re-organisation of the national fabric, affording, as this does, ample opportunity for the exhibition of the constructive faculty. Unfortunately, however, property in ideas is not so well respected and protected as goods and chattels, and therefore is as much exposed to the deprivations of the powerful and unscrupulous as material property was of old time. Now, if there be any kind of property more valuable than another, it is ideas of this order; for they not only enrich and render a nation more powerful, but often confer benefits upon the whole world. As there is, however, no protection for this kind of mental investment, it is only the noblest order of mind that will hazard years of thought on such a risk; for all the results of his labour may be pitilessly wrested from him, and his intellectual wealth and credit appropriated. Seeing, then, of what vast importance ideas are to a nation, to the world, it behoves all honest men to hand together to protect such property, and till laws can be framed to punish robbery of this kind with inflictions as great as those for larceny and hurglary, to visit such malefactors with a swift moral lynching.

It is not at all improbable that before long we shall have an association for protecting the originators of ideas, and a kind of intellectual police organised for the protection of mental property. It is the more needed, as the thoughtless who see nothing in "the right thing" when it is done, are as numerous now as in the days of Columbus; it appears so simple, everybody ought to have thought it; yet the fools who "cannot see anything in it" when it is done, may be as easily nonplussed on the spot as they were a century or two since with the egg.

Now then a great idea may be accidentally stumbled upon; but in the majority of cases ideas come of great natural ability, thoroughly cultivated faculties, and self-devotion; of a very considerable investment of time, vital energy, and money. The seeds of great thoughts fall here, there, and everywhere, but seldom, indeed, do they fall on sufficiently good ground to fructify. And are the fruits of the harvest reaped from such golden soil as this to be at the mercy of any powerful but lawless free-hunter, appropriated without possibility of appeal or redress?

Evidently people believe such flagrant spoliation is possible. There is a shrewd suspicion abroad that the powers ruthlessly appropriate any person's ideas, they will; and the question naturally arises, "Whose turn will it be next?" No one can be certain that he himself may not soon be a sufferer.

Men of the order of intellect referred to ought to be the very first objects of a nation's regard and protection, and to be brought to the front as soon as the possession of such powers is discovered. Such men there are, though their fame does not perhaps as yet extend beyond a very limited circle; and it is well we have such "watchers," with power to point the way, and who, being free from the distracting influence of official detail, can conceive and be the expounders of the general forms of a new order of things. Men of this calibre of intellect require the more protection, inasmuch as being too proud to solicit either acknowledgment or reward, they are the more easily despoiled of their own.

Although, as we have said, there is a very prevalent and strong suspicion that the powers that be appropriate whatever they will in the way of ideas, without acknowledging or rewarding the originators, we are very loth to believe that any body of English gentlemen would coolly and wittingly despoil any man of his intellectual property and title,—would filch and strut in borrowed plumes,—because their owner happens to be a modest and silent worker, powerless as things are constituted to hold his own against such tremendous odds. We are well aware that it lies within the power of the Imperial Government to appropriate, under

certain circumstances, private property for the benefit of the State, and this power may properly extend to ideas. "The Queen can do no wrong," but if compensation can be legally demanded for an appropriation of goods, much more ought compensation to be obligatory in case of an appropriation of ideas, and the public have a right to know the name of the original owner of the intellectual property appropriated. It is the duty of every Englishman to see that justice is done to proprietary in ideas, as well as of goods and chattels. To deprive a man of his fair acknowledgment and reward, after having originated some important project of State reform, is to rob him of his intellectual wealth,—of the most valuable of all property. But although we cannot bring ourselves to believe that any body of English gentlemen would be deprecators of this kind, there is, doubtless, a predatory class which preys on other men's ideas. This is the class which furnishes the pick-brains of society. But, as we have said, petty larceny in ideas, much less wholesale appropriation, will no longer be tolerated. Like other thieves, the pick-brain will try to erase the crest and initials from the stolen property, and usually adopts similar scoundrelly tactics when morally prosecuted, but all in vain. If he parades the stolen property, it is seen to be out of keeping with his mental antecedents and consequences, and, to use a material analogy, as incongruous as a diamond pin in the cotton necktie of the "emcksmann." The pick-brain, as the highway robber or the pickpocket, can never make the property appear as if it were his own; and even should a knave of this kind succeed for a time in wrongfully withholding the credit of an idea from its rightful owner, the future will have no difficulty in deciding to whom the title and property really belonged.

CROWN RIGHTS AND THE BUILDING ACT.

At the usual meeting of the Metropolitan Board of Works, on Friday in last week, the superintending architect stated that during the recess it was found that a building was in course of erection in Whitehall-gardens, beyond the line of frontage of Gwydyr House. A letter was therefore sent to the secretary of the Local Government Board, calling attention to the 13th sec. of the "Local Management Act," 1852, and the necessity of an application to this Board for consent. The secretary replied that the matter had been referred to the Office of Works, and Mr. Lawrence of that office pleaded that the 6th sec. of the Building Act exempted Crown buildings. The solicitor of the Metropolitan Board took the contrary view, and held that the Office of Works had no right to go beyond the general line of frontage in any street. After a brief discussion, in which the opinion was expressed that the matter was of importance, and should be definitely settled, the solicitor was empowered to take such steps as he might consider necessary.

ORIGIN AND HISTORY OF THE GREAT CENTRAL GAS COMPANY.

A PAPER on this subject has been read at the Society of Arts by Mr. A. Angus Croll, who was the mainpringer of the Great Central Gas Company; but in dwelling on what he did to help the breaking-up of the metropolitan gas monopoly, he forgets or fails to allude to the primary force which not only destroyed gas monopoly in the metropolis, but in many other places throughout the country, and reduced the prices on an average two or three hundred per cent., while it raised the dividends of the gas companies, as always predicted, in fair proportion to the reductions in price. The *Builder*,—which the first opponent (a creation of the *Builder*'s, as an opponent), characterised as "the monopolist of incendiary gas intelligence,"—alone did all this work, by its articles, continued for years, on "The Gas Movement;" and Mr. Croll's origination of the Central Gas Company was just one of the innumerable results of that movement.

In reference to the later history of the Central Gas Company, Mr. Croll says:—

"It is with great pain and reluctance that I proceed to speak of the subsequent history of the company. It is, however, necessary to glance at it in a sentence or two. The embezzlement of 79,000*l.* by one of the clerks of the company a few years ago excited the astonishment of the whole empire, and the disastrous Wood-street fire involved them in a loss of 30,000*l.* Thus, from these two circumstances alone a sum of 109,000*l.* has been lost to

the supporters of the company, and yet its property was laid upon so firm a basis that it has paid 10 per cent. upon its capital from the commencement of the undertaking, in spite of all losses. And now the company has checked all further prosperity and development by allowing another and less thriving company to absorb their own, on condition of receiving a dividend of 10 per cent. This being the highest legal dividend, the shareholders have only suffered indirectly by losing the prospective advantages of investing additional capital at a high rate of interest in extensions of plant and works, such extensions, and consequently all such further profits being reserved for the shareholders of the Chartered Company, which has absorbed them.

But if the shareholders have only lost this privilege, what have the gas consumers in the City of London lost? The Great Central Company were paying 10 per cent. dividend, the highest permitted by the Act of Parliament; and therefore if the contract with the writer had remained, and he would have realized a good profit, and the price of gas ought now to have been reduced 6*d.* per 1,000*ft.* The gas rental of the Central Company for the year ending June, 1871, must have been about 93,000*l.* per annum; adding 10 per cent., the usual annual increase, and we have for the present time a rental of about 102,300*l.*

Taking the quantity of gas required to supply this rental at 2*s.* per 1,000*ft.*, viz.,—i*s.* 9*d.* for the gas supplied at the company's meters in accordance with the New Central, and 3*d.* per 1,000*ft.* for increasing the illumination six candles in addition, it is evident that the price of gas ought now to be reduced, had it not been for this last and most improvident act of the Central Gas Company, which would not only have effected a saving of 20,000*l.* to the consumers supplied by the Central, but the gas would have been of a purer quality, and of an illuminating power equal, as shown by the present mode of testing, to twenty candles.

At the close of the discussion which followed the reading of Mr. Croll's paper, he said:—"As regarded the general question altogether, he had no desire to say one single word in reference to gas companies generally, but only wished to put on record the connexion which he had had with the promotion of the Central Gas Company, as it had now ceased to exist. The result of the paper amounted to this, that whilst the gas companies opposed it at first, saying it was impossible to sell gas for less than 7*s.* per 1,000*ft.*, they were now selling it at 4*s.*, and getting a dividend of 10 per cent. Mr. Chubb (who is secretary of the Imperial Gas Company) shook his head, but Mr. Chubb's company derived a larger amount now than it did before, and at the same time supplied gas to the public at 3*s.* 8*d.*, instead of 7*s.* Looking at all these facts, he did not think he need be ashamed of the action he had taken in the matter."

We are certainly not ashamed of the part we took in the matter.

EMPLOYERS AND EMPLOYED.

As the question of strikes and the relations of employers and operatives is occupying so much attention, Mr. John Smedley, the principal of a well-known and very old-established firm at Matlock, sends us particulars of his own experience. He says:—"We have never had a strike, or any disagreement with our hands in my time, nor in my father's or grandfather's time. We have been engaged in spinning and manufacturing long before the commencement of this century. My ancestor's idea was, that those who rode inside the coach should make those as comfortable as possible who are compelled, from the mere accident of birth, to ride outside. Mr. Smedley then enters into particulars as to arrangements for preparing refreshments and meals at the option and chiefly at the cost of the operatives, and as to other conveniences at the cost of the firm, such as soap and towels for washing, which is done in the time of the firm, and so on; and he thus continues:—

"Many years ago I had to follow the changes constantly going on in manufacturing and go into a class of goods more in general demand, in which, of course, we find keen competition; but that did not induce me to try to alter the policy towards the workpeople, and I have still found it the most profitable to keep to our plan in trying to make them as efficient as possible for the work they have to do. I believe the present disagreements between employers and employed is the long neglect of consideration for the workers, and the want of sympathy and personal knowledge and intercourse with them, and now, like a neglected family, it is bringing its natural and inevitable result, and till this be altered masters may meet and pass resolutions just as effective as if they passed one that there should be fine weather for the next three months."

Amongst other arrangements, Mr. Smedley says:—"We keep a supply of dry stockings for those women to put on who come from a distance and get their feet wet, and every overlooker has a stock of mackintosh petticoats to lend the women going a distance on a wet night. When I go amongst them all recognise me, and it is always a pleasure to go through the mill. I wish I could make their lot easier, for with all we can do factory life is a hard one. . . . It is a sad state of things when masters have to combine against the hands and the hands against the

employers: it has just the same effect as parents combining against their children and the children against their parents. If the children are not what they ought to be, it is very certain to be the parents' fault in not gaining their affections and confidence."

RENFREW MUNICIPAL BUILDINGS.

CHOIRS of persons, including Freemasons, Good Templars, Odd-Fellows, Foresters, Knights of Malta, and all sorts of associated bodies met together in Renfrew on the 13th inst. to lay the corner stone of the new Municipal Buildings designed by Mr. J. J. Lamb, architect, of Paisley. The style adopted for the building is a free adaptation of foreign modern Gothic, with a colouring of Scottish baronial. The principal front, towards Hairstreet, presents a façade 70 ft. in length, two stories in height, with a tower at the north-east corner 21 ft. square. It is finished at the angles with large corbelled turrets, awfully out of place, notwithstanding the locality, and rises to a height of 103 ft. to the platform of its lofty roof, finished with ornamental crossing and finials. About 80 ft. from the level of the pavement, and between the turrets of tower, are balconies entered by four doors from the prospect room. In the centre of the elevation to Hairstreet is a balcony, from which the public in the square can be addressed on the occasion of open-air public meetings at election and other times. The walls of the building are built in random rubble. On the entrance floor, entering from Hairstreet, there is the chamberlain's office, a bank office, and private room; and entering from Fulbarstreet there are the town clerk's public and private offices. The council chambers are also on this floor, 39 ft. long and 24 ft. wide, entered from a corridor. From this corridor, and also from Dmlopstreet, the police office, superintendent's and witnesses' rooms are entered, and these are furnished with cells, strong-rooms, &c. The public-hall is on the first floor, is 65 ft. long and 41 ft. wide, and will be seated for about 800 people.

The construction of the building is under the superintendence of Mr. Chas. Henderson; and the following are the names of those tradesmen whose offers up to this time have been accepted:—Masonry, J. Drysdale & Son, Glasgow; joiner work, Mr. Wallace, Paisley; slater work, John Robertson & Son, Johnstone's; plumber work, John Morrison, Paisley; plaster work, John Brown, Greenock; iron girder, John Stewart & Son, Irvine; miscellaneous ironwork, Alex. Pottie, Renfrew.

THE KING'S SCHOOL, SHERBORNE.

THIS school, which was originally founded by Edward VI., has been lately reconstituted under the Endowed Schools Act, it being intended that it should be the chief school of the West of England, and number between 300 and 400 boys. For this purpose, large building works will have to be undertaken, including either the building of a new chapel or enlarging very much the present one, which was a portion of the old Abbey buildings, restored and enlarged by the late Mr. R. C. Carpenter. There are also in contemplation a large schoolroom, library, and governor's room; study buildings, class-rooms, laboratory, and scientific lecture-rooms; masters' houses, with dormitories; besides a swimming-bath, covered five-court and workshops. Instructions have been given to the architects, Messrs. Slator & Carpenter, to report on and prepare alternative schemes for the consideration of the governors.

BRIGHOUSE CEMETERY COMPETITION.

THE designs submitted have been exhibited. The local Board expressed their approval of the style of the Pontefract cemetery chapels generally, and they also stipulated that premiums would be given for the three best plans, the cost of erection not to exceed 2,000l. The three chosen as the best have each a spire rising from the centre. In one a mortuary chapel is annexed, so that the hier would not need to be taken into the chapel proper at all, and in the chapel a mirror is shown, so arranged that the hier could be seen by the mourners in the chapel during the burial service. This plan is much approved by the Board, but it is considered that the building, as shown, could not be erected for the sum stipulated.

This plan, drawn by Messrs. Gay & Bartram Payton, of Bradford, is placed first—premium, 25l. The second, 10l., is given to Mr. T. W. Helliwell's plans. The third, 5l., is awarded to Messrs. Holtun & Connor, of Dewsbury.

THE TRADES MOVEMENT.

LONDON.—A public meeting of carpenters and joiners has been held at Wilcox's Assembly Rooms, Westminster Bridge-road, for adopting measures in furtherance of the nine-hours movement. Mr. Sadler, having been voted to the chair, stated that a memorial had been presented to the master builders, asking that the hours of labour be reduced from ten to nine hours per day, and that the wages be increased to the extent of 1d. per hour. The result of that would be that, making allowance for the Saturday half-holiday, the hours of labour would be 51 per week, and the wages would be 11. 18s. 3d. per week. A resolution was unanimously passed approving of the course the delegates had adopted.

Maidstone.—A meeting of bricklayers and carpenters has been held at the Sun Inn, High-street, Maidstone, Mr. Tonlin occupying the chair and Mr. Horscroft the vice-chair, to receive the reply of the employers, after a conference with the deputation of workmen held in the week previous. The reply stated that at a meeting of the master builders the following resolutions were adopted:—

"Firstly, 'That on and after the 1st day of July the standard wages of bricklayers and carpenters of this town be 6d. per hour.' Secondly, 'The full time of 56 hours to commence on the second Monday in February and terminate the second Monday in November, and that the short time of 50 hours commence on the second Monday in November and terminate the second Monday in February, beginning at 7.30 a.m., having breakfast previous to commencing, and a half-hour only to dinner.' Lastly, 'That all other existing regulations remain unaltered.'"

After some discussion, the following resolution was adopted, which was directed to be forwarded to the employers, after which the meeting terminated:—

"That this meeting, having heard the offer made by the employers to their memorial and code of working rules after the conference with the deputation, think it a step in the right direction, but that it is still most unsatisfactory as six years ago a struggle of six weeks' duration was maintained for the same amount per hour the employers now offer, and this meeting could not think accepting any sum less than 7d. per hour all the year through, 5d. hours to constitute a week's work from the second Monday in February to the second Monday in November, and 40 hours from the second Monday in November to the second Monday in February. And, further, this meeting declines to deviate from the general tenor of the code of working rules."

Birmingham.—The question of increased pay has been discussed by the arbitration board, and ultimately the question was left to Mr. Kettle, who decided that, considering the position of the town of Birmingham, and the advance of the wages of skilled labourers, an advance of 10 per cent. should be granted. He therefore fixed the pay of carpenters and joiners and plasterers at 7d. per hour up to September, and for the rest of the year 7½d. The labourers he decided should be paid 4½d. per hour throughout the year.

Altrincham.—A strike of painters at Altrincham and Bowden has come to an end, the masters acceding to the demands of the men for an advance of wages from 6½d. to 7d. per hour, and a reduction of the hours of labour from 58 to 54½ per week. Several minor propositions on the part of the masters with regard to the working rules have been accepted by the men.

Newcastle.—When the late strike at Newcastle for nine hours was settled, it was agreed that overtime should not count until the whole of the 54 hours had been worked. The workmen were dissatisfied with this, and the dissatisfaction has been greatly increased, and the delegates of the Nine-hours League have agreed to call a meeting, at which a resolution will be submitted asking a conference with the employers with a view of obtaining a revision of overtime. The workmen want each day's overtime to count for itself. Trade is busy, and it is feared the matter may not be easily settled.

Cockermouth.—The joiners of Cockermouth have struck work, in consequence of the refusal of the masters to grant them an increase of wages amounting to 2s. per week, in addition to adopting the nine-hours system. Since then a compromise has been effected to adopt the nine-hours system, the men withdrawing the proposal for an increase of wages. On this understanding the men have resumed their employment.

Barrow.—The painters in Barrow have struck for an advance of wages. The men some months ago gave the masters notice that on and after the 1st of April the sum of 7d. an hour would be demanded,—the working hours to be fifty-four per week. On the 1st of this month no arrangement was agreed upon, and the men granted another week to enable a decision to be made. At the expiration of the week the masters made an offer of 6½d. per hour, but this the men refused. After consideration, the workmen agreed to accept 6½d. With the exception of two or three of the masters, the 6½d. was refused, and the result was that between forty and fifty men have struck. Hitherto the painters have been paid at the rate of 26s. per week.

Dumfriess.—The workmen of Messrs. J. Edgar & Sons, Dumfriess, who struck work on account of slaters being employed to point the interstices in the courses of the walls, have removed their tools. On the other hand, all the masons in the employment of Mr. James Halliday, at Cowhill Mansion, and at Sir James Anderson's new villa at Dumfriess, struck for slaters being employed pointing the walls at Cowhill. Hitherto it has been quite common to employ slaters for that purpose, as masons will not work on a hanging scaffold beyond a certain height.

Edinburgh.—After a struggle of six weeks the marble masons of Edinburgh have gained their demands,—the fifty-one hours limit, with the same weekly wages.

Arbitration and Compensation for Injuries.—We read in a Leeds contemporary that Mr. Mundella is about to introduce a Bill "to make further provision for arbitration between masters and workmen." The Bill is being drafted by Mr. Wright, barrister, and Mr. George Howell, who is acting on behalf of the working classes. A Bill is also in preparation for the amendment of the law with respect to giving compensation to workmen who may be injured, whilst performing their duties, through the negligence of their employers in failing to take proper precautions for their safety.

Berlin.—The master builders and carpenters of Berlin have issued a notice stating that, in consequence of the journeymen carpenters not having relinquished their strikes against particular masters, notwithstanding the warning against that course of action already published, they have determined to discharge all journeymen carpenters, and to close their workshops.

LONDON CARPENTERS AND JOINERS.

Sir,—I am instructed by the committee of the Carpenters and Joiners' Nine Hours Movement to forward you a copy of a resolution passed at a general delegate meeting on Saturday evening last, at the committee-rooms, Brown Bar, Bloomsbury, for insertion in your valuable paper. It was passed after hearing a second letter read from the secretary of the Master Builders Society, stating that they think all further discussion on the subject unnecessary, and therefore decline to receive a deputation from the carpenters and joiners, giving as a reason that they have already received a deputation from the Masons' Society, and that we are to take it as actually a deputation from our own body, which is absurd, and in our (the delegates') idea no answer at all to our reply to their first letter, which was also a refusal to receive a deputation or meet us in any way to discuss the question of the nine hours, and if possible to bring the matter to an amicable settlement without having to take more serious action in order to gain our object; for the men are determined to stand by the principles contained in the memorial, and the responsibility will lie with the employers, and not with the men, if a strike takes place, and which very likely might have easily been avoided, had they condescended to meet us. There have been several large and influential meetings held, at which resolutions approving the course taken by the delegates have been unanimously passed, and for supporting them in bringing the movement to a successful issue.

Copy of resolution passed April 26th, 1872.—"Resolved, that no overtime be allowed on the nine-hours movement is settled; and should any man, or number of men, be discharged through it, we pledge ourselves to support them."
CHAS. MALKIN, Secretary.

THE NEW WORKS ON THE EAST LONDON RAILWAY.

THE East London Railway Company have just commenced the extension of their line from Wapping to the Shadwell Station of the Blackwall Railway, which will place the company's line in communication with all parts of London north of the Thames. The works will necessitate the difficult engineering task of passing under the London Docks, the route being through the St. Katherine's Dock basin, which will connect the company's intended northern lines with their present southern system, *via* the Thames Tunnel. When the new works just commenced are completed, the company will not

only have obtained railway communication as far as Shadwell, but by means of an exchange station which they intend to erect, they will also have access to the Fenchurch-street station of the Blackwall line. The passage through the docks will not only be an unusually heavy piece of work, but also by far the most expensive portion of the entire undertaking, as, independently of the actual cost of the work itself, the dock company have power to charge the railway company 120,000l. for the privilege of their line being allowed to pass under the docks. The line was intended to pass under the docks by a tunnel, at a deep low level, so as not to impede the dock traffic; but in consequence of the dock company not consenting to the railway company tunnelling under them at a lower depth, the railway company have been compelled to fall back upon the old plan of constructing the railway through the docks in a coffer-dam; and we understand that it is probable that the company will have to execute this portion of the work themselves, under the direction and advice of Mr. Hawkshaw, their engineer, in order to relieve the contractor from possible penalties. The estimated cost of this extension is 270,000l., the whole of which has just been raised by the recent debenture issues. On the completion of the new line, a new and commodious station is intended to be erected at Wapping, in lieu of the present temporary structure. It is intended to carry the line still farther, from Shadwell to Whitechapel, where it will join the Metropolitan extension of the Great Eastern line now in progress; thus giving the East London Company direct access to the intended main terminus station of the Great Eastern Company in Liverpool-street. It is fully expected that the works on this section will very shortly be commenced, and proceeded with simultaneously with the construction of the line under the docks to Shadwell.

BUILDERS' CLERKS AND THE SHORTENING OF THE HOURS OF LABOUR.

At a general meeting of the builders' clerks of Manchester and neighbourhood, held at the Hare and Hoards Hotel, Shudehill, at which most of the principal building firms in the district were represented, it was resolved that the following memorial for shortening the hours of labour be presented to the Master Builders' Association:—"Our memorialists most respectfully bring this before you with confidence, knowing the kindly feeling at present existing between employer and employed. That we have good grounds to complain of the long hours now made in the builders' offices of this city and neighbourhood we think you will allow. On comparing our hours with those of the clerks in engineers', merchants', and other offices, we find that we are engaged from three to four hours per day longer, and at books and calculations that for technicalities and intricacies are not to be surpassed in any other profession. We are also employed longer hours than any of the tradesmen or labourers connected with the building trade, and at a sedentary occupation which it is well known is anything but conducive to health. We beg, therefore, that our hours may now be from 8.30 a.m. to 5.30 p.m., with the usual interval for dinner, so that we may have greater facilities for mental and physical improvement. We feel assured that your interests will not suffer, as, from the increased energy which must follow such a concession, we shall then be better able to perform our several duties, and the good feeling existing will be greatly strengthened."

CHURCH OF ST. MARY THE VIRGIN, CROWN STREET, SOHO.

The first stone of the new chancel of this church was laid on April the 17th by the Rev. Canon Liddon. The chancel stands on ground lately occupied by mean houses at the east end of the church, and adjoins the new clergy house. The present nave has no architectural merit, but is interesting as having been formerly a Greek church. It has been, however, much altered and widened when used as a Dissenting chapel. It is intended ultimately to take the whole down, and the new chancel is designed on a scale to harmonise with the design of the future nave. The site, though broad, is not long, and being situated in a crowded and confined street, the church has been designed by the archi-

teets, Messrs. Slater & Carpenter, on a large scale as regards height and width. The chancel is of two bays, with windows on the south, and with the east end facing Crown-street. It is groined in sexpartite groining, with stone ribs and red brick vaulting. This is supported by massive buttresses, terminated above the parapet by gables. The side walls are relieved of all weight by heavy arches inside and out from one buttress to the other, and are placed midway, these forming deep recesses on both sides. The windows are coupled lancets, with cusped circle over. The clear width inside between the buttresses is 29 ft., and between the walls 36 ft. The height from the nave floor to the groining is 60 ft.; to the top of the gable from the pavement, 85 ft. The east wall has five cusped lancets, with a rose over in the gable. The whole will be built of red brick inside and outside, with stone dressings sparingly used. There will be twelve steps to the altar, over which there will be a magnificent baldachino; but no fittings are at present in hand. On the north side is a small window into the chancel from the oratory of the clergy house. The nave will be of equal height with a north aisle.

Designs for the new schools on the north of the clergy house and church are being prepared by the same architects.

For the chancel works Messrs. Gibson, Bros., of Southall, are the contractors, and Mr. Boulden is the clerk of works.

SCHOOL BOARD FOR LONDON.

The first series of competitive designs,—viz., those for the Johnson-street, Stepney, group of schools—were delivered on the 16th of April. The buildings are to accommodate 1,080 boys, girls, and infants. The schools for the boys and girls are required by the conditions to be designed on the system of class-room division, with a large general hall, in which both boys and girls will assemble at the opening and closing of the school, and for singing lessons, drill, and other purposes. We gave a list of the architects invited in a late number, but some of them declined the competition. Messrs. T. R. Smith, J. W. Newman, Jarvis & Son, and Arthur & C. Harston are amongst those who have sent in designs.

The Board has confirmed the provisional agreement entered into between Mr. Robson, on behalf of the Board, and Mr. Macey, for the purchase of some freehold land near the Temple Station, as a site for their offices. The price is to be fixed by arbitrators,—viz., Mr. Clark (Messrs. Farebrother, Clark, & Co.), Mr. Currey, and Mr. P'Anson.

SCHOOL BOARDS.

Derby.—At a meeting of the General Purposes Committee tenders for the erection of Gerard-street School were considered. The following were the estimates sent in:—Mr. Bridgart, 2,895l.; Mr. Dusanoy, 2,950l.; Mr. Woodiwiss, 3,235l.; Mr. W. Slater, 3,090l. It was resolved to recommend the Board to accept the tender of Mr. Bridgart, which was the lowest. The committee further recommended the Board to ask the Department to sanction the borrowing of 4,500l. from the Public Works Commissioners, repayable during a term of fifty years. The loan was for the following items:—2,895l. for building; 250l. estimated cost of desks and fittings; 790l. cost of land; 150l. commission; law charges unknown. These recommendations of the committee were agreed to by the Board.

Dewsbury.—The Dewsbury School Board met to examine the plans sent in by competing architects for the three School Board schools intended to be erected at Dewsbury Moor, Boothroyd, and Springfield. The plans selected were by Messrs. Holtum & Connor, of Dewsbury, architects.

ST. LUKE'S CHURCH, LOWER NORWOOD.

This church, after having been closed for eighteen months, undergoing a complete internal reconstruction, was re-opened on Sunday last, when the Bishop of Winchester preached to a large congregation. The church, which was originally opened in 1825, was constructed to seat 1,412 persons, 688 being free seats. The cost of the church was 12,387l. It is stated that the accommodation in the church, as reconstructed, instead of being increased, is much curtailed, the total number of seats being only

1,100, according to the architect's plan. As a rule, church alterations and improvements are usually accompanied by increased accommodation; but in the case of the reconstruction of this church the rule has been reversed.

THE BUILDING FOR OFFICIAL BODIES.

It has been stated officially that the building proposed to be erected on the Thames Embankment, for the accommodation of the School Board, is also to accommodate the Metropolitan Board of Works and the Asylums Board. If this arrangement be carried out the present habitat of the Metropolitan Board of Works may come into the market, and might be made to serve the purpose of several of the scientific and other societies who are seeking appropriate accommodation, with one large meeting-room, to be used jointly.

THE NEW SCHOOL OF SCIENCE, MUSEUM, AND ART GALLERY, AT SOUTHAMPTON.

The new school of science and the new museum and art gallery at the rear of the Hartley Hall, Southampton, are just being completed by Mr. J. Crook, the contractor. The school is approached from the vestibule of the Hartley by a long corridor on the south side. There are two class-rooms of about 20 ft. by 16 ft. 6 in., and 16 ft. high, and a large drawing-class room 32 ft. by 16 ft. 6 in., and 16 ft. high, with a small room over the lavatory for the use of the master. The art gallery and museum are connected with the science schools on the south, and the art school on the north, and approached by a temporary passage on the west between the Hartley Hall and the new buildings. There are two large rooms of about 42 ft. by 20 ft. wide, and about 18 ft. high, with a connecting door both to the science school and the school of art. They are lighted from the roof, with a glass counter-light in the centre of the coar'd ceilings, which are moulded and panelled. The large circular-headed swing doors are filled in with embossed plate-glass panels. The gas fittings are three large brass starlights in each room, and the ventilation has been studied and provided for by Mr. Lemon, the surveyor to the Corporation, from whose designs and under whose superintendence the works have been carried out by Mr. Crook. The science classes will shortly commence their studies in the new rooms.

SALTING OF PARIAN.

The late Mr. C. H. Smith suggested brushing the crystals of saltpetre off the walls as fast as they appeared, and so remedying the evil complained of by "J. S." The crystals are reabsorbed in damp weather if allowed to remain upon the surface, and crop out again when the air is dry; but if removed as they appear in the solid state, the supply, of course, ultimately fails, and the desired end is attained.

Sir,—I have used Parian cement continually, and have found it answer exceedingly well; but last autumn I cemented some internal walls with it, and the paint applied is now perfectly destroyed. A part of it has salted, as your correspondent remarks; a portion has so destroyed the paint that it has become a mere powder; and a part has apparently separated the oil from the paint, the former running down in small streams. To add to the annoyance, a most disagreeable smell is emitted.

I should be obliged if any of your correspondents can account for this, and suggest a remedy. ARCHITECT.

COMPLETION OF ST. PAUL'S CATHEDRAL.

Sir,—The latest proceeding of the "Decoration Committee" does not augur well for the success of this undertaking. The members have thought it advisable to appoint a consulting architect who should advise them upon, and therefore, to a certain extent, control, Mr. Penrose's design. The least to be expected was that an architect who had had great experience in classic work would have been chosen, instead of which one has been appointed whose speciality is Gothic of the severest type.

The following is an extract from a speech made

at a meeting held during the recent Conference of architects:—"Nobody ever heard me, or the school with which I happen to be identified, say a word against Greek architecture; but we have fought, and will fight, against the *Sir Christopher Wren abominations*." Mr. Burges understands Gothic architecture, but, holding such opinions as the above, is he the man who should be called upon to assist in completing St. Paul's, "in accordance with the ideas of Sir Christopher Wren"? Is it true they manage these things better in France? ONE ANXIOUS.

FROM AUSTRALIA.

Melbourne.—The Corporation have had an organ built in London suitable to their town-hall. It is said to be the largest and finest organ which has ever left Great Britain. Messrs. Hill & Son were the builders. The organ was taken out by the ship *Lammermoir*, and is being put up by Mr. Robert Mackenzie, who has in charge its erection. The erection of the instrument will take six to eight months, principally through an error in laying the foundation for the organ when the hall was built. It was supposed that it would stand on a level with the orchestra, but instead of this it will be sunk a depth of 6 ft., and a stand is being made for it which will rest on iron pillars reaching to the basement of the Town-hall. The hall itself is 63 ft. high, by a width of 74 ft., and the organ's dimensions are, height, 46 ft.; breadth, 52 ft. 6 in.; with a depth of 24 ft. The great organ has seventeen stops; the choir organ, ten; the swell organ, fourteen; and the solo organ, thirteen. One of the pipes is large enough for a man to pass through.

The promoters of the new opera-house, proposed to be erected on the triangular piece of land in front of the Model Schools, bounded by Albert-street on the one side, and Nicholson and Spring-streets on the others, have been active of late, although their movements have not been made public. An application was recently made to the Minister of Lands for a grant of the site just mentioned for the Academy of Music, under which title the opera-house will be designated. Plans were forwarded to Mr. Grant, showing the various elevations of the proposed building, as also the interior, which, according to the design, it is said, will vie with many of the finest edifices on the continent of Europe, having several tiers of boxes, and a great depth of stage. The Minister of Lands has notified to the promoters his willingness to issue them a grant of the site. The proposal is to build the opera-house by the formation of a company.—The Church of St. Peter and Paul, Emerald-hill, of which the *Australian Illustrated News* presents a view, is designed in the Decorated Gothic style of architecture, and shows a slight mixture of French ideas. The plan embraces a nave, 25 ft. wide, terminated by a polygonal apse, and side aisles, 12 ft. 6 in. wide each, a "ladies chapel" on the southern side and lesser chapel and sacristy on the northern. Two projecting porches, one on either side, give access to the aisles. The tower stands at the north-west angle, and is surmounted by an octagonal spire, terminating with a wrought-iron cross at an elevation of 110 ft. The tower projects about 8 ft. beyond the west gable, which likewise projects about the same distance beyond the south aisle, thus obtaining a broken and picturesque outline. The angle formed by intersection of the tower and nave is occupied by circular turret stairs, which lead to the organ-gallery and upper floors of the tower. The organ-gallery extends the entire width of the nave. A large wheel-window of elaborate design occupies the centre of the west gable. Irregular-coursed bluestone ashlar has been used for the general construction, the base strings and weatherings being dressed. The bracing of the different windows has been executed in pressed cement. The total internal length will be about 120 ft., a width of 54 ft., and the height to the ridge is 50 ft. The estimated cost of the building complete is about 9,500l., affording accommodation for nearly 1,100 persons; but at present only so much as will accommodate 600 people has been built, involving an expenditure of about 4,500l.

—A new Welsh Presbyterian or Calvinistic Methodist Church has been opened for divine worship in Latrobe-street, Melbourne. It was designed by Messrs. Crouch & Wilson, and was erected by Mr. Ireland, the total cost being about 1,800l. Its style is Early Decorated. It is built of brick, on stone foundations, and measures, over all, 65 ft. 6 in. by 42 ft. It is intended to stucco the whole interior of the

church, but at present only the front elevation has been so treated. This façade stands upon an axed bluestone base, and is 50 ft. high to the top of the finial on the gable. The principal entrance is in the centre, and above it is a large triple-light window, with geometrical tracery filled with stained glass from the manufactory of Messrs. Ferguson, Urie, & Lyon. The interior is divided into two portions. The church proper, which measures 34 ft. by 48 ft. 6 in. in the clear, has a sloping floor, and the walls rise to the average height of 25 ft., the mean height of ceiling being 29 ft. At the rear of this are two vestries, together occupying the whole width of the church, and so arranged that should the extra space be required to meet the growing wants of the congregation, the throwing down of the dividing wall will not mar the proportions of the building. The height of these rooms is 11 ft., the space above being in one room, to be used for lecture purposes or smaller week-night services.

CORWEN CHURCH.

THE parish church of Corwen, North Wales has lately been restored, and also enlarged by the erection of a south lean-to aisle. Previously to the recent works the building was a harn-like structure, possessing scarcely any architectural character, although the main walls were in a good condition. The debased windows have been cut away, and new ones of a proper design inserted. The east end of the chancel had a triplet window of Early English date,—blocked up, however: this has been opened out. The old church possessed transepts, the south one being of no antiquarian interest whatever. The latter has been pulled down, and a lean-to aisle substituted for it, the north transept being still retained. Stone copings and carved crosses to all the gables replace the common slate verges of the old building. A stone arch has been corbelled out over the entrance to the chancel, which is not otherwise now constructionally divided from the nave. The exact position of the ancient rood-screen (not now existing) was discovered, and so supplied an authority for the length of the chancel, and the south chancel door, with its remarkable stone head, has been carefully preserved. The tradition is that Owen Glendower, from a neighbouring mountain height, violently threw his sword against the church, where its impression still exists. The nave and south transept roofs have been opened out and repaired where necessary. New wood brackets have been placed under some of the tie-beams. It was found necessary to put an entirely new roof to the chancel, with a polygonal-shaped panelled ceiling to it. The nave arcade, opening into the south aisle, is in four bays, with simple carved capitals of an early character. A fragment of the frieze of the old rood-screen has been utilised for the altar-rail, uprights and brackets being placed underneath it. The roofs are covered with the local slates, a simple serrated tile cresting serving to emphasize the chancel. The nave, aisle, and transept are paved with tiles. The sanctuary has been laid with rich encaustic tiles of Mr. W. Godwin of Llangwladine's manufacture, according to the architect's design. A reposes of brown alabaster and marble inlay has been placed over the altar, and is the gift of Archdeacon Ffolkes. The chancel seats are of oak, with pierced fronts and shaped moulded bench-ends. The pulpit is of Bath stone, and has been given as a memorial to a relation. The emblems of the sacred Cross, Star of Bethlehem, Purity, Christian Hope, and the immortality of the soul, are introduced in the pannels. The fragment of the rude old Norman font has been set upon a base of suitable character. The nave is seated with deal stained benches, having square panelled ends.

The carving to the church, the pulpit, and the reposes have been executed by Mr. J. Lewis Jaquet, of Vauxhall Bridge-road. Mr. W. E. Samuel, of Wrexham, was the contractor for the work, the total expense of which amounts to about 2,000l. The architect is Mr. Ferrey, F.S.A. The restoration of the tower has been deferred to a future period.

Music and Drawing in the City of Paris Schools.—The municipal council of Paris has voted a sum equal to 4,800l. for the teaching of singing in the city schools and the expenses of the Orpheonic meetings. It has also awarded a subsidy of 3,420l. to the schools of design.

ARRANGEMENT AND CONSTRUCTION OF FARM BUILDINGS.*

In former years nothing, perhaps, was more neglected, in an architectural point of view, than the designing and arrangement of farm buildings; and I think it cannot be denied that most of the sites were badly chosen, some being on low ground where drainage—which, however, at that time was little thought of—would have been impossible, and in many cases instead of the floors being raised from 6 in. to 8 in., which they ought to be, were probably sunk to that extent or more below the level of the surface, the result of which is, that the floors of the buildings were occasionally standing 2 in. or 3 in. deep with water and liquid manure coming in from the folds.

Other sites are on the slope of a hill, and the ground excavated to make it sufficiently level for the buildings, and some important parts, such as the stables, byres, or the barn, are built against the side of the thus formed embankment with the roofs nearly level with the surface: the consequence is, that the water percolates through the walls, causing the floors to be always wet and damp; and in many cases, although drainage was easy, still, perhaps, not attended to or thought of.

Again, some buildings are placed on the top of a hill, without having the slightest shelter; consequently in stormy weather the roofs have been blown off and the cattle almost starved to death by being exposed to the bitter blasts.

I have also noticed that the farm-houses were sometimes placed on the low side and close to the steading, and the moisture from the folds running in waste almost to the very entrance-door. And in addition to these evils how often we see the buildings placed at one side or in one corner instead of in a central position of the farm.

With regard to the arrangement of the buildings, no care or thought seems to have been entertained for the comfort or health of the horses and cattle, or for the convenience or saving of labour of the farm servants, but have the appearance of having been placed by accident rather than by design; for, instead of the straw-horn being placed in the centre, and contiguous to the stables, byres, and folds, where straw is mostly required, how often is it placed in an isolated position? as if it made no matter what distance the straw was to be carried and littered about,—no matter whether the byres, stables, &c., were at a considerable distance from the folds, and the manure from them never trodden by the cattle, but merely laid up in a heap at the outside of the door, and perhaps the cattle, placed by themselves, exposed and without sufficient shelter during feeding in winter months, in wretched hovels unfit for the purposes for which they are required.

I have also seen the stable and byres, with, perhaps, one or two hovels placed together, and the barn and straw-house in quite a different part, or at the other side of the stackyard, with a road running between them and the stables, and probably a more modern cart-shed, with a granary above it, in some distant position, and in some cases the granary is placed above the farm-house at a considerable distance, so that the corn had to be carted to it from the barn.

And with regard to the stables and byres, neither light, ventilation, nor drainage, was ever considered, which are now known to be so essential to the health and constitution of the horses and cattle.

This is but a brief description of this class of buildings, and which might be treated upon at greater length, but I think sufficient to show the absurd manner in which the site and the arrangement was carried on, and the slight regard which was paid to the comfort and convenience of the stock as well as the oversight in not providing the means for saving of labour in attending upon them.

From the bad arrangement of such steadings, whatsoever new buildings may be required to increase the accommodation, there is little chance of being able to design them to advantage, or to make a suitable and necessary improvement either in the plan, the accommodation, or the site; therefore, in such instances as those which I have already described, and when they are in a dilapidated state, I consider it the cheapest and best plan to have them taken down and have new buildings erected in a modern style, and on a suitable and convenient site.

During the last few years agriculture as a

* By Mr. J. E. Watson, architect; read at a Meeting of the Hexham Farmers' Club.

science has made rapid strides in the cultivation and improvement of land, and with the aid of the steam plough and other implements which have been invented, large tracts of land, which formerly lay waste, are now in a productive state, consequently larger crops, as well as greater extent of grazing-land for sheep and cattle, have been obtained. It has, therefore, been found essential and necessary that additional and more convenient accommodation in the farm steadings should be obtained for the housing of stock and cattle, as well as for the advantage of both landlord and tenant, by the erection of suitable and well-arranged buildings, totally different from the inconvenient and unsuitable erections which have existed for years; and for this purpose different agricultural societies have offered premiums for the best plan and design, and in the year 1861 the Royal Agricultural Society of England, at their exhibition at Leeds, offered a premium of 50*l.* for the best arranged plan, and in that competition I had the honour of gaining the first prize. The plan now exhibited is almost a correct copy, and which I intend taking as my model in giving a description in this paper.

The first thing to be considered is the site, and in choosing this for a new building I am of opinion that it ought to be as near the centre of the farm as possible, this being the proper position for convenience. Keeping in view that it be of easy access by sufficient and good roads, that it should be a dry situation, and easily drained by taking away both the day water and the water from the spouts, as well as the drainage of the liquid manure into the tanks, and also that it should be capable of affording a good and sufficient supply of water; not to be too much exposed, but in a sufficiently sheltered position; free from the faults described in the sites of old buildings, and to keep in view that the folds always face the south, so that the cattle may be sheltered and have the advantage of the warmth of the sun. By attending to these points, not only is expense saved, as less excavation is required, less labour in laying the drains and foundations, and probably less expense in the cartage of the materials, but also additional comfort and convenience may be obtained.

In designing farm buildings I have always considered compactness and symmetry the great elements of composition, by placing the parts which depend upon each other as near together as possible, and removing to a separate place the buildings in which no stock is housed, also to provide ample means for sufficient light and ventilation.

The designing and arrangement of farm buildings are generally open to a deal of criticism and contention, perhaps more so than any other class of buildings; for in various parts of the country different systems of farming are adopted, consequently contrary opinions are entertained, and even in the same locality sometimes there exists a difference of opinion as to the arrangements of the steadings and the methods of rearing and feeding of stock, some preferring stall feeding, some in favour of large folds, others in favour of small folds, to contain four or five cattle each; some are in favour of open folds, with the feeding-triangles covered over with sheds, to protect the cattle in wet weather; whilst some are in favour of the folds being entirely covered in, and which system seems to be advancing and gaining ground. I have also known in some cases objections made to liquid-manure tanks; whereas others are favourable to them.

As improvements in agriculture continue to advance, suitable and improved buildings will be still more required, and no doubt many of these differences of opinion will in course of time cease to exist.

I have endeavoured to combat with these differences of opinion as much as possible in making the arrangement, so that it can easily be altered to suit either of the systems just mentioned, and the form I have adopted is simple and compact, easy access being obtained to each portion of the building, without being much exposed in stormy weather, as any one attending the horses, cattle, &c., can do so with comfort and little labour in comparison to that which was required in an old farm-steading, owing to the want of proper arrangement and the isolated position of some of the buildings.

I have always arranged my plans so that the barn and straw-house should occupy a central position, as the straw is an article in constant request; therefore, the buildings, folds, &c., which require the greatest supply, ought to be grouped round it as much as is compatible with

the size and extent of the building, and to have a direct communication with the feeding-boxes, stable, byres, hovels, and so on, to enable the supply to be easily kept up, and as much under cover as possible.

The same arrangement applies to the turnip-houses, having passages to the feeding-boxes and sheds; and in some cases I have made these passages sufficiently wide for a tramway, with a suitable truck or wagon to convey the cut turnips to the cattle.

The passages between the covered feeding-sheds are sufficiently wide and spacious to allow of a sufficient quantity of turnips being always stored for the use of cattle in the adjoining folds.

The granaries are above the hovels, for the sake of ventilation, extending each way right and left so as to store different kinds of corn, and having a direct communication with the under and upper barns, as well as with each other, the straw-house being in the centre, the full height of both stories, to afford space and accommodation for packing a large quantity of straw.

It is essential that the barns and granaries ought to be constructed so that they may be kept free from vermin. To accomplish this, I invariably have the bottom or ground floors laid with concrete cement on a foundation of broken stones or bricks, from 6 in. to 9 in. in thickness; the floors of the upper barn and granaries may be done in a similar manner, by laying the floors in the first instance with rough narrow battens, upon at the joints to give a key to the cement work; the walls ought also to be plastered up to the window sills with a good thick coat of cement, which, as well as making them proof against vermin, is also a preventive of damp.

The feeding-boxes are placed in close proximity to the folds, and are well ventilated and lighted from the top with squares of rough white glass as skylights, slated in with the slates; a passage is arranged in connexion with the turnip-house for feeding the cattle; the doors may be hung in two halves in height, so that the upper part may be left open when extra ventilation is required; the division rails are made movable, so that they can be taken out when larger boxes are required.

The feeding-sheds are open, and made sufficiently wide for cattle to feed entirely under cover; the remaining part of the fold is open, but as contrary opinions are still entertained as to the desirability of having the folds covered, it will be seen on reference to the plan that a roof can easily be placed over the open part at a small cost, or the whole may be left open without interfering with the general arrangement.

The stables, byres, &c., are placed at right angles to and at the end of the hovels, in such a position that they can without much labour be supplied with straw and fodder; the manure also can easily be thrown into the folds. In some localities there is a difference of opinion as to whether a hay-loft ought to be placed above the stable; some prefer it, and imagine that without it a sufficient quantity of hay cannot be stored; others condemn it entirely. My experience teaches me to think that it is better without, and to keep the stable open to the roof, with proper ventilation at the ridge, and a few glass squares, which can be had for a trifling cost, slated in to give additional light as well as an additional degree of comfort. The Inclosure Commissioners object to lofts above the stables, and request well-ventilated houses for hay attached to each stable. Or in some instances I have introduced a small window at the head of each stall, made with solid frames, and hung on pivots; this not only throws light into the racks and mangers, but when the stables are empty they can be opened, and having windows at the other side, a thorough draught is created, which thoroughly ventilates the stable.

Metal fittings for partitions of stables, also for racks and mangers, are now greatly manufactured, and if some of a cheaper and less expensive style could be adopted, I think they might be used to great advantage in stables of farm steadings.

In fitting up the byres I always recommend the partitions between the cows to be made of stone slabs, about 4 in. in thickness, and the feeding-troughs of fire clay or cement. I find by experience that woodwork soon goes to decay, and that stonework is more easily kept sweet and clean.

The calf-house is in direct communication with the byre, fitted up with pens, and properly lighted and ventilated.

Separate loose boxes are provided for sick horses and cattle, without having any communication with the other parts of the building.

The piggeries are also placed convenient to the folds, so that the manure can easily be put into them. But as metal fittings are now much used they are sometimes fitted up more in connexion with the other parts of the building.

With regard to the floors, which are generally done with rough paving, I am inclined to think that the whole area of the building ought to be laid with concrete cement flooring, that for the stables, byres, &c., to be well grooved to prevent the horses and cows from slipping, the remainder may be plain; the channels can be formed without the aid of dressed stone, and it would be the means of preventing damp and harbour for vermin; the extra cost would perhaps be something like 2 and 2½ to 1 at the outset; but as no repairs would be required for a considerable length of time compared to what is required for common paving, it would, perhaps, be as economical in the end. I have adopted this method successfully in stables attached to noble-men's and gentlemen's mansions.

Machinery can be fitted up in connexion with a shed and saw-frame for the purpose of cutting gates, railing, &c., which are always required for the use of the farm.

The drains ought to be properly laid, and to communicate with each stable, byres, feeding-sheds, &c., so as to convey the liquid manure into the cesspool. Drains ought also to be laid to convey the rain-water from the roofs to some convenient outlet, for the purpose of keeping the steadings always dry.

The superintendent's house, cart-shed, work-shops, &c., are placed on the south side of the square, the back wall of which forms an excellent garden wall in connexion with the farmhouse. It will be observed that these buildings, where fires are required, are placed in this range to be as far as possible from the straw, so as to prevent the danger of fire.

Another advantage is, that the superintendent's house being placed at the entrance, no one can have admittance without being seen, and the entrance-gates, as well as the other gates leading to the folds, being locked at night, makes the place secure, and the superintendent living on the premises can always attend to the horses and cattle, especially when required in cases of necessity.

Dairy-farms can be constructed on a similar plan, having the byres and the feeding-byres under one roof, similar to what an entirely covered fold would be, having a direct communication with the straw and fodder-house, dairyman's house, &c.; the stables, cart-shed, with granary above, barn, straw-house, &c., forming a distinct part, but all in connexion with each other.

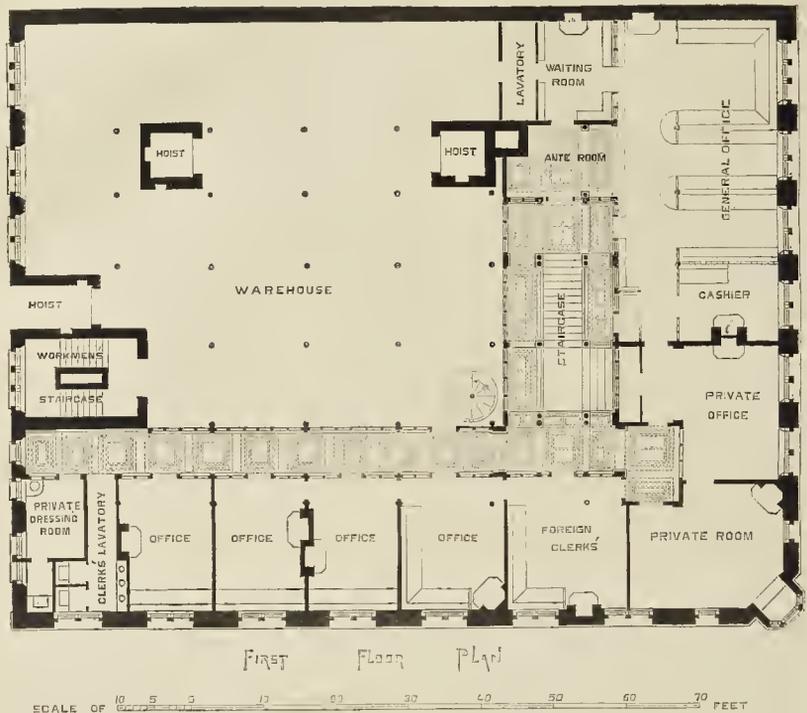
In the erection of farm-buildings, care should be taken that the floors are always kept well up from the surface of the ground, to prevent damp as much as possible.

Not only have improvements taken place in the plan and arrangement of steadings, but likewise more taste is shown in the elevations, and the introduction of some central feature in the form of a simple campanile gives it a neat and picturesque appearance.

The future advantage to be gained is, that the buildings may be enlarged to any necessary extent; in fact, by mere contraction or expansion of dimensions, may be adapted for a farm of any size without in the slightest affecting the design or arrangement. And as it is now considered by several eminent practical agriculturists that in a few years open folds will be considered "as things of the past," a glance at the plans will show that in addition to the roof over the feeding-sheds in the folds, which are at present generally sufficient, how simply another roof may be put over the open part, making it entirely enclosed, or otherwise the folds for the fat cattle may be covered in, and those for the young cattle left open. The hovels, then, not being required, could easily be converted into additional byres, feeding-boxes, or store-rooms, as might be required.

I trust, therefore, that the design I have adopted will be considered not only good in itself, but that it is capable of alteration and adjustment so as to meet the ideas of different people for some years to come, whatsoever their opinions may be as to the arrangement of farm buildings, and the methods of rearing and feeding of cattle.

With regard to the cost of buildings, it is generally understood that the stones are to be had on the estate for the expense of winning



NEW SHIPPING WAREHOUSE, DEANSGATE, MANCHESTER.

only, and that the cartage of the materials is done by the tenant. In such cases the general cost amounts to something like 3d. per cubic foot. No doubt there is a difference with regard to some of the buildings, as a stable, lyre, &c., with its fittings and requirements, will cost more than a plain straw-barn or feeding-shed; but, taking the whole into consideration, the price I have mentioned is near to what the cost will be. Of course the advantages of different localities must be taken into consideration.

Perhaps the roofing is a subject which requires most consideration, as the Royal Agricultural Society of England, at their show in Manchester, in 1869, offered premiums for the best description of roofs, and at which I was appointed one of the judges to report upon them. There were models of slate, iron, and felt roofing exhibited, and I cannot explain their merits better than by quoting from our report. "Slate roofing being familiar to all persons, it is unnecessary to describe the mode of construction, which professes no speciality. The cost per square of 100 ft. may be taken at 5l. 0s. 10d., or rather over 1s. per foot. The models or examples of galvanized corrugated iron roofs, on wrought-iron framing, were tied together by the ordinary wrought-iron rods, with king-post rod and key. The cost per square was stated to be 3l. 18s., or nearly 9½d. per foot, including wall-plates. The felt roofing was in the form of a circle, of which it was stated that the pitch should be 1¼ in. per foot, preserved in its shape by a girder formed of 'bows and strings,' with lattice-work between them, tied by a solid web of timber equal to one-fifth of the span, to give extra strength to the bearings. These lattice-girders are from 8 ft. to 10 ft. apart. On these are purlins, 22 in. apart, covered with a sheet of ½-in. boards in long lengths, and from 9 in. to 15 in. broad, upon which is laid the felt, which is again covered with tar or varnish properly prepared. It was stated that spaces 75 ft. in width had been covered

with perfect satisfaction, and that spaces 100 ft. in width could be covered without any intermediate supports. The cost per square is stated to be 1l. 12s., or nearly 4d. per foot. The period of durability of slate roofing may be stated to be at least fifty years; that of iron, twenty-two years; and that of felt, eight years; the first requiring no other act of maintenance than ordinary repairs; the second requiring strict attention in painting, to preserve it from the corroding effects of uprising vapours; and the third, in addition to repairs, requiring a coat of tar or prepared varnish every other year, to preserve it from the effects of the sun and weather. The question of economy is not, therefore, determined by the first course, but must have special reference to the periods of duration of each description of material; for, as the roof will require to be replaced at the termination of each period, it is necessary that the principal money first expended should be repaid within such periods. The true state of the case, as respects economy, will be understood, therefore, by comparing the annual amounts per square of ground covered which must be gained to repay the cost within the periods mentioned; and calculating the value of money at 5 per cent. interest, they are as follows:—Slate, 5s. 6d.; iron, 5s. 10d., with painting once in three years; felt, 4s. 11d., with tarring once in two years. Each is liable to ordinary repairs,—iron and slate requiring very little indeed, and felt requiring more."

A NEW WAREHOUSE, DEANSGATE, MANCHESTER.

A new shipping warehouse, covering about 1,000 superficial yards of land, has been recently erected for Messrs. Reiss, Brothers, in Quay-street, Deansgate, a district in which other warehouses will be erected within a few years, as the city is rapidly extending in that direction, and

it is intended to open out a new street into Salford by a bridge over the river Irwell, and to widen Deansgate, which is one of the main thoroughfares.

The building consists of eight floors, the lowest two of which are beneath the street level, the sub-basement being devoted to the machinery, viz., boilers, engines, pumps, &c., and the basement-story to the packing-room, with hydraulic-presses (which have been executed by Messrs. Norbury & Shaw, engineers, Salford).

The ground-floor is used as a twist-room, and the offices are placed on the first floor. These are handsomely fitted up with desks and counters in wainscot oak. The remaining floors are appropriated to the grey-room, the print-room, the making-up-room, and to stores, respectively.

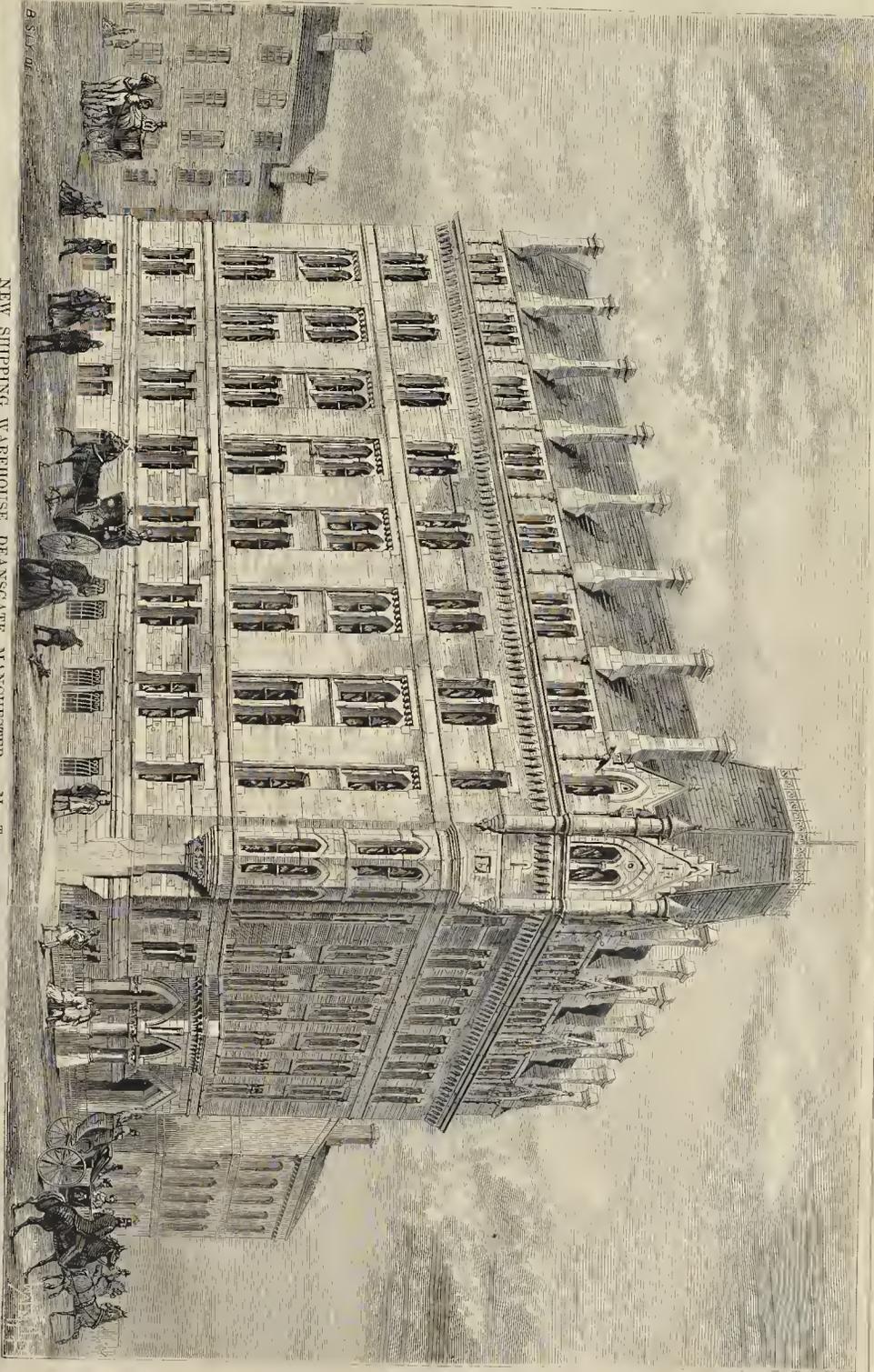
The principal entrance is in Quay-street, with a porch projecting over a sunk area, which affords an unusually good opportunity of lighting the sub-basement story, the area being 6 ft. wide, and lined with white glazed bricks.

The floors are connected, in addition to the principal staircase leading to the offices, by separate stone stairs for the workmen, as well as by three hoists from bottom to top of building, and from the first-floor upwards by a circular wooden staircase.

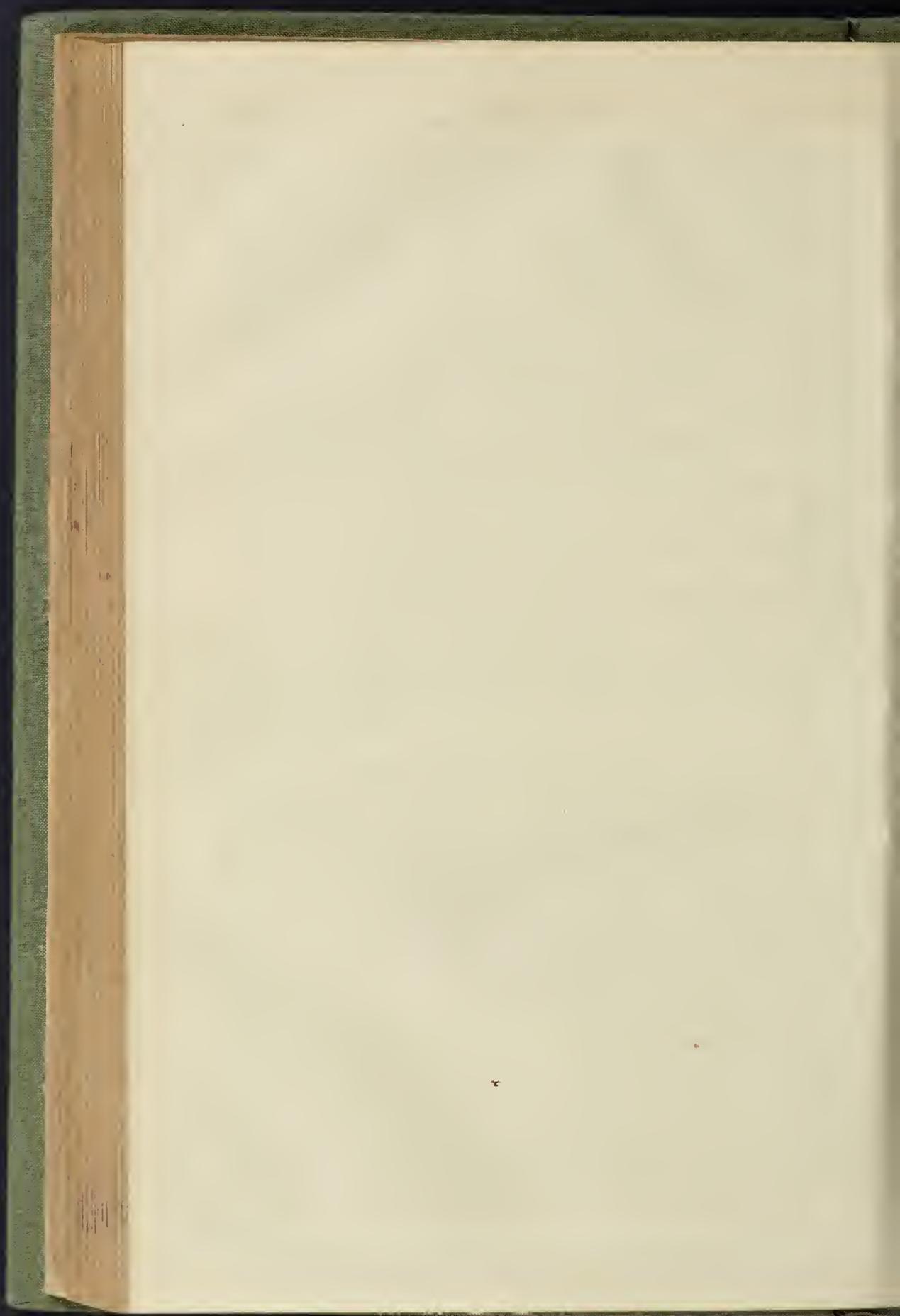
The exterior is mainly of red brick, with stone dressings; and the angle at junction of Quay and Longworth streets is filled with an oriel window of stone, two stories in height, with projecting base on ground floor.

The building is surrounded on three sides by streets, and there is a loading-place, or hovel, extending the whole depth from Quay-street to the back, with cartway through, and loading-stage in direct communication with the two steam-power hoists.

The architect is Mr. Thos. Worthington, and Messrs. R. Neill & Sons have executed the building under his superintendence.



NEW SHIPPING WAREHOUSE, DEANSGATE, MANCHESTER. — MR. THOMAS WORTHINGTON, ARCHITECT.



GAS FROM WOOD.

The substance of the following is from "Musspratt," and may help your correspondent, Mr. A. Morse. Dr. Pettenkofer was the first to use gas made from wood to illuminate the city of Munich. It matters little what kind of wood is used, provided it be dry, or as free from water as possible; as the principal chemical constituents of all common woods are nearly alike. The wood is placed in the usual U-shaped retorts, previously made, and is made to pass through a freely given off, and is made to pass through the same arrangement of condenser, scrubbers, and impo-purifiers, as for coal gas; but as wood contains no sulphur, the heat of the retort is lower than for coal; and as it is given off more freely, it is sooner done, and in about a quarter the time required for coal. Liebig and Steinheil give the illuminating power of this gas as one-fifth greater than coal gas. The tar is more abundant and the charcoal more valuable than the coke made by the coal process. The charcoal when drawn from the retort is cooled with wet sand. E. G.

COMPENSATION CASE AT PENZANCE.

In the case of Mr. William Fox, of Penzance, against the Local Board of the same place, the under-sheriff of the county, in which the Local Board of Health for the north-east corner of Albert-street to be widened and improved. Mr. Fox, the claimant, said he wished to point out that the piece of land in question had a 40-ft. frontage Market-jew-street and a 41-ft. frontage in Albert-street. The piece retained by the Local Board was 26 ft. deep at its widest part, and together they required 720 ft. of Mr. Fox's frontage. In May, 1869, the Board offered 1000, which was refused; in January, 1871, Mr. Fox offered to take 420. Evidence for the claimant having been given, Mr. T. Cornish, for the Local Board, said this was the first case of the kind in Penzance, and the second, he believed, in the county, in which the Local Board of Health for the purpose of effecting a public improvement restricted a man from building, but offered him compensation. They had offered for this very property 5000, at a public sale, but Mr. Fox secured it for 525. They offered him 1,800, for the sole of his rights in the neighbourhood. And when he came to deal for this particular corner they tendered him a sum which they deemed adequate, and in fitting which they were guided by several other similar compensations. Having smartly criticised valuations given, of 1 and 1/2 a foot, Mr. Cornish gave several precedents in the purchase of frontages in Penzance. 1000, is an ample sum for the piece of ground now sought for 400, an unreasonable amount. The Sheriff very carefully summed up, commenting on the widely divergent views of truthful and estimable witnesses of property as to its value; and the jury, after a deliberation of quite an hour, gave an assessment of 3000, for the land and 500, for consequential damages.

CHURCH-BUILDING NEWS.

Stradbroke.—The restoration of the spacious parish church of Stradbroke has just been completed, the work having been carried out by Mr. R. M. Phipson, of Norwich and Ipswich, architect, and the building has been re-opened at the same time the row of wretched cottages which formerly stood to the south of the church, and blocking out the view of the church on the south side, have been bought by the parish and pulled down, the ground on which they stood being thrown into the churchyard, round which an iron palisading, with stone and flint piers at the gateways to the west and the south, has been erected. The works the architect recommended for a very comprehensive character, and have been carried out to the letter. The open roof of the nave had suffered less than any other part of the church, and has been restored all its details according to the original framework, the rotten beams, purlins, rafters, &c., being replaced in oak of exactly the same size and mouldings. The roofs of the north and south aisles were too far gone for repair, and entirely new roofs of pitch pine, moulded and carved, with ornamented spandrels and carved stone corbels, have been put up. The north chancel aisle has a similar new roof, but the south chancel aisle was in a better state of preservation, and required simply restoration. The old chancel roof turned out to be even better than Mr. Phipson had anticipated, and an entirely new roof has been put up. This roof is in the Decorated style. The nave and chancel roofs are covered with green slates, and those of the aisles with lead. The clerestory of the nave consists of four clustered two-light windows in the north, and the same number in the south, walls, and one two-light single window at each end; and were in a very decayed state, and have been almost re-made, the walls being re-faced with flint. The chancel arch, a considerable portion of which was debased brickwork, has

been reformed by a moulded arch, with stone shafts, caps, and bases. The stonework of the windows throughout the church has been restored, and the west gallery has been cleared away. The walls of the interior have been relieved from their coating of plaster, and have been cemented and stuccoed. The square pews have all been swept away, and the whole church re-seated with oak open benching, the nave and aisles having square ends, on the panels of which is executed tracery work varying in pattern. The chancel benches have carved poppy-heads representing chiefly natural foliage. The west window has been filled with stained glass of Geometrical design, by O'Connor. A new panelled ceiling has been put under the belfry floor of the tower, and the circular stairs leading to the belfry have been repaired. All the doors are of oak, with ornamented wrought-iron hinges, handles, locks, &c. The passages are all paved with red and buff tiles. The church is warmed by Boulton's heating apparatus. The south porch was a large semi-modern excrescence, mean in the extreme, and was condemned. In its place is a new porch with hammered flint facings and carved stone doorway and parapets. The old north porch has received attention. In many places the outside flint work of the walls was bad or had been made up with bricks, and in all these places it has been replaced, and the buttresses, quoins, copings, crosses, parapets, gables, &c., have all been restored, and, in fact, the whole exterior has been made good. The belfry windows formerly had wooden louvres, which have been taken out, and the stonework of the windows having been restored, new slate louvres have been inserted. The whole was carried out by Mr. Grimwood, builder, of Weybread. Mr. H. Vine, Eye, has done the mason's work; the superintendence of the bricklaying portion of the work was entrusted to Mr. Grimwood's foreman, Mr. G. Bullen; and Mr. Gibson, Fressingfield, did the glazing. The total outlay, after allowing for old lead and other materials, will amount to nearly 3,500. The only thing that remains to be done is to put in a new five-light east window, the present four-light one not being large enough for the restored church, and to supply a reredos, and we understand this addition is in contemplation. At present there is no organ, but a fund to purchase one has been commenced.

Chichester.—An addition has recently been made to the interior of the church of St. Peter-the-Great, by the erection of a new reredos, a gift from the vicar and Mrs. Gruggen. The reredos, which is principally of stone, is divided into three compartments, separated by short columns of coloured marble with carved capitals, supporting four angels, who carry in their hands the crown of thorns, the instruments of scourging, the spears, the dice, the cross, and the shroud, all emblems of the Passion. The subject of the sculpture in the central compartment is Our Lord in the act of breaking bread with the two disciples at Emmaus. It is said to be intended to place a new reredos in the church of All Saints, to be composed of encaustic tiles, and that it is also in contemplation to pave the east end of the church, and erect three stone steps for the communion-table.

West Bromwich.—The memorial stone of the restored parish church of All Saints has been laid. The contractors to the new building are Messrs. Burdett & Co., of Wolverhampton; and Mr. Somers Clarke, jun., of London, is the architect. The contract is for 6,3000, towards which 3,0000 have been already obtained. The church, when completed, will seat about 700 persons. The style of architecture will be that of the fourteenth century. The congregation will be provided with chairs until the funds will be sufficient for pews. Memorial windows will be put in the west end of the church by Colonel Bagnall. The Dartmouth memorial window will be restored, and another memorial window will be placed in St. Chad's Chapel by the vicar's brother, Mr. Charles Willett. The cost of the chancel has been defrayed by the Earl of Dartmouth, and the sacristy by the vicar. The bells will also be re-hung, at the cost of Colonel Bagnall.

Halifax.—At the annual meeting of the Ripon Diocesan Church Building Society, at Leeds, a grant of 3700. was made towards the erection of the much-needed church of St. Augustine. The plans have been prepared by Mr. Coad, of London. The edifice will consist of a nave of five bays, transepts, and chancel, with apsidal termination. The style is Early Decorated, and the church will possess one or two special

features not to be found in any other church in Halifax; for example, the apse, with its five long two-light windows, and the lofty clerestory windows. The nave will be 34 ft. long, and the chancel will be ascended by three steps, three others leading to the sacristy. The total accommodation will be for 750 persons.

Lakenheath.—At a meeting recently held as to the repair of the parish church it was resolved, at the suggestion of the Archdeacon, that the architect for the archdeaconry shall be called in, who will make a survey of the building without charge, on condition of his being selected for architect in case any repairs were really set about.

Birkenhead.—Bebington parish church has been re-opened, after being closed nine months for re-seating and other improvements. In the present restoration the fabric has not been altered in any way, the works being confined to cleaning the interior thoroughly, and rendering it dry by asphaltting the whole of the area under the floors, re-tiling, heating and ventilating, and seating throughout with open benches of oak, and constructing a choir and chancel by screening between the piers of the eastern portion of the interior. The fittings of the choir and chancel are of carved oakwork, in keeping with the few portions of ancient work which are in the church. All the ancient oakwork has been conserved and incorporated in the new fittings. The windows have been re-glazed with beaded glass. The floors have been renewed, and are laid with tiles and marbles. The total cost of the restoration of the edifice will be about 2,6000, of which 2,0000 will be subscribed by the parishioners generally. The cost of the chancel will be about 5000, or 6000, and the rector of the parish has taken upon himself to find the amount.

Chester.—The new Church of St. Thomas, at the end of Parkgate-road, has been consecrated by the Bishop of Chester. The adjacent burial-ground was consecrated at the same time. The new church is erected from designs of Mr. Gilbert Scott; the builder being Mr. Roberts, of Chester. It is of Early English architecture, the material being red Roman sandstone. The original plan of the architect was calculated to accommodate about 1,000 persons; but some important portions yet remain to be erected, and as far as at present completed only about 520 can be seated. The cost has been about 5,0000, raised by subscription, with the exception of the site, which was given by the Ecclesiastical Commissioners. About half an acre is intended to be devoted to the erection of a school, at some future time, in connexion with the church. The new church is a chapel-of-ease to St. Oswald's. Two more bays, the north porch, and the tower have yet to be added. The interior is floored with Minton's encaustic tiles. The present seats are only temporary chairs, of the same character with which the public are familiar, in the nave of the cathedral; two covered chairs in the chancel were given by Mr. Lamont.

Croydon.—The new church of St. Luke, Wood side, has been consecrated by Dr. Parry, the Suffragan Bishop of Dover. The new edifice is built in the Early English style, and was erected at a total cost of 1,13000, raised by voluntary subscriptions. The architect was Mr. W. V. Arnold, who gave his services gratuitously, the builder being Mr. T. J. Witt, of Dingwall-road. The church is capable of seating 300 persons, and 100 of the seats will be free and unappropriated. St. Luke's is the first church erected at Woodside.

Pittlevell.—The church has been re-opened by the bishop of the diocese, after having undergone partial restoration, during which many interesting architectural features have been disclosed. There have been five stained-glass windows added. There remains much to be done, as the whole of the windows in the south side are still in a state of decay, and the interior has yet to be re-seated. A new roof has been erected throughout, in English oak. In the nave and aisle it is plastered between the timbers, and in the chancel boarded. The chancel is further enriched with carved angels as finials of hammer-beams. The roofs of the nave and chancel are covered with green Westmoreland slates, with Bath stone rigging, and the roof of the aisle is covered with lead. The internal walls have had all the plaster stripped off and have been newly pointed, thus showing all the ancient work, notably some very early Norman windows in the arcade between the nave and the aisle, evidently belonging to the original church on the site. The flooring has been com-

pleted, boarded floors being laid and the passages paved, the chancel in tiles and the nave and aisle in black and red Poole tiles. The east window represents the four evangelists, with their respective emblems beneath, by Mr. A. Gibbs, of London. The west window is also by Mr. Gibbs. It is a three-light, representing St. John the Baptist (centre), Peter, and Paul. The north window of the chancel (three-light) is by Messrs. Clayton & Bell. The subject is the Presentation in the Temple. There is a small two-light window over the east window. The subject is the Amniction. This window is the work of and presented by Mr. A. Gibbs. The south window of the chancel, within the sacarium, by Mr. A. Gibbs, represents Christ found amid the Doctors in the Temple. The church is warmed by hot-air apparatus, by Messrs. Haden, Trowbridge, Wiltshire. The cost of work executed is about 3,000. That which remains to be done will cost about 1,250, exclusive of the tower (about 500*l.* more). The church bells (six in number) have been restored—five recast by Messrs. Stainbank, Whitechapel—and hung in a frame for eight, with the view of adding two others eventually. The cost of this is about 200*l.*, and 30*l.* has been expended in making the organ as efficient as possible. The architect is Mr. Ewan Christian, of London; and the contractor, Mr. Walter Aris, Hastings.

Lindley.—The corner-stone of the chancel to the parish church, Lindley, has been laid. At the north side of the chancel, which is in process of erection, there will be an organ-chamber, and on the south side ministers' and choir vestry. The chancel will be 25 ft. long and 21 ft. wide. A tracery stained-glass window, by Ward & Hughes, of London,—subject, the Ascension,—of the value of nearly 400*l.*, will be placed in the east end of the chancel by Mr. H. B. Taylor. The architect is Mr. J. N. Crofts, Liverpool; contractors for mason work, Messrs. J. Royston & Sons, Lindley; joiners, R. Whiteley & Nephew; plasterer, E. Jowitz; plumber, H. Garton; painter, W. T. Earnshaw. The estimated cost is 1,500*l.* A new organ by Messrs. Conacher, of Huddersfield, is in course of erection, making altogether an outlay of 2,000*l.*, towards which about 1,500*l.* have been already raised.

Catterick.—The parish church has been reopened after restoration, at a cost of 2,000*l.* The alterations and improvements are as follows:—A new chancel, built by Messrs. Forster & Andrews, of Hull; oak reredos and altar-rails (present); new vestry, with heating-chamber underneath, and porch; windows reglazed with cathedral glass; new choir-stalls, prayer-desk, and stone pulpit (the gifts of the Booth family); new chancel-floor of encaustic tiles, given by the vicar; brass standards (a present), &c.

Tamworth.—St. Paul's Church, Dosthill, a village situated about three miles from Tamworth, in the parish of Kingsbury, has been consecrated. Great efforts have been made to supersede the old building, which has served as a chapel of ease, and the result has been the erection of a Gothic edifice, built of the sandstone from the neighbouring quarry at Whaley. The church consists of nave and chancel. In the latter is a stained east window. The building, we believe, was designed by Mr. Holmes, of Birmingham, the work being executed by Mr. Lilly, of Ashby, contractor.

Alvescott.—The parish church has been reopened after restoration. The old ceiling of the roof has been removed, the floor has been repaired, open varnished pine benches have been substituted for the pews, all the doors have been renewed in English oak, a new pulpit has been substituted for the old one, and the church is heated with a warming apparatus. Among the features of the alterations are the reredos and a new east window. The latter is filled with stained glass from Munich, and has been erected in memory of the Rev. A. Neate, the late rector. These alterations have been carried out on the designs of Mr. Slater, architect, Westminster, by Mr. Plaster, of Bampton. The total cost of the restoration has been between 600*l.* and 700*l.*

Waverthorpe.—This Late Norman church has been re-opened by the Archbishop of York, but the addition to the churchyard was not consecrated, the enclosure not having been completed. The church, which was closed in August, 1870, has been restored at the sole cost of Sir Tatton Sykes, bart., of Sledmere, being the third church recently built or restored by him; a fourth, at Helpthorpe, being nearly complete, and another, at Lutons Amho, having been begun. The restoration was placed in the hands

of Mr. G. E. Street, R.A., of London, and the work, as at Thexendale and Fimber, has been carried out under the supervision of Mr. R. Hayward, of London, the resident clerk of the works. In the restoration every ancient feature has been preserved, the old walls and windows have been restored, the gables of the nave and chancel have been raised to the pitch of the original church, and the roofs have been covered with lead. The peal of three ancient bells has been re-hung in the tower, to which a leaden roof has been added. Externally, the church presents its old appearance. Internally, the edifice consists of tower, nave, and chancel, with south porch. The three lights of the old east window have been filled with stained glass, by Clayton & Bell, of London, representing the Ascension; and the two-light windows on the north and south side,—and, in fact, all the other windows,—have glass from the same artists. A south one-light window in the chancel has a figure of St. Andrew, and in the nave, upon an ancient corbel in the south pier of the chancel arch, is placed a full-length effigy of St. Andrew, in Caen stone, by Redfern, of London. The windows on the north side of the nave contain figures of St. Mary and Mary Magdalene, and an ancient Norman north door has been opened out. The windows on the south side have figures of St. Peter, St. James, and St. John. In the south-west angle of the nave is placed the old carved Norman font. An iron screen separates the nave from the tower space, which forms a vestry, over which is the belfry. The church is seated with oaken stalls throughout, and the warming is by Porrett's hot-air system. The spaces of nave and chancel are paved with coloured tiles. The pulpit is by Leaver, of Maidenhead; the screen by Parker, of London. The builder was Mr. Booth, of London; and the decorators of the ribs and roof are Messrs. Bell & Arnold, of London.

Oxford.—St. Frideswide's Church has been opened and consecrated. The foundation-stone was laid on the 13th of December, 1870, and lack of funds compelled the cessation from the work for a time last summer. The site upon which the new church stands is to the left of the Botley turnpike-road, just beyond the bridge which forms the main entrance to New Osney. The land is rather more than an acre in extent. With respect to the interior, we may state that benches have not yet been provided, chairs being used throughout the nave. The choir has, however, been fitted up with permanent benches. The floor within the apse is laid with encaustic tiles, relieved by freestone steps. The floor of the chancel is also laid with encaustic tiles. As the space is now allotted there is accommodation for about 250. Not only has the building of the tower been left, but also the benches and the interior stone carving. Messrs. Honour & Castle were the contractors. The original contract, as taken by them, was 3,950*l.*, but, owing to the lack of funds, not more than about 2,500*l.* have been spent. The architect of the works is Mr. S. S. Teulon, of Westminster.

DISSECTING CHURCH-BUILDING NEWS.

Nantwich.—The foundation-stone of a new Baptist chapel has been laid on a site in Market-street, Nantwich. The building will be in the Gothic style. The width of its frontage is 36 ft., sides 71 ft. It will be built of red painted bricks, and ornamented with white and blue bricks in string-courses, and white stone from Grinsell quarries. There will be projecting gables at each side. The interior will seat about 400 people. There will be one gallery in polished pitch pine, and the pews open seats. The upper portion of the building will form a lecture-room, vestry, and school. The estimated cost of the building and land is upwards of 1,300*l.*, towards which 700*l.* have been already promised. Messrs. Horsfield & Son, of Halifax, are the architects; and Mr. Henry Ray, of Nantwich, is the builder.

Edgeley.—The foundation-stone of the third Wesleyan chapel in succession on the same plot of land in Edgeley has been laid. The Italian style of architecture has been adopted in the design. The building will be of brick, with stone dressings. The principal feature in the front is a Corinthian portico of four columns, surmounted by a balustrade. Within the portico is the principal entrance to the chapel. On each side of the portico are two tiers of windows, giving light to the staircases. The length of

the building internally is 72 ft., and the breadth 41 ft. 6 in. At the rear of the building, on the ground floor, a large class-room, suitable for week-night preaching and prayer-meetings, and a minister's vestry and a staircase for the children are arranged. The gallery is the whole length of the chapel, extending over the vestibule in front and class-room, &c., at the back. The entire height of the chapel from the ground-floor to the ceiling is 31 ft. The building will be well lighted and ventilated. The accommodation is for 750 persons. The total cost of the building will be about 3,000*l.* Mr. P. Hodgkinson, of Hulme, Manchester, is the contractor for the whole of the work. The chapel was designed by, and will be carried out under the superintendence of, Messrs. Hill & Swann, architects, Leeds and Sheffield.

Fartown, Pudsey.—The foundation-stone of a new chapel for the Methodist New Connexion has been laid at Fartown, Pudsey. The estimated cost of the new building is 1,650*l.* It is to furnish sittings for 450 people. Messrs. Nelson, of Leeds, are the architects, the style being Italian. It will have a gallery at one end and an organ and choir recess at the other, and two vestries, with other offices, will be provided. Messrs. W. Wood & Son, of Pudsey, and Mr. E. Boys, of Pudsey, have entered into contracts to do the main portion of the work.

Gateshead.—The memorial-stone of a new Congregational Church, situated in Hexham-road, Gateshead, has been laid. The principal feature of the building, the walls of which are to be of local wallstone, the dressings being ashlar, also from a local quarry, is the tower and spire, which rise to a height of 113 ft. from the ground to the top of the vane. The church is lighted in the front by a four-light window with a recessed head, on each side by lofty two-light windows of a similar character, and at the back by a rose-window. These will be all filled with Hartley's cathedral tinted glass. In lead quarries, with margins of colored glass. Entrance is obtained by three doorways, one in the centre for the ground-floor of the church, and one on each side communicating directly with the gallery staircases. Internally the church is divided into nave and aisles by arcades of iron pillars supporting wooden arches, from which springs a wagon-headed roof. A narrow gallery runs along each side of the building and extends on the front to a much greater depth, being carried over the front vestibule. The seats, which will provide accommodation for 800 adults, are all open, with slanting backs, and are of stained deal. The passages are to be paved with mosaic tiles. The warming is to be by Lewis's patent warm-air apparatus, and the lighting by gas pendants and brackets. A special feature in the design is a ladies' and deacons' room, provided in an annex communicating with the tower entrance. The schools externally will be the bulk of stone like the church, and will accommodate 500 children. They comprise, on ground-floor, infants' school and five class-rooms, and on first-floor a library and a large school-room, which latter, when arranged, as intended, for lectures, will accommodate 400 adults. It will have a gallery at one end, and a curved brace roof. The heating and lighting will be on the same principles as the church, special attention being paid to ventilation. The cost of the church is estimated, at 3,360*l.*, that of the school at 1,000*l.* The contractors are:—For the whole of the building work, Mr. J. A. McMartin, of Gateshead; Mr. G. Wilson, of Leeds, for the glaziers' work; Mr. J. W. Lewis, of Newcastle, for the heating apparatus; and Mr. Dovey, of Manchester, for the ornamental metal work. The whole is designed and carried out under the superintendence of the architect, Mr. J. B. Pritchett, of Darlington.

Handforth.—The corner-stone of a new Wesleyan chapel has been laid at Handforth. The building (which will be of brick, with stone dressings, and in the Gothic style of architecture) will accommodate 250. It will cost about 1,600*l.* The architect is Mr. Sutton, of South-

Saltire.—The corner stone of a new Primitive Methodist Chapel and Schools, in course of erection about midway between Shipley and Saltire, on the Bingley-road, has been laid. Sir Titus Salt, bart., in consequence of a severe attack of gout, was unable to be present. The building is to be erected from the designs of Messrs. John Kirk & Sons, of Huddersfield and Dewsbury, architects. The basement floor will contain school-room, lecture-room, infant class-rooms, three small class-rooms, and kitchen. There will also be separate yards on each side of

the building for boys and girls. There will be spacious staircases communicating with the ground floor and gallery of the chapel. The ground floor will contain large and small vestries, lavatories, the main body of the chapel, and two side wings, containing entrance, vestibules, and staircases to galleries and schools. These entrances will be approached by bold flights of stone steps from Bingley-road. The gallery will extend round the entire chapel, and will be supported on ornamental cast-iron columns, the gallery front being moulded with panels filled in with ornamental perforated cast-iron work on carpet ground. The body of the chapel and gallery will contain sitting accommodation for 1,000 persons. The paving and other wood-work will be of red deal, stained and varnished. The chapel will be lighted by means of ornamental sunlights suspended from the ceiling, and will be warmed by hot water on the best principle. The style of architecture will be Italian, freely treated, the principal front being towards Bingley-road, from which it will be separated, by a distance of eleven yards, by a low boundary wall, surmounted by ornamental iron palisading, with gates of similar design to each of the three entrances. The whole of the building will be constructed of hammer-dressed wallstones and plaster dressings from the local quarries. Its entire cost will be about 4,500*l.* The whole of the works are being carried out under the immediate superintendence of the architects, Messrs. Kirk; the clerk of the works being R. Walsh, of Shipley. The contractors for the various works are:—Masons' work, Mr. G. Horsfall, Heckmondwike; joiners, Messrs. Bacon & Whitaker, Shipley; plumbers, Messrs. Ransworth & Sons, Shipley; slater, Mr. E. Norton, Shipley; plasterers, Messrs. J. Wilkes & Son, Baildon; painter, Mr. G. L. Smith, Hindhill.

Hatfield.—The chief stones of Holywell Green Congregational Church have been laid on the site of the new church, now in course of erection, at the sole cost of Messrs. John Shaw Sons, in an one of the prominent hills of the land, and the spire will be seen for miles round. The design is the Geometrical style of Gothic architecture, and comprises nave, 48 ft. by 6 in.; aisles, 58 ft. 6 in. by 10 ft. 1 in.; choir, 18 ft. by 14 ft. 3 in.; two vestries the rear, and two porches in front, formed by a tower on one side, and the staircase on the other. The nave is divided from the aisles by a series of five arches each, which will be of solid stone, supported by polished granite piers, with ornamental foliage caps of stone. The roof will be wagon-headed in form, having gilded braces and purlines of pitch pine, with stercorated ceiling between. The present accommodation on ground floor, and in an end gallery be constructed in the recess between the tower and staircase, is designed for 600, but the addition of transepts, for which the design is being specially arranged, 400 more seats can be provided at any future time, giving the total up to 1,000 sittings. The seats are designed to be 34 in. from back to back, and are to be allowed to each individual. They are to be open, with slanting backs, and fitted up with book and hat boards, and all of pitch pine finished. The pulpit will be of Caen stone, with marble pillars. The windows will all be filled with stained and painted glass. The sills and margins of the passages will be paved with mosaic tiles. The warming of the church will be effected by Lewis's patent warm-air apparatus, and the vestries by the patent warm-air chamber fireplaces of the same maker. Originally, the galle end to the road contains two light windows under the gallery with a five-light window over them, occupying the space, which will be surmounted by a stone cross. The angle stands the tower, the ground floor which forms one of the vestibules to the church, entered by a door with moulded arch, supported by granite columns. Over the door is a five-light window lighting the ringing-room; the next stage is the clock and top or belfry, being filled by moulded two-light belfry windows. From an arched cornice springs a spire, surmounted by a vane rising to the height of 20 ft. from the ground. The spire is decorated at the angles by ornamental pinnacles called "broaches," and is relieved by a series of "lozenged" lights. At the angle of the tower is a second entrance lobby, lighting the staircase to the children's gallery. The building is surmounted by an octagonal spiral roof. A connexion is designed between the school and this lobby by a covered

and glazed corridor. Each side of the church is designed with three two-light windows, surmounted by gables, the larger two being designed so that they can be extended to form the gables of transepts, when an enlargement of the church becomes necessary. The choir has at the sides simple windows lighting the vestries, and at the back a rose window, which will be seen above the organ. The building is being erected of local stone, which is said to be among the best in the kingdom, the brown being used for the outside chiselled; the white cleansed for the inside. The architect is Mr. J. P. Pritchett, of Darlington; the clerk of works Mr. Dowgill; and the contractors for masons' work Messrs. B. Edwards & Son, Holywell Green; slating, Messrs. Hill & Nelson, Batley; plastering, Messrs. Bancroft & Son, Halifax; joiners' work, Mr. Joseph Hodgson, Holywell Green; plumbing, Mr. J. Aspinall, Elland; glazing, Mr. W. I. Booer, Leeds; painting, Messrs. E. & B. Briggs, Lov Moor; iron and brass work, Mr. J. Dovey, Manchester; granite and marble work, Messrs. Penning, London; carving, Messrs. Walker, Emley, & Beall, Gateshead; warming, Mr. J. W. Lewis, Newcastle-on-Tyne. The cost will be about 6,000*l.*

Tatenhall.—The new Congregational church has been opened for divine service. It is Gothic in style, and built of the white stone of the neighbourhood, except the carved portions, for which stone from the Grinsbill Quarry has been used. The entire length is 63 ft. 10 in. by 31 ft. 6 in., while the height from the basement to the eaves is 15 ft. 6 in., and from the basement to the ridge of the high-pitched roof, 38 ft. For the roof, Bangor congres slates, with green bands, have been employed, and fancy ridge-tiles. The front elevation to the street is a gabled one, with an entrance-porch and vestibule on each side, the outer porches being ornamented with small octagonal hutresses and the doors with columns on either side, and carved capitals and bases. Between the porches is a four-light window, with circular traceried lead and moulded arch, and extending in each direction from the window-sill to the porches are carved and moulded panels. On each side of the building there are five windows, three two-lights and two three-lights, with cusped trefoil heads and carved capitals and bases, and on each side one of the three-light windows is used for the porch, having two lights in that and one in the chapel. The windows are glazed with cathedral-tinted rolled glass, with stained borders. The roof is celled, but so as to show the four principals, which rest on moulded corbels, below each of which are gas-jets. The whole of the woodwork is of pitch-pine, stained and varnished, the most prominent part of that being the minister's pulpit, or rather desk, which stands on a raised platform in front of a recessed moulded arch, with carved capitals and pillars. The building is warmed by one of Porritt's hot-air stoves, lighted by gas, and ventilated by circular apertures in the ceiling, a current of air passing between that and the roof from the louvres near the apices of the gables, and the front galle is terminated by a stone finial. The architect was Mr. T. M. Lockwood, and the builder, Mr. Charles Holland, of Chester. It was estimated that the cost of the chapel would be 1,350*l.*, and that, together with the adaptation of the old chapel to school purposes and a mausoleum for the minister, the total cost would be 2,200*l.*

SCHOOL-BUILDING NEWS.

Stafford.—A meeting, presided over by the Earl of Shrewsbury, has been held at Stafford, to consider what means should be adopted for carrying out a proposal to build new schools in Rowley-street for the parish of Christ Church. Lord Shrewsbury said that, for one, he thought the subscriptions should not be returned, and he should be very happy to increase his own gift as a quasi-memorial of his late friend the vicar. They would require 48*l.* 16*s.* 3*d.* to complete the undertaking. He had been thinking how he could help in the matter. Whit-Monday was a shoemakers' holiday in Stafford, and he should have much pleasure in placing his grounds at Ingrestre at the disposal of a committee for the holding on that day of a *fête* at which intoxicating drink should, as at Alton, be served out at intervals only. In that way enjoyment might be afforded to the people of Stafford, and an addition be made to the Christ Church School fund. The proposal was heartily received, and the Mayor thanked his Lordship for his kind offer.

His Worship expressed the opinion that larger schools than those contemplated should be built. A committee, consisting of the borough members, the Mayor, and other gentlemen, was appointed to give effect to Lord Shrewsbury's offer.

Shanklin.—The new parochial schools at Shanklin, the foundation-stone of which was laid in August last, have been opened. The buildings comprise three large and lofty schoolrooms, intended to accommodate 100 boys in the upper room, 120 infants in the centre room, and 100 girls in the lower room. In connexion with these are lavatories and other rooms. There is a large playground, in one corner of which is situated a commodious house for the master.

West Mersea.—The newly-erected schoolhouse at West Mersea has been opened. The school and master's residence are erected with red bricks, jointed with dark mortar, and Bath-stone dressings. All the windows and doorways are of Bath stone, and the windows are glazed with tinted cathedral glass. The interiors of the school and class-room are arranged in accordance with the requirements of the Committee of Council on Education. The roof is celled under the collar-beams, the exposed timbers and all the joiner's work being wrought, stained and varnished. An abundant supply of pure water has been procured from a well sunk near to the school, and is conveyed to the several offices by a force-pump. The playgrounds and master's garden are divided by rustic fences, and the whole site is enclosed by an ornamental brick wall. The school is entered by a porch at each end for boys and girls. The schoolroom is 40 ft. in length, and 18 ft. in width; and the class-room is 24 ft. by 16 ft., and 11 ft. in height to the wall-plates. The work has been executed by Mr. Alfred Diss, builder, under the superintendence of Mr. Horace Darken, architect, Colchester.

Farington.—The committee of the British School are about to erect new school buildings near the entrance to the town from Lechlade, the present school being found inadequate to the number of children attending; and a sum of 600*l.* has been raised towards this object. The contract for the erection of the new school buildings has been taken by Mr. Williams, builder, Abingdon.

Pendleton.—St. Thomas's Schools, Hanksinon-street, Pendleton, have been opened for school work. The plan comprises girls' schoolroom, 60 ft. by 30 ft.; little boys' schoolroom, 43 ft. by 24 ft.; infants' schoolroom, 35 ft. by 19 ft.; class-room, boiler-room, store-room for spare forms, &c.; three porches, latrines, &c. Attached is a good-sized master's house. The walls are faced with stock bricks. The latrines are entered under cover from the schoolrooms, and have a constant current of air passing through them, securing thorough ventilation. The heads of the windows are filled with a floriated kind of stained glass, in three or four tints. The large school-room will be used for Sunday services, the little boys' school forming a quasi-chancel. The accommodation is for about 450 day-scholars. The work has been carried out by the builder, Mr. James Birch, under the superintendence of the architects, Messrs. Medland & Henry Taylor, of Manchester.

STAINED GLASS.

St. Martin's, Scarborough.—Miss Mary Craven is giving three new stained-glass windows to this church, as an expression on her part of loyalty and devotion to the royal family. One will be a thank-offering for the recovery of the Prince of Wales, and the adjoining window will be given as a tribute of respect to the Princess. The third window will be given in token of loyal and devoted attachment to the Queen. This latter will be a companion to the window of the "Three Kings," which Miss Craven gave in memory of the Prince Consort nine years ago. The Archbishop of York has given his sanction to Miss Craven's intention. When these windows are placed, every window in St. Martin's will be filled with stained glass with the exception of one, and that we believe is also promised.

St. Michael's, Cambridge.—Messrs. Hardman, of Birmingham, have completed a memorial window for the east end of this church. The window has been so coloured as to admit as much light as possible. The subjects illustrated are:—The Expulsion of Adam and Eve from Paradise; our Saviour, with the gloria, surrounded by angels; the Sacrifice of Isaac; St. Michael and Diabolus arguing over the Body of Moses; the Angel slaying the First-born in Egypt; St.

Michael and the Dragon; the Slaying in the Assyrian Camp; the Angel appearing to Joshua; the Fiery Furnace; and Daniel in the Lions' Den. At the top are six angels. The whole has been adapted to the fifteenth-century architecture of the window. The cost was 500*l.*, which was defrayed by subscriptions. The chancel is being altered and improved from plans by Mr. Gilbert Scott, but although the work is not nearly completed, the church has been re-opened.

All Saints', Wington.—A window of stained glass, to the memory of the late Rev. John Vane, for forty-two years rector of Wington, has just been placed in the south side of this church. The work has been executed by Messrs. Clayton & Bell, of London, at a cost of about 150*l.*, which sum was raised by voluntary subscriptions. The top portion of the window represents St. James, St. Thomas, St. Andrew, and other saints. The centre represents the Raising of Jairus's Daughter, the Raising of the Widow's Son, and Christ Blessing Little Children; while the lower lights contain representations of the Nativity, the Presentation in the Temple, and the Flight into Egypt.

St. Andrew's, Whittlesey.—The east window of this church has been put in, and gives an appropriate finish to that ancient structure. The window is "Flanboyant;" it has been reduced 18 in. in order to allow room for the reredos erected on the design of Mr. R. R. Rowe, of Cambridge. This, however, is not noticed inside the building, as a still larger part of the window was before hidden by a grotesque, "Belief," &c., executed by some native artist in times gone by. The window is the work of Mr. Constable, of Cambridge.

St. Sidwell's, Exeter.—A stained glass window has just been placed in this church, to the memory of two sisters, daughters of the late Mr. William Kennaway, of Exeter, who were lost at sea. The window is composed of three lights, the centre representing our Saviour walking on the sea. The side compartments contain two medallions set in tracery, the one representing a cross wrapt in light shining over the sea, and the other a dove bearing an olive-branch above the waters. The whole is the work of Messrs. Mayer & Co., of Munich, its erection being superintended by Mr. Blake, of Exeter.

Trinity, Stockton.—A stained glass window has been placed in this church, by Mr. Joseph Wron, of Boston (formerly of Stockton), in memory of his mother. The stained glass was manufactured by Messrs. Mayer & Co., of Munich and London, and consists of four lights, which represent eighteen subjects chosen from the life of our Saviour.

Dudley Parish Church.—A memorial window for this church to the late Dr. Browne, has just been completed. It is in the style of the fifteenth century, and consists of three lights. The subject chosen for illustration is the Resurrection of our Lord. It was by Messrs. Hardman & Co.

Warbleton Church.—The large east window of this church has just been filled with stained glass. The work, which was completed for Easter Day, has been executed, both as to colour and design, by Messrs. Horwood, Brothers, of Frome, Somerset, and represents the four scenes of—1. "The Agony in the Garden." 2. "The Crucifixion." 3. "The taking down from the Cross." 4. "The Burial."

Higheles New Church.—A stained-glass window has been inserted at the western end of this church, as a memorial of Mr. Herbert, whose murder by Greek brigands produced such a painful sensation throughout the country two years since. Below the window a brass plate has been fixed, bearing the following inscription:—"To the glory of God and in memory of their friend, Edward Herbert, born 1st Sept., 1837, and murdered by Greeks at Oropos, 21st April, 1870, this window is erected by Fanny, Edith, Eveline, Ogilvy, Alan Herbert, and Henry and Norman Ogilvy."

Holy Trinity Church, Halifax.—The stained glass for a memorial window to the late Rev. Austin Henry Weston, curate at this church, has been placed in its position at the west end. The glass is from the works of Messrs. Ward & Hughes, of London, and the subject is, "Our Lord Blessing Little Children."

Earls Barton Church.—Stained glass has recently been placed in the east window of this church by Mr. Edward Thornton, at whose expense the chancel is now being restored. The window is a narrow Early English triplet, each light being filled with five Scriptural subjects, arranged on types and anti-types from the Old and New Testaments. The subjects illustrated

go across the window, and commence with—1. The Birth of Isaac foretold; The Annunciation; Samson's Birth foretold. 2. Creation of Adam; Our Lord's Nativity; Birth of St. John the Baptist. 3. Sacrifice of Isaac; Our Lord's Crucifixion; Moses lifting up the Brazen Serpent. 4. Lowering Joseph into the Pit; Our Lord's Resurrection; Jonah cast on the Dry Land. 5. Translation of Enoch; Our Lord's Ascension; Elijah taken to Heaven. The whole of the subjects have white diapered backgrounds. The work was executed by Messrs. Bell & Almond, of London.

Books Received.

How to make a House Healthy and Comfortable. By HENRY J. LANCHESTER. London: F. Harvey, 1872.

If we were to say that a reader of the *Builder* would find in this brochure anything he had not seen before, we should say what was not true; but it is necessary to state a truth many times before it will be attended to; and as Mr. Lanchester has set forth succinctly two or three important matters in connexion with fresh air and drainage, his very little book may be usefully circulated. To brighten it up, and end with something like effect, the writer reprints our rhymes, "The New House that Jack built."

The Natural History of the Year. By the late B. N. Woodward, B.A. London: Partridge & Co.

This revised edition of the late Mr. Woodward's pleasant and thoughtful sketch of the history of the months is illustrated by a number of delicate woodcuts from drawings by Mr. Birket Foster and others. It is addressed to the rising generation, and is well calculated to induce an interest in country life, to lead to the study of Natural History, and to open young eyes to what, though around and about them, is often unseen. The cover is a little overdone with gold and colour.

VARIORUM.

THE new number of the *Quarterly* contains what must be called a slashing article on the "State of English Architecture." Slashing to right of us, slashing to left of us, slashing in front of us, echoes and thunders. Much of it is our own thunder, with which, of course, we are satisfied; to some of the other thunder we may offer objections or comments if an opportunity occur. The following paragraph will show the tone in which the writer deals with various modern works:—

"The Church of St. James the Less, at Westminster, has been greatly praised for its decorative work, though it really is but a baby house. Its parti-coloured tower is built with polished marbles up among the clouds, and of magnificently bejewelled level with the eye. Its organ-towers, designed by an architect and manufactured by a mechanic, is so disproportioned as to be absurd, and is quite incongruous with the mean wall that it screens. The interior, chequered all over with bits of colour, is not the serious effort of a man, but mere effluviary and child's play, giving the same wide-mouthed pleasure as a new trick of sleight of hand. The decorations of the roof are for the most part inivisible. The mental debasement which we have already referred to has in this and in many other churches shown itself by making it what children would call 'a place for loggins.' There is a great deal of nonsensical scorn of those who object to Gothic work that it is dark and gloomy; but these childish church architects are the cause, and their works are a justification of this, at first sight, very reasonable objection. At St. James's the aisle windows are mere slits in the wall, not to admit daylight evidently, but to show some small panes of differently stained glass, which cause this dismal darkness, and serve to mystify the weak-headed people for whom such work is sympathetically designed."

Architects "have been the bane of art for the last 300 years," "the architectural gibberish of St. James's Club is cognate with similar discordant and incoherent utterances at Manchester and Balliol;" the new buildings at Kensington Museum are, "in fact, neither 'art' nor in any sense true handicraftsmen's work, but mere machine and copy work; heartless, senseless, and absurd;" Blackfriars Bridge "is really a wonder of depravity"; the Midland Railway Terminus is "a monument of confectionery"; the London University buildings are pointed to as a work of "painful incapacity," and the Piccadilly side of Burlington House is signalled as "the most contemptible public building that the architectural profession has achieved." The denunciation is so general and so loud that it is likely to miss much of its intended effect.—"Notes on Continental Schools. By John F. Moss,

Clerk to the Sheffield School Board. Grant & Co. Fleet-street." Having spent his vacation in visiting some of the schools of Holland and Germany, Mr. Moss wrote these intelligent notes, intending them exclusively for presentation to the chairman and members of his own Board, but they were thought deserving of publication. With regard to the size and general arrangement of the Dutch school buildings, some particulars will interest:—

"In the province of Utrecht the usual dimensions of school-rooms are fixed as follows:—Length, 16 metres, or thereabouts; breadth, 8 metres. (Metres=39.3707 in.) Such a room is calculated to accommodate about 150 children. Wherever practicable a room this size is divided into two parts by glass doors, or some similar contrivance. In villages; however, this is often considered undesirable, owing to the difficulty of employing more than one head teacher. As a rule the elementary schools of Holland are conducted in buildings of one story only. In some districts of the large towns it is not always convenient to follow out this rule; as, for instance, in Amsterdam there is a free school built in three stories, with three large rooms or departments, on a spare lot of ground near the 'School Zeemanshop,' the economists in the council have decided that the ground that part of the town was far too valuable to be lavishly used for one-storied buildings only. But this kind of arrangement is considered objectionable by the educational authorities, and especially by the large schools at Amsterdam which came under the writer's notice, however, the rooms were apparently larger than the size prescribed by the authorities. In the case of Utrecht, the schoolmaster has stated to be upwards of 300 children congregated in one room without any division except in the ordinary arrangement of the classes. The number is sometimes much larger."

"In the planning of Dutch public schools great care appears to be taken that there shall be a thoroughly convenient and well-arranged system of desks, and in all the schools I visited there are gymnasiums, which are occasionally used for other purposes during working hours—such as for singing lessons. But many schools are as yet incomplete in this respect, though the great desirableness of such a provision seems to be generally admitted. In other respects the arrangement of the buildings seemed very complete."

"The desks are placed in groups along the whole length of the room. The teachers seem unanimous in their approval of the short length of desks, and they hold the system to have very marked advantages. As much space as possible is left between each class, and the teachers' desks are placed immediately in front, with blackboards and other apparatus close at hand. The head master's desk seems to be usually fixed on a small platform, so as to command a full view of the whole school. Each child has his or her particular place in the school, assigned at the commencement of the quarter, half-year, or year, as the case may be, and the children retain their places until a change is authorised by the teacher."

Miscellaneous.

Homes for the Working Classes.—At a meeting of the Board of Works, Colonel Hogg, M.P., in the chair, the Parliamentary committee reported on a letter from the Hampstead Vestry as to the desirability of the Board obtaining power to make provisions for house accommodation for the working classes, who will be dispossessed by the proposed improvements of the Board. It had been suggested that certain portions of the land to be taken by the Board should be set aside as building sites for the accommodation of the working classes. The architect had selected three sites to be so set aside, and the committee recommended that the solicitor be instructed to prepare a clause for insertion in the Improvement Bill of the Board, now before Parliament, to this effect. Mr. Dalton, in moving the adoption of the report, said that the works of the Board would turn 1,457 persons out of their homes, and the plots to be set aside would accommodate 3,452 persons. Mr. Richardson moved the postponement of the debate. The chairman said he had been in communication with the Home Office on the subject, and he had been much pressed by members of Parliament to come to a decision at once. The result of his communication with the Home Office was embodied in the report. Mr. Alderman Stone warmly supported the report, which, after some discussion, was adopted.

The Metropolitan Extension Railway.—Erection of Waiting-rooms on the Platforms.—In compliance with a memorial which has just been presented to them, the directors of the London, Chatham, and Dover Railway Company have decided to erect waiting-rooms upon the platforms of the several stations of the Metropolitan Extension line between Ludgate-hill and Victoria. At present the only waiting-rooms at most of the stations on this line are on the lower level adjoining the booking-offices, and passengers must either seek shelter there, and run a great risk of missing their trains, or constantly expose themselves to the inconvenience arising from rain and inclement weather.

The Northampton New Cattle Market.—The new cattle market, now being constructed on the Cow-meadow site, will not be ready for use probably till the end of the year, but progress is being made with it. Roughly speaking, the market occupies about the centre of the ground between the back of Bridge-street, and the railway-embankment. The principal entrance is from the newly-constructed road, which, commencing against A'Beckett House, runs parallel with the New-walk. It is 40 ft. in width, and the actual entrance consists of a double gateway, and the two openings each being of 20 ft. The two gates are to be divided by a large pier, and on each side a lodge, the foundations of which are already laid, will be erected. The lodges will be small structures, will have sharp-pitched roofs, with round turret, their character being of a quaint Continental type. The entrance-road breaks into three branches. One of these continues straight down the centre of the market, whilst the other two branch off to the right and left at right angles along the top, with a width each of 25 ft. There is an octagonal space, in the centre of which a fountain, with drinking-troughs, &c., is to be erected. Besides this fountain there will be four drinking-troughs in the market, near to the main entrance. The works are being executed by Mr. R. Dunkley, of Blisworth, under the superintendence of the architect and surveyor, Mr. E. F. Law. The process of "filling in," so as to raise the level of the market, is now being rapidly proceeded with, and the brickwork is also in a forward state.

The Prizes of the Painters' Company.—The educational movement on the part of some of the London guilds is a good sign, and has not come too soon. The Painter Stainers' Company, which was anciently called, was one of the first, and a comparatively small way, to offer medals and premiums for works connected with "the art and mystery of painting." The subject for which they offer rewards to decorators, artisans, apprentices, and others is described as "altarpieces and decorative paintings," and the prizes, three in number, are,—1st. The Company's silver medal and freedom of the Company; 2nd. The Company's silver medal; and 3rd. The Company's bronze medal. These rewards are open any under the age of thirty years engaged in no trade, and residing within a radius of twelve miles from the Company's Hall. The specimens must be sent in between the 18th and 25th of May. It is to be hoped that some good work will be elicited. The Company do not ask for design (they would probably be disappointed in the result if they did), as the programme says the subjects may be copied either from an antique bust, cast of ornamental grouping, decorative moulding, or otherwise.

Worcester Cathedral Chimes.—The new set of twelve bells in this cathedral has just been furnished with a set of chiming hammers, which very simple contrivance the whole peal may be easily chimed for service by one person. This arrangement is the invention of the Rev. T. Ellacombe, rector of Clyst St. George, Devon, who first set them up at Bitton, Gloucestershire, in the year 1821, where they have been used ever since. They have this great advantage, that they are cheap in construction, and are not liable to get out of order; they are perfectly free from noise, are ever ready, and never the way; neither do they at all interfere with the ringing of the bells, while the lines may be brought down to a manual in any part of a church. The work has been done by Mr. Thos. Cooper, of Woodbury, Devon, church-bell hanger, who has set them up in many other churches. The cost is but 11. a bell, exclusive of travelling expenses.

South Kensington Museum.—Visitors during the week ending 20th of April, 1872:—Monday, Tuesday, and Saturday, free, from a.m. to 10 p.m.;—Museum, 15,753; Naval and other collections, 2,726. On Wednesday, Thursday, and Friday (admission 6d.), from a.m. till 6 p.m.;—Museum, 2,936; Naval and other collections, 131. Total, 21,547. Average corresponding week in former years, 13,280. Total from the opening of the Museum, 535,811.

New County Lunatic Asylum for Kent.—Justices for Kent have approved of the purchase of 114 acres of land on Chartham Downs, at a cost of 5,866l., being at the rate of 51s. per acre, upon which to erect a new asylum for lunatics.

Railway Conference on the Refreshment-room System.—A meeting of directors and managers of railway companies, at the Westminster Palace Hotel, has been conferring upon the present arrangements and management of refreshment-rooms at railway stations, especially in regard to the increasing facilities thereby afforded for the sale of intoxicating liquors, not only to the public, but to railway officials and servants, and upon measures to mitigate the evils arising from the present system. It was convened by the National Temperance League, who propose the prohibition of the sale of intoxicating liquors to railway servants whilst on duty; the provision of tea and coffee of good quality; and the free supply of filtered water. At the close of the discussion it was unanimously decided to suggest, amongst other proposals, to railway Boards throughout the kingdom: that intoxicating liquors should not be hawked on any station; that the rules against the railway servants on duty purchasing intoxicating liquors should be rigidly enforced; that the propriety of excluding the sale of spirits at refreshment-rooms (at any rate at many stations) should have the attention of the Boards; that in relating the refreshment-rooms care should be taken by the Boards that simple refreshments, such as tea and coffee of good quality, should be sold at moderate prices; and that all the main stations on each line should, as far as possible, be supplied with good drinking water, in convenient places, free of charge.

Royal National Hospital for Consumption.—This institution is making good progress towards the completion of the design of its founder, Dr. Arthur Hill Hassall. The hospital is destined to find accommodation for upwards of 100 male and female patients in eight separate blocks of buildings on the cottage principle, erected at the Undercliff, Ventnor, Isle of Wight. Three blocks of buildings have been completed, and a fourth block is now commenced, Sir William Martins having undertaken to bear the entire cost of its erection. During the past year 53 men and 36 women in-patients have received the benefits of the hospital, besides 22 out-patients. The Chairman of the Biennial Festival, the Bishop of Winchester, stated that at present the hospital had only 500l. per annum of annual subscriptions, whilst it required at least three times as much. At this moment there were 50 applicants for admission who could not be admitted for want of room. The chapel fund was progressing; about 700l. had been subscribed for the purpose. A gentleman had undertaken to build one of the houses of the fifth block as soon as some equally benevolent friend came forward to erect the adjoining house. The secretary (Mr. Ernest Morgan) subsequently announced a list of subscriptions amounting to 2,000l. Dr. Hassall also announced that "An Anonymous Lady" had made a gift of 1,500l. towards the erection of the fifth block.

New Thoroughfare from Woodbridge-street to Clerkenwell-close.—The Clerkenwell Local Board are taking steps for the construction of a new thoroughfare from Woodbridge-street to Clerkenwell-close, passing the south boundary wall of the House of Detention. For the purposes of this improvement, the magistrates have offered to transfer gratuitously to the parish a strip of land outside the wall recently purchased by the county for the enlargement of the prison. The proposed new road will lead into St. James's-walk, and it is considered that it will be a great public improvement.

Lamps on the Thames Embankment.—At the meeting of the Metropolitan Board of Works last week, a letter from Mr. Parkes, contractor for the globe lamps on the Thames Embankment, was read, asking permission to supply the United States Treasury, by request, with a duplicate of the lamp and drawings of the standard. The Works Committee recommended that the request be granted, and that the United States Treasury be also permitted to have the use of the core-boxes, for the purpose of casting the standards at their own expense. On the motion of Mr. Runtz the recommendation was carried.

Bells and Gun Metal.—Much of the cannon taken by the Germans in the French war is to be turned into church bells. In this way not less than twenty parishes on the Rhine alone have been provided with bell-metal. The Cathedral of Cologne and that of Frankfort-on-the-Main have also received some.

Proposed New Town-hall, Northallerton.—The directors of the Northallerton Market and Public Improvement Company have approved of the designs submitted by Messrs. Ross & Lamb, architects, Darlington, for the erection of a Town-hall, consisting of a covered Market-house and Assembly-room, in the centre of the town, and the old, insightly shambles, which have disfigured the fine town-street for so many years, are being pulled down. The new town-hall will cover a space of 110 ft. by 35 ft., and will afford shelter and accommodation for country butchers, parties attending with butter, eggs, and farm produce. There will also be vaults and cellars for depositing and packing the same, and every requisite convenience. The public room will be 72 ft. long by 32 ft. wide, with a handsome staircase, a raised platform, ladies' and gentlemen's retiring-rooms, cloak-rooms, &c. The contractors are Mr. Richd. Peacock, Northallerton, for excavation and brickwork; Mr. I. Hope, Darlington, plasterer; Mr. Thomas Thompson, Northallerton, joiner; Mr. J. Baines, Ripon, slater; Mr. George Layfield, Northallerton, plumber; Mr. W. T. Cooper, Northallerton, painter; Messrs. Hyerleid & Spence, Middlesbro', founders; and Mr. James Dodgson, Northallerton, stonemason.

Great Western Telegraph.—A company, to be called the Great Western Telegraph Company (Limited), has been incorporated, with a capital of 1,350,000l., in 67,500 shares of 20l. each, to connect New York with England, and the West Indies directly both with New York and England. A comparatively short cable may also continue telegraphic communication to Brazil. The route will be from the Land's End to Bermuda, and with one line, thence to New York, and another to St. Thomas's, in the West Indies. A contract for the making and laying of the cables for the price of 1,330,000l. has been made with Hooper's Telegraph Works (Limited), upon the basis of a specification for a similar cable recommended by Sir Samuel Canning, C.E., and Mr. Latimer Clark, C.E., last year, and recently revised by Sir William Thomson, F.R.S., and Mr. Fleming Jenkin, the company's engineers and electricians.

Worcester Model Dwellings Association.—An adjourned meeting of this association was held at the Guildhall on Thursday, April 18th, Mr. John Parker presiding. Mr. Aldrich, hon. sec., stated that the committee had investigated the financial condition of the association, and found that there were liabilities, principally to tradesmen, amounting to 300l. Mr. Parker had offered to allow 100l. due to him to remain unpaid, and Mr. G. W. Hastings had undertaken to advance 100l. if an equal sum were provided by other members of the association. It was pointed out that either the liabilities must be met, or the property sold. A strong desire was expressed that the work of the association should be continued, and ultimately the gentlemen present agreed to advance the amount required to make the 300l., with which all debts will now be paid.

The Universal Foul Air Purifier.—Under this title Mr. Lidstone has registered a compact little arrangement for holding charcoal to be affixed to the end of vent-pipes of drains carried to the tops of houses or other positions. He says,—

"For ventilating public sewers, vent-pipes can be carried into the interior of lamp-posts, and this purifying apparatus may be placed in the lower part of such lamp-post or receptacle, the pipe being carried from the top of the purifying apparatus to the top of the lamp-post." The specimen sent to us is much too small to be of any use, but this defect is, of course, open to easy remedy.

International Exhibition.—In connexion with the western annex of the International Exhibition building, South Kensington, Mr. T. G. Messenger has erected for the Commissioners a Cotton House, or house for the growth and exhibition of the cotton plant. The framework is of iron, and the enclosing materials are slate, slabs and glass. The heating-apparatus evidently provides for a high temperature, and the arrangements for opening all the lights at once are simple and ingenious.

Discovery of Antiquities in Belgium.—Excavations for archeological purposes have been lately undertaken at Jupille, in an ancient place of sepulture in Belgium, and have resulted in the discovery of a considerable number of skeletons, one of which had on the neck a golden collar. A remarkably fine mosaic pavement has been discovered.

Restoration of the Spire of St. John's Church, Bury St. Edmunds.—A meeting of the parishioners of St. John's having been called for last Tuesday evening, to receive the report of Mr. J. D. Wyatt, of London, the inspector of churches for the Archdeaconry, on the condition of the spire, the report was read, and the Chairman observed that there could be no doubt from this report that they ought to repair the spire without loss of time, and the first thing would be to decide who should erect the necessary scaffolding. In the course of conversation the opinion was generally expressed, and confirmed by Messrs. Tooley & Robinson, that the scaffolding should be constructed by the builder who did the repairs, and whose men would work on it with more confidence if they raised it themselves as they went along. Mr. Tooley believed the work would not cost in all less than from 200*l.* to 250*l.* The Chairman remarked that it was important there should be no delay, so that they could get the lightning-conductor up before any thunderstorms came. He had no fear of being able to raise the money. The meeting appointed a committee to collect subscriptions—first in the parish and then out of the parish, and it was resolved that advertisements should be inserted in the local papers, calling attention to the report and soliciting subscriptions.

The Difficulty of Estimating Cost of Drainage.—As a proof of the difficulty of estimating drainage works, where water is present in the soil, we may mention that Mr. Aird, one of the leading contractors in the Metropolitan Main Drainage Works, made the following statement publicly at a meeting of the Institution of Civil Engineers in London:—"With respect to the cost of construction, he could state that, with few exceptions, they were executed within the contract price. One of these exceptions occurred in a portion of the work on the premises of the Deptford Gas Works, where it was intended to put up a gasholder. To facilitate this, the work of the sewer underneath, for a length of 130 ft., was commenced. Unfortunately, the contractors were not able to carry it out. His firm then undertook the work, and completed it. The estimated cost was about 2,000*l.*, whereas it actually cost upwards of 16,000*l.*"

Northern Architectural Association.—The fourteenth annual meeting of the members of this association was held on the 10th inst., at the Old Castle, Newcastle-on-Tyne, Mr. J. Hogg presiding. Mr. Thomas Oliver, the hon. secretary, read the annual report, which gave a *resumé* of the operations of the association during the past year, and also expressed congratulation on the number of members, which amounted to sixty-one, being an increase of one. The finances were also in a satisfactory condition, there being a balance of 19*l.* 7*s.* 9*d.* in the hands of the treasurer. The report was adopted. Mr. W. J. Shotton, of Sunderland, and Mr. Robert Lamb, of Darlington, were elected members. Mr. Oliver and Mr. Thompson were appointed delegates to the Architectural Alliance meeting, and to the annual Conference of Architects proposed to be held in May next.

Restoration of Exeter Cathedral.—A preliminary meeting, under the presidency of the Earl of Devon, and subsequently of Earl Fortescue, was held, on Tuesday last, at the residence of Mr. E. B. Stevens, A.R.A., 110, Buckingham Palace-road, for the purpose of forming a committee of Devonshire and Cornish men resident in London to promote a subscription in aid of the restoration of the cathedral of the diocese. The meeting was unanimously in favour of such a committee being formed, and we believe a list of members will shortly be published.

The Lister Statue.—At a meeting of the committee charged with the duty of arranging for the erection of a statue of Mr. S. C. Lister in a central part of Bradford, it was resolved to give a commission to Mr. M. Noble, of London, sculptor, to execute a colossal statue of Mr. Lister in Sicilian marble, at the price of 1,000*l.* The figure will be 10 ft. in height, and will be erected on a granite pedestal of 11 ft. or 12 ft. in height.

Metropolitan Water-Supply.—In reply to a question in the House of Commons, the President of the Board of Trade (Mr. Fortescue) said the Board had no power whatever to regulate the sources of the water-supply of the metropolis, except to prevent the water being taken from below Teddington Lock.

Archaeological Discoveries at Uttoxeter. Mr. F. Reelfers, of this town, has within the last nine months made a series of discoveries of interest, sites of Roman stations, from three of which he has Roman pottery. One station he points out as being on Uttoxeter High Wood. He has pottery from this station of which the north side remains perfect. He believes the premises of Dr. Taylor, situated in High-street, is the site of another, a small part of the terrace of which remains in the croft near the Hope and Anchor inn. He points out a third station at Stramshall, where he has made numerous excavations, and in all met with Roman potsherds, one piece of which is ornamented. The site of the fourth station he is enabled to identify as at Madeley Holme, in the Madeley field, where he has dug and met with ample evidence of the character of the place by the discovery of many fragments of late Roman pottery. He connects with the last a series of fine terraces at each side of the hill, remaining perfect on the west side, and constructed, he believes, most probably for defensive purposes rather than for cultivation. He also connects with these stations a meshwork of Romano-British mazes.

New Well-Boring Engine.—A new boring apparatus has been made at the Eagle Foundry, Ipswich, for Meux & Co.'s London brewery. The leading feature is the employment of a large flat rope in lieu of iron rods, the advantage of rope over rods being that the former can be drawn from the bottom of the well to the top or lowered from top to bottom in three minutes, while the rods would take more than an hour. The jumping cylinder is so adjusted that the tool can give a very powerful blow and also one hardly sufficient to crack a nut. The double cylinder winding-engines in connexion with the boring-engine are capable of drawing out 10 tons at a time. The depth intended to be bored at Messrs. Meux & Co.'s brewery will exceed 1,100 ft. The well will be sunk under the direction of Mr. Allison, who claims patents on parts of the boring-machine.

Alvescott Parish Church.—During the restoration of this church the following remains were discovered, and have been preserved.—An altar slab, reredos, Easter sepulchre and ambrey, double sanctus bell niche, leper's window with two book ledges in thickness of the wall adjoining, two squints from north and south chanceries, piscina, reliquary, and three consecration crosses. The old fifteenth-century panels in the south transept, alternate red and blue, with gilded stars and bosses, were too rotten, owing to past neglect, for present restoration; but the new roof of the transept has been so arranged that at any time the panels may be reproduced and set on the inner face, so as to restore the old appearance.

The Mazarin Bible.—An important discovery has recently been made by Mr. Richard Sims, of the British Museum, in the course of his researches in the Archbishop's library at Lambeth Palace. He found that a volume, described as a manuscript, was in reality a fine example of an early printed book, which further examination proved to be the second volume of the celebrated Mazarin Bible. The "Mazarin Bible" is the earliest printed edition of the Bible known. It is supposed to have been printed by Gutenberg and Faust, at Mentz, between the years 1450 and 1455, and it is probably the first book printed with movable metal types.

Slip of Wall.—An accident occurred last week at Pathhead, Fifeshire, whereby five men were killed, and four severely injured. The men were employed in building a retaining wall at a new floorcloth factory at present in course of erection by the Messrs. Naum. The wall had reached a height of about 60 ft., when it gave way, burying the men in the ruins. It appears that the wall was about 4 ft. thick, and as it rose it was filled in behind with sand and earth from the bank which it was intended to keep up. The earth is supposed to have sunk, and by its pressure caused the wall to give way.

Houses unfit for Habitation.—The Holborn Board of Works, acting upon the recommendation of their surveyor and medical officer, have required the owner of these houses in Ormond-yard to demolish the premises, under the provisions of Mr. McCallagh Torrens's Artizans and Labourers' Dwellings Act. It was stated at the Board meeting that no structural alterations or improvements could possibly render the houses fit for human habitation.

Opening of the Free Museum, Nottingham.—The museum in Wheeler-gate, now the property of the town, has been formally opened by the mayor, in the presence of an influential company. The greater portion of the objects of interest which the museum now contains was the property of the Nottingham Naturalists' Society, and a considerable number of valuable objects were from time to time added, until the museum assumed the dimensions which it has had for the last few years. The place in which the exhibition was placed was for some period the old Mechanics' Hall, but previous to the fire by which that institution was destroyed, convenient rooms had been secured in Wheeler-gate. When the corporation resolved to adopt the Public Libraries Act, the society offered the museum, and a small but useful library, to the town, and the offer was accepted by the council. The re-arranged cases occupy two good-sized rooms, and objects of interest and value are to be found therein, illustrative of many very important departments of natural history.

The Crystal Palace Picture Gallery.—The annual exhibition of new pictures of the English, French, and Belgian schools opened on Saturday last. The private collection of Mr. James Virtue, containing eighty valuable pictures and water-colour drawings, also being shown in a special side gallery. In one of the private galleries there is a collection of modern paintings lent to the company for exhibition by the proprietors of the *Art Journal*. Mr. S. C. Hall has lent for exhibition some water-colour copies of Frith, Creswick, Ansell, Herbert, MacIse, Enslin, Elmore, Leslie, J. H. Mann, Webster, Newton, and Bellows. At the south end of the gallery there are 131 copies of celebrated paintings by the old masters, culled from the principal picture-galleries in Europe. The copies have been made in water-colours by Mr. West, and being the property of the Crystal Palace Company, who value them as artistic studies, are not for sale.

Extension of a North London Railway Station.—The railway-station in Broad-street, jointly used by the North London and the London and North-Western companies, has for some time been undergoing a considerable enlargement by the erection of additional offices and buildings for the London and North-Western Company, built at the expense of that company. The additional buildings, which have just been completed, have extended the principal elevation of the station to almost double its former dimensions. The newly-erected portion of the structure is uniform in design with the rest of the building, but a special feature in the added part just finished is that the elevation is composed of an admixture of red, black, white, and yellow bricks.

The Reconstruction of Farringdon Market.—The Court of Common Council has had a strong party debate as to whether the decision of the Court that the Farringdon Market should be reconstructed, in order to provide room for the sale of vegetables and fruit, should be frustrated or not. Mr. Isaacs led an opposition which objected to the raising of 150,000*l.* necessary for what modification might be made in the original plan. A long and noisy controversy ended in Mr. McGeorge carrying the adjournment of the debate, and giving notice to move the rescinding of the resolution.

The London Gas Companies.—An important conference has been held at the Vestry-hall of St. Martin-in-the-Fields, to consider how the interests of gas consumers are affected by the Chartered Gas Company's Bill, in the Lords. The conference was unanimous in resolving to oppose the Bill, which has already been challenged as unfair to consumers by the Metropolitan Board. The Chartered Gas Company seek additional capital to the amount of 1,000,000*l.*, and power to pay upon this a dividend of 10 per cent. to the shareholders.

The City Surveyorship, Norwich.—The council have considered the appointment of a surveyor in the place of Mr. Benest, resigned. It was resolved that the matter be referred to the corporate officers' salaries committee to report to the council. It seemed to be the general feeling that there should be only one surveyor instead of two as heretofore.

Theatre Burnt.—The Theatre Royal, Melbourne, has been destroyed by fire.

The Royal Pier at Southampton.—The works connected with the extension now approach completion. The pontoon, having been repainted and fitted into its place, the iron bridge connecting it with the pier has been dropped upon the iron tanks provided for its reception. The strengthening of the pier provides deep water at all tides for the steamers of the Isle of Wight company, and is an additional attraction to romancers. The steam packets will also have advantages in embarking and disembarking their passengers and freight.

Reading Architectural and Archæological Society.—At a general meeting of this society, held on the 17th inst., at the Athenæum, an essay was read on the subject of "Bells," by Mr. A. E. L. Oswell, who, in the course of his paper, dealt exclusively with the general history of the bell, the origin of chime-ringing, the number of variations possible to be played on various peals, and the history of some remarkable specimens of bells. In the concluding part of his essay, he gave a description of the method manufacture.

Figledean Vicarage.—On the 6th instant the corner stone of a new vicarage was laid in this village by the Bishop of Salisbury. There was an appropriate service, conducted by the Rev. H. C. de St. Croix, assisted by a village choir. Enough of the brickwork appeared to give the visitors some idea of the nature of the new building, which is to be externally decorated with red bricks, relieved with bands of paper brickwork, &c. The designs are by Mr. T. White, London; and the builder is Mr. T. Gregory, of Clapham Junction.

New Pottery Galleries.—Extensive galleries are nearly completed in Orchard-street, Portman-square, for Mr. John Mortlock. The new galleries are 120 ft. long by about 22 ft. in breadth. The main gallery is some 22 ft. high, with recessed and panelled ceiling, frieze, and dado. The works, which have been in hand about four months, are being carried out under the direction of Mr. Nash, architect, Royston, by R. J. Sutton, of Putney. The foreman of works is Mr. M. H. Judge.

TENDERS

For villa, at Teddington. Messrs. Thicke & Wilson, architects.—

Table with 2 columns: Name and Amount. Includes Dove, Brothers (£1,825 0 0), Bishop (1,785 0 0), Sibly & Son (1,765 0 0), Williams & Son (1,742 0 0), Grover (1,685 0 0), Hurst (1,650 0 0), Macy (1,645 0 0).

For new verandah round the present refreshment-room, at Horseay Park, for Mr. Gatti. Mr. A. J. Bolton, architect. Quantities supplied by Mr. Pimmsall:—

Table with 2 columns: Name and Amount. Includes Mann (£500 0 0), Bowman (670 0 0), Williams & Son (555 0 0), Carter (547 0 0), Hill & Sons (accepted) (524 0 0).

For new factory, in Hornsey-road, for Mr. W. Culmer. Mr. John Viney, architect:—

Table with 2 columns: Name and Amount. Includes Toop (£738 0 0), Heath (698 0 0), Danford (630 0 0), Spurgeon (573 0 0), Hawkes (accepted) (510 0 0).

For addition and general repairs to house, Lordship-lane, Stoke Newington, for Mr. Bird. Mr. John Viney, architect:—

Table with 2 columns: Name and Amount. Includes Madgin, Jun. (£515 0 0), Deveraux (510 0 0), Garland (390 10 0), Hawkes (365 0 0), Heath (accepted) (353 0 0).

For new residence, at Hornsey, for Mr. E. Smeeton. Mr. John Viney, architect:—

Table with 2 columns: Name and Amount. Includes Hawkins & Ward (£549 12 6), Parsons (530 0 0), Heath (483 0 0), Hawkes (accepted) (465 0 0).

For stables, looms-houses, forges, and chimney-shaft in the of the Oxford and Cambridge grounds, Chalk Farm, for Mr. Chas. Martin. Messrs. Tosh & Hayward, architects. Quantities supplied by Messrs. Pimmsall & Co.:—

Table with 2 columns: Name and Amount. Includes Hill & Son (£5,661 0 0), Kelley, Brothers (5,030 0 0), Mann (5,565 0 0), Manley & Rogers (5,462 0 0), Aitchison & Walker (5,268 0 0), Robbins & Co. (5,275 0 0), Scrivener & White (5,267 0 0), Bowman (5,257 0 0), Williams & Son (5,177 0 0), Jay (5,134 6 8), Goodman (4,897 0 0).

For school and residences, at Grays, Essex, for the School Board. Mr. T. R. Naples, architect. Quantities supplied:—

Table with 2 columns: Name and Amount. Includes Gibbons (Total £3,440 0 0), Taylor & Son (2,903 215), Thora (2,797 238), Wallis (2,733 247), Blake (2,730 255), Cobham (2,672 268), Joslyne (2,633 270), Stephenson (2,503 278), Tyler (2,500 300), Niblett (2,440 320), Cattell (2,440 335), Dover, Walls, & Co. (2,317 339), Wright & Co. (2,275 339), Crook & Will (2,135 330), Shipman (1,750 200).

For Newdigate School:—

Table with 2 columns: Name and Amount. Includes Lynn & Dudley (£1,550 0 0), Johnson (1,421 0 0), Hill & Sons (1,399 0 0), Shearburn (1,340 0 0), Hamplin, Brothers (1,252 0 0), Putney (1,223 15 0), Inkpen (1,150 0 0), Chart (accepted) (1,100 0 0).

For free library and museum, at Blackburn, Lancashire, Messrs. Woodzell & Collett, architects. Quantities by Messrs. Taylor, Son, & Jackson:—

Table with 2 columns: Name and Amount. Includes Stephenson (£8,000 0 0), Abbott (7,350 0 0), Ashworth & Broughton (6,807 11 0), Cotterall (6,980 0 0), Cooke & Green (6,915 0 0), Mansell & Dent (accepted) (6,920 0 0), Higham, Brothers (6,475 0 0).

For a family residence, Brunswick-square, Brighton, and alterations to adjoining property, for Mr. John Preston. Mr. F. Warburton Stent, architect:—

Table with 2 columns: Name and Amount. Includes Perry (£6,284 0 0), Gammon (6,246 0 0), Turner (6,138 0 0), Chappell (5,972 0 0), Colls (5,628 0 0).

For a hop warehouse, in Bermondsey-street, for Messrs. Beeman & Hotokin. Messrs. Wadmore & Baker, architects. Quantities supplied:—

Table with 2 columns: Name and Amount. Includes Myers & Sons (£3,427 0 0), Dowds (3,290 0 0), Dove, Brothers (3,185 0 0), Rider & Son (3,108 0 0), Jackson & Shaw (2,955 0 0), Gammon & Sons (2,894 0 0), Browne & Robinson (2,867 0 0), Scrivener & White (2,804 0 0), King & Son (accepted) (2,570 0 0).

For new house, on Hampstead-heath. Mr. C. Eales, architect. Quantities supplied:—

Table with 2 columns: Name and Amount. Includes Watson, Brothers (£1,975 0 0), Mann (1,945 0 0), Kelly (1,883 0 0), Scrivener & White (1,828 0 0), Clowser (1,792 0 0).

For shops and offices, corner of the Poultry and Old Jewry, City. Mr. Herbert Ford, architect. Quantities supplied by Messrs. Karslake & Mortimer:—

Table with 2 columns: Name and Amount. Includes Nightingale (£8,876 0 0), Higgins (8,628 0 0), Stinson (8,176 0 0), Meyers & Son (8,155 0 0), Perry, Brothers (8,039 0 0), Brass (7,931 0 0), Kilby (7,782 0 0), Couder (7,791 0 0), Perry & Co. (7,676 0 0), Browne & Robinson (7,439 0 0), Scrivener & White (7,431 0 0), Turner & Sons (7,430 0 0), Henshaw & Co. (accepted) (7,995 0 0).

For additions and alterations at "The Cedars," Old Charlton, for Mr. Sharpe. Mr. Geo. Elkington, architect:—

Table with 2 columns: Name and Amount. Includes Fox (£3,060 0 0), Elliott (2,274 0 0), Cawdran & Corne (2,132 0 0), Wood (1,708 0 0), Cooke & Groome (1,423 0 0).

For new manufacturing premises, at Chelsea, for Mr. F. Bell. Mr. Dovey, architect. Quantities supplied by Mr. Shrubsole:—

Table with 2 columns: Name and Amount. Includes Perry & Co. (£1,875 0 0), Turrell (1,712 0 0), Sawyer (1,590 0 0), Peares (1,450 0 0), Gough (1,449 0 0), Brown (1,415 0 0), Cooke & Groome (1,287 0 0), Tucker (1,162 10 0).

For house in Bloomham-road, Bedford, for Mr. James Corcoran. Mr. Horsford, architect. Quantities supplied:—

Table with 2 columns: Name and Amount. Includes Moore (£1,685 0 0), Power (1,628 0 0), Haynes (1,505 0 0), Freshwater (1,450 0 0), Litchfield (1,332 0 0), Spencer (1,268 0 0), Dover, Wills, & Co. (1,229 0 0).

For farmhouse, Irnham, Corby, Lincolnshire. Mr. J. Lavender, architect:—

Table with 2 columns: Name and Amount. Includes Story (£1,235 5 11), Putnam & Co. (1,155 0 0), Kirk & Parry (1,130 0 0), Hubbard (1,095 0 0), Ridd & Son (975 0 0), Langmaid & Way (945 0 0).

For four shops, at Rotherhithe. Mr. George Stooke, architect:—

Table with 2 columns: Name and Amount. Includes Daniels (£1,825 9 0), Machine (1,184 10 0), Stentford (accepted) (1,107 0 0).

For alterations to stables, Frognaul-rise, for Mr. W. H. Wills. Mr. R. Walker, architect. Quantities by Mr. W. E. Stouler:—

Table with 2 columns: Name and Amount. Includes Clowser (accepted) (£541 0 0).

Athenæum, Camden-road.—Add to list given in our last Health, 3,265.

TO CORRESPONDENTS.

Country newspapers should be marked.—F. B. P.—Nemo.—F. R. G.—Messrs. H. J. V.—A. H. G.—R. H. C.—O. J. P.—M. F.—S. L.—T. G.—J. S.—E. K.—W. R. R.—L. & W.—W. & C.—L. & Co.—B. N.—C. E.—Dr. M.—R. F. C.—A. H. G.—J. R.—S. & Co.—P. & B.—H. C. W.—P. S. A.—A. C. P.—Thurman Jun.—H. J. W. (was forced to decline recommending)—H. T. E. (next week; too late for this), Messrs. F. (ditto)—M. H. J. (ditto)—Nemo (ditto).

We are compelled to decline pointing out books and giving addresses. All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication. Note.—The responsibility of signed articles, and papers read at public meetings, rests of course with the authors.

NOTICE TO SUBSCRIBERS.

Advertisements cannot be received for the current week's issue later than THREE o'clock p.m. on THURSDAY.

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In consequence of the Reduction in the Newspaper Postage, Subscribers within the United Kingdom can now be supplied with THE BUILDER direct from the Office at the rate of Nineteen Shillings per annum, PAYABLE IN ADVANCE.

The Publisher cannot be responsible for TESTIMONIALS left at the Office in reply to Advertisements, and strongly recommends that COPIES ONLY should be sent.

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Architects, before committing themselves to any system of Warming, should send to TRUSWELL, BROTHERS, & HOLDEN, 100, Nottingham-street, Sheffield, for a prospectus of their Improved Patent Hot-Air Apparatus. [ADVT.]

The Builder.

VOL. XXX.—No. 1526.

Conference of American
Architects.

ARCHITECTS in America are moving anxiously. We have just now received the printed report of the "Proceedings of the Fifth Annual Convention of the American Institute of Architects," held in Boston at the close of last year, and may usefully give some extracts and particulars. Mr. Richard Upjohn, the President of the American Institute of Architects, opened the meeting. In the course of his address, he said:—

"The increasing appreciation of the subject of architecture by the community at large, though gradual, affords cheering indications that our labours are beginning to impress and educate the minds of our people. In this connexion it may be well for us to consider with what aids and among what influences and associations we are working in our endeavours to perfect and embody our art. In the first place, as regards ourselves, we are differently situated from those of our profession who labour in countries abounding with ancient examples. Such witness of evidence and power as it spread over the Old World, it is not ours to enjoy. It is true, many of us have had our experience of architecture enlarged and improved by a twelve months' tour, more or less, through Europe and other countries. But, after all, this is a poor repeat when compared with the continued feast of those who dwell among the works of past ages, and are awakened to note the wonderful creations surrounding them. The innumerable precedents which older examples present are invaluable to those who are anxious to learn. Then, again, the people of those countries, whose civilisation and culture so long ante-dates what is to be found amongst us, are more or less alive to the beauty of the works of their ancestors, and they are ready to accept the labours of those whose vocation it is to restore and recreate the works of old.

We have not those advantages, our situation is different; our country is in its youth, our fathers, for generations back, were not reared on the soil which the present generation call, by right of birth, their own. No great monuments of finished art and laborious devotion, such as grace the Old World, have been for ages impressing their lessons on the minds and hearts of the children of this new land of ours. We and our children have grown and matured without such influence and education. But it is our mission, as a profession, to worthily supply in this new field these educators, so that at least we be not less faithful to the men of the future than, in other lands, the men of the past have been to those of the present. We are engaged in this very work now, when we produce, with fitting accompaniments and originality, what has been taught us by those of old time. Following in the well-chosen steps of those who have preceded us asking for the old paths, yet ourselves leading in the direction of an intelligent and timely progress, we shall have followers who will appreciate our aims, and labour with and after us in establishing truthful works. And, indeed, we are not without encouragement from the great mass of intelligent people among whom we labour. The increased facilities of communica-

tion with Europe, which are yearly drawing great numbers of our people into contact with the very examples which we would wish them to study, have been the means of leading them to accept and appreciate the well-directed efforts of the profession. Men who have once seen and tasted of the beautiful, will not be long satisfied with what is inferior, especially if they have the means to provide for themselves what they have learned to admire and wish for. In the single instance of decoration, witness what an encouraging advance has been made during the past ten or twenty years. And generally it might be said that the revival of architecture, in all departments, which is to be found in France and England, is being felt to a large extent, as a salutary influence and impetus amongst us. The art of photography, which has reached so high a standard, has contributed much toward the spread of enlightened views and appreciation of architecture. Another encouraging feature of the times is to be noticed in the increased facilities of transportation, which have brought within the reach of almost every market the large varieties of stone and other building materials, in which our country so abounds. Owing to those facilities, we have been able to utilise, and that sometimes in combination, stones and marbles of various formations and colour; therein, certainly, the architect finds a wide and interesting field for the exercise of his best taste and skill."

Amongst the various reports brought up came one on Education. The committee said:—

"The problem of architectural education, then, as a practical problem, is simply this: How can a young man, in addition to the general culture to which he may aspire, attain such training in the elements of this professional knowledge as will entitle him to a cordial reception as a paid draughtsman in an architect's office?"

The practical answer to these questions is twofold. There are two courses that a young man may pursue to this end. He may enter an office as a pupil, or he may enter a school of art or science as an architectural student. The office-training has the advantage in point of pertinence, it being an exact training for office-work; but it is almost necessarily deficient in breadth and system. A young man trained in this way is taught the use of his instruments, and soon acquires the handiness needful for the kind of work he is set to do; but he has no opportunity to learn to draw except with his T-square, and for the history and principles of his own art or of art in general, he must depend upon his own enterprise and such resources as he can, out of hours, command. An intelligent fellow may, in this way, learn a good deal, but it cannot be said that he is taught much. It has been proposed, and has of late been urged in England,—where the problem of professional education is receiving much attention,—that the numerous educational appliances already existing, in the shape of isolated courses of history, construction, crayon drawing, water-colours, &c., should be made use of to supply the deficiency of training, and that if students and draughtsmen will not attend the evening courses, which it appears they do not, time should be allowed for the article pupils, at least, to profit by these opportunities in the day-time. But it would seem hardly to require argument or the test of experiment to show that this demand is unreasonable, and impossible to be met. On whatever terms a pupil may be received in an office, he cannot, in the conduct of office work, be distinguished from the draughtsman and assistants. The work given to him is as necessary to be done as that given to them, and he, no more than they, can be sent off in the middle of the day to improve his mind."

It was pointed out that courses of architectural instruction had been established in various educational Institutes. The report from Chicago showed that there are about sixty architects practising in that city with little or no uniformity as to general rules and regulations; further, that they greatly needed a library for general reference, all the private libraries with but one or two exceptions having been destroyed by the fire.

The report of the Secretary for Foreign Correspondence (Mr. H. A. Sims) showed that with a view to establish friendly relations with foreign art societies, he had been in correspond-

ence with the Institute of Portuguese Architects; the Architectural Institute of Scotland; the Royal Institute of Architects of Ireland; the Architects' Union of Berlin; the Architectural Union of Hamburg; the Austrian Engineers' and Architects' Union of Vienna; the Imperial Academy of St. Petersburg; the Archaeological Society of Athens, through Mr. Robert P. Keep, U.S. Consul; the Architects' and Engineers' Union of Hanover; the Architects' and Engineers' Union of Breslau; the Central Society of Architects of Paris; and the Society of Architects of the Department of the North, at Lille; an interesting list.

The Committee on Professional Practice, in their report, after commenting on the childish and barbarous spirit of professional rivalry, at once suicidal and fratricidal, that damages the profession, proceeded:—

"If it is true that it is rather through ignorance and want of thought than from any malicious purpose that the public deal so hardly with the profession, it is even more the case that it is thoughtlessness and ignorance of the real and permanent good in the profession itself rather than malice that has prevented, and still prevents, a hearty and even generous co-operation in the endeavour after a more wholesome professional life. It is owing to the absence of well-understood and intelligently accepted principles of conduct, and of clearly-defined maxims, that the false lights of momentary interest lead men astray. Now, in our own professional relations nothing is defined or clearly understood, and an intercourse with each other is too often that of well-meaning blunders, inflicting the greatest injuries and committing the most unpardonable breaches of manners and morals in utter innocence and ignorance. Hence jealousies, slights, heart-burnings, backbitings, and all manner of uncharitableness. It is just so in business: amateurs in stock-johing do things, in a conceit of shrewdness or smartness, and under a general notion that all is fair in war. They are the more to blame, for the difference between honest conduct and swindling. The rules of behaviour in these particulars, however ignorant of them we have grown up, were, in fact, settled long ago. But with us it is not so; the profession is, in a sense, a new one. Its relations are exceedingly complicated and difficult. The distinction between the proprieties and the improprieties is by no means an innate idea; and so it happens that, confident in our integrity, but quite ignorant of any general principles of conduct and of scruples, we do things for which the terms unprincipled and unscrupulous are a feeble characteristic. These things are not confined to the young or to the viciously-inclined. We all, trusting in the absence of any well-established principles of professional conduct, to the rectitude of our purposes, stumble blindly at times into regretted ways. It is by bringing light into such obscurity that professional associations like this find their best work. It is thus that in the medical and legal professions well-understood codes of behaviour have been established, that, like the code of manners which regulates the intercourse of daily life, lifts them out of the mere brute struggle for existence into life of intelligent and fraternal co-operation. We are still very much in the barbarous ages. But something may easily be done by a comparison of opinions upon some prominent points to settle the right rule of conduct. It is the uncertainty of the moral law that provokes these sharp animosities, and the very existence of such a code, even if it were difficult and uncertain in its applications, would at least tend to foster the spirit of scrupulousness, that sense of the difficulty of the situation and of the need of care and circumspection, which is the essence of practical morality, the chief safeguard of conduct."

The question whether an architect should give "supervision" or "superintendence" to his building, led to an interesting discussion. It was generally agreed that the architect should retain the chief control, but this, as it seems to us, was not the real point of the inquiry, which, in reality, opens a question that may be very usefully discussed further.

A paper on Terra Cotta was read by Mr. Sturgis; and Mr. Wight made a valuable statement as to the effects of the fire at Chicago. A

dinner closed the proceedings at the end of the second day, when several addresses were delivered of more than average interest. A few sentences from one of them must close our notice. "We know," said the President of Harvard College, "that beauty and enthusiasm for beauty are not dead but sleeping, and we live in the hope that if we succeed in holding fast our political and social freedom, fair fruits will yet grow from the rich soil of our material prosperity. Indeed, we see signs of this fairer growth. Our very institutions of finance, transportation, and trade, are becoming magnificent as they get substantial. The most elaborate rooms of Medieval finish which I know in these parts are occupied by a bank in Court-street. Our railroad companies are beginning to realise that brick and wooden sheds do not offer all the accommodation which the public may profitably get. Our successful insurance companies are building palaces. These better buildings, though they are for business purposes, will bring us Americans one step nearer palaces for painting, sculpture, music, education, and religion; yes, and palaces, too, for that noble and refined family life which is the most characteristic product of Christian civilisation. Architects must watch with pleasurable anticipation the distinct strengthening in this country of the tendency to accumulate money in families. After all, there is no patronage for an artist like that of the single patron who has only himself to please, and is thoroughly master of his own resources. Hitherto our form of government and social mobility have not seemed favourable to the transmission of great properties from one generation to another; but we already see that education and culture have become hereditary, and soon wealth will be. The catalogues of Harvard, Yale, and the other older colleges, prove the transmission of culture. There are already families which have had four, five, and even six consecutive generations at Harvard College. New methods of securing property to descendants, particularly to women, are constantly invented, and some of these methods will succeed. Let us all look forward to that cheerful day when competitions and building committees shall be no more; when the individual owner, or representative of owners, shall engage the first leisure of his architect by a handsome preliminary fee, and pay his architect's bill for professional services when the work is finished, in the same spirit in which he pays the bill of his legal counsel, and when the architect's bill shall be based on the equitable value of services rendered, and shall be limited only by his desire to keep the business of actual clients and get that of other sensible persons."

The whole of the proceedings serve to show that the questions under discussion by our professional brethren on the other side of the Atlantic are very like those which occupy our solvers, and that the inquirers are characterised by high feeling and wide intelligence.

THE INTERNATIONAL EXHIBITION OF 1872.

THE International Exhibition of 1872 may be said to have opened on the 27th ultimo; not with a flourish of trumpets, but with what was simply the largest, and in some respects the most brilliant, evening party of the season. The name of H.R.H. the Duke of Edinburgh, as *locum tenens* for his brother, the President, was on the invitation cards; and his Royal Highness, with his sister, the Princess Louise, if they cannot be said to have done, at all events received, the honours of the evening. On no previous occasion, in all probability, has the mere mass of visitors formed a spectacle so imposing in itself. Toilettes of all kinds, light, music, motion, and a crush, made up an evening that must rank as a success. Complaints have been made by some of our contemporaries of want of organisation,—that is to say, people were free to come and go, as at any private party, undirected by the police. It would be well for us to fall more readily into

the self-organising habits of our continental neighbours, on occasions of this kind. We cannot sympathise with the demand for more of the "move on" style of arrangement. Only, as unfortunately, all the visitors are not provided with carriages of their own, we must plead for more ship-shape cloak-room accommodation on other similar occasions for those who require it.

Of the Exhibition proper it is hardly fair to give details, in the present state of imperfect arrangement. A good deal, however, is already in place. The gallery which will probably be regarded by most visitors as the scene of the chief attraction,—that which contained the pottery last year,—is now in course of rapid adornment by cases of jewelry. Some of them contain objects of great beauty, value, and interest. British manufacture bears the palm, as far as we have at present seen. The costly *parures* of certain London jewellers are not more remarkable than are some of the specimens of the artificial jewelry of Birmingham. One case contained a number of shell *caues*, which purported to be English, but which we should have thought to be Roman. Some of the peasant jewelry of Continental countries is also extremely interesting.

The lower gallery, on the west side of the gardens, is filled, as it was last year, with machinery, to be exhibited in motion. It seems to be in a much more forward state, and also, it struck us, more numerous in specimens, than in 1871. The upper gallery on the east is devoted to foreign pictures, and that on the west to British pictures. To the subject of these we shall, of course, return. The galleries are much less crowded with sculpture and other objects than last year. On the other hand, there is less to distract the attention from the pictures themselves. Above all things, it is to be remembered that these objects can here be seen. The walls are fairly covered in each gallery, and not overcrowded.

English sculpture is arranged in the semi-circular arcade on the ground floor, together with water-colour drawings, engravings, and photographs of all kinds. On the upper floor, cotton fabrics are arranged in frames and cases. Passing through the galleries to the south of the garden, we come to a room devoted to South Kensington terra-cotta. There is a division allotted to scientific instruments, a number of machines for printing and similar processes are in course of erection, and the Birmingham manufacturers present a shop of working jewellers, busily engaged in their craft. The galleries devoted to paper, *papeterie*, and all the wares of the stationer, are very elegantly filled, from the 2½-mile roll of paper manufactured for the *Times* newspaper down to the minute requirements of the desk. Connected with the paper department is a novel and very instructive collection. It purports to contain all the newspapers of the world, or at least so many as very fairly to represent that extraordinary kind of literature. Permanent photographic processes are at work near the door.

Last year we devoted a special article to the architectural contributions to the International Exhibition, regretting at the same time that there was not more of novelty among the designs, and that foreign architectural ability was so meagrely represented. This year there is not enough, either in quality or quantity, to warrant any such special mention, and we must be content to give a passing notice to the architectural work, along with other branches of design which are more or less represented in various parts of the buildings. Such architectural designs as there are to be seen are, at all events, more within public reach than last year, when they were elevated to the Albert Hall Gallery. The present position for architecture is on the ground-floor of the east quadrant. Here are hung about eighty drawings, a good many of which, however, represent buildings some time since completed, many Exhibitions that they may fairly be considered exempt from further criticism. Among those sufficiently new or original to invite special mention, one of the first we notice is a pen-etching of the new premises for Messrs. Sotheran, in Piccadilly, now erecting from the designs of Messrs. George & Vaughan; a building of which we may take an opportunity of saying something more in detail. The etching severely represents the effect of the design. Two or three designs for schools for various school boards, by Mr. Charles Henman (Alexander & Henman), are all more or less good, in a quiet, unpretending way, and very agreeably drawn and coloured; No. 3, 672,

for the Stockport School Board, is the best, and indicates some originality in grouping and (apparently) in planning; but the plan is not given. "Interior Decoration of a Ball-room" (3,613), by Mr. T. Cox, is satisfactory, as showing a harmonious arrangement of quiet colour, chiefly secondary and tertiary, with no great originality of detail. It is a relief to find a Renaissance colour-design without the odious pinks and yellows commonly supposed to be proper to the style by modern decorators. M. Schoy, of Brussels, deserves mention, as the one foreign contributor. He sends a finely-executed drawing of a very questionable design, entitled, "An Architectural Composition." Mr. Young's "Garden and Entrance Fronts of a Country House" (3,688) is very pretty, in half-timber construction, with, perhaps, just a little too much determination to be "picturesque." The same gentleman exhibits "designs and executed examples of modern domestic architecture," possessing the same kind of merit. We rather think this frame of drawings has been exhibited before. Mr. Edis's "New Houses in Queens-

borough-terrace, Bayswater" (3,632) show that the author is not wedded to one style; it is a very agreeable design for street architecture of an unpretentious description; and Mr. Sorby's "Pair of Villas at Peterborough," show both solid picturesque treatment and plenty of work for the money. Messrs. Perry & Hanson's "Altar to be erected in the Church of the Augustines, Bruges" (3,648), is a good Classic design of the kind, shown in a neatly-executed line drawing. Mr. Truefitt's "Additions to Aboyne Castle" (3,650), is an interesting specimen of architectural self-restraint in dealing with a severely plain building; the only architectural expression in the new portion resulting from a slight grouping of the windows, in massive and perfectly plain walls. The "Devonport Mission Chapel" of Mr. Glover (3,678), is a good specimen of picturesque treatment of a single apartment under one roof. Other exhibitors are Messrs. Tenlan, Waterhouse, Seddon, T. R. Smith, and others, whose names are more or less known; but with the exception of those already mentioned, the drawings are mostly either what are well known, or do not contain sufficient novelty of treatment to call for remark here.

From modern architectural design to reproductions of ancient ones is an easy transition, and the Room XVII. (in the east gallery), mainly occupied by this class of objects, contains specimens of considerable interest, including casts or copies of a good deal of Indian work; chiefly from remains at Fattipur, Sikri, near Agra, modelled last year by Corporal Jackson and native moulder, under the direction of Lieut. Cole, R.E. The largest and most interesting of these is the "Porch of Sheik Salem Chist's Tomb" (3,901), a specimen of Mogul architecture of the latter half of the sixteenth century. The treatment of the large brackets supporting the canopy, in serpentine curves, with the bands filled with pierced tracery, is most remarkable, and certainly picturesque, though far more wooden than marble in character; and the gentlemen of the Kensington Science and Art Department, who exhibit and notify this as a "pure specimen of architectural truthfulness," have possibly something to learn on that head yet. The four pillars (3,903) are characteristic specimens of the same school; these are, of course, covered with surface carving, in one case the diaper on the column being formed by a collection of bud-like knobs (something like the "Early English" halfloffer) entirely covering the surface. More interesting, and beautiful in their way, are the pillars and other details from the Sultana's apartments (same school and date), said to have been carried out by Akbar for one of his wives who was of Turkish extraction, and whom he wished to please with something in the style she was accustomed to see. The delicacy and variety of surface diaper on this work is most remarkable. A "Portion of Carved Band of the Khat; Pathan Art, probably end of twelfth century" (3,912), is a very fine specimen of free scroll-work and leafage design in stone; the surface nearly flat, and the interspaces between the ornament sunk about an inch or more, very much after the manner of decoration which an English architect (Mr. Colling) has largely affected. There is nothing new under the sun; but this peculiar bold treatment is what one would expect to find under a northern rather than a southern sun. Adam Kraft's bas-relief of "Christ bearing the Cross," from the church of

St. Sebaldus at Nuremberg, is shown in a cast (3,950) from the original; a design full of intense expression, and noteworthy for the effective yet not over-elaborate treatment of the drapery. In this room are sundry electrotype imitations of English goldsmiths' ornamental work of the seventeenth century,—not remarkable, certainly, for purity of style or effective treatment. Somehow gold seems to betray its votaries, in art as well as other things, into a taste for the showy and meretricious. A Russian gold goblet (seventeenth century) in one of the cases shows far more artistic and refined treatment, the ornament, partly figures, being a low and delicate *repoussé* much more fitting to the material than the lumpy scrolls of the English work, which seems chiefly adapted to impress one with an idea of its market value as bullion. A fac-simile of a very little bit of Irish illuminated border in this room (3,957), dated to the sixth century, is worth a note for its peculiarity and alleged antiquity; the ornament being formed by three sets of narrow bands of deep orange, light orange, and green, respectively, very cunningly intertwined. This room contains sundry other reproductions of Indian details, copies of ancient European work of different kinds, &c., a cast of the Roslyn "Prætoric Column" among others. Fac-similes are shown, by Messrs. Salvini, of the S. Vitale mosaics from Ravenna,—very quiet, and almost grey in prevailing colour of drapery, against a gold ground, and with that pronounced and formal stiffness of style and attitude which some of our friends wish to see adopted as the model for whatever further mosaics may be introduced into St. Paul's Cathedral. Copies of the Fairford windows appear; but these have been well seen before.

In the North-east Staircase (according to our recollection, though it is printed North-west in the Catalogue) we may notice, in passing, the only bit of stained glass design to be seen (up to date of writing these remarks) showing anything of originality or speciality of treatment calling for remark. This is a small "domestic" window, by Messrs. Gibbs & Moore (1,036), consisting of a centre circle, with a small heraldic design, the rest made up of small panels, with flowers and a little conventional foliage in the upper and lower portions. The treatment is emphatically that proper to stained glass, and the colouring rich and harmonious. A small Renaissance window, of the same size, and by the same artists, has a very nicely conceived centre figure; the rest is a somewhat commonplace pattern of scrolls and shells, the colouring of which leads us again to ask why the word "Renaissance" should be of itself enough to frighten away all pure colour from a window, and reduce it to dirty drabs and browns; and why pure colour cannot be applied to a design "Classic" in its general outlines, as well as to anything else? Will no artist in stained glass make the experiment? The rest of the stained windows have mostly nothing to distinguish them from a hundred others of the ordinary type; unless we except one on the North-west staircase, part of a window for St. Paul's, Dock-street, in which there is some novelty in the lines of the design in the upper and lower portion, and of novelty certainly in the centre design (Christ rebuking the storm), where there is stained glass work modulating in conventional waves, and curving in conventional spray round the rudder. It is high time to prove offered for the best treatise on the "True Limits and Capabilities of Stained Glass Design," and the result circulated among the "artists."* We shall find somewhat more satisfaction in looking at the specimens of furniture design, which are not so numerous, nor on the whole so interesting, as last year's, but exhibit a good average of merit in design, and much beautiful workmanship. This is mostly in Rooms VII. and IX., in the west galleries. In a general way, we are glad to see less of that ostentation of simplicity, shown in excessive squareness and plainness of form and outline, which we protested against in reviewing the last collection, and which is just as much an affectation, in its way, as the weak, sprawling curves of the French "fashionable bouclor" style; of which, also, there is less, indeed very little, to be seen this year. Ebony and inlay predominate considerably. Among the best of the ebony cabinets is one designed by Mr. Talbert (2,770) in a quasi-Renaissance manner, with very little that can be called

carving, the ornament being mostly very flat or incised; the back to the cupboards is formed by a naturalistic diaper of dark green leaves on a gold ground; the whole effect is very artistic. No. 2,767, exhibited by Doulton & Co., shows a new suggestion in cabinet ornament, the panels being filled with bas-reliefs in pottery (figure subjects), but the result is hardly satisfactory, the material being too incapable of sharp finish to be used successfully on such a small scale. A glazed terra-cotta mantelpiece (2,785), designed by Mr. Gamble for the South Kensington Museum, forms another of sundry indications either that this material cannot be a medium for high-class decoration, or at all events that the right treatment of it has not been hit upon: the smooth, washed-out look of the glazed foliage decoration (of a very commonplace character) is anything but pleasant to look upon. A "stained and painted ash cabinet," by R. Chapman (2,780) is a suggestion for speciality of treatment which might be very successfully applied where economy is an object; the ornaments (including small figure subjects) are drawn in dark line upon the slightly-stained surface of the wood, the grain showing through the whole, the misfortune in this instance is that the ornament is poor in character and the figures very bad: the general shape and make of the article is solid-looking and purpose-like. A "Mediaval" sideboard, designed by Mr. Tarver (2,764), shows the good effect of gilding upon plain oak, the ornaments being mostly incised and gilt, a very pleasing and simple method of decoration. No. 2,761 is another individuality in cabinet-work, a carved piano, by Luis Cavaige (Spain). The wood is left untouched by varnish or any other compound, and every portion of the surface carved in elaborate flat enrichment of a semi-Moorish character, with great variety of detail; there is not the slightest attempt at colour decoration. The general effect is very pleasing, and in very good taste, but it wants just a little more decided motif; a little plain surface, or a few inlaid darker bands, would have given a little point to the design; it is interesting, however, to come across a mode of treatment so entirely different from what we are mostly used to in modern work. No. 2,760 is a cabinet, with panels formed of what are called in the catalogue "stoneware bas-reliefs," but which are not bas-reliefs at all, but mere incised designs on the stoneware surface, the lines filled in black. The effect is good, and may be taken as a suggestion worth notice. An "ebonised" cabinet, with painted panels (2,781), is fashioned by the "Decorative Art Society," *en masse*, as it would appear from the catalogue,—the panels painted with figures, on a gold ground, of a hawk and a lady feeding a swan. The figures are up to the average of this sort of work in merit. An inlaid table (2,783), by E. Prignot, is one of the very best things of the kind that we have seen. The design is Renaissance in character, but treated with conventionalised ornamental details of considerable novelty, as well as elegance, and with a very happy and effective combination of tints in the various woods employed. The designer has contrived also to render the supports of the table elegant and pleasing in form, without looking weak or flimsy, a point in which few furniture artists seem to succeed. An inlaid cabinet (2,786), in rosewood and lighter woods, near this, is also worth attention as a good piece of work of the kind. No. 2,777 is a good specimen of modern Gothic oak furniture, by J. Pencknots. It is a little too architectural in form and detail, but a very good, solid piece of work, the ornament chiefly formed by black inlay and panels of rich brown tint. There is more refinement in the details than we sometimes see in modern work of this school. No. 2,772 is a better thing of the same class, by S. J. Nicholls: a very good and refined piece of work, indeed, especially in the clever way in which the ends are treated; the design of the upper portion here is particularly elegant, more noticeable as this is just the portion which it is generally most difficult to treat satisfactorily in this kind of work. A "fire-place, with painted tiles, oak cornice and framing" (2,771), is the largest and most important piece of work of this kind in the room; the base of the composition is formed by marble and tiles; over this an oak carved Gothic framework and a large painted cove cornice, crowned with a heavy oak moulding which works in to the framework of the ceiling, the joists of which are shown. The tiles are too heterogeneous, being painted with all kinds of small subjects in that

disconnected haphazard way which some of our modern designers are too fond of, and which indeed is, in fact, an avoidance of "design;" the carving above is exceedingly good. The cove is painted with a green diaper, and three figure-subjects, indicative generally of domestic felicity, introduced in medallions on gold ground: there are on the framework below also two very elegant figures, similarly treated, apparently representing "work" and "play." The combination of the tiles and oakwork is pleasant in effect, and though we think much more might have been made of the tiles by a different method of treatment, there is no doubt that on the whole this is a fine piece of work, generally creditable to the two gentlemen whose names are appended to it, S. J. Nicholls and C. Rossiter. The figures, which are of a much higher class than we ordinarily find in furniture work, are, we presume, Mr. Rossiter's contribution to the design.

We may have more to say next week as to some of the other specimens of ornamental design of different kinds, which are scattered in the usual indiscriminate style up and down the building.

THE ART UNION.

The annual meeting of the Art Union was held on Tuesday last in the Adelphi Theatre, Lord Houghton in the chair. Among those present were Sir Walter Stirling, Bart, Sir W. Bodkin, Mr. E. Antrobus, Mr. J. Martin, Mr. J. B. Butterworth, Mr. Z. Troughton, Mr. W. Smith, Mr. R. Wilde, Mr. Francis Bennock, Mr. Lumb Stocks, R.A., and Mr. W. E. Frost, R.A. Mr. L. Pocock, hon. sec., read the report, of which we print the pitch:—

The Council have the gratification of announcing that the sum subscribed for the year now ended amounts to 11,930, 12s. 6d.

The eight plates of coast scenes engraved from the works of English artists in water-colour have proved exceedingly popular. A large proportion of the impressions are already in the hands of the members, and the remainder will be delivered as soon as possible. The success which has attended this issue may induce the Council to consider the expediency of making a somewhat similar experiment on a future occasion.

Since the last meeting the Council have been deprived by death of two valuable members, Dr. Mortimer, formerly head-master of the City of London school, and Professor Westmacott, R.A. The latter, especially, has been a frequent attendant at the meetings, and constantly rendered valuable assistance by his professional knowledge and experience. To fill up one of the vacancies thus caused, Mr. W. E. Gunbleton has been elected.

The Council continue to receive very efficient aid from the local secretaries and agents in all parts of the world, and on this occasion they would refer more particularly to the services of Mr. Whitcombe, Cheltenham; Mr. Baily, Birmingham; Mr. Furst, of Christiania; Messrs. Foye, Von Beckroth, and Dreyer, in Prussia; Mr. Walsh, in Hobart Town; Messrs. Hutton, Tonkin, and Watts, at the Cape; Mr. Glazier, of Hartford, and Mr. Ranlet, at San Francisco, in the United States. The accounts have been audited by three members of the finance committee, and by Mr. Atkinson, of the Bank of England, and Mr. W. Wright, to whom thanks are due.

The following is a brief summary of the receipts and expenditure; a detailed account will, as usual, be printed in the report.

Amount of subscriptions.....	£11,930 12 6
Allocated for prizes.....	28,410 0 0
For print of the year, almanack, report, &c., and reserve	3,051 0 0
Agents' commission and charges, advertisements, postage, &c.	2,469 11 8
	£11,930 12 6

The amount to be expended on prizes will be thus allotted:—

22 works at.....	£10 each.
20 " "	15 "
13 " "	20 "
12 " "	25 "
10 " "	30 "
10 " "	35 "
8 " "	40 "
6 " "	45 "
4 " "	50 "
4 " "	55 "
2 " "	75 "
3 " "	100 "
2 " "	150 "
1 work at.....	200 "

To these will be added:—

- 1 Marble "Wood-nymph."
- 8 Nelson Columns.
- 2 Cameos.
- 30 Townley Vases.
- 2 Bronze Medallion Inkstands.
- 40 Wood-nymph Statuettes.
- 20 Small Tazzes.
- 300 Chromos of "Bellagio."
- 60 Chromos of "Kite Flying."
- 80 Busts of Princess Louise.
- 30 "Ety" Silver Medals.

These, with the prizes given to unsuccessful members of ten years' standing, will raise the total number of prizes to 940.

For the coming year the Council have prepared a plate, admirably engraved by the Late Wm. Holl, from the

* One or two windows there are still to be filled, apparently, "for better or for worse;" we sadly fear the latter.

picture, "Rebekah at the Well," by F. Goodall, R.A. The picture sets forth the scene at the moment when Abraham's servant, having accosted the damsel, and asked for a little water out of her pitcher, she gave him to drink, and drew water for his camels also; and as the camels had done drinking, the man took a golden carrying and two bracelets, and put them on her ear and wrists, and "wondering at her, held his peace, to wit whether the Lord had made his journey prosperous or not."

The artist has with consummate skill rendered in the face of Rebekah an expression, emblematic of the tender she feels at the unexpected address of the servant,—joy at the prospect of a wedded life, which, by the women of Judah especially, was considered as necessary to escape contempt,—and a kind of inspired awe at being chosen as the one who was destined to be the mother of "thousands of millions," and in whose seed should "all the nations of the earth be blessed." The anxious look of the servant, also, waiting to see if his suit should prosper, is admirably given. The Council have every reason to believe that this plate will be a great success.

During the last twelve months which have elapsed since the last annual meeting, there has not occurred, in connection with matters of art, any event which appears to call for particular notice in this Report, and it has been thought, seeing that a new generation has grown up since this association first saw the light, thirty-six years ago, that a slight sketch of the origin, progress, and present position and prospects of the Society might be acceptable. To give a full and exhaustive account of the transactions would require more time than can on such an occasion be devoted to it.

In the year 1837 the Kunst-Verein of Germany had taken for some years in operation, and there was an association of a somewhat similar kind formed in London, which occurred to a few lovers of art that it would be a public benefit to establish an institution of the same kind in London. A committee was accordingly formed, of whom four are still members of your Council, and they published their first programme in February of the above year. In one most important particular, however, their plan differed from those with which we are acquainted, inasmuch as in all existing art-unions the selection of works to be given as prizes was made by the governing body, it was determined in this case that the selection of the prizes to the prizeholders themselves. We have the managers of this Society ever seen any reason to repent of this arrangement.

The amount of subscription in the first year of the Society only reached the sum of 897. 6s., with which the prizeholders were able to purchase thirteen works, varying from 10s. to 100s.

In the second year of its existence, the Society adopted the principle of setting apart a certain sum for the purpose of engraving a picture, that each member might have an impression of the plate,—feeling that, by combination, a work could be produced, and placed in the hands of every member, of the market value, at least, of his subscription, without unduly trenching on the fund for the purchase of prizes, and that every subscriber would have a direct and certain return for his outlay.

By the third year the amount of subscriptions had reached 1,252. 1s., and relations had been established with thirty-seven gentlemen in the provinces, who gave valuable assistance, in making known the objects and advantages of the association. This amount, to which much attention has always been paid, and the result is, that there is scarcely any part of the world to which the publications of the Art-Union have not penetrated, through the instrumentality of gentlemen who devote a large amount of time and trouble to the promotion of the cause of art.

In 1841, His Royal Highness the late Duke of Cambridge became President of the Society. His Royal Highness always took great interest in its proceedings, and generally presided at the annual meetings.

In 1841 a sub-committee was appointed to consider the future prospects, and the most efficient mode of working the enlarged means of the Association.

Their proposals in particular emanated from the deliberations of this Committee, which have since held prominent places in the Society's programme.

It was determined to endeavour to give the production in England of artistic statues in bronze.

It was proposed to commence a medallic series of the history of Britain—to produce five or six medals each year; having on the obverse the head of some distinguished painter, sculptor, or architect, and on the reverse, a subject from one of his works.

The first result of the sub-committee's recommendations was the offer of a premium of 600. for a series of designs in outline, illustrative of some epoch in British history, or of the work of some English author, and a further remuneration for the artist's superintendence, if it should be deemed expedient, to engrave the composition selected. The object of the committee was to call the attention of our artists generally to that purity and correctness of drawing, and severe beauty of form, which, apart from colour, and all the effects of light and shade, exist in the compositions of the finest of the ancients, in the outlines of our own Flaxman, and in the compositions of Kleophasen, and some later Germans.

All the preparations for holding the annual meeting in 1844 were made, the date being fixed, as usual, for the last Tuesday in April, when the Committee were startled by the receipt of a letter from the Treasury to the effect that the proposed exhibition was illegal, and that the continuance of the same would render all parties concerned liable to prosecution. The Committee thereon immediately suspended all proceedings. A memorial was addressed to Sir Robert Peel, setting forth the amount of benefit already conferred on the artists of the country by the Art-Union, and the great loss and disappointment which would arise from stopping the distribution of the large amount of money then actually in hand. The Committee had an interview with the Minister's Secretary, but were unable to obtain any guarantee to allow them to proceed with the drawing.

A meeting of artists was held, numerous petitions were presented, and, on the motion of Mr. W. W. W. a Committee of the House of Commons was appointed to consider the whole question of art-unions, and what are the most expedient and practicable means to place them on a safe and permanent basis, and to render them most subservient to the improvement and diffusion of art through the different classes of the community."

In the meantime a temporary Bill was prepared by Lord Montagu, and carried through Parliament to enable the distribution of prizes to take place, and the meeting was held on the 13th of August.

The Report of the Select Committee of the House of Commons was a complete investigation of all the points which could be urged for and against art-unions, and the conclusions in their favour were thorough and unanswer-

able. Nevertheless, there was some difficulty in getting the Government of the day to use their influence in getting the Bill, founded on the Report of the Committee; but the assistance of the Duke of Devonshire, and of the legal art-unions, under certain conditions, received the Royal assent on the 13th of August, 1846, and on the 1st of December of the same year the Association was incorporated by Royal charter.

In the year 1845 the Committee offered a premium of 500. for an original picture, illustrative of British history. Twenty-six artists were sent into the field, and on the 18th, 1846, and the premium was awarded to one of Queen Philippa interceding for the lives of the Burgesses of Calais, afterwards found to be by Mr. H. C. Selous, who had, on a former occasion, received the premium for his illustrations of the "Pilgrim's Progress." A premium of 500. was at the same time offered for a group or single figure in marble, to be completed for by models in plaster, the size of the intended work. In reply to this proposal twenty models were sent in, and exhibited in the concert-room of the Princess's Theatre. The premium was awarded to "The Dancing Girl Reposing," found to be by Mr. Calder Marshall, now R.A. The figure was most successfully executed in marble, and in the year 1868 it was the chief piece in the collection, and fell to Mr. Kenning, of Brighton, Northampton.

In 1845, almost the first experiment in producing statues in porcelain was made. A reduction of Mr. Gibson's beautiful figure of "Narcissus" was sent into the field, and in the hands of Messrs. Copeland and Garrett, and a very satisfactory result was obtained. This was the beginning of that series of twelve statues which are now in the hands of the most popular of the Society's productions. It may be mentioned incidentally that of the Clytie bust in porcelain, which was copied and distributed.

In 1846, with a view to affording encouragement to the art of gem-engraving, but little practised in this country, the Committee offered premiums of 600., 300., and 150. for the best canoes in profile by British engravers, the work of Minerva, in the collection of bronzes in the British Museum.

The first and second premiums were awarded respectively to Miss Elena Pietrucci and Mr. Henry Weigall.

A very important feature in the Society's programme is the *Reserved Fund*—a fund formed from the reservation of 25 per cent. of the amount subscribed to each work, as required by the charter of incorporation,—from the portion of the amount set apart for prizes, not expended by the prize-holders, from the amount reserved for the purchase of the exhibition of prizes,—and from the interest of the fund itself. The object of this fund is to obtain a gallery, and otherwise assist in promoting the objects of the Association.

The Council have at different times had before them proposals in reference to the erection of a gallery and the purchase of a picture, but have not as yet been able to combine the qualifications which appear to them essential for such a purpose. They are still anxiously endeavouring to effect the object in view, and, in the mean time, the fund is employed in the production of works for distribution in future years. The interest of the money thus borrowed is repaid to the fund from the subscriptions of the year in which the work so produced is made use of. This fund now amounts to 10,114.

In the year 1848, the Council were much surprised to receive, from the Lords of the Committee of the Privy Council for the Arts, a letter to the effect that their intention to interfere with the constitution of the Society in three several particulars, viz. that the works of art to be given as prizes should be selected by a committee instead of the prize-holders themselves—that the annual issue of a print from some picture by an English artist should be discontinued,—and that 10 per cent. should be reserved out of the subscriptions for the purchase of works, not for distribution, but for public exhibition. The Council energetically opposed these alterations, and, after much correspondence and many interviews, the Board of Trade forbore to urge their views "against the strongly expressed sentiments of the Association."

In 1849 the Council offered a premium of 100. for a bas-relief for the purpose of engraving. Twenty-five designs were sent in, and the premium was awarded to "Eusebe" for a design of "Christ Entering Jerusalem," by the same artist, "Christ led to Crucifixion," by the same artist, was engraved, and both prints are now in the collection of the Society. The first has been reproduced in bronze, and the second in plaster.

In preparing the annual work for presentation to the members, it has always been the wish of the Council to treat directly with the engraver. Only those, however, with whom the duty rests can tell how difficult it is to have ready, year after year, a work which shall combine the necessary qualifications of artistic excellence and interest for the public at large, being dependent besides on the health and strength of the individual engraver.

A difficulty arose in this direction in the year 1850, when it was found that the work intended for distribution could not possibly be completed in time, and the Council were fortunate in being able to secure a pair of steel-plate line-engravings from Mr. Webster's pictures of "The Smile" and "The Frown," which proved exceedingly popular, and in addition to which was given a series of etchings illustrating Shakespeare's "Seven Ages" by Daniel Maclise, R.A.

In 1850 the Council offered premiums of 100. and 50. for the first and second-best model in plaster of a single figure to be produced in bronze. Forty statues were submitted, and of these twenty-four were selected, and formed a very interesting feature in the first Great Exhibition of 1851. The first premium was allotted to "Satan Disarmed" found to be by Mr. Armstrong, and the second to "Solitude," by Mr. J. Lawler. The first has been reproduced in bronze, and the second in plaster.

In 1851 the Council had to lament the loss by death of their president, H. H. the Duke of Devonshire, who strove with kind readiness to advance the interests of the Society. The Council were glad to have an opportunity of showing their appreciation of the services rendered by Lord Montagu, at a time of great personal and public danger, in 1834, by electing his lordship to the vacant office.

In the year 1855 was instituted the custom of presenting to members having paid ten consecutive subscriptions without gaining any prize, a consolation prize, in the shape of one of the best or other works, and this arrangement has been found to give the greatest satisfaction, and has had the effect of retaining many members who might have seceded, on account of their want of success in the annual distribution.

In 1860, a premium of 100 guineas was offered for a series of designs, in outline, illustrative of Tennyson's "Idylls of the King," in reply to the invitation forty-three sets of drawings were sent in. The premium was awarded to a series found to be by Mr. Priolo. They

were engraved, and formed part of the annual presentation to the subscribers of a subsequent year.

In 1862, the Council commissioned Mr. John Leighton to design a large tazza, to be produced in ceramic ware, as a memorial to the Prince Consort. The tazza was to contribute, in however small a degree, to the preservation of the memory of one to whom this country is in so many ways—especially in the numerous and important services so deeply indebted, Her Majesty was graciously pleased to accept one of these tazzas, and desired to have three of the same prepared for her, for presentation to special persons.

At the International Exhibition of 1862 the bronze and parian works of the Society, arranged on a raised stand, formed one of the most attractive of the "trophies" placed along the central nave of the building.

In 1863, a premium of 600. was offered by the Council for a life-sized figure or group in marble, to be completed for by finished models in plaster. In reply, fifteen models were sent in, and, by permission of the Committee of the Privy Council for Art, were exhibited in the South Kensington Museum. The premium was awarded to a group, "The Wood-Nymph," found to be by Mr. C. B. Birch. It was successfully reproduced in marble by the sculptor, and will be the first prize of the kind ever presented to be placed along the central nave of the building.

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In 1865, arrangements were made with Mr. Stocks for engraving Mr. Maclise's noble wall-painting in the Palace of Westminster, of "The Meeting of Wellington and Waterloo." The work was entrusted to the hands of 700 artists from Germany, France, England, and elsewhere, received princely hospitality during the whole time, and who were employed in the execution of the work, and in effectually carrying out the promise of the motto, everywhere displayed, of "Welcome to Rubens' Land." The work was completed in the month of August, 1865, and the impressions will be the presentation to the subscribers of the Society.

By the lamented death of Mr. Maclise—with whom the Council had many transactions, and as many opportunities of estimating his talents as an artist, and as a man of the most honourable and large-hearted nature—they lost the advantage of his superintending care in bringing these works to completion. They feel, however, that the result will be, in every respect, most satisfactory.

In 1866, the Council had to deplore the loss of their president, Lord Montagu, whose genial and efficient assistance was afforded to the Society, and who continued opportunities of acknowledging. The office was offered to, and accepted by, the Right Hon. Lord Houghton, long a member of the Board, who has since generally presided, and frequently aided with his advice and experience at the meetings.

In the year 1868, Art-Union became again the subject for Parliamentary inquiry.

It was felt by many persons taking an interest in the advancement of art, and by none more strongly than by this Council, that, in the act for legalising Art-Union, the conditions on which such an Association should be permitted to be formed were too lax, and that sufficient power was not vested in the Board of Trade to prevent the fraudulent use of the name of Art-Union, which sheltered themselves under the name of Art-Union.

A committee of the House of Commons was appointed, with Lord Robert Montagu as chairman, which examined the witnesses, and made a report recommending that the administration and enforcement of the Art-Union Laws should be placed under the charge of the Science and Art Department, on which such a report was made, and a code of regulations should be adopted, which were, in nearly every particular, identical with the regulations of this Society. The Council had every reason to be satisfied with the mass of evidence which came out, proving beyond controversy the value and importance of their operations; and even those most hostile to us admitted the excellence of its management, and called it the model Art-Union.

Unfortunately, in consequence of the pressure of business in the House of Commons, the matter went no further, and the regulations recommended by the committee are still a desideratum.

At the International Exhibition in Paris, in 1867, none of the Society's prints and bronze statues were exhibited.

In the same year the Council offered a premium of 200 guineas, with 100 added if the result proved very satisfactory, for a set of drawings illustrating some poetical or historical work of a British author, or events in British history. Thirty-five sets of designs were received, and the premium was awarded to a series illustrating Canon Kingsley's story of "Hereward the Wake," which was found to be the production of Mr. H. C. Selous, who had on two former occasions carried off premiums offered by the Society. The drawings were engraved by Mr. Charles Lewis, and formed the presentation work for the year 1870.

At the International Exhibition at South Kensington, last year, the marble statue of the "Wood Nymph," occupied a conspicuous position. A very effective collection of our bronzes was also contributed, together with two canoes beautifully cut by Mr. Rogers, of "St. George," and "Ariel." These will be given as prizes in to-day's distribution.

A similar contribution has been made to the exhibition, to be opened to-morrow.

Such is a brief review of the progress of the Art-Union. It has had its varied fortunes, but has pursued steadily its path of duty, in the face of circumstances at times very critical and difficult to meet. Its present position proves that it has triumphed over all.

It has fostered native talent and assisted rising artists,—cultivated and diffused a love and taste for art through every class, and raised the standard of ornament to be found both in the cottage of the peasant and in the palace of the noble,—and the cause and the noblest of the empire.

It must be a work of time and labour to imbue with a feeling for art the great bulk of a mercantile community, where the return in pounds, shillings, and pence does not lie on the surface. In the short spaces of relaxation obtainable by those pressing forward in the battle of life, there are but a few minutes to be spared, and it is not possible that art should be a mere recreation, or that art should be content to take its position on its unwhimsical and refined nature may be able to gain. It

is only by degrees that its rotaries can be taught to feel the exquisite enjoyment which its full appreciation is capable of conferring.

LEWIS POCOCK,
EDWARD E. ANTROBES, Hon. Secs.

The Chairman, after alluding to the interesting sketch of the progress of the Society which had just been read, paid a tribute to the memory of the late Professor Westmacott, who, notwithstanding his advanced age, had been so vigorous, that his decease had come upon his friends with the shock of a surprise. He had been identified with the interests of British art; and, if he had not been so prolific as some, his memory would remain among British artists with a fame singularly pure, and as one whose works were characterised by extreme grace and elegance. Alluding to British art, Lord Houghton said he understood that the exhibition of the Royal Academy now about to be opened was extremely rich in *tableaux de genre*, and if these were not of the highest class of art, they were at least the most popular. Alluding to the wonderful sale of the collection of Mr. Gillott, he said it showed how good a thing it was to invest money with judgment in pictures. It might, however, be well to consider whether these immense prices of works of art were really very beneficial. An artist whose pictures fetched such large sums could not fail to experience a feeling of some hardness from learning that others were reaping the largest fruits of some of his hardest labour. However, there was reason to believe that, notwithstanding the large amount of money contracted on these pictures, there was still enough left to go into the pockets of the artists of today. In the encouragement of rising art this Society was of great value, and what a prize-holder might select with judgment would be no other than a lasting pleasure to himself, but might prove a good investment for his children. He would recommend prizeholders to look out for young artists, and for such as displayed genius; not to object to buying a picture with an unknown name, for there was not one of the greatest painters who had not been once unknown. He recollected when he had been in Parliament that in going round to canvass he had always met some good-natured people who kindly wished all the candidates to succeed, and now he could only follow their example, and hope that all present might get prizes, though there might be some physical difficulties in the way of this. He concluded by moving the adoption of the report.

Sir Walter Stirling seconded the resolution, and said he thought that the enormous prices which had recently been obtained for pictures might be in some degree attributed to the love and appreciation of art which had been fostered by this institution. Sir Walter made some strong observations condemning the removal of Carlton House and Burlington House, and on the anticipated pulling down of Temple Bar. The report was adopted.

Mr. F. Bennoch moved a vote of thanks to Messrs. Lewis Pocock and Edmund E. Antrobes, non-secretaries, remarking that to the ever-watchful care of the past and present non-secretaries the great success of the Association must be mainly attributed. He said that some time since a gentleman surveying a wild portion of Australia had met in a house far from any large settlement a series of the Art-Union pictures. Mr. Butterworth seconded the resolution, which was agreed to.

Mr. L. Pocock returned thanks to the meeting, and moved a vote of thanks to Mr. B. Webster or his kindness in granting the use of the theatre, and to Mr. Kilooh for his assistance.

Mr. E. Antrobes seconded the resolution, and spoke in acknowledgment of the vote of thanks to the non-secretaries.

The resolution having been passed, Miss Ingram and Miss Peregrine proceeded to draw the prizes, the principal of which were allotted as follows:—

- 209.—Hayluck, T., Lower Wandswoth-road.
- 366.—Lott, Ed., New-cross; Rhodes, J., Leeds.
- 109.—Morris, K., Oakham; Slee, G., Bermondsey; Lehart, W., Hill street.
- 73.—Ashurst, H. G., Richmond; Milson, J., Canterbury, New Zealand.
- 50.—Fraser, J., Camden-road; Hulson, W. G., Plumstead; Newman, R., Hobart Town; Val, S., Coventry.
- 50.—Bishop, J., Wimbledon; Phillips, J., South Shields; Saunders, J., Kildermunster; Shepard, C. P., Boston, United States.
- 45.—Ferguson, Col. G., Pitfour, N.B.; Crickey, W., Meridian; Salmon, G. P., Distall-hale; Shaw, T., jun., Impington; Victoria, W., Northampton; Woodard, C. H., Croxson.
- 40.—Boswell, C. S., Redditch; Coleridge, Rev. E., Appleby; Harper, J., Newcastle-on-Tyne; King, M., Q.-D. G.O.E., Fall-naul; Marsland, N., Falmouth;

road; Stevens, J. C. M., Winscott; Taylor, W., Maidstone; Wilson, W. F. A., Maid-a-hill.

307.—Bishop, M. J., Paternoster-row; Blackstone, W. W., St. Ann's-road; Butler, C., 141, Drury-lane; Cross, Rev. E. H., Canterbury; Hammond, W., St. John's Wood-park; Nicholson, Master E., Sanderland; Noseworthy, E., Tavistock; Smith, J. F., Camden-road; Stuart, A. C., Customs; Sumner, Rev. J. H. R., Ellesborough, Tring.

306.—Eiso, A. C., Matlock-bridge; Bertemati, Don Jose, Jerez de la Fronteira; Ferguson, W., Stock Exchange; Fitcher, G. F., Barriage, Marlborough; Harvey, C., Alderminter; McKenzie, R., Brewery, Soho; Paton, J. P., Bedford; Prowse, W., Horseay; Richardson, J., Barcelona; Wade, G., Sheffield.

251.—Alicock, D., Waterloo; Browne, R. P., Greenwich; Couldery, H., Lewisham; Gnard, C. M., Bernadon-road; Hutchinson, R. W., Hartlepool; Littlecott, Rev., Rushall; Manger, J. W., York, Australia; Sherwin, S., Boston, England; Tate, E., Godalming; Ward, A., Loumba, Peru.

201.—Barber, S., Old Ford; Brown, T., 69, St. Paul's Churchyard; F. H., per H. C., Pidgeon; Greenwood, E. B., Arundel; Hallifax, Miss, Cludae Hall; H. E., Long, C. G., Maidstone; Lumsden, D., Port Elizabeth; Macleod, G., St. John, New Brunswick; Myhill, H., Saffron Walden; Rawle, J. S., Nottingham; Seaton, P., Selby; Webster, Mrs., Halmie, Manchester.

201.—Adams, Sam., Ware; Aplin, B. W., Banbury; Bewes, C., Plymouth; Birch, W. R., Banbury; Bradridge, G. J., Enfield; Copeland, J., Hanley; Dendun, Vienna; Ellis, J. S., South Hackney; Flemming, Miss, Acoch, roads, Great; Frinces-gardens; Greenhalgh, E., Bolton; Harley, E., Saffron Walden; Kewenig, J., Bramley; Portway, S. G., Lincoln-inn-fields; Roberson, C., Lougacore; Rogers, J. C., Blackford; Spencer, A. J., Harrow-road; Wells, G., 12, North-street, Westminster; Williams, Mrs. C. M., Cardiff; Wright, W., Preston Brook.

201.—Adams, T. W., Wells; Angus, Dr., Regent's Park; Ashdown, E., Hanover-square; Buckley, H., Manchester; Bulson, J., Moota; Dykes, E. O., Leeds; Esae, A. F., City-road; Fawcett, N. C., Kapunda; Fernandez, Dou, Gads; Gilbert, T., High Wycombe; Ivers, H., Birmingham; Hope, J. C., Scotchwood, Australia; Hirstfield, J., Bolton; Jackson, Mrs. H. D., West Brompton; Lohley, J., Hanley; McKnight, G., Wellington; Selwyn, Masson, H., Malton; Oates, J. H., Leeds; Poole, W. F., Paddington; Rutt, H. P., Barnsbury; Vero, C., Aberstrove; Watson, W. W., Glasgow.

Ascribed to the marble group "A Wood Nymph."

Bronze Vase.—Alexander, J., Borough; Bolton, J., jun., Sussex Hotel; Cairns, J., Mossel Bay; Chioley, J. J., George-road; Dally, G., San Francisco; Duns, J. C., Cork; Eveson, J. G., Scourie; Ford, W. J., Maid-a-vaile; Fraunce, Col., Hull; Gerulherdt, P. E., Mawn City; Grant, Miss, Belfast, Victoria; Harris, G., Covent-garden; Heron, J., Pockham-rye; Jolland, C. J., Newington-butts; Lees, W., Ashton-under-Lyne; Lowson, A., Abroath; Martin, E., Braton-street; Michelson, J., Pickering; Moody, J. B., York; Nova Scotia; Ness, J., Helmsley; Nicholson, W. L., Lander-terrace; Paxton, W., Little Gaddesdon; Reid, P., Dundee; Scott, 34, Great Marlborough-street; Sizer, J. J., Cheltenham; Taylor, J., Salsbridge; Turner, J., Pimlico; Wilson, S., Launce's Conduit-street; Wood, J. C., Church, Accrington; Wright, W., Preston Brook.

A Bronze Copy of "The Nelson Monument."—Core, H., Bedale; Davies, H. P., Seaford; Fotheringham, T., Gawler; Jackson, W., Garton; Knowles, H., Salford; Parry, Mrs. C. J., Torpoint; Rawlins, J., Newman-street; Webster, S. M., Warrington.

A Cannon "St. George."—Burton, W., 171, Avenue-park.

A Cannon "Ariel."—Chapman, C. W., Victoria-street, Hackney.

A Bronze Inkstand.—Alum, F. E., Craven-street; Matthews, T. B., Montreal.

THE PASSAGE BETWEEN ENGLAND AND FRANCE.

CAPTAIN WILLIAM DICEY, of Walmer, who has long given attention to the possibility of lessening the inconveniences at present attending the transit between the two countries, has devised a vessel which he thinks will obviate to a very great extent the present inconveniences of the sea journey between the English and French ports.

The principal difficulties to surmount are the rolling and pitching of the vessel, and the deficiency of accommodation on deck for passengers, and the object is to surmount these difficulties, if possible, consistently with not increasing the draught of the vessels, and in not rendering them crank or unseaworthy, and also in not diminishing the speed at which the present vessels travel.

Captain Dacey says:—It is well known that the operation of a supported heavy weight parallel to and at a distance from a floating body, will have a tendency to steady such floating body, causing it to be less sensible to the movements of the waves. This fact has suggested to me the invention of which I speak. Instead, however, of affixing a useless and dead weight at a distance from the original vessel, I convert such weight into a hull similar in all respects to the hull upon which it is to act, so that instead of a vessel consisting of a single hull, as now constructed, I have two distinct hulls parallel to and at a considerable distance from each other. By means of the girder principle, which has been found so efficacious in the construction of iron bridges, I connect these two hulls together, and thereby produce the result

that each hull acts upon the other, so that any movement which would be caused to one hull by the force of the waves is counteracted by the opposite hull, and the entire vessel remains comparatively unaffected by the motion of the waves. The vessel will consist of two hulls parallel to each other, each being 400 ft. long, 20 ft. beam, and 20 ft. depth of hold, secured together by means of girders, at a distance of 35 ft. apart, with the propelling paddles working between the two hulls. Each hull will be very sharp at each end, and flat in the floor. Estimating the draught of water at 6 ft., these dimensions will give a clear side-on of the water between the two vessels of 14 ft., and will admit of girders of this depth of a slightly arched form being placed between the two hulls—the upper part under the deck, the lower part just above the water-line. The dimensions will admit of a deck 60 ft. wide and 200 ft. in length, and this would admit of saloons, cabins, and every accommodation and convenience being constructed above the deck for the comfort of passengers, without the inconvenience of the confined cabins in the vessels as now constructed; in addition, there will be a space round for the working of the vessel."

Captain Dacey has had long experience in the East Indian marine service, and is entitled to speak. We commend his design to the attention of those who are in a position to aid in testing it.

PROPOSED NEW SCHOOLS, JOHNSON STREET, STEPNEY.

The designs for these schools, submitted in competition to the London School-Board, have been exhibited at the Guildhall, to such architects as happened to hear of the opportunity. It occurred too late, however, to enable us now to say anything about the drawings. The designs are by Mr. Roger Smith; Messrs. A. & C. Harston; Mr. H. Savon Snell (6,500 l.); Messrs. Jarvis & Son (10,200 l.); and Mr. Basil Champneys.

THE ROYAL ACADEMY.

ALTHOUGH the periodical press was courteously admitted to a quiet view of the 10th Exhibition of the Royal Academy of Arts in time to enable us to review it in our present number, it was with the express condition that no account of the exhibition should be published till after the day of the private view, this, Friday, May 3rd. We are forced, therefore, to postpone criticism till next week. We may say, however, that it is an interesting collection (consisting of 1,583 works of art, in the whole), and includes a number of pictures of very high merit. Mr. Elmore, Mr. E. M. Ward, Mrs. Ward, Mr. Frith, Mr. Millais, Mr. E. Long, Sir J. Gilbert, Mr. Richmond, Mr. Wells, Mr. Watts, Mr. Mason, Mr. G. Leslie, Mr. F. Leighton, Mr. Calderon, Mr. F. Walker, Mr. James Sant, Mr. Hook, Mr. Cope, Mr. Mann, Mr. Armitage, Mr. G. Smith, Mr. J. F. Lewis, Mr. Poynter, Mr. J. P. Knight, and Mr. P. Graham, with some others, are all worthily represented.—Sir Edwin Landseer largely. The architectural drawings and designs are about 100 in number, and will have attention in our next.

COMPETITIONS.

St. Helen's New Town-hall.—A special meeting of the St. Helen's Town Council has been held. The Council considered the report of Mr. Waterhouse, architect, on the plans for the new town-hall and the final selection of a design. Out of the six competing architects Mr. Waterhouse chose three, who contributed four plans, and he finally recommended one bearing the motto—*Respice Finem*. The meeting now accepted his judgment by ten to nine votes, and on the letters being opened it was found that the successful design had come from Messrs. Culshaw & Sumner, Liverpool. It was decided to ask Mr. Culshaw to meet the committee immediately, as alterations will be necessary.

Newington Mission Church.—The committee have decided to award the first premium to Mr. Cuts; the second to Mr. John Giles; and the third to Messrs. Giles & Gane.

Gateshead.—The congregation of the United Presbyterian Church in Gateshead, finding their present place of meeting too small, have resolved upon the erection of a new church in Bewick-road, and out of three designs for the building

sent in in competition by Mr. John Johnstone, Mr. Thomas Oliver, and Mr. Lish, of Newcastle-upon-Tyne, the design by Mr. Lish has been selected; and it is intended, we understand, to proceed with the work at once.

Nevington Parish Church.—The premiums have been awarded,—to Mr. Fowler, first; Mr. Pearson, second; Mr. Blomfield, third. Messrs. Brooks, Jarvis, and Bignell also sent designs. We shall probably take a look at them.

SCHOOL BOARDS.

Canterbury.—The Board's school is to be altered under the direction of their architect, Mr. J. G. Hall. Messrs. Gaskin & Godden's tender for the execution of the work has been accepted.

St. Austell.—At the meeting of this School Board on Saturday, the tender of Mr. J. Body, of St. Austell, was accepted for the carpenters', joiners', smiths', &c., work, and that of Mr. H. Ede for the masons', bricklayers', slaters', &c., for the erection of the Mount Charles Schools. Mr. S. Trevail, of Carne Par Station, from whose designs the schools are to be built, is appointed the architect to superintend the execution of the work: the cost will be under 2l. per child.

LIGHTING THE STAGE.

"It is interesting," says the *Athenæum*, "to notice, in an architectural contemporary, a statement that the stage of Mr. Fichter's theatre in New York is to be lighted by means of a line-light fixed in the ceiling of the auditorium, with reflectors, so as to illuminate the stage, not in that preposterously unnatural manner which custom has made less than intolerable, and the effect of which is the reverse of truth, but so that the features, and consequently the expressions, the limbs, and therefore the attitudes, of the performers, will be displayed as they were intended to be displayed, while spectators will be allowed to see the stage without the pain of facing the glare of the footlights. If any of our ablest artists would be good enough to exhibit two portraits of the same actor, one of him as he appears in the conventional stage-light, i.e., with his features illuminated from below, and another of him as he appears in the light by which human features were designed to be seen, that painter would secure the cause of true art."

It was a wise remark of Sir James Simpson to the present writer that he was half inclined to think that "there is nothing new but what has been forgotten." We have often occasion, in cases such as this, to recall the origination, or publication, in the *Builder* of past years, of ideas long subsequently put forth as something new; and so it seems to be in this instance. Twenty-five years ago, in our volume for 1847, p. 281, is a letter from Mr. J. E. Dove, in which he gives an account of this very mode of lighting the stage of the Greenock Theatre, invented by him, and executed for the manager under his superintendence. In this letter the writer says:—

"I had often been struck with the classical or picturesque expression thrown over the features of even a very plain and inelegant countenance by the elevation of the artificial light, when alone reflected on it from a point exclusively above its level. Let any one, for instance, place a mirror before his own face, and elevate the candle [now the lamp, as candles are scarce now-a-days], so that the light by which it is to be seen, to various levels, higher or lower, before it; and he will at once perceive that as the shadows come to fall exclusively downwards, a classical elegance and even beauty of effect will be shed over the most rugged countenance. Of course I do not mean that the light be elevated directly above the head, but immediately in front of it, at an angle, probably, of 45 degrees, so that the expression of no feature be lost.

On the other hand, while in a theatre, and especially in the pit [now orchestra stalls, chiefly], I have frequently been annoyed and disgusted with the effect of the unnatural glare of light from the footlights, particularly on the faces of those on the stage. The false and unnatural effect thus produced every one must have remarked. Even the very cavernous interior of the nostril of any the most beautiful countenance, which nature discreetly casts into shade, is thus explored with unmerciful, trying, and by no means beautiful distinctness. But I need not further enlarge on those reasons which led me to endeavor to get rid altogether of footlights. I did realize my idea, and that successfully, and to the satisfaction both of actors and spectators. The principle consisted in the entire removal of the footlights, and the bold substitution of a central congeries of lights in the very body of the house (a small one certainly), and almost in the place usually occupied by the chandelier, with a reflector sufficiently large and powerful to turn the whole flood of light upon the stage at about an angle of 45 degrees. A second congeries was found necessary, however, at a like elevation, but within the proscenium, or above the general range of the actors' heads, to aid in the proper and uninterrupted display of the scenery on the like principle, the complete design for which displayed comprehended the systematic use of scenery so illumin-

ated also from behind as to give the dioramic effect as far as possible."

The experiment, it thus seems, was carried out to a sufficient extent to prove not only its practicability, but its great superiority to the usual method of lighting the stage, and to show that nothing else was requisite to the most brilliant realisation of this still striking *mode* in all its details but the well filled treasury of a metropolitan theatre. The "sun-light" system in halls and churches, we may add, was introduced in Liverpool shortly after the date of this letter, and was obviously based on the idea therein described.

ARCHITECTS TAKING RETAINERS FROM THE CLERGY.

At the last sittings of the County Court of Durham, a case interesting to architects was tried. The plaintiff, Mr. J. C. Ebdy, is an architect, of Durham, and the defendant is the Rev. F. Thompson, vicar of the ancient church of St. Giles, of the same city.

The plaintiff gave the following particulars:—"1866, April 16th to May 9th. Making restoration survey of St. Giles's Church, and plans and specifications for restoring the same, at a cost of 1,200l., at 2½ per cent., 30l.; paid for excavating foundations, 6s. 6d.; total claim, 30l. 6s. 6d."

The plaintiff said that, in April, 1866, the defendant, with whom he had been long acquainted, called at his office and instructed him to make a report of the condition of St. Giles's Church, and also to show by plans how 1,200l. could be best spent in the work. He stated that the chancel of the church was not to be included in the work, as it belonged to Earl Vane. He gave a written retainer, and said he (the witness) was to look to him for payment. The first paragraph in the retainer was, "Proposed that a professional surveyor be employed to inspect the building and state its fitness for the purpose, and what should be done to make it a proper place of worship for the inhabitants of the parish, and also how 1,200l. can be best spent for the purpose." Signed by Mr. Thompson and Mr. Ebdy. He (the witness) remarked at the time that he did not consider it necessary for the vicar to sign the document, as he would take his word. Before he signed the document the defendant said he (plaintiff) should have to do the work of the rebuilding, and that he would have reduced to writing. A few days after the vicar showed witness a rough report of a survey he had made himself. The defendant did not give him any report of what he thought was requisite should be done. He merely made some suggestions about the church and the bells. He (witness) attended at the church three times, and was engaged altogether six hours and a half. Defendant was present, and witness's clerk was taking measurements of the church. He made the report and the plans, and gave them to defendant. The plans show the church as it now stands, and what it would be like when restored. One plan shows the different periods of architecture, another shows the building as it now stands, and what it would be like when restored. There are also alternative plans. The defendant made an objection to some of the details of the plans, and they were altered at his request. He said he had consulted some of his brother architects, and they would not allow a Norman window in the church to be interfered with. This rendered the alteration in the plans necessary. The plans were sufficient for all practical purposes. Altogether he was engaged thirteen and his clerk eleven days in the preparation of the plans and the report. Witness is a fellow of the Royal Institute of British Architects, and the medium charge for remuneration is 3 guineas a day, and the usual percentage when the work is finished. Some architects charge 5 guineas a day. The charge is modified if the work is not completed. If the work is tendered for by contractors, the charge is 3 per cent. If the work had been carried out he should have charged 5 per cent. Had not sued before for the bill in the expectation that the work would be carried out. Expects it will still be carried out.

By defendant's counsel (Mr. Skidmore).—Had been in practice twelve years. Is not aware whether the defendant has the reputation of knowing something about architecture except reading a paper before the Archaeological Society. The defendant said that as witness

was a young architect he would explain to me the beautiful proportions of the church; he did not point out to me the various styles of architecture displayed in the building. Would have taken it as an insult had he done so. Only went over the church with defendant out of courtesy. Defendant would never acknowledge the trustees to the church, and refused them admittance. Defendant said he must have been a fool to give witness the document before the Court. Never knew that the committee had refused to adopt the report. The report was addressed to the churchwardens as well as the incumbent, according to the usual custom, as they generally act together. Does not care to prepare plans for the chance of getting a job. It is quite common for these matters to be taken in hand by the clergyman. Professors to bind himself by the rules of the Royal Institute of British Architects, and by the rules of that body he is entitled to all claims in this demand. Would have been entitled to charge 5 per cent. for the job had he prepared the specifications. Would not have prepared plans like these for a builder, nor would have made the report. For a builder he would have prepared specifications and shown the elevations. Defendant did not say he had presented the report at the meeting of the trustees, and they almost threw them at his head. Witness did say he would abandon the present claim if he could get a guarantee he would be employed when the work was carried out.

Mr. Thomas Oliver, of Sunderland, said he was a Fellow of the Royal Institute of British Architects. He understood the nature of the plaintiff's claim. He should not have charged in the way Mr. Ebdy had done, but by time; and his bill, according to time scale, would have amounted to 40l. He did not consider Mr. Ebdy's work came fairly under the scale of 2½ per cent., as he had neither provided sections nor shown the elevations, but these could easily have been prepared from the plans.

By defendant's Counsel.—The value of a report depends upon its accuracy and its skill. Should have expected twenty guineas for such an elaborate report as Mr. Ebdy's. Probably, if Mr. Street had prepared a similar report he would have charged 200 guineas. The value of such documents altogether depended upon the skill and standing of the architect.

The rev. defendant, upon being called, gave a qualified denial as to retaining the plaintiff on his own responsibility. He told him that the nave and the tower were to be built by the trustees of the church property, and if he chose to make a report as to the state of that portion of the church which the trustees had to repair, it would give the plaintiff a little standing with the committee. He made the proposition as an act of kindness to a young man commencing business, but witness never agreed to pay for the report, merely offered his influence to get him the work. The document before the Court was merely a memorandum to submit to the trustees, and he was at a loss how Mr. Ebdy got it. At the meeting one of the trustees said he wondered how he, the vicar of the parish, had the impudence to produce any plans. Witness read a paper on his church, before the members of the Archaeological Society, but was certain he did not get any information for that paper from Mr. Ebdy's report. The report was perfectly worthless to witness, and he was prevented reading it or producing it before the committee.

Mr. Hodgson C. Fowler, of Durham, architect, said he put a very small value on the report and plans in question. There was nothing grand about them. No sections or elevations or description, showing what they were intended for, and nothing in the report but what could be gathered from any county history. It merely contained a few suggestions for a clergyman or churchwardens. The whole he should have charged for the work, and a man might charge more. The ground measurements for the plans could have been done in a morning, and all the other work in a couple of days. After a plan has been adopted, the architect makes out complete specifications, so that the different tradesmen can measure off their quantities; and he should say the specifications ought to be done in pencil by the architect, and the other work done by clerks. After the specification had been prepared, the architect would then be entitled to 20 per cent. Witness would have supplied a plan like these free of charge. He had a great deal to do with churches. Young architects often prepared plans on the chance of getting

work. He had often had letters from clergymen inviting him to make plans, on the terms mentioned by the defendant, and there was nothing unusual in what the defendant had done. He would have been rather glad, under the circumstances, of Mr. Thompson's offer, especially as the work was to be done in his own city.

Cross-examined by Mr. Grainger. Has frequently done work on the terms mentioned by the defendant. Heard Mr. Oliver give his evidence, and did not think his estimate of the value of the report and plans a monstrous exaggeration; but Mr. Oliver did not know the church, while witness did. The value of a report depended on the way a building was dealt with. The report was inaccurate and the plans were bad. Should not like to allow one of his clerks to do all the works in preparing sections and elevations. One of the plans could be used; but a larger plan would still be required, and if he had the restoration of the church to carry out, should start the whole thing afresh; in fact, he could have got more information in the course of a single walk round the church from Mr. Thompson himself.

Other evidence *pro* and *con*, but of no importance, was adduced, and defendant's counsel at great length urged that the resolution above referred to was but a private memorandum, and had not been given to the plaintiff as a guarantee for payment or employment. That there was no retainer in point of law, and it had been clearly proved that it was not an uncommon thing for architects to do work on the terms stated by the vicar of St. Giles.

The judge said there were many facts in favour of the plaintiff's demand. The production of the document purporting to be resolutions that a professional architect should be employed, and that such architect should be Mr. Ebdy, was in defendant's handwriting. There was also the performance of the work and the entries of it at the time in the plaintiff's books of account, which showed that the architect expected to be paid by some one for his services. If Mr. Ebdy had merely volunteered to make a report on speculation of getting the work, he thought the plaintiff would not have taken the trouble he did, but merely thrown out a few suggestions. He thought the natural course, if the defendant really wished to get the work for the plaintiff, would have been to have used his influence with the trustees, and if he had succeeded, then to have got full plans, and the strong censure shown by the trustees seemed to show that the incumbent had, without any authority from them, employed an architect to make a report on the church; for surely no one could be offended because a young architect had volunteered to give an opinion. The evidence of the defendant was not clear and decisive on the point urged on his side, or he should have been strongly inclined to have given him a verdict. As the plaintiff had proved many facts and circumstances in his favour, the balance of evidence was on his side. He thought, however, the charge was capable of modification, and he should find for the plaintiff for the sum of 12*l.* and full costs.

The court was crowded with architects and surveyors from all parts of the north.

TRAFFIC IN OXFORD-STREET.

Mr. GREENWELL, the vosty-clerk of St. Mary-above, in his evidence given to the Parliamentary Committee on Metropolitan Tramways now sitting, and who said he represented the owners of Oxford-street, occupying property assessed at 172,000*l.* per annum, who had upwards of six millions sterling invested in their businesses and premises, and who included many high-class tradespeople, who were almost unanimously opposed to the proposal to lay a tramway in that thoroughfare, stated that it had been ascertained that a street of less than 48 ft. wide between the curbs could not afford space for two lines of tramway, and allow carriages to pass or draw up on the sides of the street. There were parts of Oxford-street that were 31 ft. 4 in., 3 ft., and 42 ft. wide respectively. A double line of tramway in Oxford-street would prevent tradespeople from having carriages opposite their doors, which was a necessity of their business. The vehicular traffic of Oxford-street was of a peculiar character, both as regarded vehicles in motion and having occasion to main at rest for a time. All sorts of light and heavy carriages were combined in the traffic on a recent day, for instance, when the state of

the weather justified the belief that the traffic was considerably under the average, the following vehicles passed Regent-circus, between 9 a.m. and 6 p.m. :—

	Going West.	Going East.
Cabs	2,489	1,979
Carriages	707	731
Omnibuses	622	640
Carts	657	451
Vans	428	246
Waggon	114	251

Or 9,902 vehicles taking both directions. At other two points in Oxford-street the numbers were respectively 8,687 and 6,508. In some parts of the street it was not unusual for ten to twenty carriages to have occasion to stand on the sides of the street, at a short distance from each other. A double tramway was totally incompatible with such a traffic. We are of the same opinion.

SASH FASTENERS.

If a perfect sash-fastener he produced, it will not improve the thousands now in use. Here is a cheap and simple security for them:—Take a brass drop key-hole-escutcheon; lay it lengthways on the meeting rail of the bottom sash, so that the drop just touches the end of the lever when fastened; put in the two screws, and the thing is done. You just move the drop to let the lever pass, and push it back when re-fastened. One hand only is required. If the manufacturer would introduce a little enlarged catch-plate, with the movable stop on, it would be desirable; if with a spring, it would be self-acting.

H. F.

SEWAGE FARMS.

The statements made by Dr. Letheby, at the Slough Inquiry, in objection to sewage farms, are of such a damaging character, and so opposed to the particulars given by other competent witnesses, that the advocates of sewage irrigation should feel it to be their duty to inquire farther into them. If what Dr. Letheby said be true, much that has been said by others must be false, and *vice versa*.

THE SHRINE AT ST. ALBAN'S ABBEY.

The visitor to St. Alban's Abbey Church last year found on the centre of the floor of the Saint's Chapel, (the extension of the choir eastwards), behind the great altar-screen, a framing of Purbeck marble and an inscribed stone; marking, as he was told, the traditional site of the shrine of St. Alban, the proto-martyr of Britain;—the object erewhile of countless pilgrimages, and of world-wide reputation. The shrine itself had disappeared; but some carved Purbeck marble and some mouldings placed at the end of the chapel, were probably pointed out as fragments, supposed at one time to have been parts of it. In the course of the many, continued explorations undertaken by Dr. Nicholson, the then rector, with the scanty funds at his disposal, the filled-in arches at the east end of the Saint's Chapel seemed likely to repay his investigation. In 1848, the northern of the three arches opening into the eastern aisle or ambulatory (now a public passage-way) was opened out; but with no special results, beyond the discovery of part of a low altar-screen, a painted figure of an archbishop, and of some strongly-coloured surfaces, sprinkled with detached conventional flowers. A few years later the centre arch was cleared, and yielded nearly a score of pieces; and then a temporary halt was made, which came in time to be full fifteen years long. When Mr. G. G. Scott was called on to report (April 5, 1871) as to the works to be forthwith undertaken and desirable in the future, speaking of the arches at the end of the Saint's Chapel, and its aisles, his report stated that,—“These walled-up arches will probably be found to be perfect mines of antiquarian wealth. Some portions of them already partially cleared by Dr. Nicholson yielded a rich return of architectural detail, including a considerable part of the marble substructure of the shrine of St. Alban,—as charming fragments of ancient carving as can well be conceived; and we may hope that the mine is far from being exhausted.” The removal of the walling filled in to certain recesses in the south aisle, furnished the first additions to the store previously accumulated, (see page 122 ante). From this were obtained solid masses of dunch, cut into grained forms, and panels of the same;—in strictness bits of panels; for, in some, with their longest dimensions under 12 in., twelve pieces, may now be counted. But

the arch at the east end of the south aisle, one of those mentioned in the report quoted, proved, on investigation, by far the richest storehouse; hence came, among other things, the Purbeck marble, gabled panels of the sides and ends,—certainly, on art grounds, the richest find of all,—made in the last week in February. The south arch of the Saint's Chapel also contained a length of cornice, &c. To sort the larger of these resurrected pieces, and arrive at the design of each part,—of basement panels, of traceried arcades, of niche divisions: to use shellac dissolved in spirits of wine to fit together morsels almost comminuted; to trace from the form of those portions the obvious general form of the whole shrine; all these fall so well into the likeness of a natural process, in intelligent hands, that it would seem almost superfluous even to hint at them; and perhaps it is also a work of supererogation to add that, with backings of brickwork to give solidity, with roofing-slats cemented in Portland cement at the backs of broken slabs, with temporary wooden struts and other devices, the shrine is, as might have been expected, growing into shape; is partially grained over, and steadily gathering to itself the stray bits of stone and marble, that must have looked vastly like a rubbish-heap to the eye of the uninitiated.

The very general interest that has been felt and will be maintained with reference to this matter, will warrant some amount of what might otherwise appear rather trivial detail. “Of all the shrines which once adorned our island, there remain but the lower basement of the one at Westminster and a portion of that at Ely;” says Mr. W. Burges in his paper in the “Gleanings from Westminster Abbey,” (second edition, 1863, p. 128).

Two steps, each 4 in. high; a substructure, with its plinth 30 in.; open niches, 23 in. to springing of arches; arches, with crocketed gables over, 35 in.; a 7-inch cornice and 4½-inch slab on the top of all; give a total height of 9 ft. from the floor of the church to the top of the masonry of the shrine. Each of the longer sides is in four divisions (2 ft. 0½ in. centres); and the shorter sides (which we will call the ends) in one, subdivided by mullion and sub-arches (1 ft. 6 in. centres). These dimensions will show how the size of the substructure comes to be a parallelogram about 8 ft. 6 in. by 3 ft. 3 in., and how the projection beyond this of the plinth and steps equally on every side calls for an occupied floor space of 12 ft. by 6 ft. 9 in. The relative position of the parts has been determined by placing the tympanum containing the martyrdom at the west end. The Chronicle, speaking of an earlier shrine, states that the then abbot “set it up in a more exalted place, that is to say, above the high altar, in front of the celebrant, that as before his face, so also in his heart, whoever was celebrating mass at the same altar might have the memory of the martyr. And on that account, as an object of the sight of the celebrant, the martyrdom of the same, that is to say, the decollation, is figured.” This, whether the original position or not, now fixes those of the other panels, &c., at least of the superstructure, and it is therefore convenient to speak of them by the ordinary methods used as to orientated churches. The longer sides of course run east and west, as indicated by the old marks on the pavement.

The steps are of Purbeck marble; as, indeed, is all the rest of the structure, with the exception of the vaulting of the niches and their panelled divisions above the springing level. Though not all quite complete, there are some fair straight lengths,—in some of the bays with marks of usage; those fixed at the west end being rounded, and the lower step fixed on the north side worn into observable hollows, where the feet of those kneeling on the upper step would have to find their bearings. The substructure has quatrefoils in all divisions, flattened in those at the ends, each foil sub-trefoiled; a delicate moulded cornice, with carved enrichments at intervals, completes this portion; a slab jointed to the back of this cornice starting the superstructure fairly. The two central niches on each side are rectangles, those at the ends are triangles (12 in. deep), the four angle niches of the sides are trapezoids on plan (10 in. wide at back); the including rectangle is thus fully occupied with the ten niches. Cinquefoiled arches, each foil sub-foiled, hunches of foliage over the arches in the tympana of the gables, three sitting figures over the mullions, angels swinging censers at the corners, and the cor-

nice, are the details of the sides. The double arch, with sitting figure over the mullion, the sculptured tympanum over included in the gabled form, centring angles at the corners, and of course the cornice, are repeated at the ends. There are buttresses (fourteen in all) at each division, and double ones at the angles; all standing free but connected to the springings of the arches and to the cornice. The groining is hollowed, as well as the upper portions of the cross partitions of the niches, out of solid stones;—to all appearance in two heights in all cases, making ten stones for all. It is to be regretted that the varied surfaces of the groining interfered with the convenience of form of one of the stones, when wanted time ago for some rough building purpose; and consequently it was scabbled all round; so that, with the exception of just one or two clear enough indications, it is now forced to take its place without its expected form or decoration. The top of all was a single slab, $\frac{1}{2}$ in. thick, now cut down into several portions,—one end, 3 ft. 6 in. by 2 ft. 9 in. remaining, and parts of the ornamented sides in scantling. The old inscribed stone that bore the inscription, "S. Alhams, Verolamensis Anglorum, Proto-Martyr, 17 Junii, 297," and, after greatly exercising his mind, was ignominiously reversed by Dr. Nicholson, and was re-inscribed with "Britan: Protomart:." &c., now puts in very fairly a claim to be considered part of this coping stone.

Of the subjects of the carving it is unnecessary to speak in complete detail, and thus prolong a description necessarily tedious. The modelling of the foliage, the cornice is vigorous, and the execution full of spirit; the crockets of the eastern end, with their crumpled and twisted edges are very refined; the hunches in the tympana and the other crockets are of the best art, albeit some of them are a little less decisively handled. These crockets are more thoroughly conventional than the rest of this carving, which is marked by the characteristics of what has been aptly termed "the conventionalism of approach to nature." The figure sculpture, though not unpleasing, being thoroughly inoffensive and without distortion, is not of the best class, either in modelling or execution; it is, however, thoroughly subordinated to the general effect, and till something more is exacted, of each separate work, does its part very honestly.

The date of the design may, from its general character, and from the details, be placed with some certainty in the first years of the fourteenth century, when the details of the Geometrical style were in the process of undergoing changes that led to the style we call Decorated.* The eastern end of the church had for many a year been gradually assuming the form visible to the mind's eye in the mutilated, battered, desecrated condition of to-day. From the commencement about 1256 by John of Hertford (Abbot 1235-1260), of works upon the old choir, down to the completion of Lady-chapel at the extreme east in the rule of Hugh Everiden (1301-1326), a sort of regular course and progress seems to have been maintained,—albeit with some intervals of cessation. The erection of a suitable shrine was probably had in view from the very commencement of these works.

As to the method of destruction of the structure; Mr. Smith, the very intelligent mason whose hands have put together all the work as it may now be seen, has concluded from the forms of the fractures where cramps have been torn out;—that the whole was violently overturned by some battering force, and crashing down in a mass, the greater portion at least of the breakages were made at once; that it needed no iconoclastic fury to carry further the destruction that the weight of some of the stones and the form of others sufficiently account for. (For instance, the south side above the springing is almost wholly a single slab of Purbeck, about 8 ft. by 2 ft. 6 in., and only 2 in. thick in the portions between the gables; the north side is different, there being four pieces false jointed behind the figures and vertical mouldings.) No doubt the materials

nearest to hand were thrown almost at random into the walls, intended to block the various openings that then laid open what was to become the parish church; being probably carried at once to the builders from the heaps in which they had lain since the destruction. The difference of the light from that for which the shrine was designed may here be noticed; the gigantic altar-screen (erected about 1450), the blocking up of the eastern arches, the watching loft, and Duke Humphrey's monument, are all of much later date.

This discovery is likely, according to all precedent, to afford plentiful opportunity for ingenious speculation, and the amicable controversies of wit and knowledge. As a method of affording information with respect to some details not above mentioned, we subjoin a statement of a few of the points not yet cleared up. They all seemingly stand a better chance of elucidation from analogy or conjecture than from further actual discoveries. . . . As to the exact nature, form, material, &c., of the upper portion, for which the now-discovered pedestal was only the preparation;—probably, as usual, a metal or wooden structure covered with plates of gold or silver, enriched with jewels and enamels; doubtless torn to pieces and the most precious portions melted down or dispersed very shortly after the order for destruction had been given;—the knowledge is, for instance, at present very limited. The top slab previously described ($\frac{1}{2}$ in. thick) has a hole in each angle, and one in the centre of each side; all the six being $\frac{1}{2}$ in. diameter, and clean cut as for metal; not leaded or otherwise secured, but running well down into the stone. The weight of the roof, no doubt, supplied mooring enough in ordinary times, and these were also dowels to it. Between these larger holes are smaller ones ($\frac{1}{4}$ in., less deeply cut, but evidently at one time containing some infrangible standards. For,—(let us suppose on a violent overturning of the covering),—these metal standards seem to have broken their way out;—to have, in fact, extricated themselves by destroying the front walls of their prisons,—not, of course, to the profit of the delicately-carved hand encrusted along the edge of the surmounting slab. . . . The destined purpose of the ten niches so elaborately panelled and canopied has not yet been the subject even of very plausible conjecture. On the sides each is 23 in. wide by 18 in. clear depth, and about 3 ft. high. Statues or groups seem out of the question, as the scale of the sculpture is apparently finally given by the figures only about 14 in. high. Places in which the rich offerings of well-to-do pilgrims could be placed under their own eyes, or even by their own hands, have certainly been here provided in a way to gladden by anticipation the hearts of a community, not ungraciously disregardful of benefactions. Near upon 25 ft. superficial of table area bestowed even at intervals (of course) with proper objects, may have rendered precious in the delight of "well building," which mainly keeps green their memory to this day: while the results of their main labours and strivings have passed, unremembered and almost unwritten, into the everyday lives of their countrymen. How difficult at times was the task of meeting every claim, even with the apparently magnificent possessions of the Abbey, may appear from the words wrung in his last moments from John de Marinis (A.D. 1308):—

"Let not my successor fail to explain the heavy debts,—the very indigence,—of our house to our Lord the Pope —*pro cupiditate Curie Romane*" (Walsingham's "*gesta*," vol. ii., p. 108, where the very small balance of cash in hand is also carefully specified). The level of the niches and their shapes and sizes of course differ from those of the remaining substructure of the Confessor's shrine at Westminster; there, — "The lower parts of the north and south sides are pierced with three niches each. It was in these that sick people were frequently left during the night, in the hopes of a cure being effected by the intercession of the saint." Unfortunately the large slab that originally tied the whole structure together, and formed the floors of the niches, has not been discovered, another stone now supplying its place in the restoration; we are thus deprived of the information that might be afforded by a sight of the original surface. . . . The 7-in. squares placed with their diagonals on the axes, cut clearly through the Purbeck grounds of the two outer panels of each side of the substructure are also ornamental. Were they open or closed by metal work? Was it permitted to privileged visitors to touch

some objects within the structure with the fingertips of their outstretched hands?—on occasion to batho shattered or withered limbs in an atmosphere deemed of peculiar sanctity? "The infirm persons may be seen (in the illuminations) creeping through the holes in the tomb. The latter is by no means an uncommon practice, and in several parts of France tombs of this description still remain." ("Gleanings, Westminster," p. 136). But here we have 7 in. by 7 in. Can this at any time have been suitable for Englishmen, however reduced by sickness? . . . The tripartite sub-bases, by all reason may be supposed to belong to the trefoil-shaped (in section) 4-inches-across shafts of a slow twisted kind, of which numerous fragments have been found. These sub-bases cut into the lower most expanded stop,—the 12 ft. by 6 ft. 9 in. step mentioned above; one opposite the centre buttress, and one opposite each end buttress of each side of the shrine. Their complete form has not yet been ascertained. May the account given by Matthew Paris of certain fittings of Abbot Symon's (1168-1183) shrine be accepted as an indication of a possible use for these little twisted pillars in the one that eventually superseded it? "Abbot William (1214-1235) appointed that the six wax tapers should be lighted on those feasts which are celebrated in copes, and especially on the principal days; for the maintenance of which he assigned, with the consent of the convent, a mark to be received of the house at Bingham." (In Norfolk, a priory,—not always very willingly,—subject to this monastery), "instead of the pickle which we are accustomed to receive annually." . . . The four-lobed (quatrefoil on plan) shafts, in-dimension about equal to the three-lobed last mentioned, with appropriate nicely-moulded caps and bases, would seem to have been destined for some similar purpose, but their situation is indicated by no traces yet hit upon. Here the conclusion, come to under the guidance of an illuminated MS., that "two columns one at each end of the Westminister Shrine did not bear lamps, but figures (of St. John and the Confessor)" may occur to the memory of the reader.

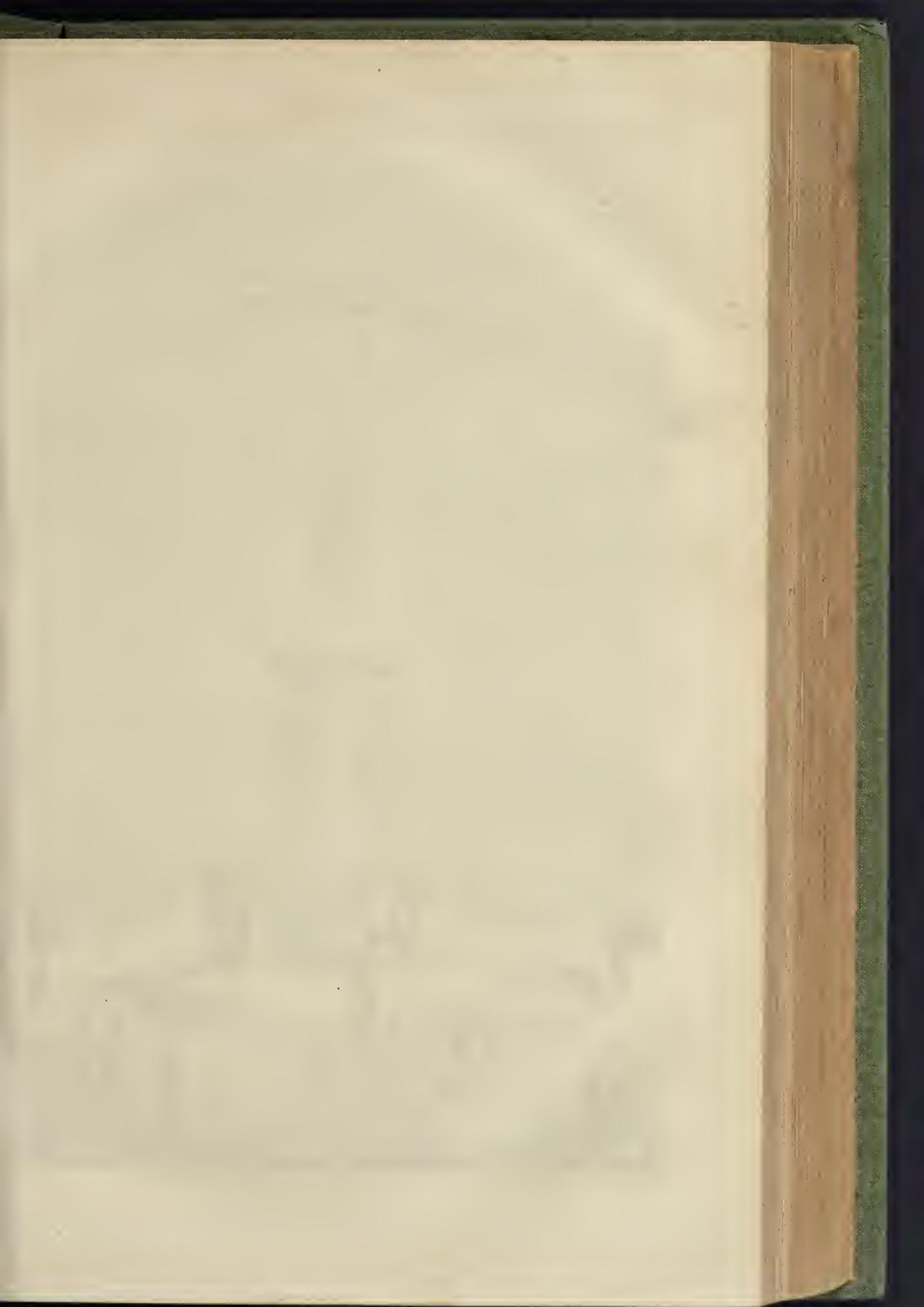
And,—so as not to extend indefinitely a sort of catalogue of bones of contention,—the colour applied to the visible surfaces of the clunch panelling and groining of the niches may be considered the last ground for controversy now to be pointed out. So liberal and so bold a use of vivid red, blue, and yellow, on skillfully-cut and admirably-designed ornamentation, should provoke from the advocates of unpainted stonework some protest against the bad taste of a later time, which disguised the pure forms of the work of an earlier age; and perhaps in return extract from others an expression of admiration for the variety and the harmony also, visible now at least when the hues are sobered by time and evil usage. The thin partitions between the niches are formed of Purbeck (14 in. thick from ground of panel to ground of panel up to the springings of the arches, finished similarly on both sides); but above of clunch (of only half the thickness wrought on one side only, as the joints of the groining centre with the supports); and the lower trefoils of the clunch tracery being on the same face with the Purbeck, are painted in its exact tone and semblance; perhaps hardly to be avoided if anything of this sort was to be done, but liable to be treated to some oblique regrets by true oligo-chromatians.

We may mention that in order to keep all changes in respect of the shrine apart from the Reparation Fund, so urgently required for the very extensive works of substantial restoration, Mr. G. G. Scott has from the first made himself personally responsible for the cost of the tentative putting together, and for the more laboured experiment now in progress (estimated roughly at 100l.); not, of course, refusing the proffered help of any taking a peculiar interest in the bringing again into complete form of one of the most admirable productions by most skilful hands, in what many are inclined to consider the period of the full perfection of Gothic architecture in England.

Looking at the arches now put up as the south side, the gable on the right hand side contains the Hawthorn in fruit; the next, Oak in fruit; the third, Bryony in fruit; and the gable on the left hand side, Maple in fruit. All the subjects being in fruit, it follows that if they were carved from nature, which seems probable, the work must have been done in September or October.

* The drawings we have engraved were made from photographs produced by Mr. Downer, of Wotford.

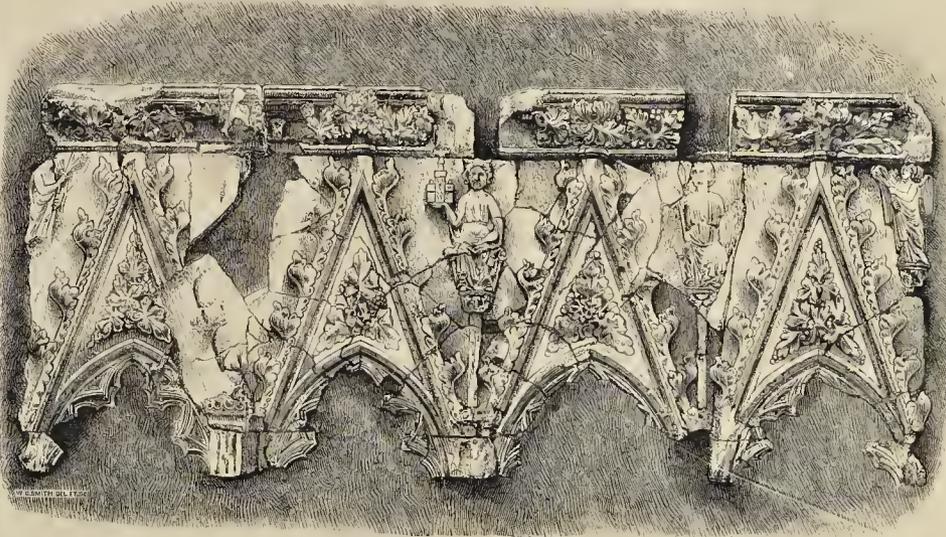
* Notice of works to the Shrine, in the time of John IV. (de Marinis or Marins), Abbot 1302-1308, may be found in the "*Gesta Albatun Monasterii Sancti Albani*," a Thoma Walsingham, regemate Ricardo Secundo, compilata." Edited by Mr. H. T. Riley. Longmans, 1867 (3 volumes). A compilation of the date of the last ten years of the fourteenth century—from 1308 by Walsingham himself, for some time manager of the copying-room of the Abbey immediately previous, from materials no longer in existence,—the date of the original redaction is therefore not known. Among the acts of Abbot John IV. — "Tumban autem Sancti Albani, ad ferendum, amover fecit, honorifice istud decorando, et expensas exposuit, sine multis curialitatibus, plus quam centum sexaginta marcas in pecunia numerata." Vol. ii, page 107.



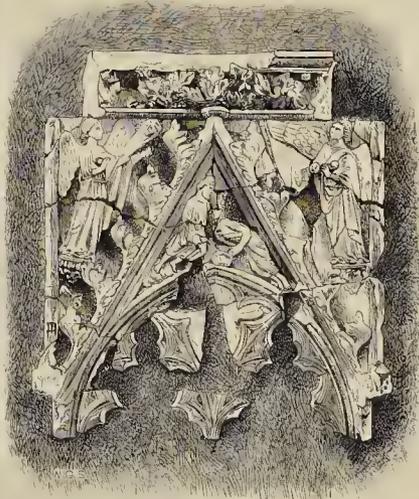


THE CINCINNATI FOUNTAIN, UNITED STATES.

DETAILS OF THE NEWLY-DISCOVERED SHRINE, ST. ALBAN'S ABBEY.



Now the South Side.

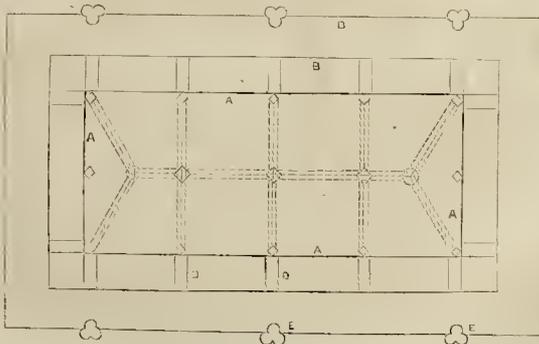


West End: Martyrdom.



East End.

A. Roof.
 B. B. Steps.



D. D. Buttresses.
 E. E. Three-lobed Bases.

Sketch Plan of the Shrine.

spaces occupied by the benches is of wood blocks laid on concrete, which makes a dry and almost noiseless floor, while according with the tile paving of the aisles better than a common floor on joists, &c.

The warming of the church, which is understood to be satisfactory, has been carried out by Mr. Porritt, of Manchester. The general contractor was Mr. J. Grimes, of Colchester.

WHO SHOULD DECORATE ST. PAUL'S.

SIR,—It is not many years since that, at the instigation of the late Prince Consort, a Royal Commission was appointed for the purpose of obtaining all the practical experience available on the subject of mural decoration, and the mode of conducting works of this kind and on a large scale, to a successful termination. Sir Charles Eastlake, whose profound knowledge of the principles of art, scrupulous care, and learning admirably fitted him for the post, was unanimously elected secretary, and a body of information collected, methodised, and so lucidly expressed as to leave nothing to be desired. All this information was expressly gathered to help our inexperience in the conduct of great mural works, such as that proposed in the completion of St. Paul's. Yet, scarcely credible as it is, a committee, in seeming total ignorance of the existence of such a body of information for their guidance, at once proceed to act upon their own conceits. In the great art-epochs it was the artist who determined the decorations of an edifice, for it is only painters who are capable of executing monumental works that are fit to determine a scheme of decoration for such a building as St. Paul's. And in the appendix to the Report of the Royal Commissioners, we have the mode in which such works should be conducted thus enumerated:—

"On no point is Cornelius more decided than on the necessity of placing a given series of frescoes under the control of one directing artist. This appears to be quite compatible with the employment of many such directors, by subdividing the works; but he thinks it most desirable that in one complete series there should be a congruity of style and general execution. In Munich, where great execution has now been gained in these undertakings, several independent masters have formed scholars to work in their style, and these have been ultimately employed on original works."

I think the public have a right to call upon the Royal Academy and the press to interfere in this matter, and to see that those few painters who understand the subject of mural decoration have the direction of this national undertaking.

SCULPTOR.

THE SUBSIDENCE OF TURNMILL STREET.

On Friday last week, at the Westminster Palace Hotel, Mr. Clutton, the arbitrator appointed by the Board of Trade in the case of the Clerkenwell Vestry v. the Metropolitan Railway Company, resumed an issue and the causes which led to the subsidence of Turnmill-street, and the damaging of the sewer in that street to an extent that rendered its reconstruction necessary. The question in dispute is one between the Clerkenwell Vestry on the one hand, and the Metropolitan Railway Company on the other, as to whether the giving way of the sewer, and the injuries it sustained, was the result of the railway excavations, or any inherent defect in the sewer itself, or owing to its age. The amount claimed by the vestry is 1,700*l*.

Mr. Horace Lloyd, Q.C., appeared for the vestry, and Mr. Horatio Lloyd represented the railway company.

On the previous occasion when the arbitrator sat to receive evidence in the case, the witnesses examined were on the side of the vestry. Mr. Hayward, the engineer to the City, and Mr. Gregory, C.E., were among the witnesses then examined, and they ascribed the sinking of the roadway in Turnmill-street, and the cracking of the sewer, to the depth at which the railway excavations were carried. They regarded the damage done as a natural consequence of the railway works.

On the resumption of the case on Friday, rebutting testimony was adduced on the part of the railway company.

Mr. Wm. Morion, the first witness examined, said he was resident engineer to the railway company in 1862, when the excavations at the Farringdon-street station were made. He superintended the construction of the work. The bulging of the wall he ascribed to the lodging of water behind it. The wall was sufficiently strong to keep back the earth at the back, but it was not strong enough to resist as well the pressure of water which escaped from the sewer.

Mr. Fayer, the engineer to the Metropolitan Railway Company, said the cutting opposite Turnmill-street was made on a slope, and afterwards the retaining wall was built. It was a very solid, strong-vaunted wall. Witness could conceive no other plan which would lead him to the conclusion that the sinking of the sewer was the consequence of the railway excavations. The sewer was an old one, and, doubtless, built in a defective manner, as most old sewers were. In former times, there was a tendency on the part of builders to "scamp" the sewer work.

Corroborative evidence was given by Mr. Baker, designer in the engineering department of the Company.

Confirmatory testimony was also adduced by Mr. Brooks, the foreman of the plate-layers.

Mr. Horatio Lloyd submitted that it was not for him to prove that the damage was the result of the railway excavations, but that the burden of proof rested with the learned counsel on the other side to prove that such was the case. He contended that the circumstances connected with the giving way of the Fleet sewer and the cracking of the Turnmill-street sewer were quite different, and pointed out that each of the witnesses on the other side had a different theory to account for the damage done.

Mr. Horace Lloyd, in reply, laid stress upon the fact that Mr. Fowler had, in the case of the Fleet sewer, expressed similar views to those which he expressed on that occasion; but the arbitrator was satisfied with the evidence given by Mr. Hawkshaw, that the damage done to the sewer was the result of the railway works, and those alone. He (the learned counsel) maintained that the circumstances of the case were analogous. The railway company seemed to have a most convenient theory. If a sewer were new, they held that it was imperfectly constructed, or had not had time to consolidate and settle itself; and if it were old, they contended that it was badly constructed, and by reason of its age incapacitated from performing the work it was constructed to fulfil.

Mr. Morion asked the arbitrator when he would give his decision.

The arbitrator said the time allowed him by the Board of Trade for giving his award terminated on the 30th of April.

SALTING ON PARIAN.

REFERRING to a letter signed "J. S." in your pages under the above heading,—parian cement, manufactured according to the patent and properly manipulated by the plasterer, will not effloresce, having nothing whatever in its composition to cause it to do so.

In the case in point, the following questions should be answered before any blame can be laid on the cement, viz.:

Was the Portland backing allowed to get thoroughly dry before the finishing coat was put on? What thickness was the finishing coat? What proportions of sand to cement were used, and what proportion of water to cement?

Parian stuccoed on Portland after the letter has become "bone dried" will almost invariably make a good job, providing the parian is not overused with sand, and not painted on for at least twelve hours after using.

EXPERIENCE.

DISTRICT SURVEYORS' FEES.

At the Metropolitan Board of Works, on Friday in last week, the Building Act Committee presented a report on the question of what are to be considered separate tenements, for which an additional fee can be charged for surveying. It appeared that a house belonging to a Mr. Flight had to be surveyed under the Dangerous Structures Act, and the district surveyor charged one fee for the dwelling, and another for the privy building, which latter he deemed a separate tenement. Mr. Flight appealed against the double charge to the Metropolitan Board, and the question being submitted to their solicitor, the charge was declared by that gentleman illegal. The Board, however, referred the matter to the Building Act Committee, who recommended "That proceedings be taken by the solicitor against Mr. T. Flight, in order that the legal question might be raised." Another report was presented on a letter from the District Surveyors' Association, dated the 9th ult., suggesting that in any Bill for the amendment of the Building Act a provision should be inserted making the district surveyor's fees a charge upon the building, relieving them from the payment of costs in appeals to the superior courts in cases where the appeals are not made by them, and enabling them to state their cases before magistrates when proceedings are taken. The committee in this report recommended that the request of the Association be not acceded to. Both reports were adopted.

ACCIDENTS.

DURING a recent thunderstorm the lightning struck one of the pinnacles of the tower of St. George's Church, Kidderminster, and injured it so much that it will probably have to be taken down. The pinnacle was completely twisted round by the force of the electric current, and several pieces of stone were thrown a considerable distance right over the tower.—A stack of chimneys, at Nostal Priory, about five miles from Wakefield, has also been struck by lightning. The stack is built of extremely strong stone-work, the top of it being more than 50 ft. from the ground. The lightning seems to have entered two contiguous chimneys, divided by a thin partition. This thin partition was untouched, but the stonework of each chimney, nearly 1 ft. in thickness, was completely shattered and blown out, leaving a hole in each nearly big enough for a wheel-barrow to enter. Stones larger than a man's head were blown out horizontally, first, over 25 ft. of roof, and then over a flight of steps extending more than 20 ft.

from the wall of the house. Thus, they were thrown nearly 50 ft. from the chimney into the carriage-road below. A thunderclap was heard at the same moment, like the report of a cannon. The trace of the electric force can be observed lower down in the chimney than the fracture described.—The chimney of a house situated in Edmonds'-buildings, New-street, Worcester, has fallen upon, and passed completely through, the roof of the Swan-with-two-Necks, and that of the adjoining house. The property is in a dilapidated condition.

SCHOOL-BUILDING NEWS.

Tower-hill, London.—The new Roman Catholic Schools here have been formally opened, in the presence of a vast concourse of people. The district is one of the most densely populated in London, and is inhabited by very poor people. The foundation-stone was laid in June, 1870, by the Princess Marguerite of Orleans, who has always taken the deepest interest in the education of Roman Catholic children in the district. Prior to her leaving England, on the occasion of her marriage with Prince Czartoryski, the princess sent her crucifix as a present to the school children. The schools are large and commodious. The block is four stories high, and built of red brick, relieved with white and yellow archings and stone coigns and dressings. The lower floor is the infant school, which is fitted with galleries and all necessaries for teaching. Attached to this is a kitchen, where food is prepared for the children whose parents are of necessity away from home during the working hours of the day. The next floor is the girls' school, which has commodious classrooms. The second story is used as a school for the older girls, where they are taught to make shirts, dresses, &c. At certain hours they are taken to the kitchen and taught how to cook the children's dinners in order to fit them for discharging wifely duties later in life. Many ladies join in this good work. For the boys' school on the next floor, lay masters are provided, and the educational work—pure and simple—is under Government inspection. The clergy found the need of establishing something whereby a bold might be maintained on the elder girls who had left school. With this end in view, a "Protectory" was established, where they are taught various trades, and furnished with one substantial meal each day, receiving a small sum weekly in addition.

Litley, Bishop's Castle.—The foundation-stone of a new school has been laid at Litley, for the parish of More and part of Lydham. The new building will be completed as early as possible, by Messrs. Coles & Sayce, the builders employed upon Mr. More's estate.

Findon (Sussex).—The foundation-stone of the new national school has been laid here. The ex-President of the Board of Trade, the Right Hon. John Bright, M.P., was present, and while Miss Willett, who laid the stone, was performing her part of the ceremony, stood beside her, and intimated to her how she was to act. Several new coins, as usual, being placed in the hollow of the stone, the vicar, before the hollow was covered up, stepped up to Mr. Bright, and asked him if he would like to place a bean new sovereign with the other coins; to which the right hon. gentleman laughingly replied, "No, thank you, I would rather not lose it." The estimated cost of the building is about 1,000*l*.

Bradford.—Holy Trinity Church Schools, which have recently been erected in Mount-street, New Leeds, in connexion with Holy Trinity Church, have been opened. The schools now consist of a boys' school to accommodate 202; a girls' school to accommodate 193; and an infants' school to accommodate 193. The infants' school is an enlargement, but the other two rooms are entirely new. The infant school is 60 ft. by 21 ft. in extent, the girls' 60 ft. by 20 ft., and the boys' 71 ft. by 19 ft. Each room is provided with a classroom. The total cost has been 2,100*l*., and all the money has been obtained except about 250*l*.

Yarmouth.—The corner-stone of the new schools in connexion with the St. James's Mission has been laid. The building will consist of boys' school, 50 ft. by 20 ft.; girls' school, 48 ft. by 20 ft.; and infant school, 66 ft. by 20 ft., with the requisite class-rooms, lobbies, and offices. The style will be of plain Gothic character. The external walling material will be of red brick, with stone and brick dressings, faced internally with red bricks, and having

white brick bands at intervals. The roof will be open-timbered, stained and varnished, and will be of good height. The buildings will form three sides of a square, with an open arcade round the central portion. Accommodation will be provided for about 500 children, according to Government regulations; and the total cost of the buildings will be about 1,500l. Mr. J. T. Bettle of Yarmouth, is the architect; and the contractors are Messrs. J. Leggett & J. H. Want.

CHURCH-BUILDING NEWS.

Rushock.—The re-opening, after restoration, of Rnshock Church, has taken place. The sum of between 300l. and 400l. found necessary for the work, having been speedily raised, Mr. T. D. Baker, architect, Kilderminstor, prepared the plans and superintended the restoration gratuitously, and his instructions were carried out by Mr. Tolly, of Lady's Wood, builder. The old square seats have been removed and substituted by stalls, the ends and rails of which are of oak, and the backs and seats of stained deal; the west gallery has also been entirely re-seated, and a new paneled front, formed of the same material as the sittings in the body of the church, supplied. The reading-desk, pulpit, and lectern, are all of oak, and entirely new, and a new organ, by Cox & Spiers, of Banbury, placed in the north transept. This instrument is the gift of the Rev. Melville R. Moore. A stained east window has also been presented to the church by the Rev. J. Percy. The chancel-arch has been cut back, choir stalls placed just without the chancel, and the whole of the interior of the building has been coloured. The repairs to the exterior have been confined to the roof, which has been rendered impervious to the weather, and covered with Broseley tiles.

West Bridgford (near Nottingham).—The parish church of West Bridgford, an ancient and venerable structure, has been again thrown open for public devotion. The dilapidated state into which the edifice was rapidly falling, rendered a restoration necessary, and Messrs. Hine & Son, of Nottingham, were engaged to prepare the necessary plans. The builder, Mr. Young, of Lincoln, commenced operations six or seven months ago. The loft and pews were swept away, the plaster stripped off the walls, and the interior made to present a renovated appearance. A new roof has been erected at the eastern end, an organ-chamber has been provided, new windows put in, and in the place of the pews free and open sittings have been substituted, capable of accommodating about 180 people. Many of the interior fittings are new, and the entire alterations have, we understand, involved an expenditure of between 700l. and 800l.

Lincoln.—The church of St. Mary-le-Wigford has been re-opened, after restoration and enlargement. There are three east windows—two lancets and one vesica—painted by Messrs. Clayton & Bell, and the gift of Mr. H. K. Hebb, in memory of his father and mother. The restoration of the edifice has been carried out according to plans prepared by Mr. Clarke, of Nottingham, the contractor being Mr. Robert Young, of Lincoln.

Wokeley.—St. Matthew's Church, Wokeley, has been restored. It has been re-opened by the Bishop of Bath and Wells. Prior to 1871 the many inconveniences associated with the architecture and arrangements of a remote period had long been felt, and on the Rev. M. Drummond succeeding to the living, the exertions of the parishioners were renewed, and sufficient funds were soon forthcoming to warrant the promoters of the restoration scheme in commencing their work. The vicar has taken the responsible office of director of the works, unaided by any committee, but it is only fair to add that he has been ably supported, in a pecuniary point of view, by Messrs. Perkins, of Eastcott House, and the family of the late Rev. Burnett-Stuart. The restoration, which has been carried out by Mr. Andrew Knowles, of Wrington, builder, at a cost of nearly 1,700l., from designs prepared by Messrs. Giles & Gane, architects, London, includes new roofs of oak and pine, the re-seating of the entire building with stalls of oak with deal panelling, a new pulpit and lectern, reredos, and windows of stained glass. The reredos, which is composed of Bath stone, with alabaster panels, representing "The Passion," is the gift of Mrs. Perkins; and the east window is contributed by the Stuart family, in memory of the late vicar. The window in the north aisle, representing "The Annunciation," has been erected

at the expense of Mrs. Perkins, to the memory of her late husband.

Melsohy.—The church of St. James the Great, Melsohy, near Richmond, in Yorkshire, has been re-opened, after repairs and restoration. The flat roof with its heavy cross-beams has given way for a pitched roof, the old square barn-like windows have disappeared, and have been replaced by stained glass lancet-shaped windows, and the old-fashioned high, straight-backed pews, with doors, are superseded by convenient pews, with sloping backs and without doors. Several alterations have been made in the chancel. The vestry has been placed on the north instead of the south side, and has an entrance from without. The old pulpit has been substituted by a reading-desk and rostrum. A new organ has been obtained for the church, and stands near the chancel. An additional bell has been hung in the belfry, and a clock in the tower.

Dalworth (near Barnsley).—The large east window of St. John's Church has been filled in with stained glass, as a memorial of the late Thomas Taylor, and under it a reredos erected of the new painted tiles lately introduced by the artist. In the former, which is of two lights, size 12 ft. by 4 ft., with circular heads and tracery, are represented in panels the subjects of Christ and the woman of Samaria and Christ in the house of Mary and Martha, the background and border forming the remaining portion of the window being composed of coloured diaper and ornament of twelfth-century character. The reredos combines, it is said, in itself a system of painting which can be carried to the highest point of art, producing when completed an imperishable mural miniature. The design over the altar-table is arranged in three panels, the centre one containing the Agnus Dei, and the two side panels the texts, "I am the true vine," "Abide in me and I in you," interwoven with the vine, passion-flower, and corn. On either side of this central design are the Lord's Prayer, Creed, and Ten Commandments. The sides of the sanctuary as high as the reredos have been painted a dull green and diapered. New decorated iron standards and an oak rail have been erected across the sanctuary. The whole of the work has been executed by J. W. Knowles, glass stainer and mural decorator, York.

Bristol.—The restoration of Temple Church is about to be forthwith commenced, and tenders for the works (from plans supplied by Messrs. Ponton & Gough) are being obtained.

Austey.—The ancient parish church of Austey, Herts, has been re-opened, after a partial restoration. The old pews have been replaced by open seats of stained deal, copied in design from some of the original oak seats found in the church. The new sittings are provided with kneeling boards, and the flooring upon which they are fixed is of yellow deal, with oak borders, and is level with the tile pavement. The west gallery has been taken down, and the choir have now accommodation in the south transept. The *misereere* seats in the chancel have been repaired, cleaned from paint and colour, and refixed in their old position. The altar-rail, altar-table, lectern, and prayer-desk are new, and of wainscot oak and walnut, and the pulpit which is of similar materials, with open-tracery panels, fixed upon a Portland stone base, is the gift of Miss Sale, the rector's sister, in memory of her father. Red, black, and encaustic tiles mixed with some portions of Portland stone paving are used for the chancel floor, which is laid to a pattern designed by the architect. The other floors are laid with Peake's red and black Staffordshire quarries. The church is heated by a Porritt's stove, the flue from which is carried up the north-east buttress of the tower, in a new shaft of masonry. The north transept gable wall, which was in a very dilapidated condition, has been taken down and rebuilt; the old windows have been reset with new stone where they were found to require it; and the whole of the stonework of the columns and arches of the arcades, of the windows in the chancel, of the sedilia and piscina, and generally throughout the church, has been cleaned and restored. The bells in the tower (six in number) have been rebung, and they have been fitted by Mr. Hooper, of Woodbury, Devon, with the new chiming hammers, invented by the Rev. H. B. Ellacombe, rector of Clyst St. George, Cornwall, by means of which a whole peal of bells may be easily chimed by one person. The work of re-erection has been carried out (under the superintendence of Mr. Butterfield, the architect) by

Mr. Gibbons, of Buntingford, at a cost of upwards of 1,000l.

Bognor.—An influentially attended meeting has been held to consider the state of the parish church of South Bersted, of which parish the town of Bognor forms the most important part. The chair was taken by the Bishop of Chichester, and it was resolved that the parish church should be restored and enlarged, and a committee was appointed. The cost of the works has been estimated by Mr. Christian, the architect, at about 3,000l. It was at the same time strongly urged that church accommodation was greatly wanted in the town, the parish church being about a mile from Bognor.

Petersfield.—The committee entrusted with the carrying out of the restoration of the parish church have met to consider the report, and to inspect the plans, &c., prepared by the architect, Mr. A. W. Blomfield. The plans, except a few minor details, were approved. The cost is estimated at something over 6,000l., and a subscription list was opened, commencing with 1,000l. from Mr. W. Nicholson, of Basing Park, M.P., supplemented by other subscriptions raising the amount to 2,250l.

Radford.—The large and commodious new chancel which has been erected in connexion with Old Radford parish church has been consecrated by the Bishop Suffragan of Nottingham. The new chancel, organ-chamber, vestry, and half of the nave resented, have cost 1,250l. The designs were obtained from the architect, Mr. R. C. Sutton, of Bromley House; and the contractors were Messrs. Stevenson & Weston. One hundred and thirty-five additional sittings have been provided. The pews and the gallery at the west end have not been interfered with, but the seats are all free. The construction of the chancel corresponds with the other portion of the building. The stained-glass window at the eastern end has been erected by the tenantry of the late Mr. Sherwin Gregory to the memory of that gentleman. The subject is the Crucifixion. The makers are Messrs. Heaton, Butler, & Baines, and the cost is about 150l. The entire estimated cost of the present restoration and improvements is 1,310l.

Books Received.

Natural Philosophy for General Readers and Young Persons. Translated and edited from Gano's "Cours Élémentaire de Physique." By E. ATKINSON, Ph.D., F.C.S. London: Longmans, Green, & Co. 1872.

This well designed and illustrated popular treatise is not a translation of Gano's chief work, nor is it an abridgment of that work; but is translated and edited from another and minor work of Gano's, which has had an extensive circulation in France, and is more suitable to general readers and young persons. It is not a strict or mere translation even of that work, however, but has such additions and alterations as were thought fitted to render the book more useful to the classes for which it is especially designed, namely, as a text-book of physics for the middle and upper classes of boys' and girls' schools, and as a familiar account of physical phenomena and laws for the general reader. In range it is considered to represent the amount of knowledge required for the matriculation examination of the London University.

An Elementary Treatise on Curve Tracing. By PERCEVAL FLOST, M.A., Mathematical Lecturer of King's College. London: Macmillan & Co. 1872.

This is a preliminary treatise on the properties of curves. The author says he supposes himself to be instructing a student whose reading has been confined to very narrow limits. Regarded as a special preparation for a special subject, it may be considered useful in giving clear ideas when the student enters upon the systematic treatment of the properties of curves; especially since the classification of curves according to degrees, and the subdivision of curves of the same degree into species are now being taken in hand by some eminent mathematicians.

Pocket-Book of Mechanics and Engineering. By JOHN W. NYSTROM, C.E. Eleventh Edition, revised and enlarged. Philadelphia: J. B. Lippincott & Co. London: Trubner & Co. 1872. THERE is much valuable matter, both practical and theoretical, in this pocket-book, and hence

its numerous editions. Besides its memoranda, it contains numerous tables.

A Treatise on the Metallurgy of Iron. By H. BAUERMAN, F.G.S. Third Edition: Illustrated. London: Lockwood & Co. 1872.

MUCH information which practical workers of iron, students, and owners of iron mines require, is furnished in this volume in a condensed and portable form, although it is not intended to be classed with the large and expensive works on the metallurgy of iron already published. It contains outlines of the history of iron manufacture; methods of assay; analysis of iron ores; processes of manufacture of iron and steel, &c., and is illustrated by numerous wood engravings from drawings by J. B. Jordan. The author is an associate of the Royal School of Mines. This third edition brings up the work to recent improvements, among which are notices of the Siemens-Martin steel process, and the various plans proposed by Heaton, Ellershausen, and others. The second edition was issued in America.

Miscellaneous.

Public Baths and Washhouses, St. Pancras.—The report for last year of the Commissioners for this Institution has been presented to the Vestry and printed. The Commissioners draw attention to a great advance made during the last twelve months; the progress made during that period having been most satisfactory in every respect. The classification of the bathers or the year ending March, 1871, was—first-class, 23,147; second class, 100,069; and for the year ending March, 1872—first class, 58,054; second class, 107,284. The working expenses have this year been considerably reduced under several heads. In wages the saving is 34, 8s., and 1d.; fuel, 37l. 17s. The balance sheet shows that 032l. 2s. 9d. have been received, and 022l. 10s. 2d. expended in working expenses, including repairs and alterations, leaving a surplus profit of 1,009l. 12s. 7d.

Ship's Lines.—Messrs. Wigham Richardson & Co., of Newcastle-on-Tyne, are making a wide reputation by their care and skill in this respect. Last week the first steamer of a new line, connected by some leading coalowners for the Canada trade, was launched by that firm from their yard at Walker. A numerous company was present. The steamer was christened the *Vibilia* (the goddess of wanderers), by Miss Rogers, and after the launch she was towed up. Messrs. Hawthorn's shears, at St. Peter's, here her engines and boilers, constructed by that firm, will be put on board. The *Vibilia* has on built to carry 2,500 tons of cargo, her machinery is over 1,000 effective horse-power. The beauty of her lines was a theme of general admiration, and the firm of Messrs. Richardson is warmly complimented on all sides for the design.

Property in Dover.—Messrs. Terson & Son recently sold by auction a considerable amount of property at Dover, Hougham, and Ilkestone. We quote some of the prices realised:—Freehold farm buildings at Buckland, containing 2r. 11p., purchased by the present tenant for 300l.; two plots of freehold arable land, adjoining the last lot, 17a. 3r. 18p., 995l.; plots of freehold land and two cottages, joining the Union-road, Buckland, 34a. Or. 24p., 30l.; West Hougham Farm, 112a. 3r. 12p., in farm-house and buildings, 4,060l.; plot of meadow-land, 1a. 2r. 18p., adjoining the last lot, 4l.; meadow-land and garden, 2r. 20p., in Ivy Tree-lane, 135l.; 2a. 12p. of meadow, 1,455l.

Harbour Scheme for Calais.—Another new one for making Calais Harbour available for boats of 3,000 or 4,000 tons at all times of tide, has been brought before the authorities. The engineers are Messrs. Liddell & Richardson. Their proposition is to construct a landing and working pier about three-quarters of a mile from the water from Calais, and to connect this by a subway from the railway-station. By going so far out into the Channel they will avoid "dig up," and by making a basin for the ships at the extreme distance they will be able to land in shelter at any time of tide, wind, or weather. It is estimated that the cost will amount only to about 400,000l.

Lectures at the Crystal Palace.—A series of lectures, under the management of the Committee of the Crystal Palace Company's School of Art, Science, and Literature, have been in the course of delivery in the theatre near the transept of the Palace on Thursday evenings. The twelfth session has been concluded by a lecture from Dr. T. Spencer Cobbold, F.R.S., upon the "Antiquity of Man." He explained that our knowledge of the age of man upon this earth was derived from the evidences of his existence which were found in the drift, in caves, &c., and that astronomy had come to the assistance of the geologist in his endeavour to fix the distant date of the appearance of man upon earth. The post-pliocene geological period was divided into the post-glacial and the [glacial and?] pre-glacial periods, and certain geologists believed the first appearance of man on earth to have been post-glacial; whilst others, who were of the most advanced school, supposed that man had been in this world before the glacial period. There was a good deal to be said for each view of the question, but he thought the balance of the evidence was more in favour of the post-glacial than the pre-glacial view. The difference between the post-glacial and pre-glacial theories of the origin of man was between 50,000 and 500,000 years ago. There were some grounds for believing that man may have been living in the pre-glacial period, say about 600,000 years ago. There was, however, no doubt in the minds of sound geologists that the shortest period must be set down at 50,000 years. He had no desire to attack any religious views, but merely to expound grave scientific truth.

Public Buildings.—The vote proposed for the new Courts of Justice will comprise 4,000l. to complete the 954,000l. for purchase of the site, and a vote of a second sum of 30,000l. towards the 750,000l. for the erection of the building. There is to be a further vote of 100,000l. towards the estimate of 285,186l. for new offices in Downing-street for the Home and Colonial Departments, &c., on which above 100,000l. have been already expended. The vote for Burlington House is to be 47,000l., leaving less than 7,000l. to be hereafter voted to make up the estimated 178,000l. The vote proposed for the enlargement of the National Gallery is 50,000l., leaving only 33,000l. more to come, in order to make up the original estimate of 92,975l. The vote for new buildings at South Kensington is 29,674l., completing the 195,000l., the original estimate. A vote of 40,000l. will be proposed for the erection of a Natural History Museum; the estimate is 350,000l., and only about 6,000l. have yet been expended. The Post-office requires a vote of 119,700l. for new works and alterations, 59,500l. completing the estimated 150,000l. for the new offices in St. Martin's-le-Grand; 8,000l. for a tunnel between the old and the new offices; 29,000l. for the new post-office (and the site) at Birmingham; 10,000l. Newcastle-upon-Tyne; 6,000l. Aberdeen; 5,000l. Colchester; and smaller sums for other new post-offices, some serving also for the Inland Revenue Department.

Improved Cabs.—The Council of the Society of Arts have turned their attention to the defective construction of London cabs, and have offered a reward of 60l. for the best improved cab of any description; two prizes of 20l. each for the next two best; and two prizes of 10l. each for the next two best. The Council consider that the cabs now in use are defective in various particulars; but it is to be regretted that they make no allusion whatever to the most serious defect of all in the "rickety hansom" safety cab. Whenever the horse suddenly falls, both cabman and passenger are liable to be pitched out head foremost. The writer of this, though very seldom in the streets, has seen the cabman thrown upon the horse on two occasions, and once the passenger in a similar predicament. The two wheels act as a fulcrum, and the shafts and body of the rickety "safety" as a lever; and the sudden fall of the horse brings down the shafts with force, throws up the cab, and out its contents. Hansom cabs are thus especially dangerous as well as inconvenient, confined, yet draughty, and uncomfortable.

The Bridgwater School Board.—This board has appointed Mr. Hay, of Bath, the architect for the proposed schools in the eastern portion of the town, and has contracted for the purchase of a site adjoining Wellington-road, near the railway-station, for the sum of 400l. The execution of the work is undertaken by Messrs. Harvey & Son, of Torquay, whose tender amounted to 1,875l.

Fall of a Wall "founded on a Rock" and Loss of Life.—A melancholy accident has occurred at Pathhead, Kirkealdy, in connexion with the erection of a wall adjoining Messrs. Nairn's Floorcloth Works. The wall, which was founded on a rock about 20 ft. from the bottom of an excavation, had been built up about 20 ft. without giving the slightest indication of insecurity, the whole fabric slipped from its rock foundation, carrying with it a number of masons, and literally burying eight quarrymen who were engaged beneath. A large staff of men at once set about to remove the rubbish, and after some time a young man, a mason, was extricated alive, but died shortly afterwards. Three other men were taken out about the same time. One mason was found to have sustained severe spine injuries; and another to have suffered fracture of the collar-bone. The next discovered was a labourer, but he was fast sinking, and has since died. The bodies of another mason and two quarrymen were afterwards found. Two of the three injured are not expected to recover.

The London Institution.—The annual general meeting of this institution was held on Wednesday, the 24th ult., in the Theatre, Finsbury-circus; Sir William Tito in the chair. The secretary, Mr. Thomas Piper, read the annual report, which stated that the circulating library had been augmented by 255 volumes, besides 75 transferred from the general library. During the present season there had been a marked improvement in the attendance at the lectures. One evidence of increased public interest had been manifested in the demand for the shares of the institution. The income for the year amounted to 3,511l. 18s. 4d., and the expenditure to 3,039l. 9s. 3d., leaving a balance in hand of 472l. 9s. 1d.

Indian Civil Engineering College.—Some of our readers may thank us for repeating what has been said already in our advertising columns, that it has been determined by the Secretary of State for India in Council that, in the examination for admission into this College intended to be held in July, 1874, and in all future examinations, no candidate will be allowed to compete who shall, on the 1st of the month, have attained the age of twenty. For the examinations in 1872 and 1873, the maximum limit of age will remain, as at present, at twenty-one.

Value of City Property.—On Thursday, 25th April, the freehold of a small house in Finch-lane, Cornhill, known as the Cock and Woolpack Tavern, was sold by auction at Garraway's Coffee-house, Change-alley, together with the goodwill of the business, for the sum of 20,800l. It is situated on the eastern side of Finch-lane, which runs from Cornhill to Bread-needle-street, and the house has a frontage of 18 ft., with a depth of 55 ft. It also includes two arched cellars under Finch-lane, held on lease, 14 years of which are unexpired.

Strike in the Sheffield Building Trades.—The workmen employed in the Sheffield building trades have struck work. They ask for 50 hours per week all the year round in every branch, and that the carpenters' and joiners' wages shall be 73d. per hour throughout the year. The employers offer 53 hours and 71d., which the men will not accept, and have drawn off, with the exception of twelve shops, where the concession has been made. The carpenters and joiners of Rotherham have also struck work for a similar advance and shorter time.

The New Fortifications at Strasburg.—Strasburg, according to German journals, is to be surrounded by a girdle of eighteen forts, at an average distance of about one German mile from the *enceinte* of the town. Five of those forts to the north-west of the city will be first built. Their construction has been undertaken by various companies of contractors, and are to be completed by the 1st April, 1875.

Mr. Peck's Prizes.—The Council of the Institute of Architects have made two supplementary awards in the Peck Prizes Competition, viz., a medal of merit to Mr. Henry Avery, of York-buildings, Adolphus; and a medal of merit to Mr. Walter L. Spiers, of Bernard-street, Russell-square, for the skill displayed in their drawings of Eastbury Manor House.

Land in Surrey.—The Middlesex magistrates have agreed to purchase 100 acres of land at Banstead, Surrey, for the purpose of a site for building a third County Lunatic Asylum. The price to be paid is 10,000l. Banstead is sixteen miles from the metropolis.

Words! Words!—From penny-a-lining some literary men have reached halfpenny-a-wording. Mr. George A. Sala, according to the *Printers' Register*, made a curious contract for writing the "Thanksgiving Number" of the *Graphic*. He was to put together 37,000 words, and to be paid for his task at the rate of a halfpenny a word. It is asserted that upwards of a quarter of a million copies of it were printed. One halfpenny per word, however, was not such very great pay as may be supposed, more especially to a paper which has already yielded 100 per cent. on its capital. Mr. Sala had a heavy task to perform: he had something like a volume to write, in a great hurry, and he got less than 80. for it. A halfpenny a letter would have been good pay, but not by any means unprecedented.

London Slaughterhouses.—Dr. Brewer has laid before the House of Commons a Bill enacting that the slaughtering of cattle or sheep by a butcher in his private slaughterhouse, duly licensed, shall not be held to be the carrying on of an offensive or noxious business within the meaning of the Metropolis Buildings Act of 1844. That Act provides that after the expiration of thirty years from its passing it shall cease to be lawful to carry on such a business at a less distance than 40 ft. from a public way, or 50 ft. from buildings of the first or dwelling-house class, save as is provided in that Act.

Another Thames Embankment.—Mr. Bean, the surveyor to the Fulham Local Board, acting under the instructions of the board, has just prepared a plan for the embankment of the Thames at the Mall, Hammersmith. The proposal is that this embankment shall be carried out partly at the expense of the Fulham Board and partly by the Metropolitan Board of Works.

The "Quarterly" and Architecture.—As the article in the present *Quarterly* has proved very distasteful, and some public writers have misled their readers as to its authorship, it may be as well we should say, though it ought not to be necessary, that Mr. Ferguson had nothing whatever to do with it.

Employers' Responsibilities.—A paper will be read at a meeting of the Social Science Association, at their rooms in Adam-street, Adelphi, on Monday, the 6th instant, at 8 o'clock, by Mr. P. H. Holland, on "The Civil Responsibilities of Employers to those Injured in their Employ."

Hanging Paper.—Carbolic acid is recommended by the *Journal of Applied Chemistry* as an ingredient in the paste used, as it will prevent the annoyance of insects and the sour smells frequently experienced in rooms newly papered.

Chapter House, Westminster.—On Monday last, the newly-restored Chapter-house of Westminster Abbey was thrown open to the public, and was largely visited throughout the day.

Gas Lighting by Electricity.—In order to ensure as far as possible the safety of the gunpowder works at the Royal Arsenal, Woolwich, the gas-lumps are in future to be lighted by means of electricity.

The Staffordshire Brick and Tile Makers. The brick and tile makers of North Staffordshire employed by ten firms have got a substantial advance upon nearly all the articles they are employed in manufacturing.

Maryport Dock Extension.—The Maryport trustees are advertising for loans for the construction of a new dock and works at Maryport.

TENDERS

For villa residence, lodge, gardener's cottage, &c., Worcester Park, Surrey, for Worcester Park Building Company, Limited. Mr. John Giles, architect. Quantities by Mr. Gooke:—

Manley & Rogers.....	£4,526 0 0
Morter.....	4,515 0 0
Henshaw & Co.....	4,404 0 0
Thompson.....	3,990 0 0
Ladley, Brothers.....	3,950 0 0
Rankin.....	3,770 0 0
Adamson & Sons.....	3,730 0 0
Atvis & Co.....	3,624 0 0
Hibbins & Tresler.....	3,393 0 0

For new farmhouse and buildings, for Mr. T. W. Downes, at Letton, Herefordshire. Mr. W. Chick, architect:—

Welsh & Son.....	£4,665 0 0
Colman.....	4,634 10 0
Everall.....	1,972 0 0
Thompson.....	3,395 0 0
King & Godwin.....	4,380 0 0
Biggistone.....	4,361 0 0
J. & W. Bowers (accepted).....	4,200 0 0

For the front portion of new business premises, in the Market-place, Reading, for Messrs. Sutton & Sons, Messrs. W. & J. T. Brown, architects. Quantities supplied:—

Lovatt.....	£4,710 0 0
Higgs.....	4,590 0 0
Sheppard.....	4,219 0 0
Strong & Son.....	4,209 0 0
Mathews.....	3,893 0 0
Woodruffe.....	3,859 0 0
Barnicoat.....	3,639 0 0
Gibson, Brothers.....	3,487 0 0
Aitchison & Walker (accepted).....	3,555 0 0

For parsonage, adjacent to Holy Trinity Church, in the Barking-road. Mr. Henry Ongly, architect. Quantities supplied by Mr. A. L. Buzzard:—

Sheffield.....	£2,636 0 0
Mortar.....	2,323 0 0
Adanson & Sons.....	2,262 0 0
Ennor.....	2,279 0 0
Rivett.....	2,272 0 0
Shapley & Webster.....	2,268 0 0
Palmer (withdrawn).....	1,850 0 0

For the erection of No. 51, Bishopsgate-street Without. Messrs. John Young & Sons, architects:—

Ashby & Horner.....	£2,075 0 0
Renshaw & Co.....	2,012 0 0
Newman & Mann.....	1,956 0 0
Brass.....	1,897 0 0
Conder.....	1,875 0 0
King & Son.....	1,860 0 0
Fritchard.....	1,858 0 0
Merritt & Ashby.....	1,779 0 0

For stabling, at Howlede, near Taunton, for Mr. J. E. Anderson. Mr. J. Houghton Spencer, architect:—

Davis.....	£2,400 0 0
Pollard.....	1,730 0 0
Moss & Rendell.....	1,590 0 0
Shewbrooks (accepted).....	1,520 0 0

For school-house and teacher's residence, for the parish of Norton Fitzwarren, Somerset. Mr. J. Houghton Spencer, architect:—

Fox.....	£954 0 0
Shewbrooks.....	855 0 0
Moss & Rendell.....	749 0 0
Giles.....	694 0 0
Templeman.....	680 0 0
Manning.....	634 17 0
Macey & Yandell (accepted).....	635 0 0

For Mission Hall, at Kingsland. Mr. H. Shaw, architect. Quantities supplied by Messrs. Pimms & Bolton:—

Shurman.....	£589 0 0
Harper.....	547 0 0
Potter.....	530 0 0
Freddy & Son.....	530 0 0
Robbins & Co. (accepted).....	496 0 0

For re-seating, repairs, &c. of Angersleigh Church, Somerset:—

Shewbrooks.....	£217 0 0
Ruddell & Moss.....	196 0 0
Giles.....	181 0 0
Hartnell.....	167 12 0
Dinham.....	160 0 0
Hartnell.....	160 0 0
Fox.....	160 0 0
Yandell.....	157 10 0
Templeman (accepted).....	155 0 0

For new business premises, in Broad-street, Reading, for Mr. C. E. Wilson. Messrs. W. & J. T. Brown, architects. Quantities supplied:—

Barnicoat.....	£1,800 0 0
Mathews.....	1,790 0 0
Seadle.....	1,650 0 0
East.....	1,650 0 0
Sheppard.....	1,640 19 6

For new business premises, in the King's-road, Reading, for Mr. A. Allen. Messrs. W. & J. T. Brown, architects. Quantities supplied:—

Sheppard.....	£1,333 0 0
Woodruffe.....	1,202 0 0
Mathews.....	1,197 0 0
East.....	1,175 0 0
Barnicoat.....	1,160 0 0
Goswell.....	1,097 0 0

For new north aisle and chancel roof to Willesden parish church. Mr. E. J. Tarver, architect. Quantities by Mr. L. E. Riddett:—

Jackson & Shaw.....	£2,698 0 0
Macey.....	2,555 0 0
Srivener & White.....	2,798 0 0
Dove, Brothers.....	2,795 0 0
Adamson & Sons.....	2,753 0 0
Shearburn.....	2,694 0 0

For making roads and drains on the Eversfield Estate, St. Leonard's-on-Sea. Messrs. Fowler & Hill, architects:—

Kenwood.....	£3,470 0 0
King.....	2,300 0 0
Bridgeland.....	1,830 0 0
Hughes (accepted).....	1,853 10 0

For alterations and additions to 171, Marylebone-road, and in erecting warehouse buildings at side of ditto, for Mr. Mills. Mr. Alfred Wright, architect. Quantities supplied:—

Mitchell.....	£1,550 0 0
Watson, Brothers.....	1,488 0 0
Simpson & Son.....	1,465 0 0
Logginer & Burge.....	1,449 0 0
Marsland & Son.....	1,337 0 0
Harris & Sons.....	1,303 0 0
Sharpping & Cole.....	1,363 0 0

For villa residence at Chislehurst, for the Rev. D. Macduff. Mr. John Norton, architect:—

Waters.....	£4,550 0 0
Taylor & Sons.....	4,031 0 0
Nisbett & Son.....	3,311 0 0
Reynolds.....	3,261 0 0
Carey & Co.....	3,020 0 0
Adcock & Rees.....	3,091 0 0
Stephenson.....	3,083 0 0
Farrant.....	3,023 0 0
Gooding.....	3,000 0 0
Howard.....	2,970 0 0
Jarret.....	2,968 0 0
Grover.....	2,885 0 0
Moore & Grainger.....	2,857 0 0
Waterson & Co.....	2,845 0 0
Aitchison & Walker.....	2,845 0 0
Wright, Brothers, & Goodchild.....	2,395 0 0
Cook & Co.....	2,562 0 0

* Accepted.

For painting, decorating, &c. at Loxford House. Mr. R. Martin, architect. Quantities not supplied:—

Warne.....	£165 0 0
Bridgman, Nuttall, & West (accepted).....	163 0 0

For alterations of three houses in Charterhouse-square. Messrs. Tress & Innes, architects:—

Hawley & Son.....	£5,123 0 0
Conder.....	4,559 0 0
Sewell & Son.....	4,556 0 0
Hill & Son (accepted).....	4,264 0 0

For new schools, and schoolmaster's and school-treasurer's residences, at Glemsford, Suffolk. Messrs. Salt & Firmin, architects:—

Pearson.....	£3,614 0 0
Tooley.....	3,400 0 0
Gibbons.....	3,245 0 0
Greenwood.....	3,157 0 0
Brown.....	2,934 0 0
Scott & Twinn.....	2,878 7 6
Theobald.....	2,830 0 0

For rebuilding house, 14, Blenheim-street, Oxford-street, for Mr. Camp. Mr. W. G. Bartlett, architect:—

Conder.....	£320 0 0
Watson, Brothers.....	797 0 0
Collis & Son.....	777 0 0
Wood.....	711 0 0
Pritchard.....	683 0 0

For alterations and repairs at 13, Quebec-street, Mr. Jones. Messrs. Finch, Hill, & Farnley, architects:—

Watson, Brothers.....	£328 0 0
Watson, Brothers.....	275 0 0
Eaton & Chapman.....	250 0 0

For schools, at Melyn, near Neath, for Messrs. Le Flower & Co. Mr. John Norton, architect:—

Diment.....	£3,355 0 0
Ward.....	3,343 3 5
Pearse & Langdon.....	3,190 0 0
Moreland.....	2,849 0 0
Roderick (accepted).....	2,172 4 0

For house for Mr. J. T. Davis, at Bromley, Kent. Quantities by Mr. J. Scott. Mr. T. C. Sorby, architect:—

Sharman.....	£1,414 0 0
Pimms & Collingham.....	1,425 0 0
Ames.....	1,314 0 0
Pearce.....	1,215 0 0

For alterations and additions to 12, John-street, Chelsea-square, for Capt. P. H. Custance. Mr. John Norton, architect:—

Holland & Hanneu.....	£307 0 0
Smith & Co.....	938 0 0
Myers & Sons (accepted).....	938 0 0

For repairs, painting, &c. at Westminster-cham for the Mutual Tontine Association. Mr. George architect. Quantities supplied:—

Lucas, Brothers.....	£695 0 0
Wagner.....	808 0 0
Pemberton.....	849 0 0
Fish.....	835 0 0
Foster (accepted).....	787 0 0

For additions to business premises, Milk-street, City side. Messrs. R. Tress & Innes, and Mr. H. A. architects. Ashby & Son (by schedule of prices) £10,314

Camberwell Vestry Hall.—Messrs. David King & Taylor, of 4, 435, together with two alternative estimates respectively 1664. 13s. and 3694. 2s., making a total of 7,413. 15s., was held accepted by the Board of Guardians of the new Vestry Hall for the Parish of St. Camberwell.

TO CORRESPONDENTS.

A & Co.—W. F. R.—E. B. R.—R. S.—C. B.—Rev. Mr. E. J. E.—Messrs. H.—J. N.—K. & Son.—P. C.—T. R.—J. V. Co.—Builders' Clerk.—C. T. W.—W. R.—J. H. S.—C. F. H.—P. C.—H. S.—H. E.—B. N. & W.—Lover of Justice C. H.—J. B.—E. W. S.—L. W. U.—Party Wall (question answered by one who can look into it on the spot).—B. G. (in T. H. H. (in type).

We are compelled to decline pointing out books and addresses.

All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily publication.

Note.—The responsibility of signed articles, and papers for public meetings, rests of course with the authors.

The Builder.

VOL. XXX.—No. 1527.

Notes at the International Exhibition.

THE arts accessory to architecture are, as we have already noted in the case of stained glass,* but very meagrely represented in the Exhibition, as to quantity at all events. The two life-size mosaic figures exhibited by Minton, Hollins, & Co. (1,070-1), from the designs of Messrs. Hart & Bowler respectively, and worked by female students at South Kensington, are very satisfactory specimens of the art; and the latter of the two is a fine

and impressive figure. The former is marred by an indefinable weakness of pose and character. The head of Daniel, from the design of Mr. Stevens, intended for St. Paul's Cathedral, is a very noble one; and the broadly-massed treatment of the lights and shadows is highly-characteristic of and suitable to the material employed. Is the title correct in the catalogue? The head suggests rather David than Daniel. A mosaic portrait of the late Prince Consort, after Winterhalter, executed by Salviati & Co. (1,078), is a capital specimen of what may be done in mosaic in the way of gradations of tone, by the use of small cubes, and negatives the opinion which has been expressed by some critics that mosaic cannot be effective at less than 50 ft. from the eye; though, of course, the employment of this fine mosaic would involve a proportionate expense. A head of Christ, after Taddei, by the same firm (1,074), shows even closer approximation to the effect of painting; but here the real characteristic beauties of the material are, to a certain extent, sacrificed. The attempt to imitate the freedom of painting is as great a technical mistake in mosaic as the imitation of the stiff archaism of the early mosaics, urged by some, would be an æsthetic mistake.

Of painted tile-work and porcelain there are various specimens, some of the best of which are from the designs of Mr. W. S. Coleman. The two painted plaques (1,054), representing nude figures, flatly treated, with conventional accessories and backgrounds, are very pleasing, and show knowledge of the figure. What is the use of the same designer's "painted tile-panels on red ground" (1,001: exhibited by Minton & Co.'s art studio) we fail to see: flowers and birds straggling heterogeneously over a red surface (*à la* Japanese art) are not very available as ornamental accessories, nor good for much in themselves. Two vases from Minton's art studio (1,034) are worth mention as pleasing in colour and form; the classical figure subjects, nearly white on a green ground, are designed with grace and freedom. The *terracos* exhibited by Messrs. Cox & Sons, a poor piece of commonplace modern Gothic with all the regulation details that we are getting wearied of, is embellished, however, by a painted tile design by Mr. Talbert (1,053) of the Last Supper, which is a very good specimen of the

correct way of treating this kind of work, the drapery being drawn in straight precise lines, with no attempt at texture or relief effect, yet not without a certain agreeable sway and balance of line; unfortunately, the faces are far less successful than the general composition, partly we fear from a concession to the foolish ideas prevalent about the treatment of the figure in what is termed "ecclesiastical" art. Adjoining this latter are two very good specimens of metal design by the same artist, in the shape of two elaborate brass lamp standards; a brass font-cover also (upon a poorly-designed font) deserves mention. These are all exhibited by Messrs. Cox & Sons, who also show a specimen of the brass standards with iron base supplied for lighting Luxembourg Cathedral. A case of church tapestry, plate, &c., by the same firm, exhibits the usual things in the usual style; one of the gold vessels is a very elegant specimen of this class of work. Among the metal work, into which we have now dropped, a small silver dessert-stand (2,701) is pretty sure to be looked at, as being the design of Sir Noel Paton, and is a very fine specimen of design and execution in silver, as far as the treatment of the material is concerned; the design is curiously *bizarre* for modern work, a satyr-like figure, with a bird's head, supporting the bowl, while the pedestal on which he stands, and on which a lizard crawls, is in turn supported by three frogs, which look grotesquely out from under it and form the feet. Perhaps it is supposed to be the grotesque character which gives the article its value; we should doubt many persons being willing to give the 200 guineas asked for it. Some of the finest bits of metal work are the damascened articles, tazzas, and vases, by Zuloaga (Spain: 2,714-15). These are exquisitely finished things, in a style of ornament combining something of Moorish richness with classic elegance of detail, and surely in no qualities that should belong to ornamental art are these inferior to the Japanese ornament just now held up to us as the only work in the world worth mentioning. Some specimens of ornamental glass design (claret jugs and glasses, decanters, &c.) on a stand in Room VII. include some very elegant and beautiful work, especially those by Messrs. Hanser & Palme: the Venetian goblet, by Salviati, which surmounts the collection, is one of those things which would be very valuable if it were old, as a specimen of a certain type of work; but we scarcely think its artistic value as a modern production very high: the funny little twists of coloured glass which give the character to it are really curious rather than beautiful. We omitted to mention, in reviewing, in our last number, the work in these galleries on the west side, one of the best specimens of wood-carving there, a sideboard, by R. Jefferson, exhibited by Gillow & Co. (2,762); but, unfortunately, in that French "scroll and Cupid" style, which is really not worth throwing away good workmanship or good money upon, the sight of which, too, in contrast with other articles (already mentioned) with the name of the said firm attached to them, suggests again the reflection we made last year as to the bad effect on ornamental art of using all styles indiscriminately, the same firm turning out anything and everything, from Louis Quatorze to the barest and squarest Medievalism, without regard to principle or taste of any kind. Why cannot some of our rich and prosperous furniture-making firms collect around them a school of artists of one mind in art, and work out a school of design of their own on definite principles? There would be some chance then of their really benefiting and improving ornamental art and public taste, instead of benefiting, as is too often the case now, nothing but their own pockets and those of their employes.

Among the east galleries are scattered some objects of ornamental art of more or less

interest. Of these, we are inclined, however profane it seems, to rank the numerous productions of the Sèvres porcelain manufactories, in the French gallery, as among those of "less" interest. That the French artists in this work do all that they aim at, and do it well, can scarcely be questioned; and the great size and perfect make of some of the larger specimens form a triumph of technical skill also. But the feeling for colour betrayed in these specimens of ware is anything but satisfactory; nor were we able to find more than one or two pairs of vases, and those among the smaller ones, which showed any richness or attractiveness in colour. Mostly the tints affected are lively pinks and reds and buffs; in short, the regulation Renaissance scale of colour, against which we have before protested in reference to stained glass. In a great many of the larger vases the artistic design consists mainly of figures, of a "Classical" nature, all of which are respectably delineated, and have a certain sensuous grace and elegance. Why is it, then, that this sort of decoration repels us, deadens our admiration, more than most others? Because, in the first place, these nymphs and Bacchuses are like old "properties" used up long ago; and because also the judgment is not satisfied at seeing figures used merely as elegant objects, adjuncts to a design, without any definite meaning or sentiment attached to them. The human figure, as the highest medium of expression in art, should not be thrown away in this way; carelessly applied as merely so much of a designer's stock-in-trade. Our own decorative artists are arriving at a perception of this, and are either studying the figure better themselves, or getting into the habit of calling in the aid of artists who can treat it worthily. At one end of the French gallery is to be found a casket worth looking at as a piece of delicate and highly-finished work. The decorative portion of this consists in panels of light wood carved in bas-relief, with classical subjects, with many figures and much detail; the figures are only 2 in. or 3 in. high, but the whole is executed with a delicacy, precision, and minuteness of finish very remarkable, and shows also a great deal of freedom of composition and pose in the little figures. The artists are Messrs. Allard & Chopin. In one of the French galleries has been placed a grand piano, from the manufactory of Erard, painted all over top and sides with forest scenery, in monochrome, in some villainous dark red compound. Anything more disagreeable in colour, and more out of place as ornament, could scarcely be imagined; yet the manufacturers evidently think great things of it, and have set a special custodian to take care of it. The mischief was done in Paris, we believe; indeed, the names of the offenders are affixed, but we forbear to give them. What is to be said or done to this kind of work?

In the gallery devoted to Belgium and Russia (the opposite end of the east galleries) are some exceedingly well-executed silver bas-reliefs from the latter country; one in particular of a female figure floating in the air, with flying draperies, which is very charming both in conception and execution: the artist's name has escaped us, and we cannot find it in the catalogue, where (as last year) it is sometimes difficult to find what is wanted. Some gold work from Brussels, in a case not far from the last-named objects, is an unpleasant contrast to the Russian work, and is, in fact, that kind of ornamental work which is almost entirely worthless as art, and which nobody would give anything for were it not executed in gold. Virgil must certainly have been thinking of art as well as of morals when he uttered his celebrated declamation against the "*auri sacra fames*."

In the ground-floor room, reached through the east quadrant, is a considerable though very heterogeneous collection of works from Japan,

* See p. 338, ante.

China, and elsewhere. Some specimens of the Japanese *cloisonné* enamel are to be found, also a good deal of gold and lacquered work, some of the most beautiful description; one gold or gilt casket, with a diaper of very flat foliage over it, is exquisite; and what a contrast to the vulgar gold work from Brussels, just mentioned, or the specimens of English work of the last century exhibited among the "reproductions" in the east gallery! The Japanese tapestries show, too, specimens of their admirable way of representing birds, and equally of their total and absurd failures in the human figure; the attempts at representing the latter appearing like the figures of a nightmare. The Chinese vases to be seen here show (as usual) very fine execution and elaborate ornament, with far less feeling for colour than in the Japanese work; on the other hand, in ornamental tapestry designs (without figures) the Chinese, as far as one can judge by the comparatively few specimens here, have the best of it, both in colour and design, the patterns being chiefly geometrical, but with sufficient variety of colour to avoid monotony. Some of these are well worth attention as suggestions for wall-paper or wall diaper design. In this room is also hidden away one of the best specimens of furniture design in the Exhibition, a buffet, by Vanderschueren (who dates from England), ebonised and with ivory inlays, the lower panels filled with groups of flowers in slight relief, in coloured stones, so as to produce a naturalistic effect not quite in keeping with the rest. An inlaid figure would have been preferable; but this is a very good piece of work, especially pleasing in general design and detail. Adjoining these are two articles, a buffet and *dagère*, both by Ricci (Venice), in very meretricious style, but admirably executed, the latter, with its boldly undercut scrolls turning from stage to stage, is as fine a piece of wood-carving as we have seen for a long time.

We have thus endeavoured roughly to indicate what there is of ornamental art worthy of notice in this year's Exhibition, so far, exclusive of the jewelry, which may be taken as a separate branch. With this exception, we believe we have alluded to most of the work that is of much consequence, so far as the Exhibition is at present arranged. The Indian Court of last year is as yet closed,—whether it is to be filled we know not; and the French annex is in a state of chaos—a jumble of boxes and cases. If these two rooms are eventually arranged, there will be further opportunity of instituting comparisons between some of the best ornamental schools of the East and the West respectively.

ARCHITECTURE IN THE ROYAL ACADEMY.

The architectural drawings, which are this year to be found in their old situation in the "Lecture Room," are in the main a very good collection, the best in average merit, we think, since the Academy went into its present quarters. Domestic architecture is the most largely represented, and there is a fair collection of civil and ecclesiastical designs, some of them of exceptional interest. To mention first the great building of the day, we may allude to the very large and finely executed bird's-eye view of Mr. Street's Law Courts design, prepared by Mr. Brewer (1,190), and which shows what the architect's own fine ink drawings could not show, the colour design, if we can so describe the use of a light and a dark tinted stone, in the usual arrangement of quoins and bands. The drawing, however, does not suggest any fresh commentary on the design; nor will the exhibition of Mr. Street's own sketch of the centre portion of the Strand front (1,163), at all avail, we fear, to change the opinion of the majority, who are so sadly disappointed with the design, however they may admire the freedom and effective touch of the drawing, which, nevertheless, is certainly out of perspective in some of the details, arches, &c. Among other "civil" buildings is the competition design of Mr. E. W. Godwin, for the Leicester Townhall, exterior front and interior of Council Chamber (1,162 and 1,188); the exterior in the architect's usual style of very solid and massively treated Early Gothic, a good deal like some other designs by the same hand, but with the improvement in this case of carrying the tower wall in an unbroken plane into the masonry below, instead of cutting it off by a cornice run right through, a defect which, in some previous designs, conveyed the impression that the tower

was utterly unconnected with the substructural design, and might have been slid backward or forward at pleasure along the whole front. The Council Chamber is an agreeable-looking interior, treated with wall tiling and profuse gilding and colour on the wooden ceiling, which takes the shape of a pointed arch wagon-vault; not a very happy form for wooden construction. Mr. Emerson exhibits (1,177), "A View of a new Mahomedan University at Allahabad," near which is a drawing of the "Rajaram High School," described as in the "Hindoo Sarcenic" style, designed by Captain Munt, R.E.: the first of these illustrating an architect's, and the second an engineer's, treatment of an Oriental style; we prefer the former. Mr. Waterhouse exhibits a view of the "Liverpool Seamen's Orphan Institution" (1,173), a picturesquely-grouped building, in his usual manner, and of which we shall give a view; and a small sketch of the "New Buildings at Owen's College, Manchester" (1,213), already illustrated in our pages. The "Hospital for Sick Children in Great Ormond-street," by Mr. E. M. Barry (1,186), is a sensible-looking brick building, also already known to our readers, with outside galleries of communication, and ventilating shafts (apparently) forming prominent features in the external design. It is a good specimen of economical architectural expression obtained in a simple manner. Mr. Seddon sends a large and apparently highly-finished pen-and-ink drawing of his Aberystwith College, which is hung too high to be properly seen for this kind of drawing, but the design is well known.

Domestic buildings are more numerous, and we start here with the name of Mr. Norman Shaw, who is in great force this year, and whose drawings, as drawings, are masterly. "Two Views of a House for F. Goodall, R.A." (1,166), show the architect's usual manner in plain and unpretentious mansions, the usual simple picturesque treatment of windows, and the usual cutting up of roof and walls in a somewhat exaggerated effort at piquant and picturesque expression. The studio, placed (why, we do not see) at an oblique angle with the rest of the building, is a marked feature in the design, indicated externally by the large square side-windows and the end oriel, which ensure light from whichever side it may be required. "Cragside, Northumberland" (1,196), another beautiful drawing, is a house of somewhat more pretension, and treated in the author's very high and elegant manner; the projecting bay at one end of the front, with its deep base of battered masonry, strongly-marked plinth lines, two tiers of windows, and finishing in what appears to be a kind of open gallery under the eaves, is in itself a feature for study. In No. 1,219 there are sketches on a larger scale of the tower and dining-room fireplace from the same house; the former an admirable bit of masonry design and grouping, the latter too ostentatiously rude and massive to be really in keeping with modern domestic life.

"Interior View of panelled Drawing-room, Cowes-fair House," by S. Salter, Jun. (1,169), is a capital drawing of an apartment which might easily have been made much more original and picturesque at the same expense; a concourse of square panels (wainscot) over the wall, and thin lines of plaster moulding crossing each other on the ceiling, are features not so new or remarkable as to bring any special credit to their designer, or he worth such a careful drawing. "The Douglas Room in Stirling Castle, restored under the direction of R. W. Billings" (1,181), is an admirable clear sepia drawing of a bit of restoration, by an architect who has made Scotch Gothic his speciality; the piquant effect of the open carved wood cornice, and the treatment of the panels of the wainscot, will not escape notice. Mr. E. M. Barry's "Cobham Park" (1,187) seems to us, for an Italian design, rather too much broken up with small pinnacles, many and various pedimented dormers, &c.; the massive brackets carrying the balconies over one or two of the windows form a good and striking feature. "Wykehurst" (1,208), by the same architect, we like much better; it is a design showing considerable novelty and originality of style, and might be described as Italian treated in a Gothic manner, with high roofs, round turrets with an arcade open story at top, and a general verticality of line and proportion giving considerable individuality of character. Some of the same features appear in the next design, "Shabden" (1,204). "Wyfold Court, Oxfordshire," by Mr. G. S. Clarke (1,193), is a remarkably-grouped design for a mansion, consisting mainly of a tower and more ornate block to the left, diversi-

fied with bay windows, and evidently containing an entertaining-rooms and "show" portion of the house, and an adjoining lofty block, irregularly grouped with the first, of much plainer and more massive character; a portion of this goes up at one angle, forming a kind of tower, with high mansard roof and long lucarnes. The merit of the design could be estimated better were there a plan, to show us the motive and origin of the grouping; but there can be no question that, as it appears here, it is a very striking and picturesquely-grouped mansion. No. 1,210 is a "View of House being erected at Cardiff" from the designs of Mr. Burges (whose name, we may remark, is invariably spelt wrong in the Academy catalogues), a beautifully-executed drawing; the style is a plain, simple treatment of Early Gothic of a somewhat French character, a little heavy, but very solid and satisfactory-looking; the upper windows are square-headed with a centre shaft, and a deep relieving arch over, with a scroll of light in the tympanum; this looks well enough on the outside, but from the interior the window design would have, we should think, rather a scattered look. "Mansion at Greenlands" (1,208) is a cold, formal Italian block with quoins at the angles, which we refer to because it is so typical a specimen of the kind of house in which the average "respectable" English gentleman delights, the merit of which in his eyes consists in its being utterly without any feature that can attract attention or give occasion for a remark. No. 1,224 is a design for (we conclude) an imaginary "Elizabethan Mansion" by Mr. Heffer: it is a very good water drawing and an elaborately-enriched design, but with no features or treatment calling for special comment. Sir D. Wyatt's "View of Alford House, Hyde Park" (1,222), is a very effective and powerful drawing in sepia (or bistre), which shows in a perhaps flattering manner the general dignified though somewhat square and heavy aspect of the building: much use is made, and successfully, of ornamental ironwork in balconies and gates; a strongly-marked cornice gives unity to the composition, and is a base to the very steep-pitched French roof above, which forms an important part of the design: we wish there was not such an array of great carved festoons under the cornice; what, let us seriously ask, is the gain to the building for the time and expense that must have been bestowed in carving this used-up ornamental feature all round? Mr. H. Jones's "Additions to the City Meat Market" is in keeping with the main structure which he carried out previously; and is as like a meat-market as blank walls and plasters can make it. Mr. G. Aitchison shows a small and unfortunately rather feebly-executed pen drawing of a "Proposed House for Lord R. Grosvenor, Dorset" (1,233); the design itself, like most of the author's, shows some originality of manner and treatment, with a considerable employment of what appears to be pierced woodwork; but it certainly wants more force and breadth of treatment to make it a successful work. "Messrs. Elkington's New Premises" (1,241), by Mr. F. Peck, an Italian design presenting nothing special in detail, is well and effectively grouped, with two high blocks, not symmetrical, divided by a lower intermediate portion lighted from the roof; at least, we assume that the whole of the block of buildings shown is included in the establishment. The "Hall and Staircase at Summerfield, Roehampton" (1,239), by Mr. Brydon, is noticeable as a capital pen-and-ink drawing of good plain work, with no striking features. Two small drawings by Mr. Edis are up to his usual mark; a "House at Bexley" (1,161) and "Riverside Premises, St. Paul's Wharf" (1,180), the latter a capital specimen of simple architectural treatment of a utilitarian building, and in point of execution one of the best, though among the smallest drawings in the room.

In ecclesiastical design there is less than usual of that class of "regulation Gothic" churches, one of which can hardly be distinguished (in the memory at least) from another; and there are one or two rather remarkable specimens. First among these we must again mention Mr. Norman Shaw, whose "View of the English Church at Lyons" (1,194) is, in fact, a drawing of one gable end only, towards the street; perhaps the rest is crushed up between adjoining buildings after the manner common in French towns. This is a rather large scale drawing, showing a bold and massive treatment of a tall gable, with wide buttresses on each side, crossed at the top by a lower gable parallel to the front, one end of which is octagonal on plan, and forms the finish to the stair-turret, the treatment of which

feature is an excellent specimen of real masonry design; the whole thing, indeed, is like a bit out of the Middle Ages, without, however, suggesting direct plagiarism. "Interior View of Trinity Church, Finchley New-road" (1,155), by Mr. Legg, is a good brick interior, with a canted wooden ceiling and solid curved braces; which, albeit not a very good way of treating timber constructively, is one which certainly produces more pleasing lines, and looks better generally, than the thin moulded tie-beams which some church architects are getting so fond of, and which are shown in one or two other designs here, accompanied by that kind of scribbled line decoration all over the walls which is so easily devised, and demands so little thought in the devising. Mr. Hakewill's brick church at Brompton (1,175), with the tower detached from the main design, and only connected by a short cloister, is not its author's best work. The "South-east View of Church of St. Augustine, Kilburn" (1,202), by Mr. Pearson, is a somewhat remarkable thing. It is a fine pen-drawing of (apparently) a brick design; the whole character extremely bold and simple; the west end flanked by two square towers, perfectly plain in the lower portion, with only one story of wall arched below the cornice, over which each is finished with a square slated spire. Behind these rises a *façade*, and still further, over the nave-roof, is seen the main tower and octagonal slated spire, with very good picturesque treatment at the point of junction, and lacunæ near the base of considerable originality. From the point of view here shown, this is a very fine group of building. Another of the more notable church drawings is that by Mr. Burgess, of the "Monumental Church at Skelton" (1,217), a small, finely-executed water-colour of the interior view of the nave. The best point in the design is the arrangement of deep, recessed panelling and sculpture in the surface of the east wall of the nave, over the chancel-arch. The same architect also exhibits a highly-coloured interior of the "Chancel of St. Mary the Virgin, Studley Royal, Ripon" (1,242). Mr. Goldie's "St. Paul's College Chapel, Stony Stratford" (1,223), is a view of an interior, plastered (or cemented), and with red brick dressings and brick wall-shafts, carrying a plain tie-beam, looking, in the drawing, almost like a piece of rough timber; as Sir Hugh Evans said, "this is affectations." In other respects, this is a satisfactory design. A bird's-eye "View of St. Peter's, Clerkenwell," showing church, parsonage, and schools, by Mr. Blackburn (1,226), is hung too high to be properly made out. It looks well. "St. Mary's, Loughton," by Mr. Watson (1,215), is a very pleasing specimen of a small country church, with a red-tiled roof, picturesquely treated, without the slightest pretension or strain, ing after effect. Then we come to an interesting design, in regard to the associations connected with its locality, &c., Mr. Street's "Proposed English Church at Rome" (1,216). Uninitiated eyes might say at first that this was a "design for a barn," so far has the architect carried his recent tendencies towards plainness of treatment; but there are character and expression about it. The side elevation shows single-light windows between deep buttresses. There is an apse, without buttresses, and with the roof-line broken by a series of rather low-pitched gables all round, not very happy in effect. A square tower, with a low pyramidal roof, is the prominent feature, and a somewhat heavy-looking square porch adjoins one bay of the south aisle, the porch-walls coinciding with and forming part of two of the buttresses. The one piece of ornament is a string of decorative wall-panels carried round under the sills of the windows. Certainly anything like "fritter" would have been out of place in the "Eternal City," but we cannot help fearing that Mr. Street, in avoiding the Scylla of over-decoration is in danger of falling into the Charybdis of dullness.

Among what may be termed decorative designs we have an elaborate drawing of an interior, by Mr. Talbot (1,201), showing a "Design for a Fireplace," deeply recessed beneath a segmental marble arch, with wall-tie-decoration above. The whole effect is very good; but the carved foliage seems too large and heavy for the scale of the rest, and rather spoils it. "The Interior of St. Stephen's Church, Dulwich" (1,211), by Messrs. Banks & Barry, may be counted among the decorative designs, as the main object is to show the proposed colouring, which seems to us somewhat gaudy and with too much preponderance of light blue

in the chancel roof and elsewhere. "A Design for Sideboard Decoration" (1,214), by W. S. Stacey, is the work, we suppose, of a connexion and admirer of Mr. H. Stacey Marks, whose characteristic style in this kind of design is here attempted to be imitated; not very successfully, we think. "The Queen of Sheba's Visit to Solomon" (1,240) is not a bad piece of conventional figure grouping, with a good effect of colour. Some small painted windows for the apse of the church at Fishponds, Bristol, by Mr. J. P. Seddon, are very good in colour, with red and green diaper grounds alternately; the figures much like most figures in stained glass windows.

Among drawings which are not designs, but sketches of existing work, may be mentioned five of Mr. Spiers's capital series of sketches among the ruined buildings at Paris, the style and merits of which are known. Mr. G. R. Clarke's view in Westminster Abbey is a fine drawing, careful and successful in realising the effect of light; of the same character, and perhaps better, is "Seville Cathedral" (1,197), by Mr. George. Mr. Brower has a good architectural oil painting, "Aus Alten Zeiten" (1,192); and Mr. Deane a very picturesque view in Verona (1,200), looking up a street, under two large arches, to more distant buildings. Mr. Naish's "Interior of Speke Hall, Lancashire," with figures in old costumes (1,170), is a very good specimen of the kind of thing, carefully and minutely finished, both as to light, effect, and figures. Mr. Florence has two small Continental sketches, of which "Study in Mantua" (1,182) is the best. We must not pass over a decidedly fine drawing by a foreign name, F. Hoffmaier, called "The last Five Days of Pompeii" (1,236), in reality a painting of the entrance of a Pompeian house, looking from the interior, which is comparatively in shadow, out into the sunlit landscape; the architectural decorations and the effect of the polished marble in walls and columns are very successfully given. As a contrast, we find on the opposite wall, just facing this, the "View from the Tunnel Mouth of Metropolitan District Station, under Victoria-street;" a well-executed drawing, sent, we suppose, to show to every one how hideous a locality may be made by the aid of modern engineering science.

On the whole, this is a very fine and interesting collection of drawings, which we have had pleasure in passing under review; the proportion of designs which have no interest, or are of a very common-place description, is much smaller than in most collections of the same kind that we have seen during the last two or three years.

NEWINGTON COMPETITIONS.

We mentioned in our last the award of the premiums for designs sent in for the proposed new Church of St. Mary, Newington. The various sets of drawings were on view last week in the committee-room of the Newington schools. The main points in the conditions of the competition were that the church was to seat 1,100 persons, and the cost to be 10,000*l.*, or not to exceed 10 per cent. on that sum; in other words, to be between 10,000*l.* and 11,000*l.* This was exclusive of any tower or spire, for which a separate estimate was to be given.

The design to which the first place has been awarded is by Mr. J. Fowler, of Louth; the style is "Early English" (lanet), of a very solid sterling character, and showing true comprehension of and feeling for this style of architecture, but not presenting any novel or very original treatment either in plan or design. The side elevation is very simple, with single lancet windows between simply-treated buttresses; the west end shows a triplet of large windows, flanked by a similar blank window on each side; the tower is treated very plainly in the lower stages, with a little enrichment by straight-lined canopies and traciced spandrels over the windows in the bell-story; the spire is very pleasing in proportion, but the composition at the junction of tower and spire appears somewhat crowded. We should suggest separating the lacunæ a little more from the angle carried and hroach pinnacles. The roof is treated by rather heavy but not ineffective timber principals, with curved braces forming a large trefoil arch. The plan is spacious, and shows in particular plenty of spare room at the west end to provide against crowding on leaving the church, and also for services around the font. On the whole, we are not surprised at a committee choosing this design, as it is a very sensible and practical one, with suffi-

cient architectural merit; but there is nothing remarkable about it.

Mr. Pearson's design, the second chosen, disappoints us, and is scarcely what we expected from him. The very lofty tower and spire would form a striking feature; and the tower is finely treated, carried up in the lower portion in almost an unbroken mass; the spire, also, is very satisfactory; but the stage between the two, the most important point in the design, is decidedly weak, and this is rather the character of the work throughout; the plain portions of the windows and details of tracery, &c., are weak and starved-looking. The west end is more boldly treated, with three large two-light windows, and a relieving arch spanning the whole, abutting against the turrets which flank the composition; another small window occurs within this arch, over the heads of the others, but the composition is somewhat ragged here, and does not combine naturally. The walls are of red brick and Bath stone, the roofs to be entirely vaulted with stone ribs and brick filling.

In the third design, by Mr. Blomfield, brick is again substituted for the Kentish rag suggested in the Instructions for the outer walls; the dressings to be of Bath stone. This arrangement of brick and stone dressings always militates against the homogeneous and monumental character which we like to see in a church; but the design is a good one, with considerable originality, especially in the treatment of the upper portion of the tower, the upper stage of which breaks into an octagon, and is finished above by a short octagonal slated spire, with picturesque angle pinnacles; this would have been still more effective had the lower portion of the tower been treated with rather more unity and severity of design, and carried up with little break or incident until the octagon stage was arrived at. The author knows how to ensure dignity and solidity of character by linking his masses of wall together in continuous planes; this is well done in the treatment of the large buttresses which flank the "crossing," and which run into the main transept walls on each side, the north transept assuming the form of a "lean-to." The roof is a wooden tie-beam and king-post construction, with a canted ceiling over; the interior proportions are spacious and lofty, but the plan is somewhat cramped, especially at the west end. On the whole, we should call this a better design than Mr. Fowler's, but not so serviceable a plan.

Mr. Brooks's design is much the finest, architecturally,—the only one of the set which exhibits anything of what may be termed the great qualities of architectural design. It is plain, even stern, in character, and with the small windows which the architect has persuaded himself give light enough,—an opinion we should be inclined to question. The main feature in the design is a tower of almost disproportionate width and massiveness, carried up to a considerable height, broken into an octagon in the upper portion (there are no "stages" here), with large flanking turrets, and with a short, massively-proportioned spire, forming an appropriate termination. On this same tower the architect has wrecked himself, as far as this competition is concerned; its cost being regarded, apparently, as quite disproportionate to the rest of the structure. There is a plain moulded cornice to the exterior, the only bit of external "ornament" being a little carving in the corbel-table of the spire. A *façade* adds another feature to the exterior, and breaks the heavy lines of the composition. The general outline of this object is very good, but the details want reconsidering and refining. The plan is rather obstructed by the large piers at the crossing. The south aisle of the chancel is arranged (with an apsidal termination) for occasional use as a chapel for early morning services, or on occasions when only a small congregation might be expected. The crossing and the portion eastward of it to be vaulted; the remainder timber-roofed. The organ is absurdly placed,—a little thing bracketed out high up on the wall, only large enough for a church one-third the size. A big church requires a big organ, if the grandeur of the music is to be proportionate to that of the architecture. Why cannot church architects learn this, and arrange accordingly? *Au reste*, we look with some regret on the non-success of this design. It may not be a very practical one, but the tower would have been a grand object, and worth paying, as Pugin said, "thirty shillings extra" for.

The design by Mr. H. Jarvis is one with con-

sideable faults; the design of the tower is very unsatisfactory, the details generally are not in very pure taste, and the whole composition is too heterogeneous in manner, wanting in unity; one part does not seem to belong to another. There are, nevertheless, very decided merits which deserve recognition; the treatment of the side windows (clearstory) is decidedly effective; so is that of the narthex which crosses the west end, the two ends of which are worked into octagonal apses which contain the stairs to the west gallery. The chancel is groined, and is loftier than the nave, an arrangement which we are not prepared to say is not the truest architecturally, as giving a better effect of climax to the internal composition; externally it is difficult to treat satisfactorily, partly, perhaps, on account of the prejudice acquired by the eye in favour of the other arrangement. The last design to be named by Mr. Bignall scarcely affords room for comment; it is sufficient to say that it is a modern Gothic design of an ordinary type, and neither better nor worse than many others of the same kind.

Five designs for a "Mission Church" for the same neighbourhood, to seat 600, at a cost of from 3,500, to 3,750, were exhibited at the same time. The first chosen of these, by Mr. J. E. K. Cutts, is a plain, sensible, brick design, of no particular merit architecturally, and which we fancy owes its place in the lists a good deal to the exceedingly neat and effective drawing of the elevations. The second one, by Mr. J. Giles, is, on the whole, a more pleasing design, with an effective timber roof with deep carved braces; the nave arches, with flat soffits, springing from coped shafts or pedestals; the materials brick inside and out. The apsidal east end is spoilt by an over-attempt at decorative effect in the shape of interlacing arches with ornament of some kind in the spandrels and interstices; the result is not happy. The third design, by Messrs. Giles & Gane, is a single-span building, looking very squat, but, of course, providing a very good and unencumbered interior area; a reminiscence of the three-aisled arrangement is presented by the manner in which the east gable wall of the nave is carried upon a large centre and two smaller side arches, springing from circular piers. The gable, as in the other two designs, is surmounted by a brick and stone heltry; an alternative slip shows a second treatment of the east end, much superior to that in the main drawing, and with a light timber heltry and fliche substituted for the brick one; this helps the design wonderfully, and carries off its squareness and low appearance: we wonder the other designers have not tried the same thing; they would have got a far better and more picturesque effect (quite suitable to a small building) in this way, than by the conventional pigeon-hole heltry. Messrs. M'Murdie & Wagstaff's is a design in buff brick, and red brick dressings, out of proportion in its parts, and looking more like a model of a larger church than a design for a small one; the turret over the entrance is pretty and picturesque in outline, but has the great misfortune of being lower than the gable adjoining. The design of Mr. Wigginton is so barely shown in a mere outline drawing, that it is in no position to be fairly compared with the others. We may take the author's own estimate, however, on the presumption that he would have taken more trouble with it if he had thought much of it.

We should have been more interested in the competition designs for the larger church (to revert for a moment) if any one of them had shown any marked attempt to adapt architecture (plain in particular) to the real requirements of modern worship. Of this there is scarcely a trace; and the design which has been selected as the best, and which we suppose will be carried out, is, though without any serious defects, as completely destitute of anything like novelty of suggestion, and indication of progress in architecture, as could well be imagined.

THE DOGE'S PALACE AND THOUGHT IN THE WORKMAN.

In these days of artistic and architectural change and uncertainty, and in which we cannot be sure, even for a few months, what will be the next phase and fashion of art, it is some comfort to think of a few principles of artistic action and ways of doing things which are and must ever be, always and absolutely certain. Happily there are a number of such principles, and with-out at present attempting even a list of them, we

may adduce one, viz., that of the absolute necessity of *bona fide* and *individualised* work in the details of buildings laying claim to architectural excellence. In other words, it is not the mere workman, as part of an apparatus, or as a machine, however good a one, that is needed for the work; but the *artist-workman*, or the yet higher artist that is demanded. Style itself, important as it is, is yet, after all, but a matter of almost secondary interest to this vital principle, for who would not rather become the possessor of a fine building, nobly and truly worked out, with studied and impressive details, in a second-rate architectural style, than to have one, even in the very noblest and best of styles, if in detail but the work or result of mere copying and machine-made work. There can be no comparison between them. This important subject has been but little, if at all, dwelt upon or recognised, yet is it one of the vital questions in art and a-ctitecture—the art and architecture of the future.

We have been led to these thoughts by some curious examples, which we have collected of the painstaking and thoughtfulness and skill of the artist-workmen of past times. Nearly all old buildings exemplify this, but perhaps there is not one of them fuller of it than the far-famed Palace of the Doges, of which so much has been written and sung. The very name seems enough, for round and about it, even apart from any technical knowledge of the architecture of the building, there clusters a host of memories and associations. What would this practical world of to-day do, we may ask, without at least a little dreaming and waste of active energy? It must die out from mental weariness, for human nature cannot live solely on the merely "*utilitarian*" and the profitable! But our purpose here, as usual, is not to dream, but to ask, whether so much could have been made out of this world-famous palace, had—all its uses and history having been the same—its structure of the ordinary machine-made modern type, the *artist-workmanship* of it, as that is now, being absent. Would this palace with its columns, carved capitals, and arcades and dispersed wall face, have produced the same effect on man's mind if *art-manufactured*? We confidently declare that it would not and could not; and it becomes, therefore, not a little interesting to discover how and in what way it was that such mental effects were produced. There is all the difference between something and nothing, between such work and mere machine work; and it would, perhaps, be impossible to point to anything more instructive in its way than to the carving and *thoughtful workmanship* to be found in the capitals of the columns of this very palace. Each capital would seem to have been a study in itself, and to have been wrought out after a careful thinking out of how it could be made to harmonise with the rest of the capitals, and at the same time to be an individual thought in itself. All this has been done in the most thoughtful manner: each cap is a new design, both in the upper arcade range of columns, and in the lower and larger columns which stand on the street pavement. There are not a few specialities which we could point out, after a good deal of study, in these capitals and columns; and there is one most notable hit of detail in one of the capitals of the lower range which is not only curious in itself, but as indicative of the age in which such work was done, and as showing how much individuality of thought and painstaking was expended in *one single capital* of one single column, out of a vast series. We refer to the one which Mr. Ruskin has named the eighteenth, and which he has described to a certain extent, as will be seen in one of the volumes of the "*Stones of Venice*." The singularity in it is its Latin inscription, or rather Latin verse, carved on the *abacus* of the capital. This *abacus* is octagonal on plan, though the column on which the capital stands is circular. On the capital itself the compositions of animals and figures are descriptive of the Signs of the Zodiac, so that we may call it the "*astronomical*" cap. There is,—to give a mere list of them,—on one of the sides of the octagon which we will call No. 1. The Creation of Man; on No. 2. Saturn and the Water-Bearer (*Aquarius*); No. 3. Jupiter, the Fishes (*Pisces*), and the Centaur; No. 4. Mars, the Scorpion (*Scorpio*), and Aries; No. 5. Leo and the Sun; No. 6. Venus, the Bull (*Taurus*), and the Balance (*Libra*); No. 7. Mercury, the Twins (*Gemini*), and the Virgin (*Virgo*); and on No. 8, completing the octagon, the Moon and the Orah (*Cancer*). All these little ingenuities to be thought about and

cleverly carved on *one capital*! Why, there is as much to puzzle over and think out as in all the details of a good-sized modern church, for having these quaint ideas in words, it was necessary to think a good deal to work them out and embody them in actual forms. Indeed, it may be a question whether the rough thinking out and working out of all this is not quite as much of a mental and artistic effort as the designing of a Parthenon capital, with all its subsidiary curves and blending of them with straight lines, or rather lines which are meant to look straight. And this, it is to be recollected, but one single capital out of a long series,—a combination, indeed, of architecture and sculpture. We might describe at some length the various sculptures, eight in number, which go to make up this clever capital, but as there are a number of fragments of it in the Architectural Museum collection, it will be merely necessary to call attention to them, that the reader may refer to the work itself; and for this other reason, that our present remarks refer more especially to the "*inscription*" or text on the *abacus*, and from which the subjects themselves are taken. This inscription is thus written; we copy literally both *spelling* and *constructions*—

DEIIMO DSADA. DECO STANMAVIT 7 EFA.*
This may be thus put into modern shape:—*De limo Deus Adam de costa formavit et Evam. The Lord formed Adam of Dust, and Eve of a rib. (We take all these inscriptions from casts taken from the capital itself. They are letter by letter accurate.)*

On the next face, reading from left to right:—*ET SATURNE. DOMVS EGILOCEVNTIS 7 VRNE; or, Est Saturne domus Egeocerotist et urne. It is, O Saturn, the house of Capricorn and of the pitcher.*

No. 3. INDE IOVI DVNA. PISES SIMVL ATQI.
CIBONA; or, *Inde Iovi donant, Pisces simul atque Chirona: Next they give to Jupiter, together with the Fishes, and Chiron.*

No. 4. E ARIES MATIS. 7 ACUTE SCORPIO PARTIS; or, *Es aries Martis: et acuta Scorpio partis. Thou art the ram of Mars: and thou Scorpion, with sharp limb.*

No. 5. ES DOMVS SOLIS. TV QVOQI SIGNE LEONIS; or, *Es domus Solis, tu quoque signum Leonis. Thou art the house of the Sun. Thou art, also the sign of the Lion.*

No. 6. LIBRA CVM TAURO. VENVS T PVRIOR AVRO. *Libra cum Taurus, Venus et purior auro. The Balance with the Bull, and Venus purer than gold.*

No. 7. OCCVPAT ERIGONE. STILBONS GEMINIQI LACONES. *Occupat Erigone, Stilbo, Geminique Lacones. The Virgin comes next, Mercury and the twin Laconians.*

And No. 8, and the last, and which completes the octagon, LYXE CANCER DOMY. T PSET IOBE SIGNORVM. *Lyxe Cancer domus, tunc pset in orbe signorum. Cancer, the house of the Moon, then shewest thyself in the circle of the Signs. Thus in these curious and quaint lines did the able sculptor of this capital find the subject for it, and the rule of *lettering* will show how little seems to have been thought of that precision and exactitude which characterises modern work. Letters are misplaced or left out, just as suited the hit of stone in which they are incised. The idea was everything.*

It would, perhaps, be impossible to find in the whole range of Gothic art any one single object affording greater proof of the great principle of individuality of work, which always characterised it, and which, indeed, made it "*Gothic*." No two things were alike; each one had its workman, and that workman was expected to think as well as to work; and there can be no manner of doubt that one of the great charms of the Doge's Palace is to be sought for in this individuality of workmanship, and in the fact of the workmen of it being *artists*, but still *workmen*. In this fine capital—but still but one out of so many—the sculptor seems to have wished to embody, as far as in him lay, the formation of the planets made for the service of man; the subjection of the fortunes of man to the will of a higher power; and as determined from the time when the earth and the stars were made. What a great lesson for men modern is here; for, if so much thought and work has been expended in the production of one single hit of what many would think insignificant detail, what are we to think when we know that the whole of a vast palace is full of it,—full of thoughtful and real artistic work, every part and

* The mark 7 stands for et, and.

† This word is a mere transcription of the Greek word corresponding to Capricorn.

detail a study? Compare this for a moment with a modern "restoration," wherein the whole of the work, however carefully done, is all mechanical, and foreign to the heads of the executive workmen. How much is there yet to be done before the real idea of art, as the expression of individuality in material forms is seen, and grasped, and realised! No amount of skill, as it seems to us, in mere designing,—no determination of style, whether Classic, or Gothic, or any other, can avail without this recognition of the vocation of the workman; and this Venetian palace is of those buildings which go to prove this artistic value of the workman. But in this little fragment of antiquarianism, out of which grew so pretty a bit of sculptured form, there are yet one or two things to be remembered to enable us thoroughly to comprehend it; and in an antiquarian view of the matter, it is of infinite importance to do so. Two things are to be kept clearly in mind. First, that each line is a sort of rude hexameter keeping the rhythm, but disregarding the rules of prosody. Secondly, that each line consists of two parts, which rhyme together; and in order to secure the rhyme, any liberties are taken with the terminations of the words. Thus, as we have said, the idea was everything: the rhyming lines satisfied the ear, the sense being well known. We have ventured to call this beautiful capital the "astronomical cap," but perhaps it should rather be the "astrological" cap, for the stars at one time dwelt in "houses." Full of errors, doubtless, were the men who thought thus, and did these things, and the like of them; and, as far off are we moderns from them in scientific knowledge as astronomy is far off from astrology. But one thing they of that distant day most certainly had, which we have not, and can never have, as things now are; and that was, the time, and temper, and working power to make practical use of their dreamings, and to embody them in sculptured and painted forms, and thus to write legibly their world's history—the history of things as they then were.

SCHOOL PLANS FOR THE LONDON SCHOOL BOARD.

We have already briefly referred to the designs sent in competition, by five architects, for the schools proposed to be built in Johnson-street, Stepney.

The "Instructions to Architects," as we understand, made the following provisions:—

1. The School to be for 1,080, in three equal departments of boys, girls, and infants, and arranged on the principle of class division (sometimes called the Prussian system).
2. The Boys' and Girls' Departments to be arranged in twelve class-rooms, each accommodating sixty children, and having an area 9 ft. superficial per child. A general room to be provided for the assemblage of the whole of the boys and girls at one time, calculated at not less than 1 ft. superficial per child, and available for one of the classes. This room to be used as one of the twelve class-rooms. One of the rooms to have a top light, suitable for a drawing-class.
3. The Infants' Department to have two class-rooms for sixty each of the youngest and most advanced, and a general room for the remaining 240 children. These rooms together to have not less space than 8 ft. superficial to each child.
4. Generally.—The class-rooms to be not less than 13 ft. high. Provision to be made in each department for masters' and mistresses' rooms and W.C.s. Each department to have separate out-offices (approached, if practicable, by covered ways), lavatories, cap and bonnet rooms, playgrounds, entrances, and stone staircases. The building to be not less than two nor more than three stories high. A care-taker's residence of two rooms to be provided. The views of the Committee of Council on Education to be carefully considered in reference to structural detail not herein described.

One of the competitors, Mr. T. R. Smith, in his descriptive particulars, says that the principle of class division in schools, sometimes called the Prussian system, is carried out in Prussia, at Berlin, for example, much as follows:—The children are entirely taught in class-rooms; the maximum number recommended in a room is sixty, seventy being considered an exceptional number. The class-rooms are oblong; it is indifferent whether they be lighted from the end or the side, but they must be lighted from one side only, and the children must have their light on the left hand. There seems no limit to the

depth from front to back of a block of seats, but the length of each bench is so limited as to allow the master to inspect every child's work from the end of the bench. For the purpose of facilitating this inspection, a gangway is preserved all round the block of children, narrow at the back and at the side nearest the windows, but made wide enough next the wall facing the windows, to be convenient for the ingress and egress of the children; and the block of seats is broken up into at least two masses by an additional narrow gangway from front to back. No child, it is thought, ought to be more than 30 ft. from the easel where diagrams, &c., are shown, and it is recommended that, as far as possible, the seat most remote from the window be not further from the wall than 1½ times the height of the top of the window from the floor. The master's desk, on a slightly raised platform, faces the block of children; an easel for the display of diagrams, a book-closet, and the stove or fireplace, occupy the space on either side of him.

The class-rooms, it appears, are ordinarily put together so as to form a compact oblong block of buildings several stories in height, and are frequently divided on plan into three portions by two staircases extending from front to rear; one of these is for boys and the other for girls. These staircases, however, often occupy the ends of the block, and sometimes a corridor connects them together; but this is sometimes omitted. On an upper floor, and between the two staircases, is placed the Aula, or general room, calculated to seat about half the number of children provided for in the class-rooms. This room generally receives some amount of architectural decoration; it is not customary for it to be divided by movable partitions or other means when not in use for collective teaching. Private rooms for the teachers, and sometimes one or more consultation-rooms, complete the essential parts of the building, which is heated and ventilated on a general system.

The principle of a side-light referred to has been adopted by all the other competitors but one, Mr. H. S. Snell, who gives a quotation from the reported evidence of Mr. Adolf Sommenschein before the Committee of the School Board for London, as to the Prussian school system, to show why he has placed all the children with their backs to the light:—

"The class-rooms each contained a platform, on which were placed a black-board and the teacher's desk and chair. All the children faced the platform, and the windows of the room were at the back of the children, so as to give each the benefit of a full light."

It is somewhat strange that such a difference in opinion should exist on a matter of fact. For our own part, we see no reason for forcing children here to stand in their own light, even if they do so in Prussia.

As to the best size for the class-rooms, while Mr. Smith arrives at the conclusion, after careful examination, that one 20 ft. by 27 ft. gives the best results, whether end-lighted or side-lighted, and whether seated for junior children at 18 in. per child, or for senior ones at 22 in., Mr. Snell makes them each 26 ft. by 21 ft., and Messrs. Harston have some 25 ft. by 20 ft., and others 27 ft. by 20 ft.

The latter make the approach to several of their class-rooms from the central hall, the other two competitors of whom we have spoken give all their rooms an approach independent of the central hall.

The committee should take evidence on these points before making their selection.

The other two designs seem to us to have fewer points to recommend them than those we have named.

YESUVIUS.

EIGHTEEN HUNDRED years and more have passed since Vesuvius vomited its ashes, mingled with rain, on the beautiful city of Pompeii, and buried it with its accumulation of treasures of art from the sight of man, till the present century. And now again has the Mount, that still stands like a threatening avenger, made its voice heard from the depths and sent forth its pent-up fires, threatening the very capital of the South itself with destruction. Science, in the shape of its sismograph, gave no warning; the oldest and most intelligent of guides—men horn and bred up on the lava-clad slopes—knew nought of the approaching awful danger.

The afternoon of the 23rd ult. began the wonderful spectacle, without warning of any kind. Signor Palmieri, stationed at the Observatory, perceived no motion of the sismograph,—an

instrument so delicate that the slightest volcanic motion at other times could be marked by it. By eight o'clock of the evening of Wednesday, the mountain had opened orifices here and there on all sides, sending down rivers of lava, thrusting out tongues of fire long and broad, appearing here and disappearing there, like some gigantic process of illumination of a vast amphitheatre.

The sea, just slightly rippled, reflected the pallid light of the moon and the kindled streams of lava. As the cones of lava were lighted up, the volcano seemed alive, and threatened terrible consequences. All the night the affrighted inhabitants of Torre del Greco (built on the ruins of Herculaneum) watched on the house-tops, with anxious eyes, the spot whence issued a new menace of destruction of their town. Theirs was not the gaze of curiosity, but of deep, anxious, fearful presentiment. The morning of Thursday, the volcano appeared calmer, but in the afternoon broke out with increased vigour. Thousands rushed to the shores of the bay to see the sublime spectacle. Caravans of the curious, of both sexes, started to Resina, "to begin the weary ascent" of the mountain, defying all danger, forgetting what destruction Vesuvius had wrought of old. And between the hours of four and eight on the morning of Friday, with horrifying sounds, it broke its hard crust, and under the feet of those most advanced on their perilous ascent opened up a deep gulf, and on their heads poured torrents of lava, while above hung a deep roof of the blackest smoke. The sufferings of those engulfed in the open chasm may have been less than of those spared for some short time in the many hospitals open to receive the sufferers.

From that time the eruption acquired fresh vigour. A hollow, incessant rumbling, accompanied by a certain trembling of the ground, and becoming duller and more monotonous as Naples, and in the villages around Vesuvius, an earthquake movement continued. The showers of lava flowing in so many different directions drove off the inhabitants of the little farms.

This eruption is not considered to be the greatest from the volcano, but the severest in the memory of man.

By the evening of the 26th, the mountain presented the form of a funeral car,—the flame bursting out of the cone, forming the top, the tongues of flame at the base, the lamps around, while over the whole rested, like a baldachin, the dense white cloud,—the sea coloured red as far as Prosilipo. At dawn of the 27th it became less, the deafening roaring, the terrifying sounds, added to the fiery tongues that issued from the mountain, and the smoke and fog, had formed a dense white mantle that enveloped the mountain, touching the sky and sea with its edges. The height to which the stones were projected during the eruption was calculated at half a mile—the summit of the dense canopy of smoke a mile; while down the sides of the mount rose, at different points, the fires from the newly-opened craters, fourteen in number, each having its canopy of dense smoke. Amid all these horrors, the Observatory, with its brave professor Palmieri, remained untouched; but, standing, as it does, somewhat elevated, it was surrounded with the newly-flowing lava. Towards the night of the 27th, the horrors partly ceased; Vesuvius was hidden partly from sight; slight detonations were still heard, flames from the cone seen, but the dense mantle was not yet raised. The sight had lost its grandeur, but fear had not been dispelled. Three nights and days of terror had been passed by the inhabitants of the surrounding villages; fourteen hatteries had been opened on the defenceless trenches of Torre del Greco, San Sebastiano, Ponticelli, Torre Annunziata, Castellamare, Naples, fulminating the fiery lava at them, and threatening to reach them with certain destruction.

The villages that certainly have been struck with the volcanic scourge are San Sebastiano, with its 1,982 inhabitants, and Massa di Somma, with 1,736. These have not been entirely destroyed,—about five or six houses still stand in the former, and the campanile of the church, though much shaken, still stands. In Massa di Somma all the buildings are not destroyed. The lava that struck San Sebastiano was divided into two currents. Ponticelli and Pollina were the most severely menaced, Portici and San Giorgio came under the third stream of lava; Resina and Torre del Greco under the fourth; the other places near, the fifth and sixth. Before reaching these parallels the enemy was silenced. The emigration of the fugitives produced a scene

never to be forgotten. And how often have the people been driven by the volcano from these spots, and again returned to take up their abode on the very site of their destroyed habitations, with a dogged, perverse courage of perseverance.

From the king and his ministers to the national guard, the noble to the peasant, all offered succour to the houseless.

The number of victims cannot as yet be correctly stated. Above 2,000 houseless are lodged in the hospitals and convents of the city.

With very few exceptions all those who were overtaken by the lava, have died from their wounds. Up to the time of writing, Vesuvius is hidden. No one can vouch for its tranquillity.

It may not be interesting to take a brief retrospect of the history of this volcano. Of its primitive eruptions few traces remain. In 63 A.D., Pompeii, Herculaneum, Stabia, were visited by a violent earthquake, which partly destroyed them. Ten years after these cities had been restored. The fatal volcanic explosion that destroyed these three gems of southern Italy occurred in 79. Subsequently, in A.D. 203, 471, 512, 685, 983, 993, 1030, 1043, happened the eight great eruptions, threatening all the inhabited parts around, and ruining many villages, as in modern times. New cities rose on the ruins of the old as now. Torre del Greco has been destroyed eleven times, and eleven times has been rebuilt.

In 1631, after being silent for 130 years, Vesuvius broke out in flames, and overran with its lava five-sixths of the territory adjoining it. New towns arose on the lava. In 1794 an immense torrent of lava reached the sea. Another disastrous eruption happened in 1800. In all these latter disturbances Torre del Greco has suffered.

In referring to the description given by Pliny the younger of the eruption, during which his uncle Pliny the elder lost his life, the similarity of the attendant phenomena is very striking, and one might be reading an article from a journal of the 25th of last month; the "ashes mixed with water" and the suffocating atmosphere (the cause of Pliny's death) were the same in both. Naples, now as then, is black with fine ashes like soot.

The terrific visitation occupies all minds. The bustling, progressive city for the time has forgotten its plans of aggrandisement,—and it has many in view. A brisk lucrative trade is about being organised with Japan—principally for the introduction of silkworms from the latter. Japanese warms are to be brought in, in plenty. Manufactured silk is to be exported. A free trade is to be opened between the two countries. Of the progress of education in the South of Italy we will write another time. That a great movement has commenced is undoubted, but the trammels of old use and prejudices have to be removed before it can flow apace.

IMPROVEMENTS FOR KENSINGTON.

ADVANCING with the times, this most important suburb is increasing in buildings and population, and sites and plots have risen in value fourfold within twenty years. The widened thoroughfare and new church add a stimulus to progress, and, as at the Bayswater side of the Park and Gardens, it bids fair to reach the outlying railway boundary of Shepherd's Bush. There is, however, a great default in the want of a transverse line of open road between these two most important western lines of road, the only one being the narrow crooked way leading from the church to Silver-street, Notting-hill.

On the 13th ult. allusion was made in the *Builder* to improvements in the line of Church-lane, the driftway whereof is in parts only 15 ft. in width; but on further consideration and inspection, a much more effective and direct, as well as a more level route, can be recommended to the ecclesiastical and municipal authorities, if upon due consideration arrangements can be made for concession to the public of a material easement, that would require all parties, and tend to the prosperity and embellishment of the town.

On looking up Church-lane from the High-street it is direct, save that the churchyard curves out upon the roadway some 20 ft., and at a distance of about 250 yards, the vicarage crosses the line at a right angle, facing down to the church. From this point the street runs westward, at an angle of 35 or 40 degrees, curving again to the line of Silver-street. Now,

to avoid this turn, and to save the demolition of eight or ten forecourts, shops, and houses, there is but one course, and that is to take a new line which would lead straight to the end of Palace Garden-terrace, at the site of the iron church; but to accomplish this the old vicarage must be removed. The intervening space is church land, the glebe extending to five acres, meadows, garden, and site of vicarage and offices, together with the iron church included. A road in this direction, through Palace Garden-terrace and the Mall, would make a straight line to Notting-hill; and the glebe grounds sloping southwards, and looking towards Kensington-gardens, would offer an invaluable site for houses of a superior class; besides that ample space could be reserved for a new and commodious vicarage, with offices and grounds.

A new road through the vicarage garden would be in length barely 130 yards, and along either side might be erected terraces, which would amply compensate for the expropriation of about one acre of land. On the east side, again, there is a frontage of 150 yards facing the Palace Garden-road, the Palace and Kensington Gardens, the choicest site in the Royal precincts for first-rate mansions. These would produce a large income, and leave enough to spare for a better vicarage, offices, and garden, in a vastly better position than the present antiquated house.

On the Bayswater line, the finest ranges of houses are built on church lands, and there is no reason wherefore church lands in Kensington should not yield their full increased value, more especially when a great and pressing public requirement calls aloud for a line of intercourse from which a large community is debarred.

As there is great solicitude amongst the inhabitants and local authorities about the widening of Church-street, and it is under arrangement to give out a portion of the Church-yard to the main thoroughfare, the present is the moment for considering the aptitude of the new and direct line of thoroughfare recommended as above; which, in addition to the advantages it must confer on a large and growing business town, would also open out a better line of access to the improved neighbourhood of Campden-hill.

Thirty years back the vicarage glebe nestled amongst these groves; the thorn and philomel warbled their delights of blooming shrubs and meads hedged in cowslips: now the scene is changed, for stately mansions, barracks, and rude brick walls surround it; therefore, although the palace-gardens and forest trees are still in view, it no longer possesses the amenities of aylvan retreat; and so the vicarial incumbent, if suited with a better manse and offices, need not lament, in tender pastoral measure, "dulcia liquimus arva;" seeing that the exchange would make him the possessor of a better placed and more modern abode, together with the addition of another 500*l.* a year to his stipend.

QUONDAM.

PROPOSED CLOSING OF RED LION STREET.

WITHIN the last few days the Clerkenwell vestry have been thrown into a state of considerable trepidation, on suddenly discovering that the Metropolitan Board of Works, in their one end of Red Lion-street, propose to close up the Bill now before Parliament, their reason being that the level of the proposed new thoroughfare will be much lower than the gradient of Red Lion-street, and that for this new street a fine frontage is required. It appears that the clerk to the Clerkenwell vestry admits that, although the plans of the proposed street improvements had lain in the vestry since the month of November last, he never observed that it was proposed to close up the one end of Red Lion-street until within the last few days. The discovery places the vestry in a peculiar position, for they have already petitioned in favour of the Improvement Bill; but notwithstanding such petition they have now resolved to oppose the Bill, alleging that the closing of the street would materially reduce the value of property in the neighbourhood, and cause great inconvenience to the public. They further urge that Red Lion-street is the main communication between James-street and John-street, and that if they were to be blocked up in the manner proposed it would be most disastrous to the traffic of Clerkenwell. So important a thoroughfare ought not to be closed. The vestry have

agreed to memorialise the Board of Works on the subject, and also to appear before the committee of the House of Commons against this portion of the Bill.

THE STORY OF A COMPETITION.

AN architect sits in his office alone:
"The night; work is over, the drawings are done—
Ground plan, elevations, and sections are there,
Ink'd in, neatly tinted, and figured with care;
And a block plan completed with infinite pains,
Crimson lake for the levels, and indigo drains;
And a charming perspective, to show the good people
How the building will look when they've finish'd the
steeple—
That is, if the public don't strongly object—
To pull down half a street to produce the effect—
In the foreground,—to add to the charm of the scene,—
Are—a curate, a dog, and a lady in green.
In short, the best judges would soon be agreed
They're a very superior set of drawings indeed.
He scans them with pride—not unmix'd with dismay,
At the time and the money they've fritter'd away—
For, in truth, he had something far better to do,
His clients were waiting and clamorous too;
But a church-competition demanded his skill,
So he left all the rest of his work to stand still.
'Twas the old tale,—nine architects handsomely ask'd
To allow all their pockets and brains to be task'd,
That a "local committee" might meet and select
One design, and the rest unrequited reject.
So he could not be such, as he counted the cost,
Odds were heavy his money and labour were lost;
But his'd one, and too late to indulge now in sorrow,
For the terms must be sent in by midday to-morrow,
And then for a month or six weeks he must wait,
Till they write (most politely) to tell him his fate.

The day has arrived, the committee have met
To look over the plans and decide on a set
Which their wisdom united pronounces the best,
And without more ado to return all the rest.
You'd think that the best of those who take part
In the judgment some few have a knowledge of art.
No such thing; but the best for their portraits shall sit
You will see if for such a selection they're fit.

First the vicar; a good man, but young—fresh from college—

With plenty of zeal, but a small stock of knowledge,
Next to him comes the senior churchwarden, a grocer:
He advocates "comfort without any show, sir!"
The next is a young man, who having never married his part,
Goes hard in for what he calls "taste," first of all.
Next a chemist—who gravely expresses a hope
That "whatever they do they'll succeed in the pope."
He's heard 'em all—here the vicar turns red—and "feels
sure,
That remarks such as this will be deem'd premature."
"He's a laid!" and a cough from our friend Mr.
Boddie.

Who, though we all know he's a terrible noodle,
Contrives on all sorts of committees to sit,
But ne'er speaks—so that 't doesn't matter a bit.
Then—a rich undertaker—whose dictum has weight
(His knowledge of churches they say must be great).
A former churchwarden—as dead as a post—
He ne'er miss'd a meeting, and that is his boast;
When a point's raised and settled, discuss'd through
and through.

He starts it soon after as something quite new.
Last, the doctor; he has a young nephew who, men
Of discernment say, one day will emulate Wren:
"A pupil of Scott, sir," clever young man,
So the nephew comes in, and he thinks it a pity
If his uncle can't manage to square the committee;
He says he'll give up, and under advice,
Takes "a Nil" for his motto—'t's modest and nice—
For the plans (if it answer'd 't would really be fine)
Are anonymous, much as they might seem to be.
And the names, each in separate envelopes seal'd
Till the final decision, remain unrevell'd.

Well! 't's clear that with such a committee of taste,
To spend time in looking at plans would be waste;
So the doctor gets up, and with much tact and skill
Moves at once they select the design mark'd with
"Nil."

He points out its merits, pooh-poohs all the rest,
And really persuades them that "a Nil" 's the best.
The good vicar wince, yet feels he's but one,
And against odds like this there is ought to be done;
So he too gives in with the best grace he can,
And they end by all voting for "Nil" to a man.

Now, whether the embryo rival of Wren
Carried out his first plan—and if so how, and when—
Or whether they found what they ought not to proceed,
And so forth, we'll leave to the figure agreed,
And so let him make them a second design,
Just about half the size and not nearly so fine;
Or when they've given up, and under advice,
Takes "a Nil" for his motto—'t's modest and nice—
The gentleman's living, or dying, or dead,
This history tells not,—but what's been said
Shows the exquisite folly of young men competing
In cases like this with the notion of meeting
Fair play, or of coming out first from the rack,
Except by some high good luck, or else by good luck;
If it make one committee-man modestly own
That he can't by the mere light of nature alone
Know what architects (less gifted men, it appears)
Only let by the study and practice of years; a
If, in short, it shows reason why sometimes we may
Object to competing in this kind of way,
Then the point of this commonplace story is plain,
Nor has it been told altogether in vain.

Engineering. Glasgow University.—Mrs. Elder, of Claremont-terrace, has set aside a sum of 5,000*l.* as a supplemental endowment in connection with the Chair of Civil Engineering here, in memory of her husband, Mr. John Elder, the well-known engineer.

THE MEYRICK COLLECTION OF ARMOUR.

This fine collection of armour, together with a number of valuable ivories and some in-valuable miniatures, as exhibited at South Kensington, was offered to the Government for 50,000*l.*, and might have been had, we believe, for 45,000*l.* Unwisely, however, the offer was not accepted, and the opportunity of making the national collection of arms and armour a really fine one at comparatively small cost has been lost. If an ordinary observer were to visit the Meyrick collection in the Grosvenor-street Gallery, where it now stands, he would suppose that he saw there all that he had before seen at South Kensington, and would surely be surprised to hear that the owner had received no less a sum than 30,000*l.* for a portion of it, which is hardly missed. If we understand rightly, the specimens have been bought chiefly for French collectors. Our Government is not well advised in such matters as this.

THREATENED DESTRUCTION AT TENBY.

The remains of the fortifications at Tenby are an interesting feature, and should be carefully preserved by the inhabitants of the town, if for no higher reason than desire to maintain its attractiveness. Nevertheless, the best part of these, namely the fine archway gateway, is threatened with immediate destruction, on the ground that it obstructs the traffic. We beg the town council to look carefully into the matter, and to think well over it before they take this step. These tangible records of the town's history, landmarks of history, should not be carelessly dealt with.

PARIS.

The Theatre of the Porte-St. Martin is to be rebuilt on an enlarged scale and as a model theatre. The question of compensation for damage done during the riots has caused delay, but the drawings are now all ready, and if nothing unforeseen occur, the new theatre will be ready, it is said, by the 1st of November.

The amount of building going on in Paris is extraordinary. A correspondent now there writes.—Great as my amazement was to see the terrible destruction of this beautiful city wrought by the Communists, it has been exceeded by astonishment at the rapidity with which the Parisians have rebuilt long rows of tall, handsome houses, to fill up the cruel gaps. The erections going on everywhere are marvellous. This does not, however, apply to the public buildings. They still remain masses of ruin, and such strange ruins too,—much more as if thrown down by an earthquake than burnt; but this, of course, is accounted for by the fact of petroleum being used, which caused explosions rather than fire. In only small patches is there any mark of smoke or burning.

THE STRASBURG CHURCH COMPETITION.

The first three premiums offered for the best design for the Temple-Neuf in Strasburg have been carried off by the pupils of one architect, M. Questel, of Paris, viz.—First premium, Messrs. Bernard, Motte, & Tournade; second, M. Beau; and third, Messrs. Farge & Sanier. The fourth was awarded to M. Salomon, architect, Strasburg; and the fifth to M. Riederer, architect, Paris. The premiums offered were 200*l.*, 80*l.*, and 40*l.*, no promise being given that either of the rival competitors would be employed to carry out his design.

SCHOOL BOARDS.

Hull.—It was recently resolved that at a special meeting the Board should proceed to the election of a surveyor, at a salary of 200*l.* per annum, whose duties should be to survey and measure school sites, prepare plans for the erection of schools, superintend the erection and fittings of schools, &c.

Huddersfield.—At the usual fortnightly meeting of the members of the Huddersfield School Board, the minutes of a special meeting of the Board, held on the 27th of April, with a view of selecting designs for School Board schools, were read. The minutes stated that it was resolved "that, as none of the plans approved by the

Board in committee only, as the Board are advised, be executed for a sum of about 2,500*l.*, the Board feel that they cannot proceed to allot either of the prizes offered; but that the Board selected "Lucius Ordo" as an architect for one of the schools proposed to be erected." It was also resolved that the Finance Committee take the whole matter into their consideration, and communicate with "Lucius Ordo" (Mr. C. Fowler, Leeds), requesting him to furnish the Board with a new design for a school to accommodate 800 children; and that, after the design had been received, the committee be empowered to instruct some competent person to estimate the cost of the building on the new plan, and then report the whole matter to the Board. The minutes were confirmed.

THE TRADES MOVEMENT.

Birmingham.—A conference of the master builders and operative bricklayers and stonemasons of Birmingham has taken place in the room of the Builders' Association. At the end of last year the plasterers, carpenters, and labourers gave notice for a reduction in the hours of labour and an increase in the rate of wages, which was referred to Mr. Rupert Kettle as arbitrator, who gave a decision in favour of the men. As the bricklayers and stonemasons did not give the necessary notice at the proper time, they were bound to adhere to the existing terms for the present year. The masters, however, offered to advance the wages of the men one halfpenny per hour, making 7*d.*, and reduce the hours to 5*h.* per week. The stonemasons accepted the offer made by the masters; and the bricklayers, finding it impossible to obtain the advance they required (7*d.*), agreed to accept the terms offered by the masters, at the same time stating that they should give notice at the end of the year for a further advance.

Leeds.—It was anticipated last week that the bricklayers of Leeds would turn out, the dispute between them and the masters turning upon the question of a further increase in the rate of pay of 4*d.* per hour, which the men demand and the masters refuse to give. Six months ago, when the rate of pay was 6*d.* per hour, the operatives made a demand of 1*d.* advance, the employers conceded 4*d.*, which was accepted by the men, they, however, giving notice at the same time that at the end of six months they would demand the other 4*d.* At the same time they submitted a code of rules. In view of the near approach of the expiry of the notice, and in order to endeavour to arrive at an amicable settlement, a conference was held between deputations of the masters and men, and the result of the interview was an arrangement with regard to the rules, but no settlement could be arrived at in regard to the further advance demanded. The masters offered to give 4*d.*, making the rate of payment 7*d.* per hour; but the men stating that they had no authority to accept less than the halfpenny, the conference terminated. A meeting of employers, which was well attended, has since been held, for the purpose of hearing the report of the deputation with regard to their interview with the men. After hearing this report, the meeting passed the following resolution unanimously:—"That the offer made by the deputation on behalf of the masters of 7*d.* per hour to the operative bricklayers be withdrawn." During the meeting a communication was received from the Brickmakers' Association, who were also holding a meeting at the Nag's Head, enclosing a resolution as follows:—"That the members of this association (brickmakers) pledge themselves not to supply any bricks to master builders or bricklayers who are not members of the Builders' Association during any dispute or strike that may arise between the master bricklayers and their men." Thereupon the meeting of master bricklayers resolved,— "That this meeting presents its best thanks to the Brickmakers' Association, and that a list of the members of this association be forwarded to the chairman of the Brickmakers' Association." Several gentlemen not before connected with the association attended the meeting and enrolled themselves as members, expressing their determination to stand by the association.

York.—Nearly three months ago the building trades of York struck for advance of wages and diminution of hours of labour, but after remaining out for several weeks, the masons and bricklayers went in at the concession offered by the masters. The carpenters, however, still remain

out on strike, their demands being fifty-three hours per week, and 6*d.* per hour; while the employers offer fifty-three hours per week, and 6*d.* per hour. There appears to be little prospect of settlement; for, whilst the masters are advertising for hands from distant places, the men are taking the same course, and cautioning carpenters not to visit the city.

Edinburgh.—A meeting of the master builders of Edinburgh has been held for the purpose of considering the following circular, which had been received from the operative masons in the city:—"We are directed by the members of the Edinburgh and Leith Lodges of the United Operative Masons' Association of Scotland to inform you that, after much consideration, they have come to the conclusion that the following bye-laws should be introduced.—1st. Wages to be paid weekly, and on the job, before dropping time on pay-days. 2nd. That sufficient shed accommodation be provided for both hewers and builders in wet weather, and proper plates kept hot for heating tea and coffee at the meal hours. In the event of this circular not being returned, duly signed by you, before Friday, May 3rd, 1872, we will consider you not favourable to the foregoing proposed bye-laws.—By order, William Armstrong, chairman; Thomas Walker, secretary." Mr. James Steele, builder, occupied the chair; and after some discussion, it was agreed that the master builders should meet the demands of the operatives as embodied in their circular, "so far as they possibly could, and in the most liberal spirit, although they considered some of the demands unreasonable."

Dumfries.—The whole of the journeyman masons in Dumfries not previously on strike have now struck work. There were meetings of masters and men, in order to come to an agreement as to the matters in dispute, which are the employing of slaters to point walls and the nine-hours limit. In regard to the latter, the men wanted the alteration to commence on the 1st of May, without any advance of wages. The masters were willing to grant the change on the 1st of August, and give 4*d.* per hour advance. A deputation of the men waited on the masters' meeting, and intimated that they accepted these terms, provided the masters would agree henceforth not to employ slaters in pointing. The masters declined to comply with this demand, and the men resolved to strike, and to withdraw the proposal to accept the nine hours on the 1st of August.

THE PRESERVATION OF NATIONAL MONUMENTS.

A PAPER on this subject was recently read by Mr. Robert Young, C.E., at a meeting of the Natural History and Philosophical Society, Belfast. In the course of it Mr. Young said,—

A nation's life may be said to be recorded in its monuments,—using the word in the widest sense, to include everything bearing the impress of man's hand and brain. The earthworks of our own island, which are variously known as duns, raths, lises, forts, or moats; the cromlechs, menhirs, and rude stone circles of the earliest times; the round towers, sculptured crosses, anchorite cells, and churches and castles, from the sixth to the fifteenth century, would all be included in this category as historical monuments. Without going the length of saying that the destruction of any one of the thousands of monuments thus referred to would be a serious national loss, it would be a perfectly correct statement as applied to the destruction of a number of the same class, as of the round towers, or the earliest churches, or stone-roofed cells, or again, as applied to the case of a monument which is unique or very rare, as our Giant's Ring at Drumbo, or the great rath at Downpatrick and Moylena, near Antrim, both of which are intimately associated with early Irish records of the greatest interest.

To take an illustration from what has occurred in our own neighbourhood within the last generation. The destruction of Trummery Round Tower was a national loss, as from the drawings which represent its aspect some thirty years ago, it seems to have been of quite a peculiar type, the only other tower then resembling it being at Dungiven, county Derry; but this, sad to tell, has also been swept away; both might have been saved by care.

Not far from Trummery, but on the south side of the town of Moira, there stood, on the edge of the chalk cliff which here overhangs the Lagan, a very fine mound enclosed by several rings; in fact, it was the Moy-rath (Moira),

which gave its name to the district, and to the famous battle in which Congall was slain. The levelling of this some years ago by the tenant of the lands in which it stood, did not possibly create much indignation in the neighbourhood; still it was an outrage, and a loss which will be felt more and more as education spreads, and a better taste prevails.

The modern school of farmers, and more especially those who have lately migrated from Scotland, with their desire for level ground for their sowing and reaping, are very much inclined to clear off all protuberances, whether prehistoric or recent, and grub up and cart away, or, what equally offends the archaeologist, bury in a deeply-dug pit the standing-stone or cromlech that interrupts the even tenor of his patent plough. To men of this type there is no appeal except through their pockets; but, fortunately for modern antiquaries, it was very different with the old Irish farmer, who had both superstitions and sentiments, the one making him dread the vengeance of the "little folk," if he put a spade into the old rath, and the other causing him to respect the ruined chapel or wayside cross which was from childhood associated with his religious ideas.

Whilst these sentiments are rapidly losing their hold all over the country, it is much to be wished that more correct notions of the real value to the community of these remains should be implanted in their stead. Why should there not be brief notices of the principal antiquities of our country placed in the books of lessons for the National schools of the three kingdoms? And along with this could there not be some instruction in this subject given to the teachers both at the head training establishments and in the model schools, by a properly-qualified professor? If this were done (and there really seems no good reason why it should not be), a very few years would bring about a marked improvement in the feeling of the lower classes towards these objects.

TURNER'S DRAWINGS.

The extraordinary prices realised by Turner's drawings in the Gillott sale, on the 4th inst., compels me to remind you that you some years ago published a letter of mine warning the possessors of these wonderful works of the fugitive nature of some of the colouring materials used by Turner in his water-colour pictures. The astonishingly increased value set upon them by purchasers seems to render needful a repetition of my detailed statement, published in the *Builder* at a time when Turner's drawings could not be sold for as many hundreds as they now fetch thousands. The "Bamborough Castle," Turner made for me for 100 guineas. As far as the subject is concerned ("Morning after a Storm") it was done from a very slight sketch of David Cox's, which I supplied to Turner. It was four years in hand; and Turner, when it was completed, said he had more than half-finished another from the same suggestion, which he had laid aside for the one he let me have. I suppose the unfinished was a very different thing, for he said I had better let him finish that also for me. Now, sir, with regard to the fading, my former letter to you on the subject will show that I had one other of the drawings, sold on Saturday for 1,210 guineas,—I gave 60l. or 70l. for it,—hanging for perhaps a year in a frame too small for it, so that on taking it out of the frame, to clean the glass, or for some other purpose, the margin which had been under the rebate of the frame, protected from the effect of light, was very much stronger and more vivid in effect than the rest of the picture, which, by comparison, was seen to have greatly faded. My letter went on to say that I took the drawing up to London, for the purpose of showing it to Turner, and that on calling on him, without the drawing, I met, at his house, in Queen Anne-street, the gentleman from whom I had the drawing. When Turner "pooh-poohed" my report of the fading, I asked him and the vendor of the drawing if they would wait together for an hour, that they might see and judge. They very willingly did so, and on my throwing the drawing on the table, Turner said, "I will never make another water-colour drawing." I replied, "There is no need for that; but let me beg of you never more to use indigo. The drawing before us shows that it is not the colour, but the light and shade which have so miserably perished, and any one can see that the whole effect of light and

dark is given by indigo." "Well," he replied, "what else can I use?" I said, "I suppose there is nothing which would so exactly suit your purpose if it could stand, but you must make shift with cochal, which you use freely enough as colour, though not as shade." Then he reminded me that in the days of Girtin they had nothing they could use but indigo. "True," I replied, "and you show me a single framed and glazed Girtin drawing, or Turner drawing of the Girtin period, that has not become feeble in the grey, and foxy in the warm parts, because of the fugitiveness of the indigo, and the permanency of the iron pigments?" Those who knew me at the time when I made the discovery of the fading of the drawing in question, know that I made no secret of it, but, on the contrary, spoke out at once to my numerous Turner collecting friends; but neither that nor my letter to the *Builder* in years gone by seems to have damped the ardour of those by whom these over-rich picture-collecting people are led captive at their will.

J. H. M.

THE PROPOSED NEW BUILDINGS AT ST. LUKE'S WORKHOUSE.

The guardians of the Holborn Union have just placed themselves in a somewhat questionable position by rescinding the resolution passed on the 20th of March, adopting the recommendation of the building committee to proceed forthwith with the administrative block of new buildings at the City-road workhouse, at an expense of 7,500l. It was urged by those in favour of the resolution being rescinded, that they were not in a financial position to proceed with the buildings, nor were they required, as there was a great decrease of pauperism in the union; but it was contended, on the other hand, that the Farringdon-road workhouse was in a state of decay, and they did not know how soon it might be condemned; and it was further alleged that, by the workhouses being amalgamated, there would be a saving of 1,669l. a year, and matters would be better managed. It was also shown that, as they were allowed to dispose of the Bath-street property on the clear understanding that they were to erect a new block at St. Luke's Workhouse; and, as the plans had been approved by the local Government Board; a refusal to erect the building now would be a breach of faith, and that they would find themselves in an awkward position with the Local Government Board. The clerk informed the guardians that, if they failed to erect the new buildings, the Local Government had power to employ men to do it for themselves; but notwithstanding this advice, the resolution that the building be proceeded with was rescinded.

THE CONNEXION OF ART AND SCIENCE.

At the Academy dinner on Saturday last Professor Tyndall said, happily; there is no reason why art and science should not dwell together in amity; for, though they are both sutors of the same mistress, Nature, they are so in a sense and fashion which preclude the thought of jealousy on either side. You love her for her beauty, we for her order and her truth; but I trust that neither of us is so narrow-hearted as to entirely exclude from himself the feelings which belong to the other. Indeed, each is necessary to the completion of the other. The dry light of the intellect, the warm glow of the emotions, the refined exaltation of the æsthetic faculty, are all part and parcel of human nature; and to be complete we must be capable of enjoying them all. Trust me that we, whose light on earth is for the most part that dry light to which I have referred, often seek, and sometimes have, "glimpses that make us less forlorn" of those aspects of nature which reveal themselves in all their fulness to the eyes of art. We need such glimpses as a compensation for much that the times have taken away from us. There are some of us, workers in science, who largely share the poet's yearning to "hear old Triton blow his wreathed horn," and who, nevertheless, in opposition to natural bias, have been compelled to give up, not only Triton, but many later forms of the power which for a time assumed his shape. Emptied of the hopes and pleasures flowing from such conceptions, we stand in more special need of all that nature has to offer in the way of grandeur and beauty, of all that history has to offer in the way of strength and inspiration, and of such interpretations by men of genius of

nature, history, and contemporary life as at this moment adorn these walls. If I might employ, in a sense so qualified as to render me sincere in using it, a form of language familiar to you all, I would say that we interpret these works of genius, these achievements in which our best men embody their highest efforts, as the outcome of the cultivated, but at the same time inborn and unpurchaseable gift of God. For though the labourer be worthy of his hire, and though the leaders both in arts and science may now by good right make pleasant terms with the world, they reached the position which enables them to do this, through periods of labour and resolute self-denial, during which their arts and their science were to them all in all; and reward was the necessary incident and not the motive power of their lives.

SIR CHRISTOPHER WREN'S SISTER.

Has it ever been accounted for why there is no mention in "Parentalia" of Anne, one of the sisters of Sir Christopher Wren? From an inscription at Strocham Church, in the Isle of Ely, it would appear that she is buried there. It runs thus: "Anna filia Christophori Wren, dec. Windsor et Wolverhampton, uxor Henr. Brounsell, LL.D., et mater Henr. Christophori, qui hic sepultus; et Anna adhuc supersitit, exigne quidem molis; sed genuinum istis magis pretii est virtutis; vitam egit alius juvenissimum, sibi unquam acerbam propter varios corporis dolores, quos admirabili patientia et æquanimiter perpessa, animam placidissimè Dec reddidit 27 die Febr. A.D. 1667, æt. sue 33."

She was born, like her great brother, in Knoyle, in Wilts, of which place Sir Christopher's father was rector, and her name appears in the parish register (1634). She married a Dr. Henry Brounsell, Prebendary of Ely and Rector of Strocham, in the Isle of Ely, where he was buried in 1678. As may be seen from the inscription, she died in 1667.

Perhaps the reproduction of these simple facts of history at a time when the "completion" (?) of St. Paul's is attracting so much attention, may elicit some further notice concerning the family and the descendants of the great architect.

SVO MATTE.

THE HARMONY OF NATURAL LAWS.

It may be accepted as an axiom in art, with the few exceptions which substantiate the truth of natural laws, and the harmony and beauty of natural ornament, that what is beautiful in form is substantially correct in construction. A subtle sympathy seems to exist between the purpose for which a structure is designed and the materials of which it should be composed; at once the key-stone of its beauty and its strength. It is this which creates in the mind of a true artist a feeling of disgust for the stucco abominations of speculative builders, and causes, even to the uneducated eye, a disagreeable sensation of fear on looking at anything which is structurally incorrect, without, perhaps, being aware of the existence of the error. The form of the arch which gives to a building the appearance of grace and lightness possesses the greatest properties of strength; it is true that the latter qualification might be possessed by a horizontal beam of iron; but it would be at the sacrifice of truth and beauty unless it outwardly declared the truth of the material. The beauty of the character of Moresque architecture is destroyed by the apparent instability of the horseshoe arch, and it need scarcely be added that this principle of construction is incorrect.

The mathematical regularity of the parabolic curve is the basis upon which the strongest engineering works have been erected; and this curve, which is the beautiful outline of a conic section, is that which is traversed by the projectile, and followed with undeviating accuracy by the jet of water. In the modern use of iron it has enabled the engineer to calculate with the greatest precision, and without any waste of material or falsely-exerted power, the proportions of these gigantic structures which cross some of the widest rivers in the world; and it is, as it were, the natural rout by which the strain which is brought upon the structure is transmitted to its supports. Suspend a rope from any height and it falls into the beautiful and natural catenary curve upon which the principals of a suspension bridge are formed. There is no falsehood, no weakness, no deception in these laws. The weakness is always in the workmanship of man. It

cannot exist in the beauty and simplicity of their action, or in the unity and harmony of their power.

When several streams of water are collected and confined, it may be from many natural causes, the engineer knows that he is dealing with a power like that of Frankenstein: that having created it he must properly employ its proclivities or it will retaliate through its own *noted* laws upon its creator. "Natural processes come to us," says Professor Tyndall, "in a mixed manner, and to the un instructed mind are a mass of unintelligible confusion. Suppose half a dozen of the best musical performers to be placed in the same room, each playing his own instrument to perfection: though each individual instrument might be a well-spring of melody, still the mixture of all would produce a mere noise. Thus it is with the processes of nature. In nature, mechanical and molecular laws mingle and create apparent confusion. Their mixture constitutes what may be called the noise of natural laws, and it is the vocation of the man of science to resolve this noise into its components, and thus to detect the 'music' in which the foundations of nature have been laid."

We have only to refer to the study of astronomy to illustrate the harmony and regularity of nature's laws, the discoveries which rewarded the patient labours of Kopler and Tyco Brahe, and in later years, those of the two Herschels. We may see, in the most simple works of nature, in her diversity of form, in her combinations of curve and colour, the music in which, as Professor Tyndall says, the foundations of nature are laid. In the strange analogy now known to exist between the waves of sound and the waves of light calling colour into existence, so that we may actually detect the artistic merit of a picture by that which, long before this singular similarity of the noises of the chromatic and harmonic scales was detected, we know as the harmony of colour. In the proportions of a tree it will be found that the sectional area of the stem is equal to that of its limbs combined; and if the stem branches into three their total area is equal to that of the stem itself; and this extends to the smallest twig upon the topmost bough.

In the haste to become rich, in the consequent necessity of evading the labour and patience of research, these lessons are frequently forgotten, outcroppings of falsehood and error are accumulated, and the promise is never realised, "Ye shall know the truth, and the truth shall make you free."

In contradistinction to this, the man of science is reminded that he is not working for himself alone, and it may be, not exclusively for the age in which he lives, but that future generations may be saved the labour of a lifetime by his additions to science, and the health and moral advancement of a nation be increased; while the artist (and it is almost impossible, as it has been shown, to separate the man of science from the artist) will improve the surroundings of his fellows by his adaptation of Nature's works in forms of beauty, and, by the means of natural laws, increase the happiness and prosperity of man; for ugliness, it matters not in what it may exist, is not only unpleasant to behold, but it is morally depraving to the mind.

BING CHAUD.

TECHNICAL TERMS AND "STANDARD" DICTIONARIES.

WHENEVER the technical dictionary appears I think its compilers will not be a little indebted to the labours of the *Builder*, and I venture to say that they will commit no small oversight should they omit to consult its many volumes. I say this much because I feel my own indebtedness to its pages, extending over a number of years, represents a considerable amount of practical information obtained, and a cultivated love of study and research, which I would never have otherwise acquired.

This aside for the present. My object now is not to pour out a volume of unmitigated abuse on the heads of our technical teachers and dictionary emendators, but to try and lead to the correction of these correctors, some of whom much need to stand corrected.

Before me as I write lies a new edition of a work entitled "The Standard Pronouncing Dictionary of the English Language." The title-page announces that it is based on the labours of Worcester, Richardson, Webster, Goodrich, Johnson, Walker, Cunig, Ozilvie, French, and other

eminent lexicographers. Here is a goodly host of authorities as auxiliaries to the editor's labour. He tells us, moreover, that there are many thousand words which modern literature, science, art and fashion have called into existence, embraced in this new edition. Well, I will confine my remarks to one of those branches which may be included under the term of arts or handicrafts specially belonging to my province.

Now for a few technical specimens, which will call for further comment hereafter:—

"Plane, s.—In joinery, an instrument used in smoothing boards."—Wrong.

"Plank, s.—A broad piece of sawn timber." Not a correct definition.

"Balk, s.—A great beam or rafter." Wrong again.

"Lintel, s.—The head-piece of a door or window-frame, the part of the frame that lies on the side pieces."—Doubly wrong.

"Rabbet, s.—In carpentry a joint, a groove cut longitudinally in a piece of timber to receive the edge of a plank."—Wrong again, though in part right.

"Joiner, s.—A long plane used by joiners to smooth surfaces, the largest smoothing plane used by carpenters and joiners."—Wrong again.

"Batten, s.—A piece of board or scantling of a few inches in breadth."—Not a correct definition.

"Deal, s.—A pine board or plank." Not a clear or full meaning.

"Board, s.—A piece of timber sawed thin, of considerable length, and usually between 1 and 9 inches in breadth."—Not a clear explanation.

"Rib, s.—In ship-building a piece of timber for strengthening."—Incomplete and misleading. What about loose building.

"Riser, s.—Among joiners the upright board of a stair."—See "Step."

"Step, s.—A stair, the round of a ladder."—Incomplete and misleading.

"Pilaster, s.—A square column usually set within a wall."—Wrong again.

"Newel, s.—In architecture the upright post about which are formed winding stairs."—Clumsy definition; also, newels are used with stairs that do not wind.

"Traverse, s.—In architecture a gallery or loft of communication in any large building."—Means a great deal more both in architecture and joinery: and the above is not the usual meaning.

"Ladders, s.—In architecture pieces of timber used to support the platform of scaffolding."—What else in stonework?

"Strut, s.—In architecture a piece of timber obliquely placed to support a rafter."—What about partitions, floors, &c.; and are struts always placed obliquely?

"Standard, s.—In carpentry an upright support."—Short, clear, and sweet, is it not? What about its many meanings in ecclesiastical architecture, chests, staveions, the ends of oak benches and pews, massive candlesticks, &c.?

So much for the "Standard" dictionary. I might multiply instances to a very great number, but I have refrained on the present occasion from producing all the bad examples. In those words I have selected some are entirely wrong, some more passable though incomplete, and more in that confused or vexatious position that is sometimes not imaptly termed "neither right nor wrong." When so many examples can be selected belonging to the domain of the architectural and building professions it is only reasonable to infer that the practical and professional men belonging to various other professions would find no difficulty in gleanings a number of wrong terms bearing upon their branches.

A dictionary, like an art, is not the growth of a day; it must grow with the language of a people, and be ever ready to interpret their wants. Dictionaries are things that are never made, though always in process of manufacture, and lexicographers are but compilers, collectors, and collators. It would be well, therefore, when technical terms in general use are about to be included in a "Standard" work, that the compilers of these dictionaries, and their publishers too, should consult a council of living, practical men, instead of merely referring to a collection of, in many cases, doubtful authorities. Had one experienced architect and one intelligent and practical artisan in the building trade been consulted when this "Standard" dictionary was compiling, its editor would not have fallen into some scores of errors connected with architecture, and terms used in the routine of building and the workshop.

It was my intention when I began these remarks to supply proper definitions in place of those given, but on second thought I do not see that I am justified in occupying space in the *Builder* in doing work that some lexicographers have already been paid for (not) doing.

Every schoolmaster now-a-days thinks he can write manuals of *typillum* on the whole circle of the sciences. In architecture, engineering, and the cognate branches, I at least know what has been attempted and the result. How very few of these works which have lately flooded the country are really useful to architects, engineers, or mechanics. A technical dictionary is, therefore, one of the wants of our time.

A CRAFTSMAN.

A HINT TO THE CITY GUILDS.

RECENTLY, though not for the first time, we directed attention to the position of the City guilds or companies, pointed out some of their defects, and briefly mapped out a plan of action that the majority of them might pursue with credit to themselves in the cause of education and art. We have been glad to note that a few of them whose names are associated with the building profession, and one or two outside of it, have made a move. Since the appearance of our last notice, we have been at some trouble in investigating the administrative machinery of some of these City companies, originally formed for skilled trade purposes, and the result of our inquiries irresistibly leads to the conclusion that one and all of them must undergo a radical reform.

These guilds number very little short of a hundred, and their income and property otherwise represent some millions. Their courts are self-elected, and there is a family relationship among a great number of their members. The money which they hold and disburse has been left from age to age in their keeping, and was given originally for the purpose of charity, education, and apprenticeship, and it is only the simple truth to say that they are no more than trustees to these funds. A Parliamentary Commission seems indispensable, as well as unavoidable.

We find that some of these companies, which it is hardly necessary to name, are *de facto* trading companies, trading on the funds, and yet not amenable to the laws of trading companies; but there are other facts of a different complexion which will not bear the light or brunt of public criticism.

The companies are to a great extent "feeders" to the municipal council, and municipal councils, we know, are now required by law to permit a proper audit of their accounts. To what extent have these minor corporations complied with these requirements, which are an absolute necessity in these suspicious and searching days, or on what ground can they claim an immunity from this fair and open order? None that we know of. Large sums of money are voted away annually in these courts to fellow associates for merely taking a part in the honourable office of administering charity funds. Then we have expensive dinners to crown these labours, votes of thanks and addresses emblazoned in gold, and portraits taken of men who have done little more than make a speech and feed upon charitable trusts. This is surely not right. Occasional dinners or refreshments, within decent limits, are good; but there is no excuse at present for the lavish expenditure and the impractical action of some City Guilds.

In the internal clockwork and elective rule of these companies there are matters which form a grievance on the part of those lamely connected. Some of these companies compel men to be free, to take up their *livery*; and many of the poor freemen are complaining of being forced to pay what is known as *quittance*. Resistance to these exactions brings results down on the heads of the offenders, which are unpleasant for them to bear.

Outside of all this internal economy the broad question before the public is, how long are the ancient handicraft guilds of London to remain in their present anomalous position? Will they move, and more at once, of their own accord, while they can do so with credit and safety, or will they procrastinate until a Minute of Council wakes them up to a sense of their insincerity, and a thunder-bolt immediately follows, in the form of a Commission? How often do the guilds require to be warned, and warned, too, by their friends, and not their enemies? We can see at a glance what they might and could do

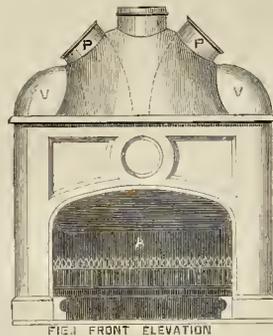


FIG. 1 FRONT ELEVATION

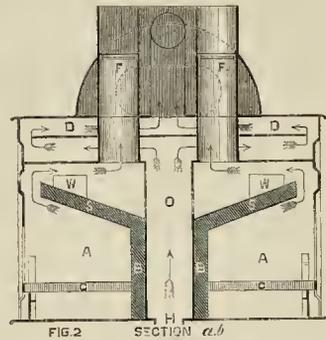


FIG. 2 SECTION a b

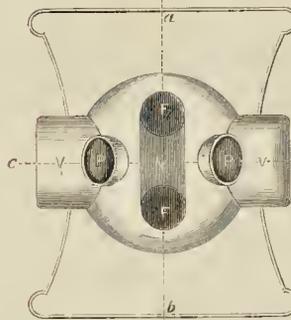


FIG. 3 TOP VIEW

SCALE OF

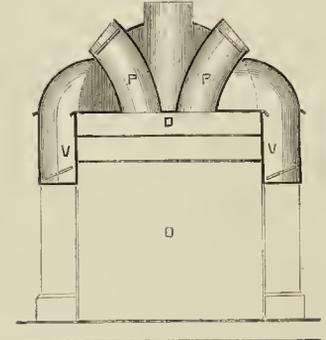


FIG. 4 SECTION c d

FEET

- A. Grate space.
- B. Fire-brick lining.
- C. Cast-iron base-plate.
- S. Soap-stone plate.

- O. Central air-chamber.
- H. Communication with fresh-air box.
- D. Detecting plate.
- F. Smoke flue.

- P. Pipes for warm fresh air.
- V. Pile-pipes for hot foul air.
- W. Water-pan.

VENTILATING DOUBLE FIREPLACE FOR HOSPITALS.

and, as a beginning has been made by some, why do not the others hasten and follow the good suit? The cause of technical education, art, and trade, and its direct encouragement, are within their province, and the labour is easy. There is a large amount of landed estate in this country and in the north of Ireland. In Londonderry, for instance, the Salters', and, we believe, other companies, hold estates which have formed more than once a subject of discussion as to their management.

We might point out what vast good these companies could effect for the agricultural interests, as well as the mechanical and manufacturing interests, of the British Empire, if an earnest resolve were made on their part. Changes must be made. Self-elected courts, composed of governing bodies numbering from ten to fifteen persons, and under, have often the entire control of immense sums, and are, from the nature of their composition, quite irresponsible. It is not to be expected that such a state of things can much longer last. Let the courts look to it themselves, and at once.

VENTILATING DOUBLE FIREPLACE FOR PROVISIONAL HOSPITALS.

We have received from the Surgeon General's Office of the American War Department a Report on Barracks and Hospitals, also a Circular giving plans and specifications for Post Hospitals. These include some valuable information, and we may find an opportunity to return to them. Our present purpose is to illustrate a cheap ventilating fireplace which is described in the Circular. The instructions are that at all posts where con-

tinuous artificial heat is required for three months in the year the wards will be ceiled and have boxed openings carried from the centre of the ceiling to the ridge for summer ventilation. There will be two of these openings, each 10 ft. long by 2½ ft. wide, and 10 ft. apart. In winter the heating will be effected by a ventilating double fireplace, the form of which is shown in our engraving.

It consists essentially of two open fireplaces, placed back to back in the centre of the ward, and enclosing an air-chamber between them. This air-chamber opens above into the ward by two pipes, controlled by registers, and communicates below with an air-box, 18 in. square, which passes underneath the floor of the ward from side to side, and the ends of which open to the external air.

The pipe from this ventilating fireplace, 8 in. in diameter, passes up through a close-fitting earthen tube or collar in the ceiling. One foot above the ceiling it enters a shaft or jacket about 21 in. in diameter, which pierces the roof, and, extending 4 ft. above it, is covered with a sheet-iron cap, which in its turn is pierced by the stove-pipe, which will be capped in like manner. This shaft through which the stove-pipe passes should be of clay or earthenware, but if a wooden shaft be used a sheet-iron tube 18 in. in diameter, should intervene between the stove-pipe and the wooden tube. At each end of the ward, and 2 ft. from the centre, will be an opening in the ceiling 1 ft. square, from which an air-box will pass to a box enclosing the lower mouth of the tube surrounding the stove-pipe. The heat of the pipe above the ceiling will thus create a continuous upward current in the surrounding tube, which will be supplied by the vitiated air from the ward through the air-boxes.

CONGREGATIONAL MEMORIAL HALL AND LIBRARY, FARRINGDON-STREET, LONDON.

The first stone of the Memorial Hall is to be laid this Friday, the 10th of May. The building will contain twenty-seven offices, including board-rooms and committee-rooms to be used by the various societies in connexion with the denomination; a library (58 ft. by 45 ft.); with gallery, and a hall for meetings, &c. (87 ft. by 45 ft.), which will also be used for public worship, and, with galleries, will accommodate about 1,500 persons; and a spacious hall and staircase, with entrance lobbies from Farringdon-street. There are also a commodious entrance and staircase at the back from Fleet-lane. Provision is made for lavatories and other conveniences. There are also apartments for hall-keeper. The library, hall, staircases, and passages will be constructed on fire-proof principles; and the whole of the basement will be vaulted with brick arches, forming extensive warerooms and cellars, with entrances entirely separate from the other entrances to the premises. The outside of the walls above the plinth will be built with Devonshire Limestone in drop courses; the plinth in Aberdeen grey granite surmounted by a bold moulding in red granite.

The jambs, mullions, and heads of the doors and windows will be executed in Portland stone, and the whole of the joiners' work in pitch pine.

The architects are Messrs. John Tarring & Son, of Basinghall-street, London.

The tender of Messrs. Jackson & Shaw, at something under 28,000*l.*, has been accepted.*

* A list of the tenders will be found on another page.



CONGREGATIONAL MEMORIAL HALL, FARRINGTON-STREET, LONDON.—MESSRS. JOHN TARRING & SON, ARCHITECTS.

ARCHEOLOGICAL SOCIETIES.

The Chester Archaeological Society.—A meeting of the members of the Chester Archaeological and Historic Society has been held in the old Bishop's Palace, to hear a paper read by Mr. C. W. Duncan, on "Ancient English Land Tenures, with illustrations from the history of the County Palatine of Chester." The chair was occupied by Mr. Sheriff Gerrard. A vote of thanks was passed to Mr. Duncan for his paper, and to the sheriff for presiding, and also for presenting the society with a medical MS.

Norfolk and Norwich Archaeological Society.—The annual meeting of the members of this society was held at the Guildhall. Sir F. G. M. Boileau, bart., occupied the chair. The secretary (the Rev. C. R. Manning) read the report. The treasurer (Mr. Fitch) read the cash account, from which it appeared that the year commenced with a balance in hand of 41l. 14s. 6d. Three coloured drawings of six of the figures upon the panels of a rood-screen at Fritton were exhibited by Mr. Fitch, who read a paper descriptive of them, written by the Rev. R. Hart. Another coloured drawing of two figures painted upon a panel of Barton Turf rood-screen was exhibited, and a paper by Mr. J. Gunn, describing one figure, that of St. Citha, was read by the Rev. C. R. Manning, in the absence of that gentleman. The Rev. A. G. Legge, vicar of North Elmham, exhibited a collection of pieces of pottery, stained glass, ornamental tiles, thimbles, a portion of a weapon, and other relics found upon the site of the old castle at North Elmham, hilted by Bishop Spencer, in the time of Richard II. Mr. T. G. Bayfield exhibited a portion of a rood-screen (which he had framed) and respecting which he read some remarks. Mr. Bayfield also showed other panels, which were also described. Mr. Fitch exhibited three original drawings, by Kirkpatrick, of brasses once in the Church of St. Clement, Norwich; some coloured drawings of figures on the rood-screen of the Church of St. John de Sepulchre; and the manuscript book of Mr. T. Tawell, founder of the Blind Hospital. Mr. Morant exhibited a tray of curious old keys, locks, a fibula, flint and bronze instruments, and other curiosities.

WORCESTER DIOCESAN ARCHITECTURAL SOCIETY.

The annual meeting of this society has been held in the Council-room of the Natural History Society. There were present—Mr. G. J. A. Walker, Vice-president (in the chair), the Revs. W. Thorn, T. G. Currier, C. Bontell, H. Kingsford, T. J. King, and H. G. Pepps; Messrs. Hyla Holden, E. Lees, H. J. Vernon; J. Severn Walker and G. S. Munn (hon. secs.). Mr. Severn Walker read the annual report, which says, in respect to the cathedral:—

"The most important work executed at the cathedral during the past year is the polychromatic decoration of the choir and sanctuary vaulting. On a buff or vellum ground extends scroll-work in more decided colours, interspersed with silver stars, medallions of angels and saints, on a blue ground, &c. Over the sanctuary our Lord is surrounded by rays of glory and groups of angels, SS. Peter, Paul, John, and James, being represented in the angles. The whole has a rich appearance, without being heavy enough to diminish the apparent height of the interior, which is often the effect of colour on ceilings when not judiciously applied. A satisfactory opinion of what will be the full effect of this decoration cannot, however, be formed so long as the choir remains in its present incomplete state, and the vaulting stands almost alone in being thus decorated. The stalls, with their interesting *miserere*s, have been admirably restored, re-fixed, and provided with new carved oak desks and subsella, of excellent workmanship. The throne and the side screens are nearly completed, a rich marble and the pavement is being prepared by Messrs. Poole, of London, and great progress has been made with the arrangements for lighting the cathedral with gas. The finials are now in perfect order, and the clock has been fixed and in admirable working condition some time. The great hour-kell, when struck, is heard at a considerable distance, and is universally acknowledged to be a most acceptable boon to the inhabitants of the city and surrounding neighbourhood. Mr. Aldis, of Worcester, has taken a series of brilliant photographs of the miserere carvings, with the remarkable stone sculptures in the wall arcades of the eastern transept and the Lady Chapel, and the eastern

panels and statues, from the Chantry Chapel of Prince Arthur, which he intends publishing by subscription in a 4to. volume, under the able editorship of the Rev. Charles Bontell, M.A."

The meeting unanimously adopted the report. The president, vice-president, auditor, secretaries, and other officers were re-elected.

The Rev. W. J. Blew, M.A., was elected an honorary member of the society.

It was decided that the next excursion should be to Wenlock and Buildwas.

On the motion of the Rev. W. Thorn, seconded by Mr. Lees, thanks were accorded to Mr. Severn Walker for services rendered to the society.

INFRINGEMENT OF A PATENT.

JUDGMENT has been delivered by the Lords Justices in the case of Murray v. Clayton, which came before their lordships by way of appeal from an order of Vice-Chancellor Bacon in Hilary Term. The bill prayed for an injunction to restrain the defendants from using or selling a brick-cutting machine which, the plaintiff contended, was substantially identical with a machine patented by himself. In the court below the bill was dismissed with costs, the Vice-Chancellor being of opinion that the plaintiff's claim to the novelty of his patent could not be sustained and that his specification was insufficient. His judgment was reversed by their lordships, who held that the plaintiff had established both the novelty and the utility of his patented invention, while the defendants had wholly failed to make out the case of alleged anticipation. The order of the Vice-Chancellor was discharged and replaced by an order granting the injunction as prayed for by the plaintiff.

INLAND SEA BATHING.

A BILL is now before the House of Commons for carrying out an idea suggested by me in the *Builder* for bringing water from Brighton by means of pipes. It will be as well to point out the necessity, in the case of such a lake being introduced as a feature in this scheme, that it will be necessary that a supply of fresh water be also supplied to the lake equal to the quantity of water lost by evaporation, as, otherwise, the water evaporating and the salt remaining, the latter element will accumulate till the water acquires the specific gravity almost of quiescent brine, rendering it anything but desirable or healthy for bathing.

W. SCARLETT.

WORKING MEN AT THE INTERNATIONAL EXHIBITION.

Sir,—Will the authorities of South Kensington allow the working classes facilities for seeing this year's exhibition? Will they understand that it is almost impossible for workmen to visit it as they would wish with the same regulations as last year? It seems to be assumed that we only regard a visit there as a holiday recreation. This is a great mistake. We wish to pay a number of visits. We would like to inspect it thoroughly, but by the six o'clock closing we cannot do so. No sooner are we fairly there than (owing to the distance most of us live from it), it is nearly time to close. I found this the universal complaint last year.

The refreshments, too, why should they be on a scale suited only to the pockets of the middle and upper classes? Is this fair? Are we not entitled to better treatment? Is this the matter very plain indeed, is it honest? Was not the surplus that originated these yearly Exhibitions contributed to by all, and should not all be considered in the arrangements? Are we told of our ignorance, too, and want of taste. Is this the way to cure us?

OMYX A TAILOR.

COMPETITIONS BEGINNING TO PAY AT LAST.

Sir,—If you have space in your columns, I think you really ought to notify to your readers the extremely liberal offer now open to them. Seeing the advertisement of the Scarborough School Board, who wish to obtain plans for their schools in the most approved manner, I wrote as requested for particulars, and was informed by letter from their clerk, that on *payment of 5s. in stamps*, they would forward a plan of the site. Since then they advise competitors not to proceed with the plans of one of the schools until the site is approved. Will the competitors be entitled to demand the return of the 5s? It would be proper treatment of them, at all events.

"OLD STAGES."

THE TURNERS' COMPETITION.

Sir,—In your impression of April 6th, there is a letter from Mr. Barber, upon "the prizes offered by the Turners' Company," and with your permission I desire to make a few remarks upon the subject.

Firstly, with respect to competitions of working men, I quite approve of them. If England intends to keep up her name for handicraft, she must do something of the sort, or in time we shall more or less fall into that carelessness which many mechanics know exists to a great extent in the manufacture of articles too numerous to mention. I coincide with Mr. Barber as regards the way in which the competition in turnery was carried out last year. Not knowing whether work was to be polished or not, I wrote to the secretary, and his answer was, "not polished," so the articles I sent were unpolished, and the work which gained the prizes turned out to be polished wood and ivory! Now, most people know that work looks better when polished. Further, if the judges had made mention of second and third prizes, it would have been some encouragement to defeated competitors, and no doubt help them in their work or business; for I can assure you, Mr. Editor, that it is a great pull on the bank of a turner in the country to lose time in taking and bringing back his goods from London, and such were the

conditions. Again, I took mine, and also the efforts of my son, and had I not done so, the articles might have been served as others were—never unpacked at all, which savours of injustice, I think. I respectfully observe, invite all the competitors of last year to send their work again polished, and when the judges are awarding the prizes for this year, let them say which is second and third, or award the tribute of honourable mention. There is another circumstance I would wish to mention—the labels of some of the competitors were changed. To say the least, that was a movement that must have led to confusion, if nothing else.

JAMES STARBUCK.

LINE OF FRONT AND THE METROPOLITAN BOARD.

The Queen v. Vallbany.—The questions for the opinion of the Court of Queen's Bench, May 7th, in this case were whether the Thames Embankment, designated at the opening "The Victoria Embankment," was or was not to be considered, within the meaning of the Act, a "street;" and whether the superintending architect of the Metropolitan Board of Works had power to lay down a line which would have the effect of materially diminishing the space upon which it was intended to build the club-house.

A rule had been obtained, calling upon the superintending architect of the Metropolitan Board of Works to show cause why an order made by him on the 18th of December last should not be brought up by certiorari, with a view to its being quashed. It appeared that the masters of St. Stephen's Club had purchased of the Metropolitan District Railway Company the waste spot of ground at the corner of Bridge-street Westminster, and the Thames Embankment, whereon they proposed to erect a building for the purposes of the club. The Metropolitan Board of Works had laid down a general line of building on the spot, extending to the end of Mr. Horsman's house, at the end of Richmond-terrace, which abutted on the Embankment. Between that and Bridge-street there was only one other building, that of the Board of Control, and the question for the consideration of the Court was whether this was such a street or continuous line of buildings as gives the Metropolitan Board of Works power to instruct their superintending architect to lay down a line of building so as to insure uniformity. The superintending architect had laid down a line.

After viewing the site,—

The Lord Chief Justice said that he and his learned brothers had visited the spot, and they were of opinion that there was no pretence for saying that the ground in question was a street or place within the meaning of the Act that gives the Metropolitan Board of Works power to interfere. It was not a continuous line of buildings. Mr. Horsman's house considerably projected beyond the houses below it on the Embankment, and the Board of Control projected much farther. It must be an actual, and not an imaginary, line of buildings to bring the matter within the meaning of the Act. The rule would be made absolute to quash the order.

Order of the Board quashed accordingly.

SOME RECENT EVIDENCE ON THE INFLUENCE OF SEWAGE FARMS ON PUBLIC HEALTH.

Sir,—The recent inquiry at Slough into the expediency of acquiring land for sewage irrigation purposes disclosed some extraordinary evidence as to the influence of sewage farms upon public health. It was then stated, that when sewage farms had been inspected at periods when no notice had been given of the intended visit, they had invariably "all been in an offensive condition, and at almost all of them the sewage was allowed to flow into the neighbouring water-courses." This assertion, with regard to Rugby, has already been contradicted in the columns of the *Times*; but, admit it to be true, it shows that sewage can be successfully purified after notice is given: therefore such evidence only tends to show that there may be periods of mismanagement on sewage farms, but that with proper management no such state of things, as before said, can occur. Fortunately, in the interests of the advancement of sanitary science and sanitary agriculture, we have the evidence of the Rivers Pollution Commissioners, who, for a considerable period, and at unknown times, took samples of the effluent water from the irrigation works of Croxson, situated at Beddington and Norwood. The analyses of these samples show incontrovertibly that even with a moderate degree of attention, such works are successful in purifying sewage, and using up, for beneficial purposes, those matters so detrimental to health. With regard to the influence of these farms upon public health, the more closely this question is investigated, the more completely will it be found that instead of such works having a detrimental influence upon public health, the evidence collected tends in quite another direction. For example, at Norwood, which has its irrigation area of sixty acres within seventy yards of the nearest houses, and within 400 yards of the densely populated district of South Norwood, the works came into operation in the year 1866. The rate of mortality of the district of Norwood

for the six years previously to the use of the sewage farm was 18.71 per thousand; and for the six years subsequently to the execution of these works, the mortality has only been 13.25 per thousand. The irrigation works of Croydon proper, containing an area of 500 acres, are situated in the parish of Beddington, and in the hamlet of Wallington: the combined population of Beddington and Wallington at the last census was 2,845. At least one-fifth of the whole of this population reside within a quarter of a mile of the irrigation farm. I find, on looking over the register of the deaths of those districts, that between March, 1871, and the 1st of April of the present year, there have been in the districts of Beddington and Wallington only 26 deaths and 101 births, or the death-rate has been at the rate of 9.13 per thousand, and the birth-rate upwards of 35 per thousand. Of the 26 deaths there were but five in the immediate vicinity of the irrigation works, arising from the following causes:—one, disease of the lungs; one, disease of the brain; one, diarrhoea (an infant); one, anasarca; one, natural death. In the whole year there has been no death from typhoid or typhus fever, and but two deaths from scarlet fever, and these occurred in a portion of the district lying a mile and a half to the south-west of the irrigation farm, and separated therefrom by the river. In the year 1870, after some extraordinary evidence given before Parliament, as to the noxious effects of the Beddington Sewage Farm on the health of the neighbourhood, I was called upon by the Croydon Local Board to inquire into the sanitary state of the inhabitants, and the sanitary condition of the district in the immediate neighbourhood of the irrigation works at Beddington. I then found there were no cases of illness that could be ascribed to the influence of sewage irrigation works upon the inhabitants residing in the immediate vicinity; on the contrary, it was shown that in many cases the inhabitants had, upon the advice of the medical practitioners, abandoned the wells in the immediate vicinity of their houses, on account of the pollution from the neighbouring cesspools, and had recourse for their water to the wells which lie in the natural drainage area between the irrigation works and the River Wandle, and that the use of this water had not been attended with any outbreak of disease; but, on the contrary, its substitution for water known to be polluted by cesspool matter in every case was followed by beneficial effects. At the time of making that inquiry I received considerable assistance from residents in the neighbourhood, who came forward to hear testimony to the innocuous character of the works upon public health. One gentleman wrote, "I have lived here ten years (living near the sewage grounds, with a large family), and have had no disease, neither has there been seated disease in the locality." Dr. Shorthouse wrote, upon the same occasion, "I have practised here for upwards of nineteen years, and I believe I have attended families in every one of the houses named in the schedule of your report. Upwards of two-thirds of the inhabitants of those houses are patients of mine now; that is, I attend when anything is the matter; and, with a solitary exception, in all my experience I have never seen a single case of disease which could have arisen from miasmata emitted by sewage. I have attended different members of the families inhabiting those houses for all sorts of diseases; but, with the exception to which I shall refer, I never saw a case which could be traced to malaria emitted from sewage. The exception occurred in a family named Hodges, who inhabited a house which I believe you have numbered 29 in your schedule (now occupied by Woodall), and the members of that family (both mother and children) several times suffered from remittent fever." An examination of that particular house in which they had remittent fever showed that they had two cesspools on the premises, one of which was within the dwelling-house. If further evidence were required as to the innocuous character of sewage-farms on health, it may be taken from the state of things in Croydon itself. The sewage-farm of Croydon is located to the west of the town, or in the locality in which the prevailing winds would carry any miasmata to the town, did they arise; yet Croydon, with its population of nearly 60,000 persons, has had a rate of mortality during the average of the past ten years of a little over 18 per 1,000, which is a low rate of mortality unapproachable in any other town of similar population. It may be

taken as an established physiological fact that, in the rapid utilisation of the waste products which are cast off by the human species, as practised in sewage utilisation properly carried out, such works, instead of having a detrimental influence on health, can be shown to have quite a contrary effect. Indeed, it is now well known that air, water, or food, that has subserved the use of animals, and has thus ceased to promote animal life (having certainly become converted into matter destructive to its existence), has by this very process been made fit for the support of vegetable life. The vegetable kingdom utilises those waste elements which have been cast off by the animal kingdom, and after utilising them retains only those substances which the air or water had originally taken up from the animal, and in its turn again gives up the air, water, and food in a fit and healthful state for the use of man.

BALDWIN LATHAM, M.L.C.E.

THE ALEXANDRA BREWERY, MANCHESTER.

AN addition to the Alexandra Brewery, in Erskine-street, Hulme, Manchester, belonging to Mr. James Cronshaw, has just been completed, and opportunity has been taken to add to the architectural appearance of the building, as well as to introduce many improved appliances. The brew-house is in the form of a huge tower without floors, 46 ft. 9 in. square, and rising 120 ft. above the street. It contains two sets of vessels supported on beams, and the utensils of each set are placed one above the other. The process of brewing is commenced at the top, and is continued on the various stages as the liquor gravitates; thus pumping, which is supposed to injure the wort, is dispensed with. In each of three walls of the brew-house are inserted two arched openings, filled in with windows and louvres. Each opening is 34 ft. high by 8 ft. 9 in. wide. The roof is surmounted by a louvre turret, which affords a ready exit for the steam arising from the liquor-pans, and has on each side a dormer containing a window or loading door. The chimney is built up from the south-west angle of the tower, and has an altitude of 126 ft. The cooler adjoins the tower, is 80 ft. by 40 ft., and has a gangway round. Two working-rooms will ultimately contain fourteen rounds of 120 barrels each; these vessels are considerably above the ordinary size. The floors are fireproof, and covered with the Val-de-Travers asphalt pavement. The whole of the basement story, 11 ft. high, under the working-rooms and yards, has a vaulted covering, and is occupied as a store. The boiler-house and stabling are detached, and built in the yard. The style adopted is of an early Lombardian Gothic type. Stock brick facing is used to two of the elevations, and common to the others, finished with hack jointing, and relieved with blue Staffordshire and moulded red bricks and Colne stone dressings. The tower has a bold cornice, with trusses and string-course, of stone, an arcade of ornamental brick-work, and vitrified glazed green and red brick panels in the frieze. The chimney on plan is square, with canted angles, and has a capping of stone, with ornamental brick blocks under. The woodwork throughout is of red deal. Special attention has been given to facilities for thoroughly cleansing all vessels. The building has been designed and supervised by Mr. James Redford, architect, of Princess-street, Manchester. Mr. John Tomlinson, of Lucy-street, City-road, was the contractor.

LETTING PROPERTY IN THE CITY.

A DISCUSSION of between two and three hours' duration took place in the City Council, the other day, respecting the letting of City property, in the course of which it was alleged by several members of the council that the City Lands Committee proposed to let certain property under its value. It appeared that the committee had recommended that a lease of No. 2, Falcon-square should be granted to Mr. Petrus Mondon for eighty years, from Christmas, 1873, at 110l. per annum, his present rent being 40l. per annum, and several members opposed the proposal, Mr. Deputy Fowler stating that the property ought to be 140l. a year, and that he knew of a responsible person who would take it at that price. It appeared that the property had not been advertised; but this was explained by a statement that the lease did not expire until

December, 1873, and the committee supported their recommendation by stating that, along with the architect, they had viewed the property, and had come to the conclusion that when a good offer was made, of something like 300 per cent. more than they had already received, they had no right to keep the property in the market, and wait for two years, in the chance of getting an additional sum. Several amendments were proposed, with the view of defeating the proposal of the committee, and the prolonged discussion was animated and warm; but the recommendation of the committee was ultimately carried.

MID-LONDON RAILWAY.

AFTER a contest not surpassed in costliness by one in a hundred of the private Bills that came before Parliament, the Mid-London Bills were settled in Mr. Hardcastle's committee on Group I. of Railway Bills on Thursday afternoon. The committee declared the preamble of the main or eastern portion of the scheme not proved, but passed the western section, from Willesden to the Marble Arch. This is practically a rejection of the whole scheme, which has been presented to the committee with great power, care, and ability.

BIRMINGHAM SEWERAGE SCHEME.

THIS important scheme, which has been under consideration by a committee of the House of Commons for nearly three weeks, has been passed by the committee, but with very important modifications of the scheme as presented in the Bill.

FAIL OF A BUILDING IN PRESTON.

ON Saturday morning last, the large malt-kilns and storehouse belonging to Mr. Brown, situate in Canal-street, Preston, fell with a heavy crash, without previous warning. Fifteen men were in the place at the time, but all except two, named Crook and Hunt, escaped, the latter being buried in the ruins. The body of Crook, who leaves a wife and six children, was recovered, but Hunt's was not found till afterwards. Three adjoining cottages were destroyed. The loss is estimated at from 10,000l. to 12,000l. At the inquest, held on the 6th instant, Mr. James Tallis, contractor, said his men erected a great portion of the building, which he considered had been well erected. It was 50 ft. high, and was in two divisions. The rods were extended across the rooms. He attributed the cause of the building falling to the giving way of two relieving arches, which were put in the foundations before the building was erected. The abutment of the arches, he thought, had gone down, and the pressure of the walls had been on the centre of the arches, and so caused the wall to bulge out. The foundations of the tower were entirely on brickwork. The ground itself was of a soft, marshy description. He did not attribute the giving way of the building to the quantity of malt in it. If the cause of the building falling had been ascertained an hour before the accident, the walls could have been relieved of over a hundred tons pressure. There were from three to four hundred tons of malt in the building. The ages of the deceased having been proved, the coroner summed up, and the jury returned a verdict of "Accidental death."

ARCHITECTURAL ASSOCIATION.

THE general business meeting for the current session was held on Friday evening, the 3rd instant. It was decided to form classes at once for the study of geology, chemistry (experimental), and surveying and levelling with field work, if a sufficient number of members give their names before the 16th of May. The delegates to the Architectural Alliance for the past year attended, and reported that, in their opinion, it was advisable to maintain the Alliance, in any case, for the present, till it is seen how the Conference under the leading of the Royal Institute of British Architects succeeds in dealing with the questions to be brought before it. The Alliance, which first connected in some sort of bond the previously isolated provincial societies, and the Architectural Association, having rendered the Conference of last year feasible, had the delegates considered, and done real service, though no one felt any wish needlessly to call much attention to it now or for the future. After some discussion, a vote of thanks was passed to

them for their services; and Messrs. J. D. Mathews, T. M. Rickman, T. R. Smith, and R. P. Spiers were re-elected for the ensuing year.

Mr. T. R. Smith, representative of the Association on the Committee of Selection at the International Exhibition, 1872, reported to the meeting; and complained of the few suitable drawings submitted. Out of twelve screens allotted only five had been used. He hoped that the exhibition of drawings, which is, in practice, more thoroughly under the control of the architectural profession than any other in London, and is held in well-appointed buildings, visited by large numbers of people, would be more enthusiastically supported in future years.

Other business, of no general interest, was transacted. The paper by Mr. G. Aitchison, on "Coloured Decoration," was postponed, at his request.

ROMAN STATION, UTTOXETER.

SIR,—Will you allow me to add a few lines to the notice you have done me the honour of making in the *Builder* (see p. 334, ante) of the interesting discoveries I have made in this neighbourhood of Roman stations? The remarkable terraces mentioned are associated with the Roman occupation of Stramshall, and not the station at Madeley Holme. "Romano-British mazes" should have been "Romano-British ways," connecting the station with other parts; a matter which I have yet to make out.

FRANCIS REDFERN.

P.S.—Working as I have to do at the trade of a dairy cooper, now much deteriorated, I have to follow up my researches under many disadvantages; but I hope they are not on that account any less valuable.

CHURCH-BUILDING NEWS.

Lanncoston.—The quaint little church of St. Thomas has just been restored at a cost of £1,000, and will shortly be re-opened. The works have been carried out under the direction of Mr. J. Piers St. Aubyn.

Debenham.—An instalment of the work of restoring the parish church has just been completed, and the building re-opened for divine worship; but it is to be hoped that before long it will be found possible to complete the restoration. The whole cost of finishing, both internal and external, the restoration of the nave and aisles has been estimated at 600l. The present restoration has been confined to the interior of the nave and aisles, where the need for some step to be taken was most pressing, and the exterior of the church presents the same dilapidated and dilapidated appearance it has had for years. In place of the high pews, however, open oak benches now cover the area of the nave and aisles, the bench-ends being ornamented with carved poppy-heads and the panels with tracery, and by the alteration additional accommodation is afforded for 70 persons, notwithstanding the removal of the west gallery. This latter, too, has disclosed the semicircular-headed west arch. Most of the stones used in this arch are of a reddish tint, and others of the same kind are to be noticed in the piers of the nave. In the passages the pavement of irregularly worn pavements has been taken up and another substituted, which consists of red and yellow bricks laid on their edges in such a manner as to form squares, with small encaustic tiles at their corners. The church is now lighted with gas from jets arranged round the capitals of the piers of the nave. The re-flooring and re-seating have been carried out by Mr. R. Coley, of Bury St. Edmund's, from plans by Messrs. Cory & Fergusson, of Carlisle; and the work was laid on by Mr. A. Pank, of Norwich; the cost of the improvements being 750l.

Saltash (Cornwall).—The old church of St. Stephens-by-Saltash, built in the early part of the fourteenth century, has, after undergoing a rough restoration, been re-opened for divine service. The work of restoration commenced in August last, and has been finished at a cost of 3,000l. for the body of the church, and 300l. for the chancel. The restoration, however, may be said to have commenced long before, the north roof having been taken down in 1863, and replaced by a new roof, built by Mr. John Sager, Barraton, and the late Mr. John King, of Trehan, at a cost of 100l. The chancel has been attended to by the Ecclesiastical Commissioners. In the chancel there are new

screens of oak, and tiles are laid down. The ceiling here is of oak. In the body of the church red and black tiles, from the Architectural Pottery Company, Poole, Dorset, are laid down. All the old high seats have been removed, and open pine benches, stained and varnished, are put in their stead. Many of the windows have been re-glazed, and a new one has been put in the eastern end of the south chancel aisle, this window having been specially subscribed for. The western gallery has been removed, and the main entrance has been made at the western door, which had been closed for a number of years. The font has been taken from the south aisle and placed in the tower, and a number of monumental slabs have been re-laid in the east end of the north chancel aisle, and around the font underneath the tower. The belfry floor has been done away with and taken into the church, and another floor higher up has been erected for the ringers. The ceilings have been cleaned and whitened, and the bosses and woodwork painted. The granite pillars of the church have been re-dressed, as will as the granite work of the windows. The granite work has been obtained from the Choesewing quarries. The church has been entirely re-floored. The tower requires re-dressing. The architect was Mr. Ewan Christian, and the builder Mr. Shaddock, of Saltash.

King's Pyon.—The little church at King's Pyon has been re-opened. The changes have materially altered the appearance of the interior. The leading feature in the alterations is the restoration of the north transept, in memory of the late vicar, the Rev. J. B. Peplow. A memorial window has been placed in the transept by Mrs. Peplow, in memory of her husband. It is a three-light window, and, in addition to tracery, with which the stained glass is enriched, armorial bearings occupy the centre pane. The old east window has been reset. The building has been reset with open pitch-pine free sittings, and the floor is paved with encaustic tiles, supplied by Mr. Godwin, of Lugwardine. The old roof has been opened up, and the oak beams varnished. A warming apparatus has been provided. The pulpit, reading-desk, and altar-rails are all now, being formed of oak taken from Wells Cathedral when it was restored. They are covered with floral carving, executed by Mr. Halliday. The eastern memorial window at the end of the chancel, over the altar, represents the Nativity of Christ, the Crucifixion, and the Ascension. This, together with the window in the north transept, is from the establishment of Mr. Evans (late Chance, Bros.), Smethwick. The cost of the restoration is calculated at about 1,200l. The architect who has professionally superintended the restoration gratuitously, is Mr. Ward, of Stafford.

Earl's Court, Kensington.—The new nave and aisles of St. Matthias Church (the ground of which had been consecrated on the completion of the chancel) were opened for divine worship on the 11th of April. The nave has an open-timbered roof, of large span, being 40 ft. 3 in. from centre to centre, of clearstory walls. The building has been erected over a temporary iron church: the services were carried on as usual, the iron church not being interfered with till the permanent building was completed. The vicar is the Rev. S. C. Haines. The stained-glass window at the west end was presented by Mr. C. F. Trollope. The bells were given by Mr. F. F. Rose. Mr. J. H. Hakewill was the architect; and Messrs. Robt. Avis & Co., of Baltic Wharf, Putney, were the builders.

Botus Fleming, Cornwall.—The restoration of the parish church (now in a very dilapidated and dangerous state) is about to be commenced at once, from plans supplied by Mr. H. Elliott, of Plymouth. Mr. P. Blowey, of Buckland Monachorum, has been engaged to carry out the work. The tenders will be found in another page.

DISSENTING CHURCH-BUILDING NEWS.

Middleton-in-Teesdale.—The foundation-stone of a new Primitive Methodist chapel has been laid at Middleton-in-Teesdale. Its style will be Italian, and the dimensions 56 ft. by 44 ft. The greater part of the building will be of rubble stone, faced with smoothed freestone. At the front there will be three entrances. After passing through the porch on the ground floor will be found two aisles, and a gallery round the whole of the building, supported on metal pillars with ornamental capitals, and faced with castings of an ancient shield pattern. The whole of the woodwork, including the rostrum,

will be of the best pitch pine. The roof will be high-pitched, and the ceiling will consist of sixteen panels with corner pieces, the four ventilators also being ornamented. A recess will also be provided for an organ. The total estimated cost is 1,450l., and accommodation will be provided for 600 persons. The architect is Mr. Race, Westgate. Contractors:—Masons' work, Mr. R. Walton, Middleton-in-Teesdale; joiners' work, Mr. G. Race, Westgate; plumbers' work, Mr. Bell, Middleton-in-Teesdale; slaters' work, Mr. Wanless, Darlington; plastering, Mr. Ormerod, Darlington.

Back-of-the-Bank, near Bolton.—The memorial stone of a new Wesleyan Methodist school-chapel has been laid. The buildings, which will be one story high, comprise a schoolroom, 40 ft. by 30 ft.; a large class-room, 20 ft. by 13 ft. 6 in.; and two other small class-rooms, each 12 ft. by 9 ft. Under one of the small class-rooms a cellar will be formed, accessible from the back-yard, and fitted up eventually with apparatus for heating the large room and infants' class-room, and also with hot-water boiler for cleaning purposes, tea-meetings, &c. According to the ground plan, the rooms are arranged so that each will be accessible without necessarily opening or lighting the others. The schoolroom, which will also be used as a preaching-room, is placed parallel with Latham-street, occupying the entire length of the plot available, and is lighted by four windows in the gable end, fronting Draycott-street, and three small clearstory lights to the side wall above the roof of the class-rooms adjoining. This room will be 14 ft. high to the square, and 16 ft. high to the ceiling. Behind the schoolroom and adjoining Draycott-street is placed the large class-room for infants (also suitable for teachers' meetings, &c.), 12 ft. high, lighted by four windows, and separated from the schoolroom by a passage, 6 ft. wide, forming the principal entrance, with vestibule having folding-doors. Beyond this are placed the other two small class-rooms, 10 ft. high, and each lighted by two sash windows. The remaining space between the class-rooms and Back-street and adjoining houses, is devoted to boys' and girls' yards and conveniences, each yard being accessible by a separate passage from the schoolroom, 3 ft. wide. Externally, the general design of the buildings is an adaptation of the Italian and Gothic styles of architecture, but of a plain and unpretending character, being necessarily devoid of much ornament. The estimated cost of the works already contracted for is about 560l., exclusive of lighting and heating, and other matters left in abeyance, which it is estimated will increase the cost to 650l., towards which 570l. are promised or subscribed. The architect is Mr. Thomas Ormerod, of Bolton, and the contractor for all the works, Mr. William Townson, of Bolton.

Melbourne.—The new Congregational Church here has been opened for divine worship. The new building was designed by Mr. G. H. Sheffield, of Derby, architect. It is in the Early English style, approaching to the Transition. It has a tower and spire 55 ft. high. The body of the church is 58 ft. in length, and 34 ft. in width, with transepts and apsidal chancel. The accommodation is for about 300 sittings. In the front gable is a large rose window, 8 ft. diameter. The whole of the external walls are of stone, and the interior plastered, with strings of mosaic tiles. The roof and interior woodwork are of pitch pine, varnished. Messrs. Bullock & Barton, of Melbourne, were the contractors. The whole cost will be about 1,200l.

Grimby.—The Wesleyan Methodists of Grimby have determined to erect a new chapel adjoining their present school in Duncombe-street to seat 1,000 persons. The entire proposed cost of the new erection is to be 2,000l., three-fourths of which are to be raised by the time the building is complete. Several subscriptions have been already promised, and there is every probability that the money will be raised.

Westminster Abbey.—We learn that in the excavations consequent upon the rebuilding of the Receiver's house at Westminster, the bases of the pillars and a part of the encaustic tile floor, as well as some other remains, of the ancient chapel of St. Catherine have been brought to light. Previously a large number of the capitals of the pillars of the ancient Norman cloisters, some of them covered with figure subjects, were turned up.

VARIORUM.

The current number of the *Art Journal*, speaking of Art Teaching in Rome, says,—“The Eternal City has always been a passive rather than an active inspirator and teacher of the fine arts. It is the stately ruins, the art-treasures, the beauty of position and climate, rather than its elementary schools or professors, which make it of inestimable value to the artist. Let a young man come here, well trained in England or elsewhere, and then make use of his own eyes rather than of oral instruction, and he will never regret the labour nor the expense; otherwise, unless he possess rare ability, the direct loss will be great. It might be different were there at this time any prominent painter or sculptor to give a decided tone to art; but since the death of Canova, Thorwaldsen, and Gibson, there has been no one of sufficient merit to act as a leader, though we have had, and still have, many artists of great merit. Each coterie has its favourite sculptor or painter, around whom it considers that the art life of Rome will centre, but these do not affect the world at large. Again, the standard of art is much higher in England than here. We may cite the case of a youth who was sent at great outlay by his friends to be educated as an artist in Rome. He received three medals and considerable credit at the Academy of St. Luke, but on returning to London proved incompetent for the primary class of the Royal Academy. The French, nevertheless, show their wisdom and generosity in the important school which they established many years since for their countrymen in the spacious and stately Villa Medici, and which they still maintain, in spite of rumours as to its being converted into the French Embassy, and of the fact of the Italian Government having offered to purchase it for ministerial purposes.”

“Hammond’s Wages Calculator for Nine Hours per Day,” is neatly printed on stout card, and varnished to hang up in warehouse or counting-house. It will be found useful in large factories.—“The Twelfth Annual Report of the Amalgamated Society of Carpenters and Joiners, from December, 1870, to December, 1871. John D. Prior, General Secretary. Manchester: North of England Co-operative Printing Society. 1872.” In speaking of the results of recent misunderstandings, this report says:—

“The newly-elected Executive Council felt it to be their first and most important duty to give practical effect to the clearly expressed will of the members, and although they have been reluctantly compelled to expel several refractory branches, yet confidence and harmony have been restored throughout the Society. Our provincial branches, with but trifling exceptions, remain loyal; our Irish, Scotch, and American branches have all proved true to the Society; and at the end of the year we have in London 43 branches, and 1,832 members. At the end of 1871 we have 414 less members than we had at the end of 1870, and the decrease in our funds during the year amounts to 739*l.* 1*s.* 3*d.* We have paid during the past year to our unemployed members the sum of 5,396*l.* in replacing stolen and burnt tools, 360*l.* to our sick members, 5,595*l.*; four of our members who have become permanently disabled from following their employment as carpenters and joiners have each received the sum of 100*l.* for the funeral of deceased members and their wives we have paid 1,105*l.*; to our aged and infirm members, 134*l.*; in maintaining the privileges of the trade, 1,120*l.*; and in benevolent grants to distressed members, 42*l.*”

Our receipts during the year have amounted to 21,916*l.* 1*s.* 7*d.*; and at its close we held a balance in hand of 16,529*l.* 1*s.* 11*d.* or 1*s.* 11*d.* 6*d.* per member. This is highly satisfactory, when we consider the very unfavourable circumstances under which we commenced the year, and leads us to anticipate a speedy and large increase in our accumulated capital, should the short time agitation become satisfactorily settled.”

—“How to make Money by Patents. By C. Barlow. London: published by Barlow & Co. Patent-office.” This pamphlet, although somewhat in the nature of a trade circular, gives useful hints and suggestions to inventors and patentees. This second edition has been enlarged and mostly re-written.—“The Journal of the Historical and Archaeological Association of Ireland (late Kilkenny Archaeological Society). Twenty-fourth session, 1872. Vol. II. Part I, fourth series. Dublin: printed at the University Press for the Association, 1872.” The contents of this number (9 of fourth series) includes, besides an account of proceedings, an interesting paper “On Ancient Lake Legends of Ireland.” It relates to the vision of “Cathair’s druid, Bri Mac Bairbreach,”—a poem foretelling the origin of Wexfordshire; translated and edited by J. O’Beirne Crowe, A.B.; another paper is titled “The Approaches to Kilkenny in Olden Times,” and another, with an illustration, is on “The Whitty Monument in the ruined Church of Kilmore, County Wexford,” by M. J. Whitty.—In the current number of the *Leisure Hour*, Mrs. Henry Mackintosh commences, under the title of “The Children of Olden Time,” to develop, “chiefly

for young readers,” a very capital idea. The portion already published says something about Saxon and Norman children, their dress, habits, toys, and so on, and is pleasantly illustrated from Strutt and other authorities.

Miscellaneous.

The Building Societies Bill.—On the 2nd inst. Mr. Bruce received a deputation of representatives of building societies and members of Parliament in the Lohly-room of the House of Commons on the Building Societies Bill. Mr. Higham, the representative of the London building societies, said there had recently been a conference of representatives of seventy-five building societies from all parts of the kingdom, the amount of whose investments exceeded 5,000,000*l.*, and they unanimously approved of the Building Societies Bill. There were probably 20,000,000*l.* invested by 50,000 persons; and what the deputation desired was that the Bill should be passed without any unnecessary delay, and thus settle the uneasiness now widespread throughout the country. Mr. Bruce said the best solution of the question would be this,—the Bill to be re-committed and their proposed amendments inserted, and then they might re-consider points as to which some difference of opinion existed. The opinion of the Government would have to be taken on the question of registration, whether it should be undertaken by the Government and connected with friendly societies. They would have the new Bill printed, and if they could dispense with a Select Committee they would do so.

Artists’ General Benevolent Institution. The anniversary dinner in aid of this important charity will be held on Saturday, the 18th inst. Notwithstanding the prosperity of our popular artists, there are others out of sight, and almost out of mind, whose prosperity has been clouded by accident or disease, their efforts not attended with success, some of whom have died, leaving widows and orphans unprovided for. It is for the purpose of mitigating these sufferings, and so mitigating them that delicacy of feeling shall not be wounded, that this Institution was established. Relief is extended to distressed meritorious artists, whether subscribers to its funds or not, as well as to their widows and orphans, merit and distress alone constituting a claim; the names of persons thus relieved are not promulgated. We invite for the assistance of our readers.

They Will and they Won’t.—Large numbers of artisans have made a general strike against working overtime. Some workmen in Birmingham think differently. The labourers engaged in the construction of the postal telegraphs received, a short time ago, an order forbidding them to make overtime. In consequence of this privilege, as they considered it, being withdrawn, they asked that their wages should be raised from 2*s.* to 2*s.* 6*d.* per week, urging the fact that they had to go away from home to work. This request was not complied with, and on Monday they went to the head office in Birmingham and demanded the day’s wages which was always kept in hand. The money was paid them and they left, and are now on strike.

The New Record Room at Lewes.—The foundation-stone will be laid this month. The contract has been taken by Mr. Berry, and the building, which will be from designs furnished by Mr. Carl, architect, of this town, will cost about 430*l.* On the ground-floor space will still be reserved for a provision market, and the New Record Room will occupy the first floor. It is approached by an easy curved staircase, 11 ft. wide, and its dimensions are 30 ft. by 20 ft. and 16 ft. high. The ceiling to the collar beam is to be covered with match-boarding, laid diagonally on moulded timbers.

The Holborn Statue of the Prince Consort.—The design for a pedestal for this statue being considered unsatisfactory, Mr. Edmondston, in the Court of Common Council, proposed that it be referred back to the committee to obtain a more suitable design, to be considered with especial reference to the proportions of the statue, at a cost not exceeding 2,000*l.* This was carried; and it was further resolved, on the motion of Mr. Hammack, that the committee should forthwith advertise for designs, and that a premium of fifty guineas be given to the author of the selected design.

Excursions round Oxford.—The committee of the Oxford Architectural and Historical Society have arranged a fresh series of Saturday walks and excursions in the Oxford and the neighbourhood, which promise to be interesting. On Saturday, May 4th, they went to the Roman villa at Northleigh, and the Churches of Northleigh and Handborough, also at Northleigh. They saw the interesting Roman remains, consisting of the foundation-walls of the buildings surrounding the large central court, the chambers for the hot and cold baths, and the beautiful tessellated pavement over the hypocaust. The Church of Northleigh is interesting as having one of the so-called Saxon towers. For May 18th, All Souls Chapel is selected, the restoration of which is in progress. The original carved stone ceredos has lately been discovered here behind the wall-painting at the east end of the chapel. On May 25th, Wantage, the Icknield Way, and Letcombe Castle will be visited. Letcombe Castle is a remarkably fine British earthwork, the most extensive of any along the whole line of the Icknield Way. It comprises some twenty-six acres, and has its trench and vallum complete. Uffington Church, the White Horse hill, Uffington Castle, Hardwell Camp, and Wayland Smith’s Cave are the objects named.

New Bridge at Great Waltham.—This new bridge, which has been long in course of construction, at Howe-street, Waltham, is now open for public traffic. It is built to replace an old wooden structure, the property of Trinity College. It is built with brick abutments and iron girders, and is 16 ft. wide and 35 ft. clear span. The roadway is formed with four cambered cast-iron girders, each about 40 ft. long, and filled in with brick arches turned in concrete. Over all there is a covering of 6 in. of concrete and 4 in. of gravel. The fencing on each side is formed with moulded iron standards, having square wrought-iron bars fixed diagonally, running through them. The approaches on each side have been heightened, and it is hoped that even in the highest floods, the public will be able to pass over, not only dry-footed, but in safety. The work has been carried out by the Chelmsford Highway Board, from the designs and under the superintendence of Mr. Frank Whitmore, architect, Chelmsford; Messrs. Coleman & Morton being the contractors for ironwork, and Mr. George Last for builder’s work.

Gas v. Horses.—“R. T.” writes,—“There are various reasons against steam-engines being used on public roads, yet there is a desire to overcome these objections. Let us see what can be done with the gas engines. Two and three horse power engines are now common for manufacturing purposes. To start and stop, the gas has to be lighted and extinguished: a hand tube, such as lamp-lighters use, would serve. Some of the advantages to be gained thereby would be,—no coal, fire, gushing steam, boiler water, cinder dust, noise, nuisance, danger, weight, nor delay; and cleaner roads. Take a tramway-car: a gasholder underneath would afford supply all day; the piston-rod could be fixed to the present iron wheels; the cost about a pair of horses, the keep less. So let us go ahead, and send horses to the dogs.”

The Carlisle Infirmary Extensions.—Tenders have been sent in to Messrs. Cory & Ferguson, architects, for the new wards, and for the whole of the contemplated new buildings to be added to the west end of the Cumberland Infirmary. No contract has yet been entered into; but one or more of the tenders for the whole work is under 5,100*l.* The estimated cost of this portion was 5,200*l.* The *Carlisle Journal* states that it is contemplated to enter into a contract for this portion first, and to decide on a provisional contract for the dispensary block and buildings on the east side, to be carried out as the funds accrue.

Theatre for Aberdeen.—Steps are being taken to erect a new theatre and opera-house here, the want of which has been much felt. A company has been formed, and most of the shares have been taken up. Building operations are to commence at once, and it is to be ready by December 1st. It is expected to cost about 7,000*l.*, and the architect is Mr. Phipps, of London.

A New Asylum.—The Metropolitan Asylum Board have purchased nine acres of land in the Old Kent-road, as a site for an additional asylum, which is shortly to be erected, and the local Government Board have confirmed the purchase.

The Wellington Monument for St. Paul's.—Some discussion has taken place on this subject in the House of Commons, in course of which the Chancellor of the Exchequer explained that the supplementary contract with Mr. Collmann on behalf of Mr. Stevens, the sculptor, was that the work should be finished in two years and a half, and it was undertaken on the part of the Government to authorise the payment of 250*l.* a month on the certificate of Mr. Fergusson and Captain Galton that the work was satisfactorily done. Ten of those payments had already been made. During the winter Mr. Stevens had been so ill as to be unable to do actual manual work, and consequently one portion of the work had been delayed, but he was informed that it was nevertheless in a satisfactory state of forwardness, and that it would be completed within the two years and a half. A third of the time had expired, and more than a third of the work to be done in that time was already done. He was informed that the work was most excellent and admirable, and a beautiful specimen of art, and it was because it was so beautiful and good a work that the Government did not wish to take it out of Mr. Stevens's hands. Whether the site was the best that could be found for the purpose or not, it was not for him to say; he thought the Government had done right in the steps they had taken to have the work completed.

The Proposed Enlargement of Lincolnshire Lunatic Asylum.—At a quarterly meeting of the visitors of the asylum, the report of the visitors was read, which stated that the Commissioners in Lunacy required a workshop to be built, and a hospital for the accommodation of sick lunatics during epidemics. The visitors had referred these requirements to a sub-committee, who found that the cost of adopting them would be 9,000*l.* The suggestions with regard to the enlargement of the building and the expenditure of another heavy sum of money, however, met with no encouragement. Sir M. Lopes therefore moved that no further steps be at present taken for the enlargement of the building. The chairman, who said he believed that neither of the Quarter Sessions benches would sanction the cost of an enlargement, took the sense of the meeting, and every hand was held up for the motion, which he declared carried, adding that something must be done to isolate patients suffering from epidemics.

Progress of the Chelsea Embankment.—The contractors for the Chelsea Embankment have already made considerable progress with the works. Several thousands of cubic feet of earthwork excavated to make way for the foundations of the Holborn Viaduct railway station, have already been made use of for the embankment, having been conveyed from the intended railway station site to Blackfriars, where it is emptied into barges and thence taken to Chelsea, where it serves to form the embankment now in course of construction. Next week an important sale of property required for the new embankment will take place. The property comprises the building materials of three houses, wharfs, stabling, and buildings in Duke-street and Lombard-street, Chelsea, at the corner of Paradise-street.

Cost of Road-scraping.—At Paddington Vestry, on Tuesday, Mr. Stephens, the surveyor, presented a report upon the different methods of road-scraping now in use in the parish. He states that the ordinary road-scraper costs 3*s.* 7*d.*; the hand-machine, 4*s.* 10*s.*; and the horse-machine, 15*s.*; while the expense of working is respectively 2*s.* 4*d.*, 3*s.* 2*d.*, and 8*s.* 6*d.* a day. The horse-machine will do an amount of work equal to that of sixteen men with the hand-scrapers, and eight men with the hand-machine. In the winter months, after a fall of snow, or during a rapid thaw, the horse-machine will perform the work more speedily than by manual labour, and with greater success, provided it be used before the surface of the road become soft. No report was adopted.

Gift to Openshaw of a Mechanics' Institute Building.—Mrs. Mary Brundret, *née* Miss Vhyatt, of Openshaw, has laid the foundation-stone of a Mechanics' Institute in the township, which she has generously consented to build and furnish at her sole expense. The building will have two stock-brick fronts, relieved by stone dressings. The internal arrangements will be a complete description, and in the plan provision is made for reading, billiard, and class rooms, and library, with house for the persons in charge. The cost will be about 3,000*l.*

The Scandinavian Sailors' Church, Rotherhithe.—The inauguration of this building for worship (the foundation-stone of which was laid by Prince Oscar, last July) has taken place, in the presence of Baron Hoebischild, Envoy of Sweden and Norway, the Dean to the Royal Danish Navy, the incumbent of the church, and several other gentlemen connected with Scandinavia and its interests. A novelty in connexion with the church (which will hold 350 persons) is a building of club-rooms for officers and men. The total cost, apart from the site (which was given by the directors of the Surrey Commercial Docks, who have in various other ways assisted the undertaking) amounts to about 2,500*l.* Mr. Biven is the architect. The design for this church is illustrated by a view in the *Builder* for 1870, p. 207.

The "A B C" Sewage Process.—A number of gentlemen, consisting of directors and shareholders of the Native Guano Company (A B C Process), and a few invited visitors, have visited Crossness, to inspect the works now going on there at the reservoir for the southern sewage of the metropolis, whence it is discharged into the river at a proper period of the tide. There were about 150 visitors altogether, and they were conducted over the works by Mr. Rawson, the general manager, who claims for the process a decided commercial success, and states that each ton of native guano leaves a clear profit of 2*l.*, at which rate the sewage of the metropolis alone would produce an annual income of 1,282,500*l.*! The chemist and engineer were present during the inspection, and readily gave information to the visitors on all points of interest.

The Maypole at Otley.—A new maypole has been erected at Otley at a cost of 34*l.* It is 71 ft. long, and 8 in. in diameter at the top, by 15 in. at the bottom. It is surmounted by a weathercock. The cost of its erection and of other proposed improvements around it, will be defrayed by public subscription. The last maypole at Otley was struck by lightning in June last, after standing more than thirty years, and the new one is provided with a lightning-conductor. A procession took place on the occasion, headed by the May Queen (a Miss Crofts), crowned and decked with flowers, and dressed in white; and the ancient circling dance round the maypole took place to a band of music in attendance. The dancers had a "scene morning" for their outing and their innocent "orgies."

Engraving by Sand-Blast.—The use of the sand-blast for engraving and ornamenting stone and glass is now fully recognised in the United States. The Franklin Institute have conferred a medal on the inventor; and they say of the process that glass ornamented thereby can only be compared with that etched by powerful acids, yet the entire absence of all undercutting renders it superior; and that some of the effects produced would be hard to imitate by any other known mechanical process, and yet the sand-blast produces them with an ease and precision truly remarkable, and worthy of the special attention of natural philosophers.

Grimsby Bells.—The bell for St. Andrew's Church, presented by the Bishop of the diocese, has arrived, and will shortly be placed in the tower of the church. Its weight is 4½ cwt.; its diameter, 26 in.; and it is from the foundry of Messrs. J. Warner & Sons, of Cripplegate. His Lordship has placed a prayer in Latin as an inscription,—thus translated:—

"I praise the Lord for sickness chased away:
Here to sick souls, O Christ, give health, I pray."

An effort might, without difficulty, be made to complete the peal of eight. The estimated cost is 600*l.*

Cost of Repairing Victoria Embankment of Thames.—The Select Committee of the House of Commons have passed the Thames Embankment Bill, which proposes to throw the cost of repairing and lighting the Victoria Embankment on the whole of the metropolis. One of the witnesses examined by the committee was Colonel Hogg, M.P., chairman of the Metropolitan Board of Works, who stated that the cost would be covered by a rate of one-tenth of a penny in the pound.

Kent House Estate, Rutland-gate.—Louisa, Lady Ashburton, and Colonel Spencer Clifford, have purchased the greater part of the Kent House Estate freehold, at Rutland-gate, for the erection of family mansions.

Improvements at Blackfriars.—An enterprising Belgian, Mr. Polydore de Keyser, of the Royal Hotel at Blackfriars, now a citizen of London, has, it is said, matured a vast plan by which a hostelry, such as can only be paralleled by that called "grand" at Paris, will be shortly added to the few handsome buildings to be seen along the river front. This hotel, when completed, will extend from the corner of William-street, along a curved frontage of 380 ft., on to the entrance of the ground at the back of the embankment, sweeping away the gasholders at Blackfriars Bridge. The hotel, the design for which is in the Modern French style, will have an entrance from the embankment into a spacious courtyard, into which carriages can drive, whilst the ground floor and basement will contain a series of elegant shops. The hotel is to be fitted up on the Continental system. Mr. Gruning is the architect, and Messrs. Trollope & Sons are the builders. The foundation stones is laid.

Metropolitan Water Supply.—In answer to Sir J. Kay-Shuttleworth, in the Commons, Mr. C. Fortescue said that the water companies of the metropolis had complied with the requirements of the Metropolitan Water Act of last session by submitting regulations on which they were agreed to the Board of Trade and the Metropolitan authorities, but which were of no authority till confirmed after an inquiry by the Board of Trade, at which the water and Metropolitan authorities would have the right of being heard. A circular had been sent by the Board of Trade to the authorities whose interests were affected to state their objections to the regulations, and the time of the inquiry, at the request of the Metropolitan Board of Works and the Corporation of London, had been extended to the 28th inst., but he could not say how long it would last.

The Brenchley Garden and Chillington House.—The extensive improvements at Chillington House, and the work of laying out the public garden to be presented to the town of Maidstone by Mr. Julius Brenchley, approach completion. Mr. Mackenzie, the landscape gardener, under whose supervision Battersea Park, Finsbury Park, and other public pleasure-grounds were laid out, has made the most of the land at the rear of Chillington House. About five acres of the old apple-orchard adjoining the private garden have been converted into a picturesque spot, and when the garden has been finished in all its details, it will form, it is said, quite a little Paradise in the centre of the town, from all parts of which it will be easily accessible. The restoration of the west wing of the house is the other chief work that is being done.

Opening of a New Cattle Market at Leicester.—A new cattle-market has been laid out on nearly 20 acres of land, and opened, in the south-western suburbs of Leicester, at a cost to the corporation of something like 30,000*l.* It is laid out in an improved manner, and comprises not only an area of several acres for horse fairs, but also ten slaughter-houses, in two blocks, for cattle, two for pigs, and one for condemned animals; besides offices and houses for the clerk and other officers, connected with the main line of the Midland Railway by a short branch line, while close to the market the Midland Company have, at a cost of about 10,000*l.*, constructed cattle docks, from which cattle have easy access to the market, and *vice versa*.

Wood v. Asphalt.—While the municipal authorities in London are replacing the last relic of the old wooden pavement with asphalt, experiments with wood pavements are being made in Paris, whence we derive the asphalt system. The trials are made with rectangular blocks about 7 in. in depth by 8 in. long, and 3½ in. wide, set on a 4-in. bed of cement. The wood is specially prepared, and rendered damp-proof beforehand, and the ends of the blocks are cut at an angle of 45 deg. The surfaces of the street are level in one case, and on a slope in another. The cost is about 10*s.* per square yard.—*Mechanics' Magazine.*

New Theatre for Sheffield.—It is proposed to build a new theatre in Sheffield. A company, we understand, is now in process of formation, and nearly half the required capital has been subscribed or promised.

Destruction of Niblo's Theatre, New York.—A telegram from New York states that Niblo's Theatre has been totally destroyed by fire.

The Newcastle Antiquarian Society.—At the monthly meeting of the Newcastle Society of Antiquaries, held on Wednesday night, in the Old Castle, the Rev. J. C. Bruce, LL.D., read a most interesting paper on his recent researches in connexion with the old bridges that crossed the Tyne at Newcastle, and the remains of them found while the excavations for the new bridge have been carried on. At its close, the learned doctor said:—"In concluding, I may say a word in reference to the bridge of the future. In order to admit of the passage of large ships to the quays above Newcastle, the roadway on each side of the central pier must be capable of speedy removal and replacement. This is to be done, as is well known, by making it swing upon a pivot. This roadway must have a stone pavement, and it must have strength enough to admit of the passage over it of a four-wheeled wagon, loaded to the extent of fifty tons. When it is borne in mind that each arm of the roadway, as it swings upon its pivot, will be 140 ft. long, the difficulties to be overcome in its construction and working will at once be seen to be very great. When it is constructed, the inhabitants of Tyneside will have to boast of the greatest work of its kind in the world."

The German Houses of Parliament Designs.—Ten English architects have sent in plans for the new German Houses of Parliament. The *Cologne Gazette* says they have set much value on appearance. Gigantic water-colour paintings, richly framed, represent, in the most interesting manner, the masses of buildings, with many towers, or richly crowned with mighty cupolas, with the effect of sun glances breaking through a grey, clouded sky. The German architects, whose works are modest and kept within narrower limits, will have their difficulties in presence of these fairy works as they come forth from the English fog.

A New Labour Bill.—A Bill, says the London correspondent of the *Leeds Mercury*, will shortly be introduced by Mr. Morrison, which will, I am told, cause somewhat of a flutter among employers. Its object is to alter the existing law with respect to compensation granted to workmen in case of accident, and to make it more favourable to the latter. Mr. Hinde Palmer and Mr. Melly have agreed to place their names on the back of the measure, which has received the sanction and approval of the Parliamentary Committee of Trade Unions.

The Royal Polytechnic.—The Directors state that they have elected Professor E. V. Gardner, F.R.S., a gentleman well known for many years past as an experienced chemist, to be the Professor of Chemistry to the Institution; and under his direction the laboratory is being re-fitted and re-stocked, and will shortly be opened for the reception of pupils, and for conducting analyses, assays, and scientific investigations of every description.

The Institution of Civil Engineers.—Mr. Hawksley, as president of this Institution, has issued invitations for a *conversations* in the western galleries of the International Exhibition at South Kensington, on Tuesday, the 28th of May. The portion of the buildings to be opened to guests will comprise the Machinery Court, the machinery being shown in motion, and the British Picture-gallery, immediately over that court.

Busts of the late Earl of Derby and Sir E. Murchison.—Mr. H. P. M'Carthy, of Osna-burgh-street, has just completed a bust in marble of the late Earl of Derby for the Merchant Taylors' Company. The likeness is said to be a striking one. The same sculptor has just received an order to execute a bust of another of the deceased honorary members of the company, viz., Sir Roderick Impey Murchison.

Drainage of Weymouth.—The Town Council of Weymouth have adopted Sir John Cooke's plans for the drainage of Weymouth, instructing the Town Clerk to apply to the Local Government Board for authority to borrow 25,000*l.* on mortgage of the general district rates. The work, if carried out, will, it is said, put the town in a thoroughly sanitary condition.

The Aquarium Clock Tower, Brighton.—A model of a clock tower has been erected at the aquarium for the town authorities to form a judgment upon the proposed erection. The local *Herald* states that opinions differ, and thinks the design "might safely be 'referred back' to Mr. Birch for improvement."

TENDERS

For the Congregational Memorial Hall, library, and offices, Farringdon-street. Messrs. John Tarring and Son, architects:—

	General Estimate.	Additional cost if Johnson's work is executed in pitch pine.	If Kemball's is used instead of Barry's—based on 1000 masonry, deducting—
Higgs.....	£32,287	£250	4100
Hill & Sons.....	30,200	810	350
Peto, Brothers.....	29,832	1,000	470
Patrick & Sons.....	29,630	420	272
Henshaw & Co.....	29,570	250	350
Ashby & Sons.....	29,269	420	350
Dove, Brothers.....	28,978	235	175
Myers & Sons.....	28,885	415	250
Perry & Co.....	28,750	400	140
Browne & Robinson..	28,455	403	420
Kilby.....	28,271	300	—
Brass.....	28,263	520	200
Jackson & Shaw (accepted).....	27,370	258	95

For wholesale market and toy arcade, for the borough of Southport, exclusive of earthwork, drains, and paving. Messrs. Maxwell & Tuke, architects:—

Sothern.....	£2,350	0	0
Dawson.....	2,345	0	0
Wilkinson.....	2,274	0	0
Wade, Brothers.....	2,204	0	0
Dunfield.....	2,181	0	0
Penn & Russell.....	2,154	0	0
Roberts.....	2,063	0	0
Wishett & Irving.....	1,969	0	0
Heywood, Brothers (accepted).....	1,890	0	0

For rebuilding premises, Playhouse-yard, Whitecross-street. Mr. Henry J. Gordon, architect:—

Emor.....	£1,905	0	0
Pritchard.....	1,854	13	0
Baughman.....	1,647	0	0
Chessum.....	1,640	0	0
Thomas.....	1,638	0	0
Little.....	1,619	0	0
Meritt & Ashby.....	1,795	0	0
Brown & Robinson.....	1,754	0	0
L. & W.....	1,631	0	0
Blackmore & Morley.....	1,495	0	0

For rebuilding No. 2, High-street, Bow, for Mr. J. W. Robey. Messrs. Hills & Fletcher, architects. Quantities supplied:—

Coleman.....	£877	0	0
Wicks & Bangs.....	674	0	0
Grover.....	647	0	0
Alexander.....	639	0	0
Sheffield.....	633	0	0
Aldons.....	604	0	0
Gregar.....	588	0	0

For sundry alterations and repairs at the "Crown and Cooper" wine-vaults, Golden-lane, City, for Mr. Richards. Messrs. Bird & Walters, architects:—

Perry.....	£420	0	0
Williams & Son.....	348	0	0
Newman & Mann.....	339	0	0
Goodwin.....	320	0	0
Boatell.....	286	10	0

For restoring the chancel and rebuilding the remainder of the parish church at Uzmanston. Mr. E. H. Lingey Barker, architect:—

James (accepted).....	£842	0	0
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For the erection of a new wing to the Alexandra mills, Derby. Messrs. Giles & Brookhouse, architects:—

J. & E. Wood.....	£2,820	0	0
Thompson.....	2,800	0	0
Brigard.....	2,320	0	0
Dusantoy (accepted).....	2,239	0	0

For the erection of a new church, at Quarndon. Messrs. Giles & Brookhouse, architects:—

Walker & Cash.....	£3,698	0	0
W. H. & J. Slater.....	3,400	0	0
Thompson (accepted).....	3,240	0	0

For the first block of almshouses for the Derby Licensed Victuallers' Association. Messrs. Giles & Brookhouse, architects:—

Dusantoy (accepted).....	£987	0	0
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For dwelling-house and stabling, Sudbury, Suffolk, for Mr. T. H. Higgs. Messrs. Spalding & Knight, architects:—

Aldons.....	£2,623	7	2
Garwood.....	2,608	0	0
Nightingale.....	2,459	0	0
Luff.....	2,390	0	0
Andrews.....	2,388	0	0
Grimswood & Sons.....	2,383	0	0
Gibbons.....	2,368	5	3
Hall.....	2,319	0	0
Stephenson (accepted).....	2,103	0	0

For alterations to Nos. 61 and 62, Paternoster-row. Messrs. Newman & Mann, architects:—

Newman & Mann.....	£776	0	0
Patman & Fotheringham.....	525	0	0
Pritchard.....	505	0	0
Pitcher.....	469	10	0
Scrivenner & White (accepted).....	478	0	0

For Congregational Chapel, at Sutton Valence, Kent. Messrs. Sulman & Rhodes, architects. Quantities supplied:—

Martin.....	£1,753	0	0
Small.....	1,725	0	0
Cook.....	1,680	0	0
Waterston.....	1,670	0	0
Tunbridge & Denne.....	1,615	0	0
Richardson.....	1,530	0	0
Clements.....	1,430	0	0
Dover & Co.....	1,515	0	0
Cornelius.....	1,457	0	0
Avard.....	1,450	0	0
Cox, Brothers.....	1,348	0	0
Bridge.....	1,343	0	0
Godden.....	1,300	0	0
Wright, Brothers, & Goodchild.....	1,275	0	0

For erection of vicarage-house, Holy Trinity, Gravesend, for Rev. J. Searth. Mr. E. H. Martineau, architect:—

Harley.....	£3,247	19	0
Scrivenner & White.....	2,910	0	0
Newman & Mann.....	2,888	0	0
Manley & Rogers.....	2,808	0	0
Longmire & Barge.....	2,710	0	0
Gould.....	2,639	0	0
Blake (accepted).....	2,567	0	0

For the completion of two pairs of villa residences, Nos. 1, 2, 3, and 4, Glebe Villas, Mitcham, Surrey. For Mr. C. W. Drury:—

Johnson.....	£1,947	0	0
Catull & Co.....	1,955	0	0
Collins.....	1,612	0	0
Dover, Wells, & Co.....	1,349	0	0
Slatford.....	1,250	0	0
Loud.....	1,200	0	0
Beard (accepted).....	1,160	0	0
Kelham, Brothers, & Co.....	1,145	0	0

For the restoration of Botus Fleming Church, Cornwall. Mr. H. Elliott, architect:—

Sanders.....	£899	0	0
Call & Pethick.....	872	0	0
Stevenson & Son.....	853	8	0
Shaddock.....	834	0	0
Bishop & Son.....	815	0	0
Scrivenner & White.....	810	0	0
Bone & Son.....	764	0	0
Clarke.....	710	9	0
Crocker & Bramblecombe.....	696	7	0
Dingle & Co.....	664	0	0
Blowey.....	650	0	0

For alterations and additions to house, at Fairmile, Esher, Surrey. Mr. Herbert Winstanley, architect:—

Asford.....	£1,253	0	0
Wood.....	1,194	0	0
Mason.....	1,018	0	0

For alterations and additions to 185, High-street, Camden-town. Messrs. Newman & Hewett, architects:—

Newman & Mann.....	£610	0	0
Scrivenner & White.....	585	0	0
Foxley.....	564	0	0
Fairchild & Co.....	549	0	0

For alterations to house on the Ridgeway, Enfield, for Mr. T. G. Hill, architect:—

Bares & Rammage.....	£496	0	0
Rist & Brown.....	379	0	0
L. & W. D. Patman.....	308	0	0

For drainage to Belsize House, Hampstead, for Mr. W. H. Stallard. Mr. C. H. Lowe, architect:—

Hart.....	£292	0	0
Mansbridge.....	259	0	0
Watts.....	237	0	0
Crockett.....	225	0	0
Thurst.....	213	0	0

For Primitive Methodist chapel and schools, Williamson-street, Holderness-road, Hull. Mr. Frank N. Pettin-gell, architect:—

W. & J. Hall (accepted).....	£5,950	0	0
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For alterations, &c. at No. 7 Ward, Peckham House Lunatic Asylum. Messrs. Tolley & Dale, architects:—

Wicks, Bangs, & Co. (accepted).....	£2615	0	0
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For pulling down and rebuilding 76, Oxford-street, for Mr. Ince. Messrs. Tolley & Dale, architects:—

	Party-wall
Macey.....	£3,396
Coffey.....	3,050
Pritchard.....	3,034
Wicks, Bangs, & Co.....	2,830
Scrivenner & White (accepted).....	2,814
Tomlinson.....	2,790
Fox.....	2,685
Meyfield.....	2,513
Flude.....	2,508
Stanyan.....	2,503
Mistock.....	2,497
Mason & Sons (accepted).....	2,490
Loveday.....	2,359

For extension of shops and repairs to two houses, 444 and 446, Edgware-road, for Mr. J. Windle. Messrs. New & Cummings, architects. Quantities supplied:—

Green.....	£2,605	0	0
Mark.....	692	0	0
Thompson & Smith.....	683	0	0
Edis & Son.....	683	0	0
Harris & Sons.....	648	0	0

The Builder.

VOL. XXX.—No. 1528.

Royal Academy
Pictures:
Reflected Lights.

ITH due regard to the specialities of this journal, our first duty in reference to the Royal Academy Exhibition is to indicate the nature and value of the architectural contributions. Having discharged our conscience of that office, and quitted that comparatively deserted chamber where no admiring crowds block the way, we are at liberty to take a glance at the more numerous and brilliant productions of the painter's art which constitute the main part of the show, and to form conclusions upon the merits and demerits

of certain examples, or philosophise generally upon the whole gathering (spectators included). Indeed, by the time these remarks will be printed, special description will have become almost superfluous: the public will already have been instructed in the columns of we know not how many literary journals and newspapers, what to admire and what to pass over; and various critics will have written up or written down their particular friends (as considerations of business or pleasure may have predominated), in that peculiar style of "art-critic" phraseology, which forms one of the chief blessings of life. Perhaps, however, we may not quite uselessly return to the charge from another quarter, and look at some of the characteristics of this year's exhibition, not so much with the view of criticising technicalities, as of considering the matter in regard to the ultimate ends of painting, as a means of expressing emotion, or of ministering to intellectual enjoyment.

In the first place we must record our conviction that the present exhibition is not equal to its two predecessors in general interest. There may be about the same proportion as usual of good painting, but there is a larger amount of uninteresting pictures than we have seen for two or three years past; pictures with which no special fault can be found, but which are simply like any others, and affect us in no possible way that is worth speaking of. We take it also that the constitution of the hanging committee has been peculiar this year, and that somewhat old-fashioned tastes and principles have been in the ascendant. Only thus can we account for the presence on the line of so much respectable mediocrity of the dullest kind, viz., that which belongs rather to the conception than the execution. In this way we must also account for the absence of that special school which for the last two or three years gave so distinctive a character to Room VII., where its productions were usually placed in juxtaposition; the school whereof Mr. A.

Moore is the most typical representative, and which, whatever its mistakes may be, includes among its members talent which may justly claim representation.

Taking the art of painting on what (*pace* M. Taine) we still think its highest ground, the utterance of feeling and sentiment through the medium of representation, we can have little hesitation in pronouncing Mr. F. Walker's contribution to be the picture of the year, and congratulate the artist on his entire success in his own peculiar walk of art, which he had abandoned last year with somewhat less happy result. "The Harbour of Refuge" (227) is one of that class of paintings in which the scene represented is subservient to the deep human interest embodied in the figures, and is chiefly valuable as accessory to their sentiment. We are in the central court of an old almshouse; the old-fashioned red-tiled buildings cover the picture as a background, with a quiet evening sky above them; in the centre of the court, around the statue of the "founder," sit a group of old men half conversing, half dozing; along the path on the left (in the foreground) comes an old woman, bowed down with weight of years, leaning on the arm of a young robust girl, who, with the selfishness of a commonplace nature, contents herself with mechanically supporting her companion, and turns her looks and her interest in another direction. These alone would form the elements of a pathetic picture, but the real force of the whole thing is dependent on the figure of the man mowing the grass in the foreground: as a mere piece of drawing we have seen few more successful things than the sway and action of this figure, with the scythe thrown back for the sweep which we expect to hear next moment in the grass; but as a matter of feeling, the introduction of this image of eager, earnest labour, as a contrast to the ebbing life of the aged inmates of the place, is a perfect masterstroke, the eloquence of which will be felt, we think, the more it is studied. Viewing the picture as a mere scene, exception might be taken to the want of decision and knowledge in the details of the building, and to a certain want of atmospheric softness in the sky (though the painter has got rid to a great extent of the disagreeable mannerism of colour which characterised many of his previous landscapes); viewed as a whole, it is a work of which not only the artist, but the English school, may be proud.

Heartily do we welcome back Mr. Mason, another painter who puts mind on his canvas, and whom illness, we believe, has deprived us of for the last two years at the Academy. Some of his mannerism of execution, too, is worn off; but it was a mannerism so pleasant and so suited to the peculiar feeling of his pictures, that we half regret its abatement. In other respects, "The Harvest Moon" (125) bears its authorship on its face completely, and exhibits in its train of figures (particularly in the young man and girl who come last) that peculiar feeling for the sentiment of rustic life with which the painter has been identified. We are not quite satisfied with the attitude or gait of the figure with the scythe and pitcher, who looks a little unsteady on his feet; and the attempt to indicate the sunset sky (behind the spectator) by the red light on the distant cottage-window is not successful, and is not borne out sufficiently by the light in the foreground figures. From this point to Mr. Leighton is a long step indeed, reminding us forcibly of the almost boundless scope of painting in the expression of various phases of feeling. The best and most individual work Mr. Leighton exhibits this year, "Summer Moon" (202), is one of those subjects which might be termed "classical," but is so, in fact, only in its being so far idealised, in circumstance and costume, as to remove it completely from associations of every-day life, and leave the

spectator free to conjure up his own fancies and associations in connexion with it. Two female figures, heavily draped, are half-reclined on a stone seat in a warm and deep slumber, the summer sky, with a few faint stars, seen behind them. The red and purple draperies, with their tone tempered by the moonlight, form a beautiful study of colour. Deep shadows are thrown from them on the side of the stone seat. Simple as its motive is, this is a picture which will well repay study, and is a very fine type of a class of subject demanding not only high executive power, but genuine poetic feeling on the part of the artist. "A Condottiere" (518), a three-quarter length of a dirty-looking ruffian, in a breastplate, painted with much power and realism, is a good illustration of Mr. Leighton's versatility; but in genuine intellectual interest, how far below the work previously mentioned. Of the works of Sir E. Landseer, "Lady Emily Peel and her favourite Dogs" (25) is the favourite with the public. Like the larger painting of "The Lion and the Lamb" (409), it is very slightly finished, but showing, in the treatment of the animals, that facility in giving expression, and defining muscle, almost by a single touch, which only a life's study could give. "The Baptismal Font" (190) is an unhappy mingling of realism with a rather unnecessary and out-of-place symbolism. Mr. Frith, we are glad to say, does not exhibit this year any of the rather sensational pictures of modern life which have made him popular with the less thoughtful portion of the picture-viewing public. His scene from "The Relapse" is as well painted as usual, but not particularly interesting. The two life-size female figures, "The Miniature" and "The Love-letter" (157 and 460) are more to the purpose, in an art point of view.

Mr. Frost's only work of importance is his diploma picture, a "Nymph and Cupid" (126). This is a classical subject, in the usual acceptation of the term,—a beautifully-finished and bright-looking thing, with high colour in the drapery, though somewhat hard. The real defect, however, lies deeper than this, and consists in the work being purely a painting, and nothing more. It is instructive to contrast this with Mr. Leighton's painting, just now mentioned, and note the distinction between this prosaic use of the classical type of figure and drapery, as an end in itself, and its employment merely as a means for the embodiment of a poetic thought. A superficial critic might class the two works together; but there is a wide chasm between them. We notice, *en passant*, Mr. Hennessy's "Summer Eve, Long Island Sound" (179), with the figures reclining in two boats, on a calm reach of water, as suggestive of a comparatively new local interest and colouring, and note "The Return from Flight" of Louis XVI. and family, by Mr. E. M. Ward (182), as an interesting specimen of the work of an artist who has done more to set forth and illustrate modern history than any other of our living painters. The next picture, "An Elopement, A.D. 1790" (183), is one with a marked individuality, in which Mr. Leslie, while charming us with a beautiful representation of early morning light, broken by trees, and reflected in the quiet stream, has given to his scene a further interest by reviving a bit of English life of eighty years ago. The pretty girl who, in a riding-dress of the period, waits on the bank while her lover is ferried across, is a capital figure in pose and expression, and looks very much alarmed at the bold step she is about to take. The number of horizontal lines in the composition is remarkable, and gives a distinctive character to a painting which is both pleasing and original in a high degree; the more so as being a change from the painter's frequent repetition of "the woman in white," who, however, appears in No. 416, this time with the name of "Lucy." Some of Mr. Le Jeune's charming children (195) have "great expecta-



the profession are shouldered and elbowed on all sides, and confounded with a cloud of persons of very inferior status and calibre. Thus the largeness of the charges made has brought a punishment. The proper consideration, however, of this part of the subject would lead us too far away just now. The whole army of distributors, intermediaries, agents, and middle-men generally will have a rude shake one of these days.

SOCIETY OF PAINTERS IN WATER COLOURS.

THE sixty-eighth exhibition of this society is fairly up to the usual mark. There are, in fact, few drawings on the walls that are not worth study; and a large number that are worth looking at; the only drawback being, with some of the older members, a degree of sameness of style which renders one year's works scarcely distinguishable in character from those of two or three previous exhibitions. This applies, for instance, to the drawings of Mr. Richardson and Mr. Duncan, who cannot certainly in any bad sense be called mannerists, but whose excellencies are so uniform in character that we might be excused for wishing a little variety, even if it were gained at the expense of a deficiency in that finished and rounded execution which marks their works. The above-named veteran artists, together with others who work in a uniform manner, Messrs. Callow, Birket Foster, Collingwood Smith, and others, maintain their position; Mr. Cox, jun., makes a good show, and Sir John Gilbert is as recognisable as usual; even, we are sorry to say, in his singularly unfortunate attempt to portray *Malvolio* (237), where he has turned the pompous steward into the likeness of a sneaking dependant. Among artists who have their speciality in looking at and transcribing nature, Mr. A. Goodwin demands attention, especially for his "Abingdon Churchyard—Old Man going to Prayers" (15), a quiet scene, clothed in a peculiar mist of sunlight, and with a distinctive feeling of no common order; "Weed Burning" (50) is another original little drawing, the subject consisting merely of a barren field with the smoke from the burning heaps drifting across the picture, and a very faint indication of distance; yet this is a most suggestive drawing; one or two others by the same artist will equally repay attention. Mr. A. W. Hunt shows his usual ability and individuality, though we are inclined to question the tone of the water in "Streatley on the Thames" (31), a somewhat unhealthy-looking blue. The brothers G. A. and A. D. Frigg contribute exceedingly well this year; the former showing in "Corri Etichan" (18) and "The Thames at Hardwicke" (48), complete success in two very different classes of subject; the latter also giving evidence of versatility in a charming figure-subject in his well-known style, "The coming Storm" (220), and in a landscape, the first drawing of the kind, we believe, that he has exhibited, "Corrie Castle, from Poole Harbour," a beautiful bit of calm water, and distant landscape. Mr. Bramwhite's "Post Haste," looks like a man galloping after a rainbow: a certain whimsicality rather than a fine drawing. The new member, Mr. Clarence White, sends drawings which fully justify his election; among others an architectural subject, "The Basilica of Constantine, Rome" (105), treated with much power and brilliancy, a warm glow suffusing the yellow stonework, with nearly pure blue in the shadows in the deeply-coffered arches. Mr. Hale is a very large contributor, the best and most original of his drawings being that of a huge rock rising up from sloping meadow-land, with the title of "A Giant asleep" (109), the sun behind sending rays of light over the peak. The same artist's other drawings are larger and more ambitious, but less successful on the whole than this. "Twilight after Rain" (156) is a fine drawing. At one end of the room is one of the finest water-colour sea-pieces we have seen, by Mr. Powell,—"A Channel Tug making up to a Dismasted Ship" (177). The vessels are small, the real picture being the sea, which has been the subject of much and careful study. The continued appearance of weight and transparency in the water could hardly be better given; the smoke of the steamer, blown downwards from the funnel in a cloud to the whole, adds much to the windy effect of the whole. Can there be poetry or interest in the hack yard of an old inn? Mr. Boyce thinks so, and gives us the "Bull Inn Yard, Ludlow" (94); that is, a bit of the yard, and the roofs of some out-buildings, diversified by a pigeon or two; there

is also an "Old Shropshire Farmhouse" (78), with its heavy brick chimneys, painted to the life; it is difficult to know whether to be discontented with an artist for spending his powers on such menial subjects, or to admire the talent which can enable him to invest them with an interest of their own. There is another little bit, "A Street Corner in Ludlow," consisting really of nothing but a high stone wall and a brick house, which is quite perfect in its way.

Figure pictures seldom form the staple excellence of a water-colour exhibition, the material, in fact, lending itself in general so much better to the requirements of landscape art; and the exhibitions of the Society are the less likely to prove exceptions to this rule, since the secession (to be regretted, from whatever motive) of so original an artist as Mr. Burne Jones. Mr. Topham's drawings, always well executed, lack intensity of interest; not to speak of a certain want of refinement. "Preparing for the Fight" (21) is the one likely to be most looked at. Carl Haag's large and (of course) finely-executed drawing, "Fillal Love" (68), prevails a generation or two back,—in general motive and feeling, we mean. It is impossible to feel much interested in such a work. Mr. Walter Goodall's "Venetian Fruit Boat" (82) is a very good work, clear and precise in execution, without the prominent exhibition of labour, though it is a very carefully executed drawing. Mr. Pinwell is, of course, highly finished and original, in his own peculiar style, in "Gilbert à Beckat's Troth" (127), but he is an artist seeking too much after peculiarity and piquancy in manner and choice of subject. In both respects, the present drawing, talented as it undoubtedly is, really is too *outré* to give pleasure. Perhaps the most original of the figure subjects is that of the "Rival Florists" (192), by Mr. E. K. Johnson; two old flower-fanciers seated on the lawn before a country-house in eager dispute as to some horticultural point; some females seated at the door of the house sallying regarding the controversy. The colour composition, though somewhat low and cold, is very harmonious, and anything but commonplace; the faces have been finished with great care. We should be glad, however, in future exhibitions, to meet with some works showing stronger feeling, more appreciation of the poetic side of life, among the drawings in which figures form the principal subject.

THE WORKS AT ST. PAUL'S CATHEDRAL.

The election of Mr. Burges by the committee, to act jointly and upon equal terms with the surveyor to the fabric, Mr. Peacock, has been already mentioned in these pages. It was not stated, however, that previously to the election the question was debated in this shape, namely, whether a "Medieval" or a "Classical" architect should be elected for the post; and, after long discussion, the question was resolved in favour of Medievalism by the votes of the members of the committee present, given as follows:—

<p><i>Medievalists.</i> The Dean of St. Paul's Canon Gregory Canon Liddon The Saccotest of St. Paul's The Rev. B. Webb The Rev. R. St. J. Tyrwhitt Mr. Beresford Hope, M.P. Mr. Gambler Parry Mr. Cazenove.</p>	<p><i>Anti-Medievalists.</i> The Lord Mayor Sir W. Tite, M.P. Mr. Walter, M.P. Mr. G. Cavendish Bentinck, M.P. Mr. John Murray Mr. E. Oldfield Mr. Butterworth Mr. W. Longman.</p>
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Nine to eight. This was done, be it remembered, with reference to St. Paul's Cathedral; and serves to show the usefulness of the committee as a body for the nationally important work in hand. If the question had been between the election of Mr. Burges and Mr. Somebodyelse, the vote would be perfectly understandable and probably quite right, notwithstanding the feeling of contempt for Wren's works which Mr. Burges has publicly expressed. But, stated as it was, it is positively beyond excuse. The mere fact that such a question was seriously put and debated should of itself lead the subscribers immediately to call upon the committee to resign. The composition of the body is entirely wrong. It should consist of painters, sculptors, and architects, with a certain number of laymen, as representing the general public. Amongst those who voted there is not a single painter or sculptor!

Mr. Fergusson, who is a member of the committee, but refrained too late to take part in the discussion, would have voted with the minority had he been present.

We are informed by a letter signed, Sills Joo. Gibbons (Lord Mayor), William Tite, James Fergusson, G. Cavendish Bentinck, John Murray, that, "considering that as regards Medievalism the voices of the committee were, in fact, equally divided; considering that Mr. Burges has limited his study and practice exclusively to Medieval works, and has not scrupled to express openly his contempt for the architectural works of Sir Christopher Wren (having, by his own admission, styled such works 'abominations'), certain members of the executive committee have resolved to call a general meeting of the subscribers to the fund, in order that they may have an opportunity of expressing their opinion on the course to be pursued under the circumstances."

Since the above was written, the Dean has denied in the *Times* that the question between a "Medieval" and a "Classical" architect for the work was debated: it must be obvious, however, that a certain number of the committee viewed the discussion in that light, or they would not have asserted it in public.

We willingly insert a letter addressed by Mr. Burges to the Dean with reference to his expressed opinion on the works of Wren:—

"With reference to my appointment at St. Paul's, may I be allowed to observe that any opinion I may have expressed in public upon the comparative merits of styles had reference to our present and future architecture, but not to the preservation and completion of the works of past ages?"

Thus, I have been employed in the completion of the chapel of Worcester College, Oxford, by decorating it in the cinque-cento style, and I may also observe that I have studied coloured decoration in Italy and Classic architecture at Athens.

As an artist I quite appreciate the privilege of being consulted as to the completion of the cathedral of London; and, whatever opinion I may hold respecting his details, I have never been so blind as to deny Sir Christopher Wren his just position as one of the greatest of our architects."

What has the Royal Academy done with reference to this national work? We should be glad to hear that the council had appointed a committee to consider the matter, and report upon it. It would not be more than the public has a right to expect from them.

THE PRESERVATION OF NATIONAL MONUMENTS.

In continuation of observations we have already printed, Mr. Young writes,—I find from a valuable communication of Mr. Kinahan in 1869, that the most interesting early buildings on the Connemara Islands are rapidly perishing. Of Ardullain, he says, "The ruins are all shattered and broken; tradition says they were in good keeping when The Martin held the wilds of Connemara. His successors look more to what can be taken out of the country than what is in it." "One cross only is in a good state of preservation—all the others and any carved stones are more or less injured." Of Innis Boffin he says, "The ancient buildings are all but swept from the face of creation, only a fragment of St. Colman's Abbey remains of all the buildings this island once possessed."

To turn to earlier and ruder monuments than these, we find that everywhere the earthen forts, raths, and megaliths are being swept away rapidly. The great series of cromlechs at Carronmore on Knocknacraugh Mountain, in Sligo, associated as they are in such an interesting way with the writings of Beranger in 1791, and Dr. Petrie in 1837, are being destroyed wholesale. Oh for an Irish Lullhook to step forward and save them! Curiously enough, the French authorities do not seem to recognise these objects (at least everywhere) as of sufficient value to protect them, for we now hear that in Brittany and Finisterre, and especially at Carnac, a great many are being destroyed. Nor are matters much better nearer home. For the following case I am indebted to a friend who has been in the neighbourhood. I mentioned the risk of being destroyed to which Avebury was exposed, and its now undoubted security, and it may be interesting to record that our Giant's Ring, with its central cromlech—a work only inferior to Avebury in importance, had even a narrower escape some twenty years ago.

The late Dr. Drew having paid a visit to Ballylesson, was taken to the top of the church tower for the fine prospect which it commands on every side. Being pointed out the Giant's Ring at Drumho, to his amazement and horror, he beheld men busily digging into the mound, and removing the materials to another place. He hurried into town, and wrote a strong-voiced

letter to the *Ulster Times*, a copy of which was sent to Lord Duggan, the owner of the soil. His lordship instantly directed that the circle should be inclosed with a proper stone wall, and no further interference with it permitted; and this came not a day too soon, for it then transpired that the leveling of the earthen mound or ring was only a portion of the *improvement* which the tenant had contemplated on the premises. He had entered into a bargain with a local road contractor, to bore, and blast with gunpowder, and then break into road metal, the huge trap boulders composing the cromlech, commonly called the Druid's Altar.

But sad as was the want of taste and feeling for antiquity at Drumbo, a more melancholy and deplorable case of this kind happened at the famous Con O'Neill's castle at Castlenegh. The owner (I believe the grandfather of the present Marquis of Downshire), hearing the old castle was much dilapidated, wrote to his agent to inclose the castle field with a wall. His orders were obeyed, but imagine his vexation and anger (for he had a strong desire to protect the old ruin) when he found, on visiting the spot that every stone of the old pile had been removed and used in erecting the wall, for which piece of economy his agent expected much commendation.

It would be unjust not to admit that there has come about a greatly improved state of feeling on these matters within the last thirty years, and specially is this true of the more cultured classes in England, although it is not confined to them. In Ireland, considering that only one association has been doing any active service during the last twelve years or so, it is much to their credit the large amount of valuable work they have effected with such limited means. I refer to the late Kilkenny—but now the Royal Historical and Archeological Association of Ireland—and may mention the following buildings of great interest, which, chiefly through the exertions of the zealous secretary (Mr. Graves), aided by members of the association, have been, by judicious repairs, placed in a state of security; viz.:—The Abbey Church of St. Francis, in the town of Kilkenny; the Round Tower of Clonmacnoise; the churches, crosses, and Round Tower at Monasterhose; and it is also proposed to effect similar repairs, as far as can now be done, to the remains of the seven churches at Glendalough, county Wicklow. But, making due allowance for improved public feeling, and for all that these private associations can undertake, it is painfully evident that there are at present no adequate means of dealing with the whole question of national monuments and their due preservation, such as the urgency of the case demands.

The first tangible recognition of the duty of the State in this matter is contained in the 25th section of the Irish Church Act of 26th of July, 1869. It provides "that where any church or ecclesiastical building or structure appears to the commissioners to be ruinous, or, if a church, to be wholly disused as a place of public worship, and not suitable for restoration as a place of public worship, and yet to be deserving to be retained as a national monument by reason of its architectural character or antiquity, the commissioners shall, by order, vest such church, building, or structure in the secretary of the Commissioners of Public Works in Ireland, to be preserved as a national monument."

The Act is manifestly incomplete, in not providing for a properly-qualified inspector being appointed, who would examine and report upon the buildings that should be considered national monuments. Perhaps it is as well that nothing has yet been done under this 25th section of the Irish Church Act, as Sir John Lubbock has given notice that he will introduce a Bill this session for the Preservation of National Monuments, both in Great Britain and Ireland; and I trust this 25th sec. may be repealed, and all the buildings worthy of being cared for placed under the one control.

From a draft of the Bill which has been kindly sent me by its author, I find a very simple machinery is proposed to be set up, resembling pretty closely the method pursued in France. Commissioners are to be appointed, who are to be vested with all the powers necessary to carry out the objects of the Act. Inspectors to be appointed by them, who will be charged with the duty of making out the lists of monuments worthy of coming under the operation of the commission. Provision made for compensating all owners whose private rights may be interfered with.

THE LATE PROFESSOR WESTMACOTT.

By the death of the late Professor of Sculpture in the Royal Academy we have lost an esteemed friend and valued contributor. Richard Westmacott, son of Sir Richard Westmacott, R.A., was born in London in 1799. His desire was to be brought up to the Bar, and it was only in accordance with Sir Richard's earnest wish that he became a sculptor. He studied under his father, and in 1820 proceeded to Italy, where he remained six years diligently occupied in examining the remains of Greek and Roman art, and investigating their history. The works of Mr. Westmacott are in many respects not unlike those of his father; graceful and tender in conception, with something of classic severity in the style, and never-failing purity of feeling,—but his genius was of a graver character, and he excelled in monumental and devotional subjects, and in fancies of a thoughtful and reflective cast. He was especially happy in the treatment of *relievi*. Among his classical and academic works may be noticed his *relievi* of "Venus and Ascanius," and "Venus instructing Cupid," executed for the Earl of Ellesmere; a seated statue of the "Cynthia Player," the property of the Duke of Devonshire; "Venus carrying Cupid," the statue of "Ariel;" "Paolo and Francesco," an admirable bas-relief executed for the Marquis of Lansdowne. More original in style are his fantasies the "Bluethel," and the "Butterfly," two bas-reliefs executed for the Earl of Ellesmere (1836-38). As examples of his monumental works, we may instance his recumbent figure of the Archbishop of Canterbury in Canterbury Cathedral, and that of Earl Hardwicke at Wimpole; and the Ashmolean monument, especially the grand figure of the "Angel Watching." Of his religious works we may mention the statue of "David as the Slayer of Goliath," "Prayer and Resignation," and the bas-relief of "Go and sin no more." Of late years Mr. Westmacott had been chiefly occupied on the execution of monumental and portrait sculpture. He produced busts of Sir F. Burdett, Sydney Smith, Sir R. Murchison, Lord John Russell, and other celebrated personages; but he was, perhaps, most successful in female busts. The group in the pediment of the Royal Exchange is from his chisel. Mr. Westmacott was also distinguished for his literary attainments. He has contributed several valuable papers to various serial publications; among others, the articles "Sculpture" to the "English Cyclopaedia," and the "Encyclopaedia Metropolitana," as also to the *Builder*, and he had delivered courses of lectures on the principles of sculpture at the Royal and London institutions. He also wrote one or two farces for the stage. He was elected F.R.S. in 1837; A.R.A. in 1838; R.A. in 1849; and succeeded his father as Professor of Sculpture in July, 1857. Mr. Westmacott died on the 19th ult., at his residence, 1, Kensington-gate, Hyde Park, after three days' illness, aged 73.

About a year before his death an accidental fall rendered his right hand useless; it was characteristic of his energy that he applied himself vigorously to make his left hand supply its place, especially in writing, and succeeded well.

THE BETHNAL GREEN MUSEUM.

It appears from a statement made last week by Sir Antonio Brady, at a meeting of the Whitechapel Literary and Scientific Society, that it is probable the new museum, which has been for some time in course of erection, in Bethnal Green-square, will be opened in the course of a few weeks. Sir Antonio Brady, who, along with the Vicar of Bethnal-green, and some other gentlemen, purchased, as our readers know, Bethnal Green-square, and gave one half of it to the Government, on the understanding that they would erect and maintain a museum upon it in connexion with that at South Kensington, complains very bitterly of the many difficulties which Mr. Lowe has interposed in carrying out the intention on which the East London Museum was granted by the Committee of Council on Education. He states that he holds the Chancellor of the Exchequer solely responsible for the delay in completing the building (which has now been in progress about four years), although to some extent he has been successful in battling with him, and he is now "sanguine enough to express a belief that within a month the building will be opened," and that her Majesty may be induced to take a part in the opening ceremony. Sir Antonio

has also another ground of complaint against the Government as respects the utilisation of the museum, in regard to which he imputes to them a breach of faith. He states that they have only granted 2,000l. for the maintenance of the museum during the first year, which is hardly sufficient to pay for the gas. He further states that he has reasons to believe that it is intended to open the museum only one week-day evening, and he expresses his determination to oppose this arrangement by mandamus, if necessary, as a breach of the agreement by which he, as one of the trustees of the land, transferred it to the Government.

The museum, which is built of red brick, in three spans or bays, is 190 ft. in length by 150 ft. in width; but the entire extent of the grounds is about 330 ft. by 190 ft., covering an area of 6,930 square yards, or something like an acre and a half, which is enclosed by iron railing, furnished by the Metropolitan Board of Works, and which, until recently, formed a portion of the railings of Hyde Park. At each side of the building there are thirteen windows, above which are mosaics, uniform with the frieze at the Albert Hall, and representing the several branches of industry, in manufactures and agriculture, together with the arts and sciences, as well as sculpture, astronomy, chemistry, music, and other studies. Running parallel with the west part of the building is a porch, composed of brick, glass, and iron, and this will be the principal entrance into the museum. It is intended to have the grounds around the building ornamentally laid out and planted, and amongst other objects of attraction will be the majestic fountain, which was one of the most prominent features of 1862. This specimen of art, which has been transferred from the Horticultural Gardens, is now in course of reconstruction, in front of the museum, opposite to the vestibule.

On the main approach, through the western entrance, leads into the central hall, which commands almost a complete view of the whole of the interior of the building. The floor of the central hall is paved with black and white marble tiles, in squares of about 1 ft. each. Eventually it is intended to place sculpture and other works of art around each side of the hall, which is very spacious. The different lays in the interior are respectively set apart for distinct specimens, in the various departments, and everything may now be said to be in its place ready for the opening, the arrangements in this respect having been completed about a fortnight ago, with the exception of the hanging of the pictures, which are more than 600 in number, mainly contributed by Sir Richard Wallace, and which is a remarkably fine collection. Sir Richard Wallace also contributes a considerable quantity of sculpture, bronzes, Sèvres china, and other rare and valuable articles, and the whole of the pictures and the last-named specimens have been conveyed to the museum, and are now being hung and arranged in the galleries solely at his expense.

The south bay of the building is devoted to the exhibition of animal products, which has for some time been stored up at South Kensington, but which has not hitherto been exhibited in consequence of want of space. The north bay also contains specimens from South Kensington, consisting of a good collection, whilst at the east end is displayed the "Museum of Economic Entomology," formed by Dr. Andrew Murray, late secretary to the Horticultural Society. The basement of the building is intended to be set apart for refreshment-rooms, apartments for the officials, and other similar purposes; but a portion of the space will be appropriated for sculpture, and also for the establishment of a library and reading-room.

THE STEPNEY SCHOOL COMPETITION.

At the usual weekly meeting of the London School-Board, on Wednesday last, the design submitted by Mr. T. Roger Smith was selected, and that gentleman was appointed to erect the school, with certain alterations.

With reference to an observation made in our notice last week of the designs for the Johnson-street School, that several of the class-rooms in Messrs. A. & C. Harston's design were approached from the central hall, those gentlemen write to say that they sent a second plan, in which none of the class-rooms are entered from the central hall. This is doubtless true, but it was not of the second plan that we were speaking. Com-

menting on the design of another competitor, they go on to say,—"If it is right that class-rooms should be entered from the central hall, then all the class-rooms should be so entered. If on the contrary it is wrong, let the whole have distinct entrances. We approve of your suggestion that the committee should take evidence upon these points before selection, as either scheme is better than a compromise, which neither combines the boys' and girls' rooms, nor thoroughly divides them, and to effect which all nity in the departments is sacrificed, and supervision rendered impossible."

ROSS WORKHOUSE COMPETITION.

Last week the Ross Board of Guardians met to select a design for their proposed new workhouse from five sets sent in competition.

The Chairman said, in reply to some observations made, that he did not think it would be worth while to take into consideration the probable cost of carrying out any of the plans, as such estimates, roughly made, were apt to be very fallacious. The Poor-Law Board would not sanction the adoption of any plan which was not drawn up on the basis of an estimated cost of 34l. per head of the inmates. That was the minimum cost sanctioned, and the Poor-Law Board did not like to entertain any proposal which was framed on an estimated cost of less than 40l. per head of the inmates. It seemed to him ridiculous in that case for an architect to propose to erect an entirely new building, to accommodate 300 persons, for 7,000l. At Mommonth, the estimated cost of the new Union buildings had been 11,000l., whilst the actual outlay amounted to 15,000l., and he thought they should confine their attention to selecting the most suitable plan, without reference to cost. There was also another provision rendered imperative by the Poor-Law Board, namely, that the cost should be sixpence per cubic foot of the entire building.

The merits of the plans were then discussed. "The set marked 'Idoneum' were framed at an estimated cost of building, according to No. 1 scheme, of 2,200l., and according to No. 2 scheme of 10,500l. The set marked with an 'intersected triangle' were based upon an estimated cost of building of 7,015l. The set marked 'Convenience' were at the following estimated cost of building:—Scheme A, 9,150l.; scheme B, 6,900l."

Ultimately the set marked "Idoneum" was selected, and was found to be by Messrs. Haddon, Brothers, of Hereford and Great Malvern.

The design marked with "Intersected Triangle" was found to be by Messrs. Lawrence & Goodman, of Bristol and Newport, Monmouthshire; and that marked "Convenience," by Mr. E. Power, London, and Mr. George Smith, Ross.

The clerk was instructed to communicate with Messrs. Haddon.

COMPETITIONS.

Chester.—The design of Mr. W. Botterill, of Hull, was selected in a limited competition a short time ago for a Wesleyan chapel to be erected on the City-road. The style adopted is the Geometric, and the design embraces a tower and spire. The contract has just been entered to with Mr. J. Stringer, of Sandbach, for 445l. 10s. The building is to be of Hambridge one. The accommodation is for 800 persons. The contract does not include the spire, and is so exclusive of lighting and heating.

New Church at Blundellsands.—In a limited competition of local architects for this new church, the committee, after consulting with Mr. E. G. Paley, of Lancaster, have accepted the designs prepared by Messrs. Hay.

Workshop.—The plans for schools selected in an competition have been approved by the committee of Council on Education. The design for larger boys' school is by Mr. J. F. Sinclair, of Orkney; of the smaller boys' school by Mr. H. Evergrove, of Buckingham-street, Strand, London, who is also author of selected design for 'Is' school.

Chorley Townhall.—The Improvement Commissioners held a special general meeting on Sunday evening, to receive the report of Mr. Ley, architect, Lancaster, as to the persons entitled to the premiums of 80l., 30l., and 20l. for the first, second, and third best designs for a new townhall. The clerk read Mr. Paley's report, which amounted to 10,000l. (the sum fixed by the commissioners), was quite insufficient to cover an area of more than 1,500 yards with substantial and well-constructed buildings, such the commissioners might be expected to erect

for the town of Chorley. In selecting the three best plans, Mr. Paley had therefore not taken cost into consideration, but carefully kept in view that the award should be given not to the finest architectural design and composition, but to the plan that shows the best appropriation of the ground, combined with the most suitable elevation; in fact, the competitors who have best studied the ground, and designs were selected as the best.—"Cotton," "To be or not to be," "Let Chorley flourish." Set No. 1. It was resolved to award the prizes in accordance with Mr. Paley's report, and the envelopes containing the addresses were opened.—"Cotton" is designed by Messrs. Ladds & Powell, of London; for the second, no address or name could be found; "Let Chorley flourish," is by Mr. J. J. Bradshaw, of Bolton.

THE BERLIN COMPETITION.

THE Berlin correspondent of the *Telegraph*, after commenting in not very flattering terms on the designs for the proposed German Houses of Parliament, submitted by French, Italian, and German architects, says,—

"The English competitors have not been trammelled, like their German rivals, by an accurate knowledge of Fatherlandish characteristics. The conditions give them *carte blanche*, and they have taken full advantage of the privilege granted. It may be, even if they have gone to extremes in the way of ornamentation, and rather designed fiery castles or 'mansions in the skies' than sober, business-like Houses of Parliament, destined to be erected in the most matter-of-fact city in the world. But they have erred, for the most part, on the side of beauty,—though there are one or two painfully ugly drawings. I regret to say, hearing English engineers, which is more than can be said for the majority of their country fellows. It may be, however, a subject of legitimate congratulation to British artists to know that incomparably the noblest in conception and most artistically carried out of all the designs exhibited is that of Mr. Wm. Emerson, a London architect, whose 'perspectives' are simply two of the most charming. His pictures that have been seen in Berlin for many a day; and I am informed upon first-rate professional authority, that the internal arrangements of the glorious Gothic building, which so grandly realises the prescription of the official programme in 'embodying the idea of a House of Parliament for Germany in a monumental sense,' are as practically excellent as its elevation is ideally magnificent. Next in attractiveness to Mr. Emerson's Waballs is a stately pile, surmounted by a lofty dome, that owes its being to the creative genius of Mr. Scott. The third and fourth honours, will, I fancy, be assigned to the designs of a Berlin and of a Hamburg architect; and the fifth prize may possibly fall to the share of another Englishman, whose drawings are hung between those of Mr. Emerson and those of Mr. Scott. The jury, I fancy, would be sorely puzzled to select from the remaining ninety-six 'Entwürfe' a sixth design that, if put into stone or bricks and mortar, would be pronounced by the world's verdict to be worthy of the great purpose to which the greatest nation on the continent of Europe has resolved to devote several of the millions it has won in the great game of war."

CAPPING REDCLIFF SPIRE.

A BRAVE LADY.

On the 9th inst., Ascension Day, the capstone and finial were placed on the spire of Redcliff Church, Bristol, in the presence of a vast number of persons gathered below to watch the proceedings. The ceremony was performed by the Mayor, Mr. W. Proctor Baker, and greatly increased interest was excited by the fact that the Mayoress accompanied her husband in the somewhat dangerous journey. Heavy rain, with thunder and lightning at the hour fixed, two o'clock, postponed the event, and would have daunted many. Not so, however, with Mrs. Baker. After the lapse of half an hour the rain ceased, and preparations for the ascent were renewed. The Mayor and Mayoress took their seats in the "lift," raised by a steam engine which has been used during the erection of the spire, accompanied by the clerk of the works. As soon as the hoist began to move, the vast crowd commenced cheering heartily, and the Mayor took off his hat and bowed his acknowledgments. The cheering continued all the time the hoist was slowly rising, and until its occupants were safely landed on the first stage, a height of 160 feet above the level of the hill. From this point to the summit of the spire the usual ascent is by means of ladders, but a special contrivance had been brought into requisition for the occasion. This consisted of a second hoist, worked by hand. It was merely two square boards, one over head and the other under foot, like the top and bottom of a box, with a rope at each corner, covered on three sides with a flag. Into this the Mayoress got, and was hoisted by the workmen to the top of the spire. Men were stationed at different points to prevent it swinging too much. Nevertheless, it did swing, and that sufficiently to make those below nervous. His

Worship showed his pluck by mounting the ladders, and he was not long in reaching the top. The next party hoisted up were the vicar of the parish, the Rev. Canon Randall, with his churchwardens, Messrs. C. B. Hare and Mervyn King. In the third hoist were the Rev. F. Auchmuty, one of the curates, and Mr. Edmund King. The whole party having been deposited at the top, the signal was given to raise the capstone, which had been placed in position early in the morning; and Mr. Baker assisted by the Mayoress, at once commenced to lay the mortar with a silver trowel. This done, the stone was carefully lowered, and the Mayor laid it in its place, in the name of the Father, Son, and Holy Ghost. The little group then gave a hearty cheer, and the men waved their hats. The people below caught the sound, and took it up, and a hearty and prolonged cheer announced the completion of the interesting ceremony.

A few words of congratulation and thanks were said by the Vicar, who remarked that the present proceedings were merely preparatory to those of the Cannynge Society's anniversary, fixed for the 28th of this month. The conclusion of the ceremony was the signal for the bells in the tower to ring out, and while the party descended joyous peals were given forth. When the Mayor and Mayoress reached the ground they received the deserved congratulations of a large body of friends.

The spire is octagonal in shape, with pannelled bands at intervals, and ball-flowers up all the angles, and from the summit of the tower to the top of the vane, not yet fixed, will be above 180 ft. in height, while the tower itself is about 110 ft. high, making a total of nearly 300 ft. It is built of Dundry stone, but the capstone is of Portland stone. This stone weighs about a ton, and is 13 ft. in girth, and 2 ft. in thickness; it is very fully moulded, fitted to meet all the angles of the spire, and a very excellent piece of masonry.

The work has been done from the designs and under the superintendence of Mr. Godwin (the conductor of this journal), by Mr. William Riee, the resident clerk of the works, and the men under his direction. The vane has been made by Messrs. Hart & Co., and is now ready for fixing.

PROPOSED SEWAGE FARM AT WALTON-ON-THE-HILL.

THE internal sewerage of the township of Walton having been completed, according to plans of Messrs. Reade & Goodison, civil engineers, of Liverpool, the local Board instructed them to select suitable land for a farm upon which the utilisation of the sewage as originally provided for could be carried out.

The land selected lies in the valley of the river Alt, about two miles below the present outfall into Fazakerley Brook. It contains 104 acres which, with the present population, gives about an acre of land for every sixty inhabitants. The whole area can be commanded by gravitation from the present subsidence tanks, and it is proposed to construct a storage reservoir on the farm sufficiently large to contain twenty-four hours' supply of dry weather sewage. The sewage is to be conveyed by a sewer 2 ft. diameter, at an inclination of 1 in 1750, and thence from its termination by an 18 in. diameter cast-iron pipe taken under the Alt, in the form of a syphon, and discharging into the storage reservoir. The estimated cost, including sewer, distribution, land, tenants' compensation, &c., is 26,600l.

On May 3rd, an inquiry was held at the Black Horse Inn, Walton, by Mr. Robert Morgan, the Government inspector, with reference to the proposed compulsory purchase of the land selected for the farm. Mr. Gallely appeared for the Board, and Mr. Potter, for Lord Sefton, the owner of the land, who opposed the granting of the application.

Messrs. Reade & Goodison, in evidence, stated that they were well acquainted with, and had frequently examined, all the land in the valley of the river Alt available for sewage purposes, including that in the scheme brought forward by Lord Sefton, and were of opinion that the land selected was, as regards soil, subsoil, and levels, the best attainable, and admirably fitted for the purposes of a sewage farm. That the subsoil being mostly a sharp clean sand, free from pebbles, and lying upon the boulder clay, with a maximum depth of from 12 ft. to 15 ft., would give ample opportunities for efficient under-

drainage. They estimated the cost of distribution, and laying out the land as a sewage farm, at 20s. per acre, and considered that 160l. per acre would cover the cost of the land, including all compensations and expenses. The whole could be commanded by gravitation from the storage reservoir.

Mr. M. O. Tarbotton, borough engineer, of Nottingham, gave corroborative evidence.

On behalf of Lord Sefton, Mr. A. Orridge, the surveyor to the West Derby local Board, produced a counter scheme for the utilisation of the sewage of Walton, on a portion of the Fazakerley Hall estate, and Mr. Hope supported his views, and condemned the Walton Board's scheme.

CO-OPERATIVE BUILDING SOCIETY AT BARROW.

THE new town and port of Barrow-in-Furness, which has so rapidly grown, and the population of which is constantly increasing, has on more than one occasion been noticed in the columns of the *Builder*. The very great demand for house accommodation on the part of the daily influx of new residents brought to Barrow by the new works which give employment to such a large number of artisans, has led to the establishment of a co-operative building society on a rather novel scale. The society, which has been named the "Barrow Co-operative Building, Investment, and Land Society," has for its objects the buying and selling land, the erection of dwelling-houses and other buildings, the buying and selling of property, and the lending of money to members on the security of real and personal property, and already a large number of shares have been taken. The society includes in its operations the purchasing of houses which members may desire, by paying according to the cost.

THE NEW PUBLIC ROOMS, TUNBRIDGE WELLS.

THIS building has been opened. It is in the Byzantine style of architecture, from the designs of Messrs. Wilson & Wilcox, architects, Bath, the builders being Messrs. Willcombe & Oakley, of Tunbridge Wells, and the cost amounted to something like 11,000l. It is composed of two wings, with large hall at the back, and the material used in building is white brick, with Bath stone dressings. The approach at the front is by a vestibule, 12 ft. wide. The wings have Mansard roofs, with ornamental iron railing round the top, and with dormer windows. The wings are built suitable for other purposes than the public rooms, and have private entrances at the sides. The rooms upstairs are approached by a staircase, with large horizontal light over, connected with the club-room, the reading-room, and the library over the vestibule. On the ground-floor there are eight windows in addition to those in the wings, and each wing consists of five floors with three windows on each floor. The circular-headed windows are separated by pilasters with carved caps and key stones, and ornamented with moulded bosses. The extreme length of the building is 114 ft. from outside wing to outside wing, and the extreme depth of the frontage of the wings to the back room is 109 ft. The great hall is 100 ft. long, 42 ft. wide, and 35 ft. high. It contains a movable platform with orchestra, the platform being divided into three compartments. It is therefore of some width (about 22 ft.), and a depth of 40 ft. The ceiling is divided into thirty-six panels, each of which is decorated, some with large (ventilating) centre flowers and others with flowers to harmonise. The walls are also divided into panels with pilasters—moulded caps carrying the ribs forming the panels. For a height of 9 ft. the walls are decorated with painted drapery. The room is lighted with a large chandelier in the centre, and two smaller ones at the ends, with eight still smaller ones intersected, the large one having 63 jets, the two smaller 90, and the remaining eight 192, making a total of 345. There are three retiring-rooms for professionals, with ladies' and gentlemen's cloak-rooms. The reading-room is 49 ft. long, 34 ft. wide, and 22 ft. high; the billiard-room is 25 ft. long, 18 ft. wide, and 16 ft. high; the club-room is 46 ft. long by 16 ft. wide; and the library 15 ft. long by 16 ft. wide. In front of the main building, and extending the whole length, is a stone balustrading and façade over the *portes cochères*.

THE NEW USE FOR SOLID DEPOSIT OF SEWAGE.

THE new use to which the solid contents of sewage is being put, for the sake of experiment,—viz., making it into a first-class hydraulic cement,—by General Scott, is thus spoken of by the London correspondent of a Manchester paper, who has seen the process:—

"General Scott, to whom the public is indebted for the erection of the Albert Hall, and much of the arrangements in connection with the International Exhibition, has made a very remarkable discovery, which is likely to solve the problem of what is to be done with town sewage. His process is to be seen in actual working at Ealing, a town of 10,000 persons, about five miles from London. I have just paid a visit to the works; and a description of them may be interesting. Near the end of the town, a mixture of eight parts of limo and one of clay is thrown into the sewer, and is allowed to run down the sewerage to a piece of land, about half a mile from Ealing. The mixture here passes into a long tank, and the solid matter having been deposited in the tank, the water passes off almost clear, and free from smell. The deposited sewage looks like mud. It is taken from the tank to a drying place, not unlike those used in a Cornish china-clay works. There it is dried by a fire, is then passed through a pug-mill, and then passed through a brick-machine. The bricks are finally placed in a kiln, and calcined; and the result is an hydraulic cement, equal to any Portland cement in the market, and saleable at a considerably lower price. By a little alteration in the precipitating ingredients, other cements may be obtained. The sewage contains such a large quantity of hair, rag, straw, and other combustible substances, that it supplies, to a large extent, its own fuel; and coke and inferior coal may be used in the kiln. But cements are not the only produce which is obtained from the sewage. By treating it with limo, a serviceable manure is obtained. General Scott and his brother (Mr. Thomas W. Scott, late of Plymouth, who is superintending the works) hope to do even more than this. It is well known that the most valuable fertiliser in manure, the ammonia, passes off in the water; and the question is if this can be extracted. As it would be worth 60s. a ton, there is clearly room and inducement to experiment. Two of the three Commissioners appointed to inquire into the pollution of rivers,—Dr. Frankland, the chemist; Mr. Morton, the well-known agriculturist (the third Commissioner, Sir William Denison, is dead),—have been to Ealing, and come back highly delighted. Deputations from Leeds and Birmingham have also been greatly struck by the process. It has, of course, been patented, and probably a company will be formed for the purpose of working it, either directly or (more likely) by granting the use of the patent on a royalty."

THE NEW SHOREDITCH INFIRMARY.

ON a site close to the Shoreditch Workhouse, in Kingsland-road, the local guardians have erected a new infirmary for the sick poor. The building is connected with the adjoining work-house, and the frontage faces Ilkerton-street. On one side the building is bounded by the parochial relief offices, and on the other by the row of dilapidated cottages called Reeve's-place. The frontage is ornamented by a vestibule, with Corinthian columns, bearing a feeble representation of a Corinthian capital. The portals having been passed, the visitor finds himself in a spacious apartment, surrounded by a skirting of encaustic brick of vermilion hue, and polished like a mirror. Surmounting the skirting stands the interior of the gault brick wall,—that material being perhaps better known as Burham brick, from the fact that it is extensively used in the construction of London sewers.

The cornice of the apartment consists of a variegated belt of encaustic and Burham brick, which gives a slightly appearance to the reception-room, which is upon the ground flat, with a palisading of metallic rails, enclosing the area of the basement story. This entrance-hall, which is about 24 ft. square, leads along a corridor, with consulting rooms on each side, to an apartment fitted up designedly as a receptacle for drugs, surgical instruments, &c. Along the range of the building through which the corridor extends are rooms for the accommodation of the medical superintendent, matron, nurses, and the ordinary staff of auxiliaries. All is arranged

upon a methodical and economic scale, devised by Mr. Lee, the architect of the establishment. Messrs. Hill, Keddell, & Waldram were the contractors, at a little over 16,000l. A. B.

SCHOOL BOARDS.

St. Austell.—At the meeting of the St. Austell School Board, on Saturday, the 11th inst., the competitive designs of Mr. Sylvanus Trevail, of Par Station, were adopted for the Pentewan and also for the Town or Central Schools. The former is to be a mixed school, to accommodate 100 children. The latter will be the central schools for the St. Austell district, which are to provide accommodation for 500 children, and will comprise boys' and infants' schools, each 60 ft. by 20 ft.; girls' school, 40 ft. 6 in. by 20 ft.; two class-rooms and a board-room, each 20 ft. square; a teachers' residence, containing nine rooms, with all necessary entrances, offices, &c. The designs of Messrs. Dwyer & Sons, of Plymouth were considered to be the next in the order of merit.

Bridgwater.—The Bridgwater Board has resolved to apply to the Education Department for the loan of 2,800l., to pay the cost of erecting new schools in the eastern portion of the town. It is in contemplation to erect another set of schools in the western part, to meet the requirements of the department.

Braford.—At a meeting of the Board, a deputation was received from Little Horton and West Bowling, praying the Board to proceed with the erection of Ryan-street school. The memorial was referred to the Statistical Committee. It was agreed that the plans of the following schools should be again presented to the Education Department for approval, and with a request that the department recommend the Public Works Loan Commissioners to advance the necessary funds:—Feverham-street schools site and buildings to cost 17,982l.; Bowling Back lane school, site and buildings to cost 9,250l.; Ryan-street school, site and buildings to cost 11,300l. Plans of the following schools were adopted and ordered to be forwarded for the approval of the Education Department, with a request that the Loan Commissioners be requested to advance the necessary funds:—Infant school at Horton Bank Top, the buildings to cost 3,465l.; Whetley-lane school, the erection to cost 7,800l.; and Lily Lane school, the building to cost 7,700l., and the roads and drains 250l. In addition to the price already paid for the land.

Epworth.—The question of the plans received for schools on the Wherstead-road and Argyll street sites has been discussed. A suggestion was made that a selection of the best two should be made, and the chairman observed that he thought it would be comparatively simple to reduce the plans to that number. The Board then considered the plans in committee. The designs for the proposed schools on the Wherstead-road and Argyll Estate sites, which have been submitted to the School Board, have been opened to further inspection in the library at the Town-hall.

Brighton.—Some discussion took place at the meeting on the recommendation of the General Purposes Committee, "That the Board do issue advertisements inviting architects to send designs for the new schools to be erected between Sussex-street and Richmond-street, after the contract for the purchase of the site has been signed." Mr. Hack suggested that the Board should make known to the architects their views as to the arrangement of seats in the Board schools; and he also thought it advisable that the seats should have backs, and that not more than two scholars should sit together at a desk. After some discussion the chairman suggested that this and other minor matters should be embodied in a report, and considered at a future time. Mr. Hack moved that, in accordance with the permission already given, and without waiting for the reply to the amended report to the Board, immediate steps should be taken to provide infant schools where most needed. Mr. Hack said that, according to the original statement, accommodation was needed for 2,000 infants; but the conversion of the Circus-street School would reduce this number by 250, and the new Ivory Lane School, when built, about 250. This, however, was only 500 out of 2,000. There was a great deficiency in District No. 2, and he proposed that, if possible, there should be a school in the neighbourhood of the Queen's-road, where there were 400 or 500 small houses and no infant school. He would also propose

that another be placed at the bottom of Gloucester-street or Trafalgar-street. In District No. 3 there was a deficiency of 215, which one school would supply, and it might be placed near the London-road. In District No. 5 there was a very large deficiency (981). This would partly be relieved by the new school in Ivory-place, which abutted on the district, but there was ample room for a school higher up the hill, where the houses are increasing very fast. When accommodation for 1,000 infants had thus been provided, they would be able to get to work better. The subject was referred to the committee.

"NATIONAL HEALTH SOCIETY."

A MEETING was held at the rooms of the Social Science Association on Friday, the 10th, to confer with some ladies, who have formed a society for the cultivation of the knowledge and practice of sanitary laws. Among the ladies of the society are Miss Twining, Mrs. William Grey, Miss E. Blackwell, Madame Parkes-Belloc, Baroness M. de Rothschild, Madame Bodichon, Mrs. Kingsley, and Miss Goldsmid. Among the gentlemen present were Mr. George Hastings, Mr. Ernest Hart, Mr. E. Chadwick, C.B., Dr. Steveling, Dr. Corfield, Mr. Westlake, Mr. Pears, and Dr. Hardwicke. A lucid statement made of the objects of the society showed that it proposed to assist in the formation of local societies, to induce schools to include sanitary instruction in their teachings, and to form an office for answering questions from private individuals and others as to the proper modes of procedure in cases of sanitary difficulty, and to establish a reference library, with plans, models, and papers. In the discussion which followed, several of the ladies spoke of the great difficulty they had themselves experienced in their endeavours to apply sanitary laws, and they mentioned the desire which many ladies had to assist in this properly home work. Mr. Hastings, Mr. Hart, and Mr. Chadwick spoke with regard to the means of organising, and as to the practical means of working such a scheme; and it was understood that the National Health Society would formally apply to be admitted as an affiliated society to the health department of the Social Science Association. The new society has a fund of several hundred pounds, and a fair list of members, and the general opinion of the meeting was that by a judicious and active maintenance of its programme it would render assistance in an important movement.

SHRINES.

SIR,—In restoring the shrine of St. Alban it would be interesting to compare it with the remains of the shrine in the church in Dorchester, Oxon. The portion existing comprises the groined covering to the ten niches: it is of quite as elaborate a character as that at St. Alban's, and the arrangement is identical: the covering is constructed in four stones jointed over the three partitions between the niches, the entire length being 7 ft. 6 in. I regret that I had not time when at Dorchester in 1867 to make a drawing. I could have offered to illustrate the subject; perhaps since then other portions may have been discovered. S. J. NICROLL.

MODEL DWELLINGS, CLERKENWELL.

THE building of a block of model dwellings, Rawstone-street, by the Brewers' Company, mentioned by the *Clerkenwell News*. The latter says,—“Bronchitis and affections of the throat and lungs have—say the doctors,—been prevalent in buildings of this kind, by reason of the openness of the staircase and landings. The Brewers' Company's dwellings are erected with a view to obviate this discomfort, the slips and landings leading to the different tenements being either protected from the inclemency of the weather. At the same time there is sufficient ventilation and air. The block in question is four stories high, and consists of three distinct rows in a row, with three separate entrances. After ascending a stone staircase, we reach a landing, which divides two distinct sets of rooms sufficient, in size, to accommodate two families decently. The number of tenements provided is eight in each house, or twenty-four altogether; each set contains a living-room, 13 ft. by 10 ft., and two bed-rooms, respectively 10 ft. by 10 ft., and 9 ft. by 7 ft.; a scullery, water-closet, pantry,

a place for coals, a shoot for dust, with all the necessary fittings. The building is of fireproof construction throughout, and has a flat roof overlooking Northampton-square, which is admirably adapted for a drying-place. Its altitude will no doubt render it a pleasant lounging retreat in the spring and summer months. Mr. E. H. Martineau, architect, Lincoln's-inn-fields, has designed the building, and the contractors are Messrs. Cubitt & Co.”

A MILLINER OF A MILLION.

WE have often admired, on the person of a charming little lady of our acquaintance, the tasteful draperies provided by Madame Louise, the Court milliner of Regent-street; but it never occurred to us that we should have to give this *artiste* public praise. However, so it is. Hanover Church, in Regent-street, designed by the late Professor Cockerell, has long been in a miserably dilapidated condition, both inside and out; and, unless we are misinformed, the lady in question has undertaken to defray a considerable portion of the cost of putting it into repair. It is to be hoped the work will be confided to good hands.

GUERNSEY.

WE hear that the building committee appointed by the States, of which Mr. Henry Tupper is chairman, have determined on re-arranging the present Fish and Vegetable Markets, and adding an extensive wing to the existing building. The work has been entrusted to Mr. John Newton, architect. £6,000 have already been granted by the States towards this object, but it is expected that the necessary alterations will considerably exceed that amount. The work of demolition of the old buildings is progressing with a view to clearing the site, under the local superintendence of Mr. Duquemin, the States surveyor.

THE TRADES MOVEMENT.

LONDON.—On Saturday and Monday last meetings of carpenters and joiners have been held, the first meeting being of delegates, and the last a general meeting, to determine on the course to be taken in consequence of the masters having refused to comply with a memorial requesting that the hours of work be reduced from fifty-six hours and a half to fifty-one hours per week, and that the wages be advanced from 8d. to 9d. per hour, making 1l. 18s. 3d. per week. The meeting was numerously attended, St. James's Hall being quite full. Mr. Lloyd Jones occupied the chair, and opened the proceedings by an address on the economical phase of the question, contending that the men were perfectly justified in their endeavours to attain the objects they desired. Mr. Wright moved the first resolution:—“That this meeting fully approves of the course taken by the delegates from the carpenters and joiners in the London district in the memorial to the employers for a reduction of the hours of labour from ten to nine hours a day, and for an advance in the wages from 8d. to 9d. an hour.” The motion was seconded by Mr. Pensum, supported by Mr. Hurry, and unanimously carried. Mr. Sadler read the proposed new rules, the principal of which were, that the hours of work should be nine per day, except Saturdays, when they should be six hours, making fifty-one hours per week; that the wages be 9d. per hour; that overtime be paid for at the rate of time and a half, and double after certain hours, but be discontinued; that piecework be totally abolished in the London district (the meeting showed their high approval of this particular rule by cheering loudly when it was read); that no alteration be made in these rules without six months' notice; and that any proposed alteration be submitted to the arbitration of an equal number of masters and men. He moved a resolution approving of those rules. Mr. Hilley and Mr. Butler spoke in support of the resolution, which, like the former one, was agreed to unanimously. Mr. Sinclair moved the following resolution, which was afterwards carried:—“That this meeting views with dissatisfaction and regret the position taken by the Master Builders' Society in refusing to receive a deputation from the carpenters and joiners of London to discuss the terms of their memorial, having thus ignored our claims and disregarded our overtures, leaving us the only alternative for adopting the necessary means for

enforcing what we believe to be a just and reasonable demand; and this meeting is of opinion that we should take action on the 1st of June, by ceasing work in such firms as the delegates shall decide, unless in the meantime the employers made known their willingness to accede to our demands; and we hereby pledge ourselves to give all the moral and pecuniary aid in our power for the furtherance of the movement.”

Stafford.—An advance of wages and the nine-hours system for winter work have been conceded to the carpenters and joiners of North Staffordshire.

Conington.—The strike of bricklayers, joiners, carpenters, and other branches, for the reduction of time, namely, half an hour per day, has come to a termination. The masters held a meeting, and agreed to grant the concession required, but in the event of any further demand or alteration, six months' notice to be given by both masters and men. The workmen have returned to their employment.

Morpeth.—The master builders of Morpeth (with the exception of Mr. James Middlemas), having declined to reduce the working hours to fifty per week, the working masons of the town met, and resolved to strike at once, and remain out till their demand, of which the masters had two months' notice, is conceded. The strike, however, has since terminated, the masters having agreed to the terms asked by the men.

Durham.—The journeyman painters of Durham turned out on strike in consequence of the masters having declined to accede to their request for the nine-hours movement. Hitherto the men, who are paid by time, worked 56½ hours for a fraction within 26s. per week, and this time they have asked to be reduced to 54 hours per week, without any corresponding deduction in their wages. After remaining out for a couple of days, one or two of the masters acceded to the application of the men, and we understand that the others have since agreed to their terms, and the men have consequently returned to their work.

Dundee.—A short time ago the journeymen plumbers of Dundee memorialised their employers for an increase of wages from 5½d. and 6d. to 6d. and 6½d. per hour. Six of the masters complied with the request; but in the other shops, both in Dundee and Broughty Ferry, the men came out on strike.

Waterford.—The Waterford carpenters, masons, and plasterers went out on strike for an increase of wages to 2s., and the master carpenters conceded the advance.

Berlin.—The united master masons, builders, and carpenters, have met, and the conditions as to time and wages granted to the Eastern trade-unions of the journeymen masons and builders were unanimously conceded. By these conditions the day work is to consist of ten hours, and the rate of payment to be from 1 l. 3 of a thaler to 1½. It has, therefore, been determined to resume work at once.

Copenhagen.—A daily paper, called the *Socialist*, has been established, and also an International Society, with a person called Pio as “Grand Master.” The International arranged a general strike of the masons and bricklayers, who had their wages increased seven or eight months ago. Several hundreds left work, and were followed by the majority of the masons. The strike has now gone on for five or six weeks, and no other workmen can be got. It was arranged in the midst of some unpleasantness with the authorities, to have an open-air meeting, but this has been prevented.

THE THREATENED STRIKE IN LONDON.

SIR,—I observe in the reports of the meeting of carpenters and joiners at St. James's Hall, that complaint is made that the Builders' Society declined a discussion with a deputation of their body. The only reason for such refusal is that there was really nothing to discuss. The Builders' Society had only just seen a deputation of the Operative Masons, and it appeared that there was but one point of difference, viz., whether the employers would increase the wages from 8d. to 9d. per hour. The employers consider that 8d. per hour is a liberal rate of wages for an ordinary mechanic, and declined to increase it. The operatives said that they would not have less than the present hours, viz., fifty-six and a half per week, unless the wages were raised to 9d., so that there was no use in going into the discussion of hours at all. The present

hours of builders in London are, as you are aware, fifty-six and a half in summer and fifty and a half in winter. The engineers and other trades have recently agreed to work fifty-four hours all the year round. The question of hours therefore can be no grievance, and is really mere moonshine, and designed only to throw a mist over the subject. The strike of the carpenters and joiners, if it take place on the 1st of June, will be for a rise of 12s. per cent. in wages, and for that alone. Moreover, one of the speakers at St. James's Hall (Mr. Wright) expressly said, when they had got the 6d. they could go in for something more. Considering as we do that 8d. per hour is a liberal payment, it will be our duty on this occasion to resist to the utmost a rise.

A MASTER BUILDER.

SIR,—A short time since we received circulars from the Masons' and Joiners' Societies asking for a concession of the fifty-one hours per week and rise of wages from 8d. to 6d. per hour. We considered this an unreasonable demand, and, on a conference with our men, they unanimously accepted our offer of a working week to consist of fifty-four hours, and wages at the rate of 8d. per hour; and the joiners, masons, and metal-workers in our employ have for some weeks been paid on this scale. This is a compromise which we believe master-builders in London would willingly give, and we also believe the large majority of men would gladly accept if they were allowed to do so by those who profess to represent them. The hardship and misery entailed on the working classes by these unfortunate strikes, is incalculable, and we do hope the present dispute will be amicably settled without recourse being had to any extreme measure.

Cox & Soxs.

THE DOCK AND WATERSIDE LABOURERS.

An organisation or union, embracing the dock wharf, waterside, and general labourers, was formed a few days ago, and already counts several hundred members. The object sought is to obtain a uniform rate of pay for all, at the rate of 6d. per hour while employed. The condition of the dock labourer has for a long time been very wretched indeed, and nothing is more pitiable than the sight of numbers of men in cold and many weather, standing outside the dock gates, shivering with cold and hunger, anxiously waiting for "a call." Scarcely when a sympathy has been expressed for the cabman and his horse, and efforts are making to afford him a covered stand while waiting for a "fare," the dock authorities ought to be moved with a Christian feeling to provide even a temporary wooden shed, with seats, somewhere within the dock gates, for those labourers who are in the habit of being employed by them.

There is not the least difficulty in the way, and the act would conduce to the respect of the dock management, and put an end to a rather dismal street exhibition.

GENERAL MEETING OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

The annual general meeting of the Institute was held on the 6th inst., Mr. T. H. Wyatt, president, in the chair, when the annual report of the Council for the current year was read and adopted. The report mainly reviewed the past, with which our readers are already acquainted. The following gentlemen were then elected office bearers for the ensuing year:—

President,—Thomas Henry Wyatt. Vice-Presidents,—Horace Jones, A. Waterhouse, John Gibson.* Ordinary Members of Council,—G. Aitchison, B.A., W. Burgess, T. T. Bury,* Z. C. Clarke,* H. Dawson, Professor Kerr, E. H. Martincau,* Harry Oliver,* W. Papworth,* R. L. Rommie, J. P. St. Aubyn, R. J. Withers,* W. M. Fawcett, J. Fowler, E. Sharpe, M.A., Honorary Secretary,—F. P. Cockrell (foreign correspondence). Secretary,—C. L. Eastlake (home duties). Auditors,—Ewan Christian, Fellow; E. J. Tarver, Associate. Honorary Treasurer and Banker,—Sir W. R. Farguhar, Honorary Solicitor,—F. Conry.

The following gentlemen were appointed as a Board of District Surveyorship Examiners:—

G. Aitchison, B.A., J. Belcher, W. A. Boehm, H. Dawson, C. Fowler, C. F. Hayward, F.S.A., E. F. Anson, F.R.G.S., J. Jennings, Professor Kerr, J. T. Knowles, Professor Lewis, F.S.A., E. Nash, C. C. Nelson, F.S.A., H. Oliver, E. W. Tarr, M.A., J. Winchcomb, F.S.A., S. Wood, and the Hon. Secretary.

Mr. C. C. Nelson, F.S.A., related the circumstances under which the portraits of Mr. Beresford Hope, M.P., and Professor Donaldson, had been painted by Mr. Charles Martin, and gave the following statement of receipts and disbursements on account of the subscription fund:—Cost of the two portraits and frames, 172l. 4s.; amount of subscriptions received (from sixty members), 124l. 18s.; amount still

* Newly-elected Members.

required, 47l. 6s. A vote of thanks was passed to Mr. Nelson for his services as honorary treasurer to the fund.

Mr. C. F. Hayward, in reference to a suggestion of the Council that the expenses of the next Conference should be met by subscription, said that if this were necessary he thought a fixed and uniform charge should be made to all who attend the Conference meetings; but he had hoped that the sale of papers read at the Conference would have covered its expense. Mr. C. L. Eastlake, secretary, stated that although they had been duly advertised only a few copies of the Conference papers had been sold. The cost of the late Conference, including the printer's account, was 132l. 12s. 7d. Mr. C. C. Nelson said he hoped that the printer's account would be less this year. The papers read at the late Conference were numerous, and the discussions very lengthy. He suggested that the range of subjects should be limited to questions of professional practice, and that the discussions should not be printed *in extenso*.

THE INTERNATIONAL EXHIBITION, 1872.

SIR,—In the article on the above in your issue of May 4th you speak favourably of our exhibits—No. 1,064, the west window of St. Paul's, Dock-street; No. 2,781, an ebonised cabinet; No. 2,772, a carved bookcase and cabinet; No. 2,771, a fire-place with painted tiles, oak cornice and framing; but in no one instance do you mention our names as the manufacturers. For some years past we have fallen in with the suggestion which many manufacturers still decline to act upon—that in exhibitions the names of the designers of the work should be made known; but while we are glad that due credit should be given to the artists, it is hardly fair that we, the manufacturers, who have expended over 1,000l. in the production of our exhibits, and whose practical experience and suggestions have contributed something even to the success of the designs, should be entirely ignored. We hope that you will find space to insert this.

Cox & Soxs.

CITY GUILDS.

SIR,—Allow me respectfully to note that your "Hint to the City Guilds" is likely, by its general terms, to defame the fair character of some of these bodies upon insufficient grounds. I know, from experience, that the funds of many of these companies are honestly, beneficially, and wisely applied. They are of two sorts, Trust and Corporate, and the moneys that belong to trusts are scrupulously spent in the direction for which they were bequeathed; and, moreover, large sums are frequently drawn from corporate funds to fill up deficiencies in trust moneys; and thus the charitable gifts are augmented out of the private funds of the company. I see no more reason for carping at the riches of a corporation than for doing so at the riches of an individual. Individuals are allowed to give "expensive dinners," and to have "portraits taken," and to do other honest things for themselves, if they do it with their own money. Besides, too, the corporate,—that is to say, the private funds,—of a company are often spent ungrudgingly in charitable and lofty aims, such as education; and surely a moderate fee may be paid out of those private funds for transacting important business at a court, while the same is done at insurance offices, banking corporations, and other business companies. I might notice much more; but I will conclude with the remark that reform where reform is needed is desirable, but that change where change is not needed is revolution.

EDWIN NASIR.

TECHNICAL TERMS.

I JOIN with others in desiring to see a good dictionary of terms used in the building and engineering trades, setting forth the variations, according to the locality, &c. Other terms than those that have been mentioned come to mind. Mortar, composed of lime and sand, is always called mortar in London and the south, but in South Lancashire and the West Riding of Yorkshire it is always called "lime." Purins, also, in South Lancashire, are called "pans;" in the West of England, "side-pieces." Rafters are called "spars" in Lancashire; principal rafters are called "backs." But these should appear in tabulated form, and a very good beginning of

a dictionary might be made by one person at least in every locality sending you, sir, the local name of the various parts or operations in a building, leaving it to you to dissect, tabulate, and publish in the *Builder* all local idioms. And this need not be confined to our own country, or even to our own empire. We do building and engineering for every nation almost under heaven, and it will not only be useful but highly instructive to compare words and trace derivations, through the languages of all the great races of the human family.

E. G.

METROPOLIS WATER ACT, 1871.

REGULATIONS AS TO CONSTANT SERVICE.

The Board of Trade, taking action as empowered by the 17th and 22nd Sections of the Metropolis Water Act, 1871, have nominated his Grace Charles Henry, Duke of Richmond, K.G., to preside at the necessary inquiry to take place under the powers of the said Act; as also, Mr. Robert Rawlinson, C.B., and Captain Tyler, late Royal Engineers, to advise and assist at such inquiry. It will be remembered that the Duke of Richmond presided as chairman at the Royal Commission which recently inquired and reported on water supply.

At the meeting of the Board of Works, Mr. H. L. Taylor in the chair, the Parliamentary Committee presented a report on the regulations for a constant supply of water, made by the Metropolitan Water Companies, and submitting a series of amended regulations to be proposed to the Board of Trade, in substitution for those made by the companies. Mr. Dalton said the regulations proposed by the companies were of such a restrictive character that if they were adopted there would in fact be no constant supply. The regulations did not become law till they had received the sanction of the Board of Trade. That Board had referred the regulations for the opinion of this Board. He moved the adoption of amended regulations, which would secure to the inhabitants a constant supply of water. Mr. Newton said this was a most important matter, because, if the companies should succeed in passing their regulations, they would defeat the object the Board had in view. The motion was carried.

A COUNTRY HOUSE: OAKLANDS, HALSTEAD.

THE house at Halstead, in Essex, of which we give illustrations to-day, is built of local bricks of yellowish white colour. Some moulded stone has been used for window-heads and columns of windows, and for the porch.

The internal woodwork of staircase, hall ceilings, and passages adjoining is carefully designed and well worked out in deal and oak, being furnished with only slight staining and varnishing.

The entrance vestibule and the conservatory have been laid with tiles from the Poole Potteries Company.

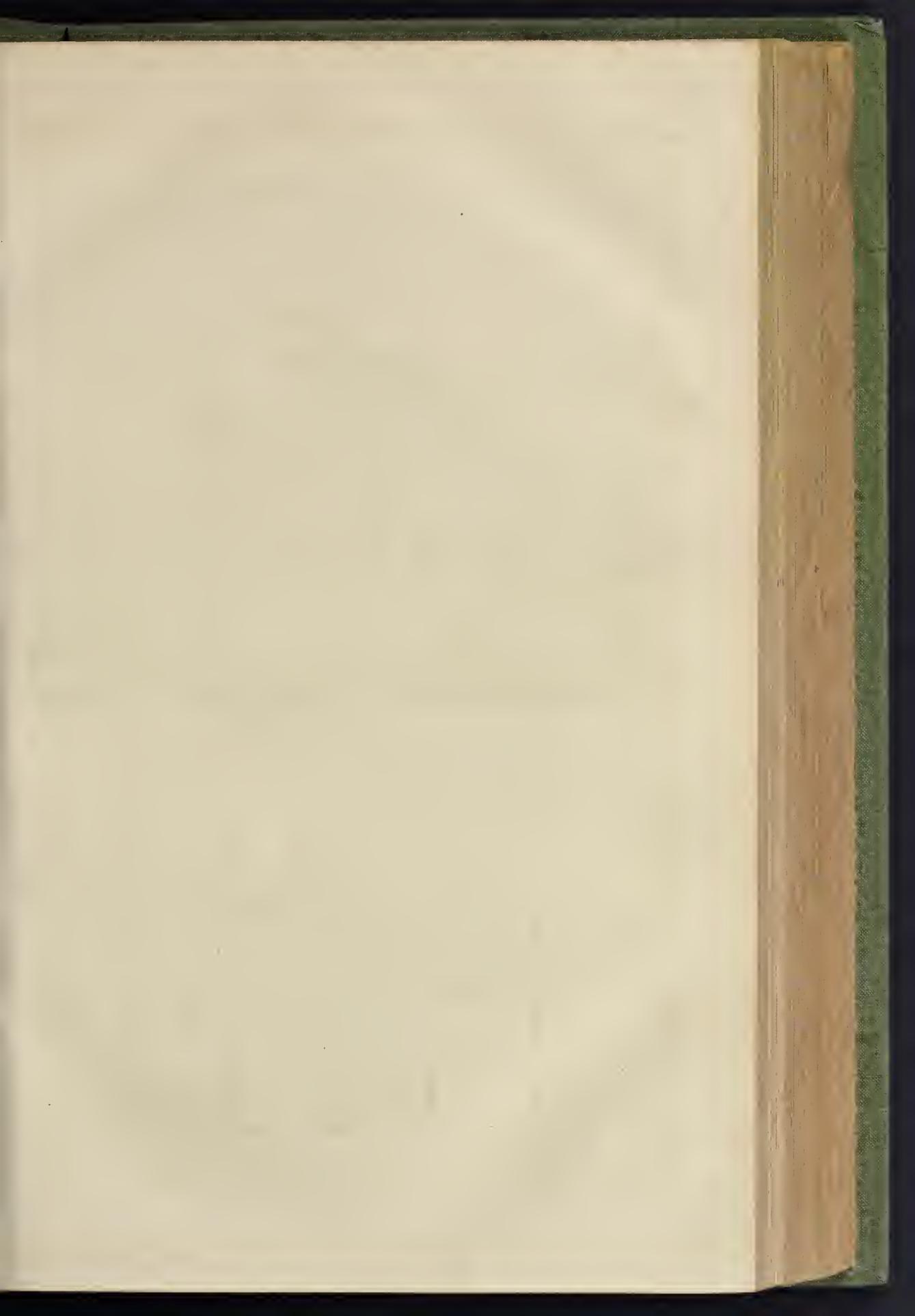
The chimney-pieces are good specimens of solid Devonshire marble from Plymouth.

Mr. C. F. Hayward, F.S.A., was the architect under whose superintendence the work was carried out by Mr. J. Sudbury, jun., of Halstead, at a cost, inclusive of fittings, of about 3,000l.

THE UNITED STATES POST-OFFICE AND COURT-HOUSE, NEW YORK CITY.

THE new post-office in New York City, U.S. is a building of large size, having a frontage of 280 ft. on the Park, and 222 ft. on the Broadway and Park-row. It has been built from the designs of Mr. A. B. Mullett, Supervising Architect of the Treasury, and will cost, it is estimated when fully completed, about one million sterling. In our volume for 1871, we gave a view of part of the building from such materials as were available, and some descriptive particulars to which we refer those who desire further information. The view, however, did not give a satisfactory idea of the building, and at the request of some of our readers on the other side of the Atlantic we now publish a view of the north-west front. The ground-floor will be devoted to the post-office. The glazed projecting roof is for the protection of the mail wagons while receiving or delivering the mails. The upper stories contain the United States Courts and their dependencies. The material used for the exterior is the Di. Island white marble.

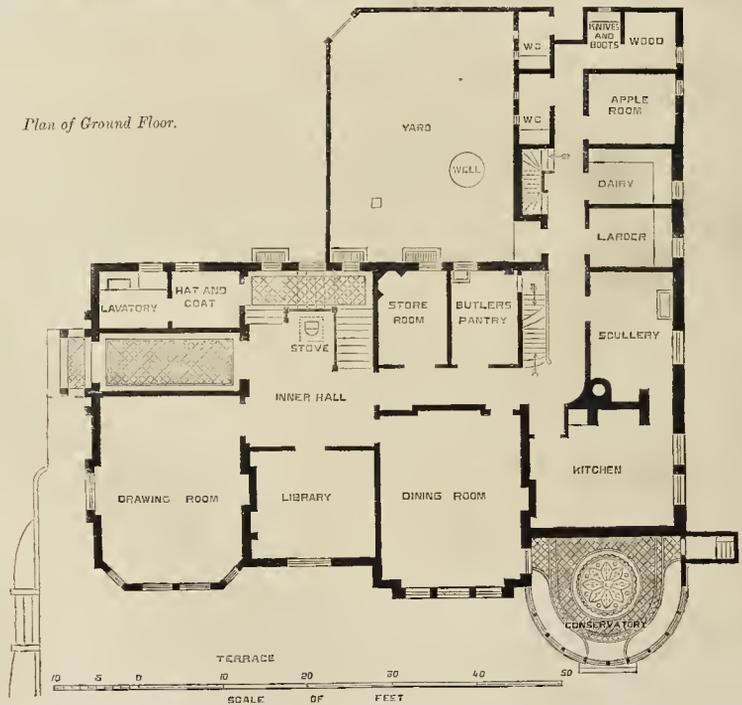
* Vol. xix., p. 924.

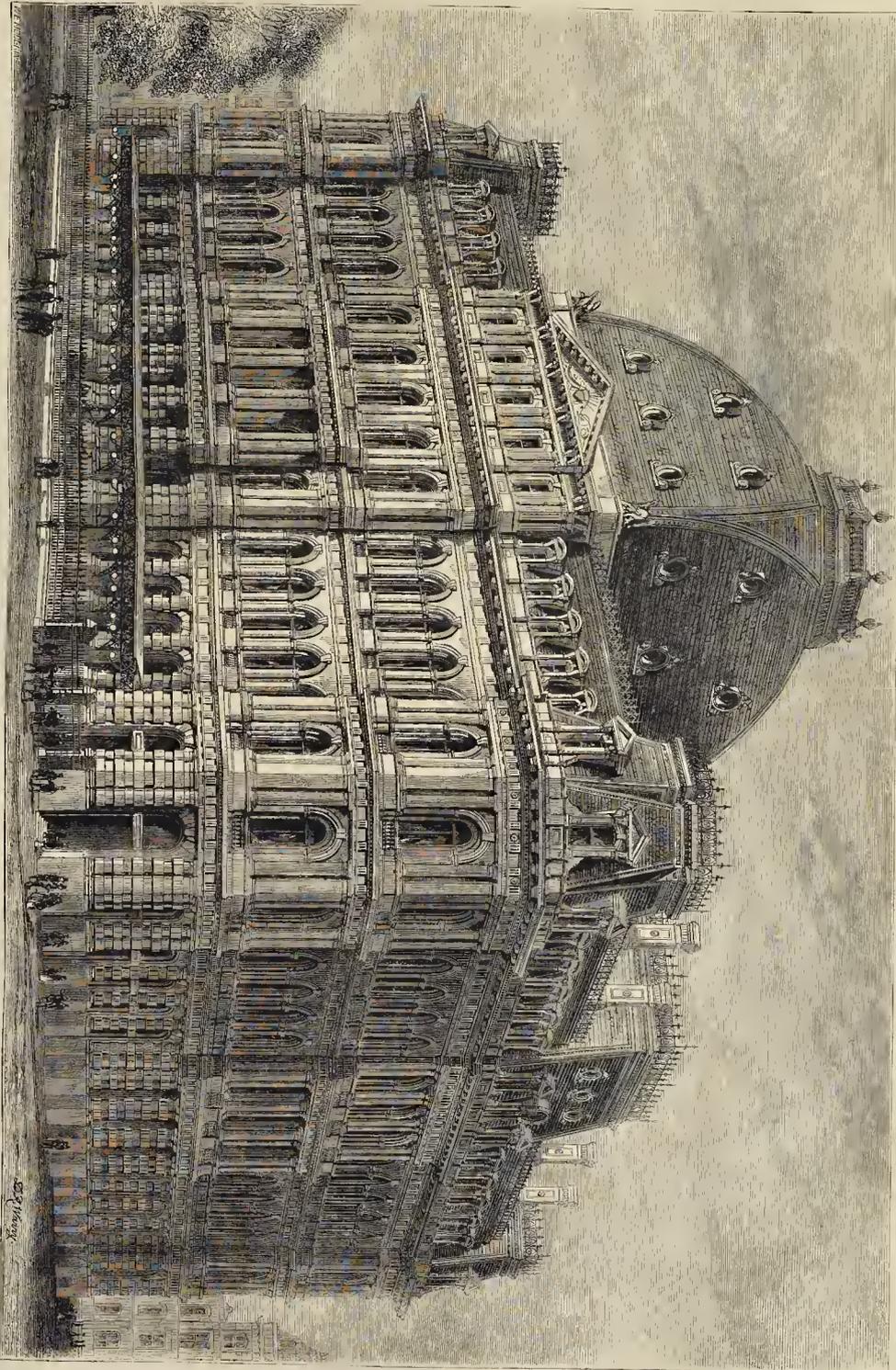


A COUNTRY RESIDENCE HOUSE AT HALSTEAD, ESSEX.—MR. C. F. HATWARD, ARCHITECT.



Plan of Ground Floor.





UNITED STATES POST-OFFICE AND COURT-HOUSE, NEW YORK CITY.—North-East Front.—Mr. A. B. MULLERY, ARCHITECT.

A VISION OF THE FUTURE.

After reading the "State of English Architecture" in the "Quarterly Review."

Time, 1882. Season, Summer.

SCENE. House in course of erection. NOBLE WORKING MAN discovered sitting with child in hand; standing by his side, his SON.

Son. Well, father, you do not make much progress!

N. W. Man. How ridiculously you prattle! Am I not waiting for an idea?

Son. Well, that is a pleasing way to spend time; why did you not let me learn your art instead of making me a shoemaker?

N. W. Man. My son, I may tell you now. Hitherto I have only said I did so because it was for your good; now I feel I may be more explicit, as my day is near its close. You have noticed that I have lately been willing to shorten the time that the "soft-handed gentlemen" should serve me. Stop, I must explain from the beginning. Sit down and listen, and you will learn much. Some ten years since I was a common mason, when there appeared an article on architecture, in a well-reputed journal of that day, stating that instead of noble working men such as had existed in the fourteenth century, a so-called architectural profession had sprung up, which comprised "a number of soft-handed gentlemen," and that consequently there was "no motive for expression in the work, and none of that 'handing,' the evidence of the artist's presence and effort, which is as valuable in building," &c. In another part it said, "The best buildings of all ages have been made, not by professional gentlemen and their drawing-clerks, but by labouring handicraftsmen of various schools of art."

Son. How well you seem to remember what the author said.

N. W. Man. I should think so! Why I have read nothing else. I have formed myself on his words. I call that article my prophet, my guide. I refused at once to work under any architect, or for any one who employed a surveyor. The novelty took, and I became the true artist, as my guide calls it, and told all my clients (I like the word, though it is modern) that I work only to please or satisfy myself (his words again) regardless alike of the public or patrons; and in setting myself against all the learning of the profession, I say, quoting again my prophet, that till I started, "The fact was we had no such thing as a building art. This had been entirely lost. We had what was called the profession of architecture, which, as it pretended to the practice of art, was in the nature of an imposture." So have I thriven.

Enter YOUNG LAWYER.

N. W. Man (aside to SON). Here comes that scamp of a common-sense man who will not believe in me.

Young Lawyer. What! not yet up to the first floor: surely even you cannot justify such delay. Why, under the old system with architects, the building would have been at least covered in.

N. W. Man. Contemptuous, as usual, of art. You forget all the dogma. I am the "master worker," the associated "chief master," and superintendent of "creators;" my work is, as our guide ten years since so ably expressed it, "simply a delight to me;" it is the "outward form and expression of a mind sympathetic and serious, but not in the slightest degree superstitious or debased."

Y. Lawyer. I confess I do not understand this twaddle. Since the time you mention science has made rapid advances. The railways,—so much thought of then,—have become almost like the old stage-coaches were to the people of that day. We now glide through the air, without fear of accidents or any jolting, and perform the distance in one-fourth the time. The post-office system is almost antiquated, messages being sent instead, as you know, at a charge of 1d. each all over the kingdom; and the charge for a telegram to India is 3d., which then cost 3l. The postal charge is reduced to 0½d., which tempts the very poor still to use it. The bottom of the sea is so covered with wires, laid in all directions, that I believe the very fish must be afraid it is a huge net put there to catch them. Fireplaces are things of the past, and every house is warmed and has hydraulic power in use therein supplied by public companies, which would surprise people who lived in the last decade as much as gas would have surprised their predecessors; and you only go backwards.

Your building seems as if it would never be completed: you draw large sums of money, and yet make no show or progress therewith; and when I complain that you are ruining my client, you simply answer you cannot help it; you are creating and building a monument: that you are trying to improve until you equal the work of the fourteenth century,—and such contemptible humbug. Fancy my talking such nonsense about my profession—that I was trying to arrive at the system pursued by King Alfred! I should be laughed at and lose all my business. By the bye, see what progress there has been in the law. No chancery—only one court, one law; no long vacation; county court able to deal with nearly all matters; one superior court. Judges always sitting, and while there are no more judges than there were ten years ago, each judge has his vacation, just as clerks and partners in great commercial houses. Why, now the law is simple and understood, and in ten weeks any suit may be concluded, even if there be an appeal, which, at the time you speak of, would have taken from ten to twenty years. What can I say to my client, Sir John?

N. W. Man. Say what you please. He dares not leave me. I am the leader of the day, and what I say is law. Sir John wants me quite as much as, ten years since, he would have wanted Gilbert Scott. Now I think of it, what have you done as to the house he occupies till this is finished?

Y. Lawyer. Why about that he bade me consult you. They will not let him remain unless he will take another lease for seven years at least.

N. W. Man. Say he had better take it. But I will do all I can that he may get in. I and my associates will live on the most generous diet,—at his expense, of course,—to incite our inventive talents; but under such pressure our brains may give way, and rest may be necessary.

Y. Lawyer. I see no inventive genius yet displayed. The building is quite barren of ornament. The only ornament is broken in pieces on the ground, and which you told me was experimental.

N. W. Man. You forget one of our dogmas. I must remind you, "Nothing is more remarkable than the way in which opportunities for decoration are neglected. The builder goes on working in the quietest way until he has a worthy idea to express, and then he does it in the most unobtrusive manner." And again, "How many a village church can be brought to mind where there is not even an external plinth, but the rudest unornamented wall, a stumpy 'ungraceful' but very sensible and useful tower, and scarcely a moulding or ornament about the building, until in some unobtrusive doorway or aisle window we find a gem of thought that gives dignity and refinement to the entire work." True, I am nearly ready as you say for the first floor joists, and not anything appears but plain walling; but I and my creators have waited days and days for ideas, and they will come to us yet as they did to those glorious men of the fourteenth century whom we strive so closely to follow.

Y. Lawyer. I will tell you what I have done. Behaving you are robbing my client, I saw a quantity surveyor. Poor fellow, he had a large business ten years since: now he tells me he has nothing to do, because you and your class, who have superseded architects, will not allow that your work can be computed by any one: and he has, for years, been measuring, over and over again, the house he lives in, as he tells me, that he may remember how to do the work when the public shall be sick of your nonsense. I stated what I wanted; but told him I believed you and your associates would kill him if he were discovered. His answer was, that the pleasure of doing real work and earning money thereby would make him brave any risk. He chose his time, and I hold here his calculation. He has added 20 per cent. to what he would have allowed when in practice, and states that it is almost unfair to do so, because now so few building materials are used by you and your associates that the price thereof is almost nominal; still, the value of any kind of labour must be more, because of the expensive style of living that you adopt. The result will surprise even you. It comes to but one-fourth of the money you have had.

N. W. Man. I am not surprised. Ours is no mercenary trade. One last quotation from the founder of our grand system will perhaps convince you. He has said "The workmen then were quite at ease. They worked among intelligent and sympathising friends. For three hundred years we have been trying to build

from above downwards. The connoisseurs have pretended to teach the public how to build, and the public fail to learn. Can we not ask the working man to show us what to do?" I, the leader of that noble band, ask you to watch. Think you in ten years we could undo the great evils of three centuries? No. It is for you to wait at least another decade; then you will be the first to proclaim the grandness achieved by the noble working men, unfettered by architect, untrammelled by quantity surveyor or thought of money.

Y. Lawyer. Shall I? But I have no time for discussion, or I would ask you if you think you have yet reached the fourteenth century. My lady wished me to ask whether you have arranged for the day and night nurseries, and what aspect they will have. She thought there must be some plan or drawing, showing what rooms there would be; but I explained that there were none in the new system of building, but that I had no doubt you could tell me.

N. W. Man. I cannot; it is too small a thing to engage my attention. I doubt not there will be some rooms that could be adapted; if not, we can easily throw out a wing somewhere.

Y. Lawyer. Could you not, as a great favour, find out, so that the wing, if necessary, might be now commenced, otherwise her ladyship's children will be grown up before it could be erected.

N. W. Man. It shall have attention.

Y. Lawyer (going). Oh! by-the-bye, Sir John desired me to ask in what style the building is supposed to be? He had an old friend dining with him, who asked the question, and Sir John replied, he thought the Fourteenth century Gothic; but he really did not know, as there had never been any drawing, and, though you had been five years at work, nothing could be seen except plain walling, and very little of that.

N. W. Man. You seem to enjoy repeating his spiteful remarks! How true that art has ever suffered by contact with cold-blooded men of the world!

Y. Lawyer. Well, you seem to have made plenty of money, and I suppose you consider yourself the embodiment of "art," and the houses you have bought (not built) must be very profitable, now that so long a time is taken to erect new ones. I should not wonder if this is also a portion of your scheme.

N. W. Man. Go on, sir. I shall not be the first martyr to my noble cause.

Y. Lawyer. Humbug! [Exit YOUNG LAWYER.]

Son. He does not seem to like you.

N. W. Man. I told you he did not; and his common sense, I am afraid, will be too much for my glorious ideas: still, Son, there is some comfort. I have done well, and can retire now on a very sufficient income. I should have liked the idea to continue, however, somewhat longer; so that I might receive adulation for the rest of my life, and grand articles in the papers when I quit this sphere. The latter seems absurd, you will say, but I think you are wrong; it must be a pleasure, even on one's death-bed, to know that your country will on the morrow resound with your late greatness.

Curtain drops.

B. F.

THE THAMES EMBANKMENT CASE OF THE DUKE OF BUCCLEUCH.

In the House of Lords Appeals, on April 30th, before Lord Chelmsford, Lord Westbury, Lord Colonsay, and Lord Cairns, judgment was given in the case of the Duke of Buccleuch v. The Metropolitan Board of Works.

In this case, the Duke of Buccleuch sought to recover compensation from the Metropolitan Board of Works for construction of the Thames Embankment between Monagu House and the River. The matter having been referred to arbitration, the umpire, Mr. Chas. Pollock, Q.C., awarded to his Grace the sum of 8,325*l.* This sum the Metropolitan Board of Works declined to pay; and on his Grace endeavouring to enforce the award by action, they called as a witness on their behalf the umpire, who stated that his award had been arrived at as follows:—For loss of causeway, 200*l.*; for structural damage to walls, 60*l.*; for capitalised rent of garden, 2,475*l.*; expense of building a wall, laying out the garden, and other matters, 600*l.*; and for loss of privacy and other amenities, 600*l.* The verdict passed for the plaintiff, subject to the opinion of the court above, on the questions whether the evidence of the umpire was admissible; and, secondly, whether if it were it had disclosed that the umpire had based his calculations of the amount to be awarded on matters which he had no right to look at in assessing the amount of compensation due to his Grace. The Court of Exchequer were unanimous in their judgment that the plaintiff was entitled to retain his verdict, but were not agreed in their reasons, the Lord Chief Baron and Barons Martin and Channell being of opinion that the evidence of the umpire was admissible, but that it showed that the umpire had proceeded on a right ground, and that the award was good; while Baron Bramwell was of opinion that certain parts of the evidence of

The umpire were not admissible, but that if they were he was inclined to think that they showed that the award was made on a wrong principle, although he doubted whether the finding of the umpire could be reviewed. The Court of Exchequer Chamber by a majority of four to three reversed the decision of the Court of Exchequer, on the ground that the evidence of the umpire was admissible, and showed that he had proceeded on an erroneous principle in estimating the amount of the compensation that ought to be awarded to the defendant.

The case was argued last year before their lordships, assisted by six of the learned common-law judges, when the latter, after taking time to consider, by a majority of five to one gave opinions in support of the award.

The counsel who argued the case before their lordships, were Sir Roundell Palmer, Q.C., and Mr. Kemplay for the appellant; and Mr. Hawkins, Q.C., and Mr. Phillimore for the respondents.

Their lordships having taken further time to consider their decision, gave judgment.

Lord Chelmsford, in course of his remarks on the case, said, there can be no doubt, and none has been entertained, that the plaintiff is entitled to compensation in respect of the taking away the causeway and landing-places, and the injury arising to his house and premises by depriving him of access to the river. The only question upon which there has been a difference of opinion among the judges arises upon the award, viz. whether the umpire had any power to give compensation for the damage by the depreciation of the mansion-house, lands, tenements, and hereditaments by the otherwise injuriously affecting the same by the execution by the Board of the said works, and by the exercise of the powers of the Act. Now, he was authorised both by the special Act and by the Lands Clauses Act, to give compensation if the premises were injuriously affected, a fact which it was the duty of the umpire to ascertain and determine. He has determined it, and awarded compensation in respect of the damage thereby sustained by the plaintiff, and I see nothing in the case to impeach the correctness of this award. I think, therefore, that the judgment of the Court of Exchequer Chamber must be reversed.

Lord Westbury entirely concurred with the view taken by the majority of the learned judges as to the admissibility of the evidence of the umpire, and as to the limit beyond which the right of the examining the umpire ought not to be carried; but upon the other point, as to the principle upon which the umpire was to assess the amount of compensation, he must concur, on this, as on several other occasions, he took a different view from that which was entertained by the majority of the learned judges and by his public and learned friends. It would, however, be needless to discuss the question further, and he should, therefore, concur in the judgment about to be pronounced.

Lord Colonsay agreed in the view taken by Lord Chelmsford.

Lord Cairns, in giving his reasons for concurring in the judgment of the House, expressed the obligations that their lordships were under to the learned judges who had been called in to assist them in determining this difficult and important question.

The judgment of the Court of Exchequer Chamber was reversed, and that of the Court of Exchequer, upholding the award, was confirmed.

A SUGGESTION.

Sir,—If the employers would consent to an advance of wages from a fixed date not far distant, and ten hours' time, as at present, for those who like to work, and the limit of hours for the objectors, guaranteeing at the same time that no "sacking" will take place in consequence, and place notices on their works to this effect, I believe they would thoroughly take the wind out of the sails of the promoters of the nine-hours movement, thereby in the end saving themselves a great loss, and the men a deal of misery; for few are sanguine enough to think that present arrangements will be of long duration. A. B.

INTERFERING WITH CHIMNEY DRAUGHTS.

In the Margate County Court a case (Williamson v. Edwards) important to builders has been tried, Mr. Towne for plaintiff; Mr. Gibson for defendant.

In his opening statement, Mr. Towne said this was an action to recover 7*l.* by his client, a widow, residing in Addington-street, from the defendant, Mr. Edwards, a builder, carrying on an extensive business in Margate, for damage done to plaintiff's property. Mrs. Williamson is the owner of two houses in Addington-street, in one of which she resided herself, and which had existed there fifty years. Adjoining this property was a small house, belonging to Mr. Edwards, and this house had now been devoted to a story above Mrs. Williamson's houses, the consequence of which was that the smoke from these two houses refused to go up, and, in fact, the houses were rendered uninhabitable. When applied to in the matter, Mr. Edwards, through his solicitor, Mr. Gibson, replied that he could do as he liked with his own property, which he believed was to be the defence to the action. Now defendant had a right to carry his house up, but he had no right to take away the light or air from a neighbour's house, nor to drive the smoke down the chimneys. Mr. Edwards had been called upon to carry plaintiff's chimneys up higher; and hereupon, he had then been called upon for the amount, plaintiff having been compelled to do it; and Mr. Edwards refused.

His Honour: It is a well-known maxim that you may build up as high as you like, but you must do it in such a way as not to annoy your neighbour.

Mr. Gibson: My client, Mr. Edwards, says that he knows of no such custom here.

His Honour: I do not say the custom exists here; but it is in consonance with the usual maxim; a man must not do anything to the annoyance of his neighbour.

Mr. Gibson: But any such decision would be very serious, and would prevent Mr. Edwards or any one else from building. My objection is that no such action will lie. And another objection I shall raise is that the plaintiff ought to have proceeded by injunction, and this would have been her remedy.

His Honour: She might have had such remedy, but because she did not I do not know that that deprives her of any right to appeal to this Court afterwards. I may say at once that I have a strong opinion that the action

will lie, and that if the nuisance is proved the plaintiff will be entitled to a verdict.

Mr. Towne, in reply, called by Mr. Towne, stated that since he had been subpoenaed on this case he had taken a run through the town and had found out three cases where the owners of new or raised buildings had paid for the raising of adjoining chimneys.

Mr. Edwards: I do not think there is an instance in the town where it has been compulsory to raise adjoining properties.

His Honour: I must find for the plaintiff in this case; and the only question now is Mr. Gibson's objection, whether the action will lie, if it is not a deprivation of easement. I think it will.

Mr. Towne: Mr. Gibson talks about an injunction as our only remedy, but that is absurd.

His Honour: I do not generally give an opinion if I reserve judgment, but in this case my opinion is strongly in favour of the plaintiff.

Mr. Gibson pointed out to his Honour that Mr. Gibson had not stated it was compulsory in those cases he had mentioned. The case then terminated.

MR. T. C. EBDY v. REV. F. THOMPSON.

MR. T. OLIVER, who, in our report of this trial, was described as of Sunderland, instead of Newcastle-upon-Tyne, thinks our report makes it appear that he voluntarily stated that probably Mr. Street would have charged 200 guineas for such a report as the one in question; whereas, he continues, "I was asked the question in this form, 'Probably, if Mr. Street had prepared a similar report, he would have charged 200 guineas?' My reply was, 'I do not know.'"

STONE MERCHANTS AND MASONS.

Sir,—I beg the favour of your inserting the following. I want some one interested as much as myself in the matter to explain by the stone supply, ready worked for fixing, to builders, at a price that masons cannot compete with. The same merchants who thus treat the masons solicit and obtain their custom, and yet express surprise after taking from them their only chance, at their inability to pay their accounts for stone. To obviate this, and show that such merchants can be done without, I would suggest that the mason should get his stone direct from the quarry, when possible, and thus save the profit he has now to pay the merchant. This would enable him to hold his own ground, and prove that a mason is not to be done without just yet. A LOVER OF JUSTICE.

COMPULSORY TAKING OF LANDS.

An arbitration case, connected with the Leeds Waterworks (Gill and the Corporation of Leeds), is one of a series of arbitrations rendered necessary by the compulsory taking of lands by the Corporation of Leeds for the formation of their several reservoirs in the valley of the Wharfe. In this case the lands taken were the property of Mr. Mathew Gill, of Blubberhouses, and are situated in the township of Foston, where the upper reservoir for the supply of water to the town of Leeds is about to be constructed. The two lower reservoirs, now partly made, are situated at Swinney, and the reference was to assess the amount due to Mr. Gill for 9*as.* 1*2d.* surveyor, Huddersfield, was umpire, and Mr. Newsam, of the firm of Newsam & Sons, surveyors, Leeds, and Mr. J. D. Martin (Martin & Fowler), Leeds, were arbitrators respectively for the claimant and the corporation. Mr. James Powell, land agent and surveyor, Harrogate, valued the compensation due to Mr. Gill for the lands taken and compulsory purchase at 1,821*l.* 1*s.* 1*d.* and Mr. John Haanam, surveyor and farm engineer, York, estimated the amount due for land at the same sum, but (including a mill-site and water-power, which he declared was available) the amount of compensation he fixed at 1,561*l.* 1*s.* Mr. Scott, land agent, Grantley, Ripon, valued the tenant's claims for land taken at 60*l.* 13*s.* 6*d.* Mr. Fenny, surveyor and engineer, Leeds, and Mr. Horsfall, surveyor, Halifax, estimated the compensation due to the claimant at 675*l.* 17*s.* 4*d.*, including the tenant's claims, as estimated by Mr. Wordsworth, valuer, Black Gate, Leeds. The umpire reserved his award.

PURCHASE OF MORE SITES FOR NEW SCHOOLS BY TILE SCHOOL-BOARD.

THE London School-Board, in addition to the several new schools which they have recently agreed to build, last week resolved to purchase, from the trustees, Ebenezer Chapel, in Shadwell, which covers an area of 9,660 square feet, for the purpose of erecting a new school for the Tower Hamlets division, to accommodate 1,000 children. The premises consist of a chapel, school-room, and two vestries, and the purchase money is 5,000*l.*

In the Greenwich division they have also agreed to provide further school accommodation, and for this purpose they have entered into arrangements for the purchase of a quarter of an acre of land situated in Brockley-road, Lower Sydenham, from Mr. Edward Saxton, of Cheap-side, for 300*l.*

In the sub-division of Hackney the Board have decided to provide school accommodation for 2,000 children, and have agreed upon the purchase, from Mr. Charles Southby Shaw, of Hackney, of 60,000 square feet of land in Clarendon-street, Bethnal-green, with four dwelling houses and a large three-storied warehouse. The lease has seventy-three years to run, with ground-rents amounting to 17*l.* per annum, and the ware-

houses can be adapted for school purposes immediately, to accommodate 900 children. The purchase money is 3,500*l.*

The Board have also agreed to purchase between 5,000 ft. and 9,000 ft. of freehold land in Hammond-square, Hoxton, subject to the assignment to the Board of the Hoxton Ragged School House. On this site they propose to erect a new school in addition to the present Ragged School.

ASSESSING TELEGRAPH WIRES.

PROCEEDINGS AGAINST THE POSTMASTER-GENERAL.

The Marylebone Vestry have resolved to take proceedings against the Postmaster-General for the recovery of the rate assessed on the telegraph wires in their parish, which amounts to 5,000*l.* The Government have offered to pay 20*l.*, which was the amount at which the wires were assessed when the purchase from the companies took place, although they altogether deny their liability on the ground that the telegraphs belong to the Crown, and that the Crown is not liable for rates. The position of the Vestry, on the other hand, is that the Crown is liable, the section of the telegraphs Act stating that the Government shall be liable to pay local and municipal rates on all property to be purchased by them after the passing of the Act, provided such rates shall not be in excess of those for which the property was properly assessable at the time of the purchase. The Vestry contend that the wires were not "properly" assessed at the time they were purchased by the Government, and counsel has advised proceedings, which will no doubt ultimately go to the Queen's Bench after being before the magistrates. At the meeting of the Vestry last week, when the proceedings were resolved upon, Alderman Sir David Salomons, M.P., stated that the Government repudiated all liability to pay rates upon property purchased by them, except such as the property was liable to at the time of the purchase. They refused to pay for any increased value, and this rate they had carried out with respect to the property they had purchased at Westminster and elsewhere.

THE STRENGTH OF BUILDING MATERIALS.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

Sir,—I shall be obliged by your allowing me to state in your columns that the discussion on Captain Seddon's paper "On the Strength of Building Materials," read at this Institute on the 22nd ult.,* was adjourned until Monday evening, the 27th inst., at eight o'clock.

In connexion with the subject of that paper, Mr. David Kirkaldy has kindly promised to throw open his "Testing and Experimenting Works," at the Grove, Southwark-street, S.E., for the inspection of members of the Institute, who will be admitted on presenting their cards between twelve and four p.m. on Saturday, the 25th inst.

CHARLES L. EASTLAKE, Sec.

REFORM OF THE METROPOLITAN BOARD OF WORKS.

An influential meeting of noblemen and gentlemen, ratepayers of the metropolis, has been held at No. 1, Carleton-house-terrace, to consider the present constitution of the Metropolitan Board of Works. Col. Tomline, M.P., who was called to the chair, urged the desirability of sending a deputation to Mr. Bruce to impress upon the Government the necessity for an improved audit of the accounts and a reconstitution of the Board, so as to make it a direct representation of the ratepayers. Mr. Shann suggested the expediency of treating the two questions separately.

Major Lyon moved that a deputation should wait on the Home Secretary, to ask him to bring in a Bill to give an appeal from the auditor's decisions.

The motion having been seconded by Lord Fitzroy, Mr. W. H. Smith, M.P., warned the meeting not to expect an early reform in the local government of the metropolis; it could only be effected by putting a pressure upon the Minister, and until that was done the question would remain shelved. Any proposal to give direct representation, which he should be glad

* At this meeting a report on Professional Charges was accepted, and will be submitted for discussion and approval at the approaching Conference.—E.D.

to see, would always be met with the excuse that the Home Office had in preparation a general measure of municipal reform for the whole metropolis.

Mr. Julian Goldamid, M.P., said nevertheless, if the Government made no sign, he should next session endeavour to get a Bill passed to transfer the election from the vestries to the ratepayers.

The motion was carried unanimously, but the meeting negatived a second proposal that the right hon. gentleman should have his attention called to direct representation, and be invited to take up that part of the question also.

At the request of Dr. Stallard, it was agreed to solicit the vestries to join in the deputation.

CONFERENCE OF ARCHITECTS.

A COMMITTEE to arrange the proceedings at the approaching conference has been appointed by the Institute, and at its first meeting, held on Tuesday last, did good work. As we do not yet know whether secrecy or publicity is to be the order of the day, we content ourselves with saying that the first meeting will probably be held on the evening of Monday, the 10th of June; other meetings on the 11th, 12th, and 13th; and that a dinner on Friday, the 14th, will close the proceedings, as on the last occasion.

GLAZED SURFACE.

STR,—I want to know a substitute for *glazed bricks* for lining walls, that can be had at a reasonable cost, glazed bricks being now very high in price, and exceedingly difficult to procure for immediate delivery.

Wall tiles are rarely true, and generally dear. Most of the cements for plastering seem too liable to chip under hard usage. What I want is a hard glazed surface, at a small cost.

AN ARCHITECT.

CHURCHES AND OTHER BUILDINGS STRUCK BY LIGHTNING.

LAST year we pointed attention to the fact that lightning was then more destructive than it had been since the year before the great earthquake. Various physical commotions of serious import have occurred since that,—such as the earthquakes in California and at Antioch, as well as in Upper Asia, in Australia, and in Iceland. The commotion of Vesuvius, too, has been notable; and still we find hurricanes, as at Zanzibar and Madras, and the lightning in this country, more destructive than usual. The parish church of Rainham, East Kent, has been struck, as also the parish church of Mashbury, Essex, which has been set on fire. The spire and belfry, which were of wood, soon succumbed to the flames, which, fanned by a strong wind, travelled eastward along the roof of the nave, feeding on the timbers between the plastering and the tiles. The fire was beaten back, so as to preserve the church. The roof of the nave is destroyed, and some of the fittings damaged by falling debris, the damage being estimated at about 200*l*. At Bampton the lightning has struck the spire of the parish church, where five iron clamps are fixed. The spire is about 180 ft. high. The force displaced ten courses of stonework on the northern side, or about 15 ft. It also split the spire on the south side. It apparently passed over the bells, destroying the wires connecting the chimes with the clock. It is supposed about 40 ft. will have to be rebuilt. Several trees in the neighbourhood were also struck. Houses at various places, as at Tamworth and at Deptford, have also been struck by lightning.

UTILISATION OF ST. PAUL'S.

STR,—I presume that the authorities of St. Paul's have now discovered that it is impossible to utilise the whole of the church at one service. Two Sundays ago we had the Lord Mayor and the Judges present. The sermon was preached from the pulpit under the dome, where the crowd of worshippers were. The Lord Mayor and the Judges occupied their usual seats in the choir. The seats beyond that occupied by the Lord Mayor were vacant. Whether he or the Judges could hear the sermon, separated as they were from the rest of the congregation, I very much doubt. It would be well if they could be asked the question. I sat midway between them and

the preacher, and distinct as Canon Liddon is in his intonation, and clear and audible as is his voice, I with difficulty could follow him, and frequently lost what he said. But it was painful to see the Lord Mayor and the other authorities of the City, with her Majesty's Judges, put out, as it were, in the cold,—thrust away into the choir, and separated from the rest of the congregation.

The great mistake of the day is "monster" everything. Man is but a pigmy being. His powers of speaking and of listening are limited. If there is no limit to man's power of speaking and listening, let our monster cathedral be built for the whole metropolis, and do away with all the churches. Some of the churches built not long ago prove the folly of such a vain attempt. Very large churches no ordinary voice can fill. Take, for instance, St. John's, Waterloo-road. The object of the architect lately called in there has been to curtail its dimensions, and bring all within the hearing of the preacher.

Mr. Street has advocated, and I think, rightly, that the choir at St. Paul's ought to be separated from the nave; in other words, that there should be two places of worship, one for the ordinary and another for the larger congregations. This cannot be done till the organ is brought back to its old place, or nearly so, and the choir screened off from the nave.

The distance of the altar-table from the congregation assembled under the dome, and the long avenue of nakedness between the one and the other, has a chilling and deterring effect. This is evidenced by the smallness of the number of the communicants. I assisted two or three Sundays ago, when we had only seven; last Sunday, I am told, there were only three. Nothing more need be said, to show that the attempt to utilise the whole of the church at one service is a mistake.

In conclusion, I beg to ask, for what purpose the several handsome presents of communion-plate have been made, if they are not to be placed on the altar?

JAMES LUPTON, St. Paul's Cathedral.

THE LITERARY FUND DINNER.

AT the recent dinner, so admirably presided over by H.M. the King of the Belgians, the numbers present were 433 gentlemen, and 340 ladies in the galleries; and the amount actually subscribed, including H.M. the Queen's annual donation, was over 3,100*l*., an amount, we believe, unexampled in the annals of the Society. The King's speeches [were excellent; Mr. Disraeli's perfect in its way; Lord Stanhope and Lord Houghton particularly happy; the music singularly good; in fact, every one concerned deserves praise except the proprietor of St. James's Hall, who gave a very unsatisfactory dinner, shamefully ill-served. We propose to speak seriously before long as to the present condition of London in respect of public dinners, and try if anything can be done to improve it.

CHURCH-BUILDING NEWS.

Leicester.—St. Mark's Church has been consecrated. The building of a church in the district at the lower end of Belgrave-gate formed part of the plan of the Church Extension Society; but Mr. and Miss Herrick took the whole responsibility upon themselves, and the church now erected on the north of Foundry-square is more extensive in plan, and ornate and elaborate in its details, than it would otherwise have been. The site is of irregular form, and the building and its adjuncts have been so designed as to take advantage of its peculiarities with the least possible sacrifice of space. The church consists of nave, chancel, north and south aisles, organ-chamber, and tower at the south-east corner. The nave is 81 ft. 6 in. wide, and 62 ft. long, and 53 ft. high to the ceiling; the chancel is of the same width and height, and 37 ft. 6 in. long, terminating in a semicircular apse. The north aisle is 14 ft. 6 in. wide, and, continuing past the north arch of the chancel, terminates also in an apse, the eastern portion being screened off for a vestry. The south aisle is in three compartments, with gabled roofs, each extending beyond the other to meet the sloping line of the boundary-line of the site; the western bay being 12 ft. 6 in. deep, and the eastern one 25 ft. deep. The lower, which is 25 ft. square, projects still further south, giving thereby, between it and the chancel, an organ-chamber, of ample dimensions, clear both of chancel and aisle, but open by arches to both. At the western end of the

church is a vestibule, fitting up to the boundary on that side, having a width of 14 ft. at the southern end, and diminishing to the width of the doorway at the northern termination. The vestibule, which is external to the main building, affords a screen to the three western doors, two of which are hung to open outwards, and is entered from a porch, with double external archway, and double doors next the vestibule, also opening outwards. This provision is made for escape, in case of any sudden alarm. The tower has both internal and external double doors, giving access to the eastern end of the south aisle. The nave is divided into three compartments by three stone arches on each side, supported on pillars having shafts of granite from the Shap Quarries, and foliated capitals and moulded bases of Ketton stone. It is lighted at the western end by a large window of five plain arched lights, the central one rising higher than those at the side. The north aisle is lighted, next the nave, by two windows, each of coupled plain lights, and one of three lights; and next the chancel by a lofty window of three lights. Each compartment of the south aisle has a large three-light window. The chancel has, on the north side, within a larger arch, a double arch, supported in the middle by coupled pillars of Shap granite. Through this arch light is admitted to the chancel from a large north window. Opposite to it is the organ-chamber, which is vaulted with brick, the arch next the chancel being, in the centre 35 ft. high. The apse is divided into seven compartments, by corbel shafts of marble, starting from the base of the north arcade, and supporting the main ribs of the roof on carved capitals of stone. Between these, in the uppermost stage, is a range of windows, each of a single traceried light, enriched by shafted angles as in the clearstory of the nave. These windows, which range with those of the nave clear-story, are filled with stained glass. Below the windows, the sills of which are 26 ft. above the floor of the nave, there is a series of seven large cusped arches, each 10 ft. high, designed for decorative enrichment. All the seats, both in nave and chancel, are of oak, and the prayer-desk and lectern are of the same material. In the chancel fittings some carving is introduced. The walls are built of slate-stone, of fine colour, obtained from Mr. Herrick's quarries, near Woodhouse, with quoins of the same material; but all dressings, windows, doorways, &c., are of Donkling stone. They are lined internally with red brick, intermixed with Donkling and Derbyshire stone. The roof is framed of fir, covered with Switthland slate. All the eaves, gutters, and upper pipes are of lead. The exterior of the church, excepting the apse and the upper portion of the tower, is of simple character throughout. The spire is wholly of Donkling stone, except tracery-hands of Derbyshire red stone. The bell-chamber windows are all open, the bells resting on a floor covered with lead within the tower. The height of the tower to the parapet is about 80 ft.; of the spire to the top of the finial, 168 ft. The tower contains a peal of eight bells. The seven windows of the apse have been filled with the following subjects, executed in painted glass by Messrs. Ward & Hughes, of London:—The Angel announcing the Nativity to the Shepherds; the Adoration by the Wise Men; the Baptism; the Crucifixion; the Angel at the Tomb; the Sea of Tiberias; and the Ascension. Beneath, in the three centre compartments, is a fresco of the Last Supper, executed by Mr. Allen. On the south side of the chancel is the organ-chamber, in which is placed an organ, by Messrs. Hill & Son, of London. The roof and other parts of the church have been decorated by Messrs. Heaton, Butler, & Payne, of Covent Garden. Those of the ceiling of the apse are subjects representing the canticle, "Benedicite omnia opera." The seats are of oak, and are calculated to accommodate nearly 700 persons. The lighting is effected by a line of gas-jets under the clearstory windows, similar to that in St. Paul's, and executed by Mr. Coleman, Cheapside. The architect was Mr. Ewan Christian, of London; and the whole work has been carried out by the builders, Messrs. Osborne, Brothers, under the clerk of the works, Mr. James Nichols, of London. The heating apparatus was got from Haden & Son, Trowbridge. The plumbing and glazing has been done by Mr. R. W. Widdowson; the altar-railing and ornamental gaswork has been supplied by Mr. Skidmore, of Meriden; and the musical peal of eight bells, by Messrs. Taylor, of Loughborough. The diameter across the mouth of the largest bell is 15½ in.

SCHOOL-BUILDING NEWS.

Haresfield.—The new national school has been opened. The building has been erected from designs furnished by Mr. J. D. T. Niblett, who is the donor, with the exception of 40*l.* granted by the Diocesan Association. The style of architecture is Gothic. The school-room is 42 ft. long by 16 ft. broad, part of the space being taken up by the class-room, which is 16 ft. in length. The roof is open-timbered, and composed of pitch pine. The exterior materials consist of red, white, and blue bricks, with stone dressings. The roof is slated with red and blue Broseley tiles. Beneath the bell-turret are the words, "Non semper alteri," with the figure of a hare, and the word "field" written above it. On the capstone of the porch the emblems of the three Christian graces (Faith, Hope, and Charity) are inscribed. Over the door inside the porch is a figure of a tortoise cut in stone, with the Latin inscription on either side and above *Per se vera Persevera*, *Per se vera*, and on either side of the porch are passages from Holy Writ. The buildings, outbuildings, and playground occupy over half an acre. The builder is Mr. A. Bridgman, of Painswick, who has lately completed several extensive buildings on the squire's estate.

Long Sutton.—A new school is being built at Long Sutton, near Langport, in order to meet the requirements of the Education Act, without electing a School Board. The Duke of Devonshire gives the land, and is a liberal subscriber to the funds. The farmers do the hauling free.

Siddall.—A new school is about to be built, by Messrs. John Holdsworth & Co., on a site a little to the southward of the temporary iron church, at Siddall. The working drawings are being prepared. The schools will accommodate some 820 children, and are arranged to form three sides of a quadrangle. The central portion is allotted to the girls, and the wings to the boys and infants, with distinct entrances, lobbies, lavatories, and class-rooms. Open fireplaces are put in each room, and in addition to these a heating apparatus is intended to be put up. Ventilation has been attended to. Owing to the steep gradient of the site, that portion which would otherwise have been useless ground is converted into covered play-rooms. This has apparently been taken advantage of by Mr. Swindon Barber, the architect, for making the elevation, which commands the valley, of the most importance. The arcade under the boys' and girls' schools, with intervening buttresses, combined with the grouping of the circular turreted staircase in one corner of the quadrangle, are features which are said to suit the situation chosen for the building. Messrs. Holdsworth intend to build another and smaller school at Salterhebble, a site for which has already been purchased. Considerable outlay will be required also in this instance, in building a retaining-wall and levelling up the ground for building purposes.

Rowledge (Surrey).—The school just erected to meet the requirements of the newly-constituted and improving district of St. James's, Rowledge, has been opened. The building will accommodate 126 children, providing for a population of 250 persons within the civil parish of Farnham, as well as for sections of the old parishes of Binsted and Frensham. It is built from designs by Mr. Wannacott, by Mr. A. Shrubb, builder, Rowledge.

Sherborne.—The memorial stone of a new Sunday School, in connexion with the Wesleyan Chapel in this town, has been laid with considerable ceremony. The plans were supplied by Mr. Lauder, architect, Barnstaple. The contract for the building was taken at 1,419*l.* The site for the new school, &c., joins the chapel premises in a triangular form to a depth of 64 ft., and has a frontage of 90 ft. in the Abbey-road. The buildings are to comprise a school-room, 58 ft. long by 41 ft. wide; a board-room (for district and other meetings), 27 ft. by 20 ft.; two class-rooms, 18 ft. by 15 ft.; a library-recess, 14 ft. by 7 ft.; and separate yards and offices for boys and girls. Arcaded porches on each side are to form entrances to the large room from the Abbey-road, and porches will also be provided from the chapel premises, to give convenient access from the series of class-rooms into which the present school-room beneath the chapel is to be altered. The school-room is to be 32 ft. high to the ceiling, and will be lighted by four-light lancet windows in each gable, and six twin lancet lights on both sides, springing from double-moulded strings running round the room, with encaustic tile bands 8 ft. from the floor. The ceiling is to be boarded and fitted (octagonal sided), divided into

panels by the top chamfered roof timbers; and a pierced cornice will run round the room, the springing of the ceiling. Ventilation is to be secured by section-troughs and fans above the ceiling, and fresh-air inlets in the ground-floor. The latter will also be connected with the apparatus in the basement for warming the buildings. All the walls are to be luted with dado, 3 ft. 6 in. from the floor. The board-room is also to be lofty, and will be entered from the chapel side, while the entrance to the class-rooms will be from the school. The elevations are to be in local stone masonry, with Ham-hill dressings. The main features of the frontage will be the large four-light window, with blind arcading underneath, and the arcaded entrances on each side, with ornamental iron gates. The style of the building is to be Early English or First-pointed Gothic. The treatment will be simple. The work is to be carried out by Mr. T. Farrell, builder and surveyor, Sherborne, from plans prepared by Mr. Alexander Lauder, architect, Barnstaple, who is at present engaged on several metropolitan buildings, and whose designs have been adopted for various buildings in the neighbourhood, amongst which are the Wesleyan Chapel at Yeovil and the Chapel and Schools at Milborne Port.

North Shields.—The new schools, in connexion with Christ Church, North Shields, have been formally opened. The site adjoins the parish church-yard on the east, and was given by the Duke of Northumberland. It comprises an area of three-quarters of an acre. The north end is reserved as a site for a teachers' house. The buildings are arranged so as to face on to a new street running northwards from the Tyne-mouth-road (which is at present included in the playground of the schools). In plan the group forms a cross. The centre limb is the infant school, and measures 54 ft. by 25 ft. internally, and 19 ft. high to the ceiling. On each side of this are the entrance lobbies, giving access on the south side to the boys' school, and on the north, to the girls' and infants' schools. The boys' and girls' schools are 52'4 ft. by 20 ft. internally, and 18 ft. high, with class-rooms, 18 ft. by 15 ft. projecting from the east front. Accommodation is thus provided for 470 children. The materials employed are red bricks, and for arches bands of black bricks, with stone mullion and other dressings to the windows, &c. The walls are built hollow, as a security against damp. Internally the part below the windows is faced with glazed fire-bricks, the remainder being plastered. The woodwork of the principals of the roofs is visible internally. The windows are glazed with Hartley's quarry glass, and each of the side windows has a metal casement, for ventilation. All the woodwork is simply varnished. In the infant school are two large galleries. The contract for the entire building was let to Mr. R. Bolton for 2,065*l.* Mr. F. R. N. Haswell, of North Shields, is the architect.

Bristol.—The corner-stone of the new Schools in the parish of St. Simon, Baptist Mills, has been laid by the Mayor of Bristol (Mr. W. Proctor Baker). The building is situated in the rear of the church. It will comprise a girls' schoolroom, 60 ft. by 21 ft.; a girls' class-room, 21 ft. by 16 ft.; an infants' schoolroom, 60 ft. by 27 ft.; and an infants' class-room, 22 ft. by 20 ft. The structure is to be of brick, with free-stone dressings. The style will be unpretending. The roof is to be tiled, and the rooms will be lighted with a number of circular-headed double and treble windows. The main entrance will face towards Claremont-street and Pennywell-road. A piece of ground contiguous to that upon which the school is being built has been reserved for a mistress's residence. The building is being erected by Mr. J. P. Stephens, from designs by Messrs. Medland & Son, architects, Gloucester. It is intended to accommodate 250 infants, and 200 girls. The contract price is 1,244*l.*, and the site has cost 460*l.*

Hoby (Leicestershire).—The new school here has been opened, and is now in daily use. The building, which is Gothic in character, is of red brick and white stone dressings, and comprises two rooms, which are capable of being thrown into one, and forming a large room for parish meetings. There are ante-rooms, with lavatories and out-offices. Both school-rooms have open-timbered roofs, and the walls inside are of pressed brick, painted. The schools are warmed by open fire-places, and are well ventilated. The work has been well carried out by Mr. Whail, builder, of Frisby, under the superintendence of Mr. R. W. Johnson, architect, of Melton Mowbray and Ketter-

FROM SCOTLAND.

The Scott Monument at Edinburgh.—The committee of subscribers have ordered sixteen statues for the niches in the monument from the sculptors formerly selected, who have agreed to furnish them, executed in a satisfactory manner, for 50*l.* each, the committee furnishing the stone and fixing the figures in their places. The following is the arrangement:—The statues of Jeanie Deans, Laird o' Dumbiedykes, Amy Robsart, and Leicester, by William Brodie, R.S.A.; Flora M'Ivor, Baron Bradwardine, Glee Maiden, and Hal-o-the-Wynd, by John Hutchison, R.S.A.; Rebecca and Friar Tuck, by Clark Stanton A.R.S.A.; Magnus Troil and Minna, or Brenda, by Mrs. D. O. Hill; Queen Mary and Halbert Glendinning, by D. W. Stevenson; and Diana Vernon and Balfie Nicol Jarvie, by Mr. G. A. Lawson. Thirty statues are required to complete the monument, which, at 60*l.* each, including stone and facing, amounts to 1,800*l.*

Renfrew.—The new municipal buildings of Renfrew are making progress in their construction. The style of architecture is a combination of the French Gothic with the old Scotch Baronial. In addition to the council chambers, there will be superintendent's and witness' rooms, the town-clerk's public and private rooms, with police-office, cells, and a public hall capable of accommodating upwards of 800 people, besides ante-rooms and retiring-rooms for ladies and gentlemen. There will be a town clock with four dials, each 7 ft. in diameter, and a balcony, which may be adapted for hustings. The tower in connexion with the buildings will be upwards of 100 ft. in height.

Elgin.—New Roman Catholic Schools here have been opened. They are built on the east side of the chapel, and are composed of two distinct and separate apartments, with different entrances, the front one being from Institution-road, and the back one from Abbey-street. The front is in a line with the gable of the chapel, and the architecture is in keeping with that of the church. There is a large room in front, and another stretching backwards for nearly 40 ft., giving ample accommodation to upwards of 150 children. The whole internal arrangement has been carried out on the most modern and approved principles, and with an eye to economy, in placing and fixing the desks and other furniture. The total cost, including enclosing walls, gates, and railings, is about 500*l.* Mr. Melvin, of Elgin, was the architect. The contractors were:—Messrs. J. Young, mason; W. Hay, carpenter; Bain & Morrison, slaters; D. Simpson, plasterer; J. Gordon, plumber; and J. Kintrea, glazier; and for railing and gates, J. Ramsay, Fifehead.

Glasgow.—A new church is now finished, and was lately opened, at Whiteinch, near Glasgow, for the accommodation of families in connexion with the Church of Scotland, in that rapidly-rising locality. The building, which is in the Pointed or Gothic style of architecture, contains in the area 555 sittings; and when the galleries are added it will accommodate 800 seat-holders. The roof is open-timbered, stained and varnished; and coloured ornamentation has been sparingly introduced. Externally, the front is of an ornamental character, the side walls are divided by single-light windows and massive buttresses, and behind there is a circular window; the keystones of all the windows and the main doorway are carved with incised work, which is to be filled in with chocolate-coloured cement. The gable is surmounted by a bell-turret and spire, terminating with a metal cross. The angles are square pinnacled buttresses, terminating with iron finials. The architect was Mr. G. W. O'Donoghue, of Glasgow and London.

Arbroath.—The parish church of St. Vigan, near Arbroath, has just undergone a process of restoration, and been re-opened for public worship. The edifice is one of the earliest in Scotland still in use in public worship. It is known among antiquaries by its sculptured stones, supposed to be of a sepulchral character, and the latest date assigned to which is the end of the tenth or the beginning of the eleventh century. The church is believed to have existed long anterior to that date. The Bishop of Brechin, in his recently-published work on the Scottish saints, has identified St. Vigan with St. Fechin of Folbar, in Ireland, who died A.D. 664. The sepulchral monuments belonging to it are unusually numerous, and prove it to have been a religious site of the first importance in the district. During the progress of the works connected with the recent restoration,

stones with finely-executed mouldings of the finest Norman were recovered from a fifteenth-century wall, in which they had been used as rubble. Numerous ancient crosses and other stones were discovered.

Books Received.

Atchley & Co's Timber Merchant's Guide. By W. RICHARDSON, Timber Broker. London: Sprigg, Atchley, & Co., Great Russell-street. On the faith, of course, that its numerous tables are accurate, this is a very useful volume for building contractors, surveyors, builders, and all other trades connected with building. It contains valuable tables for all purposes connected with the trade; marks of wood; essay on the strength of timber; and remarks on the growth of timber.

Miscellanea.

The Pinsky Prebend Estate.—In the House of Commons on the 2nd inst., Sir T. Adland stood up to defend the dealings of the Ecclesiastical Commissioners of the Pinsky Prebend Estate; or, rather, to deny emphatically the truth and justice of the allegations which had been made concerning them. Under these circumstances, says the *Times*, we thought it desirable to ascertain the condition of the estate by actual inspection, and the result has been to confirm at all points the correctness of the Medical Officer's report. A few filthy and dilapidated hovels, although now closed and condemned, are still standing to bear silent testimony to the kind of habitations which the Commissioners have allowed to exist since they came into possession more than four years ago. . . .

Vib regard to new buildings, they are precisely such as Dr. Sutton has described. Not of any extraordinary height, they are placed so near each other that the intervening roadway becomes mere alley, and this alley is often serpentine in winding, or it has no direct outlet, so that its air remains unchanged. The buildings themselves are often workshops. They are built back to back, with no possibility of ventilation. Many shops are completed and occupied; others are in course of construction. In many cases were so placed as to occasion an insufferable nuisance; for the removal of which the sanitary authorities have been compelled to intervene. Upon the whole it seems plain that the Ecclesiastical Commissioners have done nothing which was not strictly within their rights, but they have failed to show either the intelligence or the public spirit which might be fairly expected from trustees for the public.

Tramway Car Windows.—In the Court of Common Pleas, Miss Wesley, sister of Dr. Wesley, the organist at Gloucester Cathedral, sought an action against the North London Tramway Company, to recover compensation for an injury received in one of their cars. The plaintiff had opened up a window, and had placed her hand upon the ledge, when the window fell, and hurt one of the fingers of her right hand, thereby seriously interfering with her profession as a teacher of music. The company contended that the accident was attributable to the plaintiff's negligence, but the jury awarded her 100*l.* damages. The windows in question, the writer thinks happens to know, are dangerous traps for fingers. They lift up instead of being pushed down, in opening, and are intended to be caught by a spring, but are often so stiff that they cannot be lifted high enough, and down they come of a sudden upon a too convenient ledge of hands or fingers. The cars have plenty of ventilation above and at the end: why not fix these trap windows (twenty in every car) altogether, and so end all danger and all squabbles to them. Selfish persons, for their own exclusive detection, open them, at the risk of rheumatic headaches to six or eight other persons, so often thus get colds without knowing how, on the continual strong draught which the vance of the car pours upon their heads and shoulders, through these open windows.

Works in the International Exhibition. A sideboard in the International Exhibition mentioned in our first notice (p. 339, ante) as being from the design of Mr. Tarver, was manufactured and exhibited by Messrs. Morant, Boyd, Blanford, of New Bond-street. It is an excellent piece of workmanship.

Turning on the Water at Kidderminster. The memorial stone of the engine-house of the Kidderminster waterworks has been laid, and the water temporarily turned on to test the works. The whole of the works when completed will cost the ratpayers something short of 1*l.* per head. There are 24,000 inhabitants, and the total cost of the works will not amount to more than 20,000*l.* Mr. Fairbank is the engineer, and Mr. Hilton the contractor. The reservoir is 200 ft. square by 12 ft. deep, and is estimated to hold 3,000,000 gallons of water. It was erected by Mr. Hilton, under the personal superintendence of his manager, Mr. Vale. Since then, Mr. Vale has become partner, and the new engine and boiler-house will be erected by the new firm. The engine-house, when erected, will be 90 ft. by 50 ft., and will be of the best red brick, with red and blue dressings. The chimney will be of white brick, and will cost in all 1,280*l.* The engine and boiler will be supplied by Messrs. Clayton & Co., of Preston. The well is now completed, and is in depth 150 ft., and its diameter is 8 ft. in the clear.

Kensington Church.—On the 14th the new parish church of St. Mary Abbots, Kensington, was formally consecrated by the Bishop of London, in the presence of a large number of the metropolitan clergy and laity. It is Geometric in style, and has been built under the hands of Mr. G. Gilbert Scott. It consists of a nave and chancel, each with side aisles, and, in addition, there are a second aisle to the chancel on the north side, and two transept-like projections from the aisles, north and south, thus increasing the width of the building towards the east end, where the tower and spire will eventually rise on the north side of the east window. It will accommodate about 1,600 or 1,700 persons, all on the ground floor, and it has no galleries. The seats are low and open, the pews having been abolished, and a certain portion of the seats is free. The cost of the building thus far may be set down as standing at about 24,000*l.*, towards which a considerable amount is still wanting. A view of the exterior and plan of this fine Church will be found in an earlier volume of the *Builder*.

Kent House Estate, Rutland-gate.—With reference to a paragraph in our last, mentioning the sale of part of this estate in the Kensington-road for the erection of residences, Mr. Sang wishes it made clear that a considerable portion of it still remains for sale. It will give some idea of the rise that has taken place of late years in the value of land in this neighbourhood when we mention that for a front plot of 5,580 superficial feet, the price asked is 18,000*l.* Lady Ashburton gave this amount for a similar plot to Mr. Mitchell Henry, M.P., the then proprietor. Another front plot, situated between Lady Ashburton's and the first mentioned, and containing 5,619 superficial feet, is priced at 17,000*l.*

The Stratford-on-Avon Museum.—A book-case made of old oak timber, found in Shakspeare's House, and carved by Mr. John Marshall, has been placed in the upper room of the Stratford Museum, where it is ready to receive the valuable collection of Shakspearian books, comprising about 300 volumes, liberally presented by Mr. Halliwell-Phillips. This collection has arrived at the birthplace, and is temporarily deposited in the Record-room, but it will shortly be arranged in the book-case. A main feature in it consists in voluminous unpublished annotations on the text of Shakspeare, illustrated by many thousand cuttings from old black-letter books, as well as by numerous early engravings. The collection will not be thrown absolutely open to the public during the lifetime of the donor, but permission to consult it for special objects will be freely granted.

Street Watering.—The Westminster District Board has accepted the tender of Messrs. Braby & Son for supplying four water-carts with springs, and fitted with their improved distributor pipes, which enable the flow of water to be adapted to the width of the streets and to the varying degree of moisture of the road, at the sum of 28*l.* each.

Position of Public Lamps.—The Westminster District Board of Works have declined to undertake the lighting of sixteen new lamps which have been erected in front of the Albert Mansions in Victoria-street in lieu of the ordinary lamps, considering that the proper position for public lamps in such a thoroughfare is the edge of the kerb.

Land Sale, Bristol.—Last week the Hampton Court estate was offered in lots, and realised satisfactory prices. Lot 1, a piece of freehold pasture land, near the Ashton Vale Iron Works, containing 1 a. 2 r. 2 p., was sold for 185*l.* Lot 2, a close of freehold pasture land, containing 1 a. 2 r. 2 p., was bought at 290*l.* Lot 3, a similar close of land, containing 2 a. 2 r. 4 p., was sold for 390*l.* Lot 4, another close of pasture land, containing 4 a. 0 r. 20 p., was knocked down for 900*l.* Lots 5 and 6, two closes of arable grazing land, containing together 10 a. 2 r. 18 p., were sold for 935*l.* Lots 7 and 8, two plots of building land, having frontage in West-street and Back-lane, Bedminster, containing 3 r. 10 p., were sold to Mr. H. B. O'Donoghue for 1,000*l.* Lots 11, 12, 13, and 14, other plots of building land, containing together 1 a. 2 r. 39 p., were sold to Mr. H. B. O'Donoghue, for 1,450*l.*

The New Market Buildings in the City. The extensive new premises, consisting chiefly of large suites of offices, which have just been erected in Mark-lane and Mincing-lane, and now fast becoming occupied, have been named Market-buildings. The new premises form a prominent feature in the neighbourhood. The Mark-lane elevation is built of red brick, with stone facings around the spacious windows in the elevation, the ground-floor being of stone, with Tuscan pillars. The Mincing-lane elevation is much in the same style of architecture as Mark-lane, but differs in appearance from the latter in so far as white bricks have been used instead of red.

The Right Thing must be Done the Right Way.—A short time ago a clerk in the Admiralty, named Roffery, submitted to the Admiralty some suggestions as to iron ship-building. Though it is admitted that these suggestions were of a valuable character, Mr. Roffery has been suspended for twenty-one days, he having offended official dignity by writing direct to the Admiralty, instead of forwarding his communication through the head of his department, Captain Chamberlain. Nelson, if we remember rightly, was once reprimanded, after winning a battle, because he had fought it against orders. It cannot be helped. Authority must be maintained.

Harbours at Jersey.—The foundation-stones of two new harbours were laid on the north side of the island of Jersey last week, the one being at Bonne Nuit, and the other at Grève-de-Leucq, both of which places are extensive fishing stations, which hitherto have been without the least shelter for the numerous craft that frequent them. In addition to the primary object of its construction it is intended to utilise the harbour at Grève-de-Leucq for the shipment of the Mont Mado granite, which is found in that part of the island.

Llynvi, Tondy, and Osmore Coal and Iron Company, Limited.—This company has been formed for the purpose of acquiring three properties, in South Wales, now in active operation, which together will form one of the most extensive coal and iron works in the kingdom. The capital of the company will be 550,000*l.*, partly in 7,000 shares of 50*l.* each, making 350,000*l.*, and the remainder taken by the vendors.

Explosion of Dynamite.—An alarming explosion has taken place on Durdham Down, Clifton, where some railway works are in progress. About 4 lb. of dynamite in a chest exploded. Fifty men were in a shed, about twenty yards from the chest, when it occurred, and the explosion broke innumerable windows in the neighbourhood, and was heard in the remotest parts of Clifton; but no one was injured, though many men were blown off their seats.

Dinner to Workmen at Leicester.—The completion of St. Mark's Church has been celebrated by a dinner given to the workmen by Mr. W. P. Herrick, at whose expense the church has been erected. The dinner took place at the George Hotel. After the cloth had been drawn the Rev. Canon Burfield was elected to the chair, and was supported by Mr. A. Ellis, Mr. Osborne, Mr. Nichol (clerk of the works), Mr. Walter Lindley (foreman), J. Cox, J. Onehy, and several others connected with the firm.

Cottage Hospital Movement.—It is proposed to erect a cottage hospital at Chippenham, to promote which an industrial meeting has just been held, when appropriate resolutions were passed, and a committee appointed to promote the object in view.

A Skeleton in Every House.—*Fun says.*—"Our excellent contemporary the *Builder* contains an advertisement which, compared with sensational tales as a rule, may be described as several stories high.—"Two skeletons in Hampshire, 20 miles beyond Southampton, are required to be immediately completed." At first, we were inclined to think that the services of an able anatomist were required by some modern Frankenstein; but our own residence—we live in a modern villa—soon reminded us of the fact that unfinished houses are often spoken of as skeletons, and that many of them retain their claim to that title even after they are supposed to be finished, for the wind blows through them as if they were mere bony structures."

The Congregational Memorial Hall.—The Memorial Hall, of which we gave a view in our last, came into existence from a desire expressed in many quarters to celebrate the 29th of August, 1862, when more than 2,000 ministers of the Church of England were ejected from their charges because they could not conscientiously subscribe to the Act of Uniformity. Other objects were contemplated, and a fund of 250,000*l.* was raised. In the first instance a site was found in New Earl-street. Ultimately the site was disposed of to the Metropolitan District Railway, and the present site, a part of that of the old Fleet Prison, was procured, to the extent of 9,000 ft., for the freehold of which 28,000*l.* were paid.

Raffaello's Cartoons.—With a view to preserve accurate copies of the cartoons of Raffaello, the Lords of the Committee of Council on Education, acting through a committee, propose to select nine artists to make preliminary studies of given parts of three of the cartoons. Artists will first be required to complete an accurate copy either in water-colours, tempera, or oil, of a photograph, full size, of a head selected from the Beautiful Gate. These will be sent in to the Secretary of the Science and Art Department by the 31st of July, 1872. From the candidates so competing, nine may be selected to make accurate coloured copies from the cartoons themselves of portions set out by the committee as a final test.

Report on Works in the City.—The usual Report, for 1871, of Mr. William Haywood, Engineer and Surveyor to the City Sewers Commission, has been issued in a printed form. In respect to the proposed widening of the public way on the western side of St. Paul's Churchyard, it states, the negotiations had not materially advanced at the end of the year. The inhabitants on the lines raised objections, and so did the Cathedral authorities on behalf of those going to the cathedral, and the matter at the end of last year remained at that stage. The experiments with asphalt paving were being continued; wood paving was also again in hand in an improved form.

The Idiot Asylum at Knowle.—The foundation stone of the Midland Counties Middle-class Idiot Asylum has been laid at Knowle, a village midway between Birmingham and Warwick. The ceremonial took place with full Masonic honours. The asylum, when finished, will cost 20,000*l.*, but a portion only will now be erected, affording accommodation for twenty patients of each sex. Lord Leigh, in laying the foundation stone, used the identical mallet with which Charles II. laid the foundation stone of St. Paul's Cathedral.

The Protection of Children under the Factory Act.—At Chorley, Mr. J. Quin, a manufacturer of india-rubber, has been summoned by the Government Inspector for a breach of the Factory Act. A youth named Salisbury had been engaged in the mill, and on the 23rd and 24th of April he worked thirty-two hours "at a stretch," without cessation, except at meal-times. At the end of the thirty-two hours the lad fell amongst the machinery and was killed, and it was believed that the accident was due to exhaustion. Mr. Quin was fined 10*l.* and costs. We wonder he was not tried for manslaughter.

Casbel Rock.—A Bill to vest the Rock of Casbel in trustees, for the purposes of the restoration of the cathedral and the preservation of the historical ruins, is now before Parliament. The Duke of Norfolk, Archbishop of Casbel, Marquess of Clanricarde, Earls of Denhig, Fingall, Granard, Kenmare, and Limerick, Viscount Southwell, and other men of note, are among the proposed trustees.

The Losses at Chicago.—The "Fire Marshal" of Chicago reports the aggregate losses by the great fire to have been upwards of 190,000,000 dollars, there being 51,500,000 dollars on buildings, and the remainder on personal property. The fire, he states, burned over 2,000 acres, destroying 25,000 buildings. The amount of insurance was about 90,000,000 dollars.

The Public Park Movement at Ashton.—The committee organised for the purpose of procuring a public park at Ashton-under-Lyne, have within the past week purchased the Highfield estate for 2,000*l.* On receipt of the money Mr. H. T. Darnton returned 500*l.* as his subscription.

Rust's Vitrifed Marble.—In our "Notes at the International Exhibition" (p. 357, ante), we mentioned the "Head of Daniel" in mosaic, from a design by Mr. Stephens. We are asked to add, and do so willingly, that this work is exhibited and executed by Mr. Jesse Rust (in his patent vitrifed marble material).

Society of Arts' Conversazione.—The Society's Conversazione is fixed to take place at the South Kensington Museum, on Wednesday, the 19th June.

TENDERS

For the erection of new printing and publishing offices for the *Surrey Advertiser*, Market-street, Guildford. Mr. Henry Peak, architect:—

Mason	2628 0 0
Stradwick	620 0 0
Garrett	375 0 0
Pollard & Son	544 3 0
Loe	538 0 0
Burkett	437 0 0
Swayne & Sons (accepted)	424 10 0

For taking out wood front and fixing a stone lower front, for Messrs. J. Hoole & Co., 36, Aldermanbury. Mr. W. Lambert, architect:—

Bostel (accepted)	2203 0 0
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For finishing two villas, at St. Margaret's, Isleworth (without fences), for Mr. Fisher, Mr. W. C. Bank, architect:—

Hatton	21,438 0 0
Newton	1,144 0 0
Walton & Son	1,065 0 0
Ware	975 0 0
Ellis	950 0 0
Blackmore & Morley	825 3 11
Lyons	923 0 0
Hulbtle & Co.	825 0 0

For drainage, kerbing, channelling, and other works connected with the repair of Victoria-road, Park-road, and Church-road, in the manor of Aston. Mr. W. Batten, surveyor:—

Jones	59,312 15 0
Fitzmaurice	8,932 0 0
Reed & Balfour	8,275 3 11
Palmer & Lee (accepted)	8,011 5 0

For new parsonage in the Holland-road, Kensington, for the Rev. G. Booker. Mr. T. Lawrie, architect:—

Adams (accepted)	1,550 0 0
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For the erection of a warehouse, Smart's-buildings, Holborn, for Mr. J. P. Sherry. Mr. W. Hudson, architect:—

Jennings	21,307 0 0
Newman & Mann	1,324 0 0
Morland & Son	1,265 0 0
Hell & Son	1,240 0 0
King & Son	1,183 0 0
Sewell & Son	1,187 0 0
Wicks & Bangs	1,182 0 0
Drowse & Robinson	1,124 0 0

For the erection of schools for the Port of Hull Society, in connexion with the Sailors' Orphan Home, Park-street, Hull. Mr. W. Botterill, architect. Quantities not supplied:—

Musgrave & Son	22,730 0 0
Marshall	2,768 16 0
Stanley	2,769 0 0
Lison & Wilkinson	2,753 19 0
Habbershaw	2,732 0 0
Clarkson	2,695 0 0
Sergeant	2,684 0 0
Jackson	2,684 0 0
Hockney & Leggins (accepted)	2,677 0 0

For the alteration and enlargement of Eastells House, Hull. Mr. W. Botterill, architect. Quantities not supplied:—

Morrell	21,163 0 0
Habbershaw	3,824 0 0
Musgrave & Son	3,300 0 0
Marshall	3,641 12 0
Clarkson	3,610 0 0
Hutchinson & Son (accepted)	3,599 0 0

For the erection of two pairs of labourers' cottages at Broughton, Bucks, for Mr. Leyton Louwides. Messrs. Brown & Faulkes, architects:—

Durley	2,705 0 0
Mayne	650 0 0
Honour	550 0 0
Smith & Fincher	659 10 0
Senior (accepted)	559 0 0

For the erection of a factory, with engine-house and chimney-shaft, at the corner of Bowling-green-lane, Farningdon-road, for Messrs. Orrin & Geer. Mr. W. S. Witherington, architect. Quantities by Messrs. Lindsay & Giddard:—

Carcase.		With Fittings.
Little	25,237 0 0	25,237 0 0
Rider	4,459 0 0	4,798 0 0
Williams & Son	4,450 0 0	4,785 0 0
Henshaw & Co.	4,257 0 0	4,351 0 0
Edson & Chapman	4,111 0 0	4,462 0 0
Sabey & Son	4,069 0 0	4,437 0 0
Perry & Co.	4,100 0 0	4,436 0 0
Palmer & Son	4,100 0 0	4,400 0 0
Brown & Robinson	3,932 0 0	4,323 0 0
Elkington	3,800 0 0	4,066 0 0

For alterations at 56, Manchester-street, Manchester square. Mr. W. S. Witherington, architect:—

Knapp	489 6 11
Torrey	465 0 0
Little	495 0 0

For Camberland Infirmary, near Carlisle:—

Mason's, &c. Work.	
Hatton & Bell	23,422 0 0
Nilson & Co.	3,161 4 8
Milbar	2,348 2 6
Armstrong	2,795 0 0

Carpenter and Joiner's Work.

Court	1,383 3 9
Black	379 3 6
Armstrong	1,343 0 0

Plumber's Work.

Hills	457 0 0
Lowthian	450 16 2
Thompson & Son	410 15 0

Slater's Work.

Irving	141 13 0
Norson	149 10 0
Nanson	138 0 0
Graham & Co.	122 12 0

Painter and Glazier's Work.

Wenard	275 0 0
Westray	243 7 6
Canning	278 10 0
Slee & Morgan	218 10 6
Scott	215 14 0
Hill	213 10 0

Glazier's Work only.

Johnson	137 2 6
Waller	150 10 0
Ormerod	95 0 0
Johnston, Bros.	83 5 0

For the Works.

Bell	162 10 0
Lees & Graham	82 9 2
Clark	79 15 0

For the Works.

Armstrong	5,350 1 0
Milburn	5,219 0 0
Without.	5,056 11 0
Without.	5,051 7 6

For photographic studio, Southsea. Messrs. Dancett & Inkipp, architects:—

Lascelles	2,550 0 0
Cunning & Edmunds	540 0 0
Hovvitt & Co.	459 3 6

For the erection of refreshment-room, near the Steam boat-pier, Battersea Park, for Mr. Alexander Biechli Mr. S. J. Medman, architect. Quantities not supplied:—

Baker	290 0 0
Lathey, Bros. (accepted)	290 0 0

For additions to 102, High-street, Peckham. Mr. Dinwiddy, architect. Quantities supplied:—

Fenn	2,953 0 0
Wiles	797 0 0
Nightingale	787 0 0
Hunt & Son	717 0 0

For additions and decorations, Halkin-street, Grosvenor place. Mr. Dinwiddy, architect:—

Balmeil & Son	2,663 0 0
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For villa residence for Mr. G. Fox. Mr. Norton, architect:—

Hesse	23,443 0 0
Waguet	3,180 0 0
Stephenson	3,173 0 0
Lovell	3,100 0 0
Aitchison & Walker	3,080 0 0
Moore & Grainger	2,980 0 0
Hughesdon	2,975 0 0
Grover	2,975 0 0
Clarke	2,965 0 0
Gooding	2,915 0 0
Johnson	2,745 0 0
Crook & Wall	2,700 0 0
Wright, Brothers	2,675 0 0

TO CORRESPONDENTS.

T. W. (should have given reasons. The mere observation is of no value).—W. B. C. apply to the secretary, who will supply the proper form.—Archibald S. (restored too late).—E. P. J. (you are in charge for them).—T. L. S. & Co.—W. F.—A. W. Y.—R. F. H. J. A. & C. H. E. L.—W. W. T. O. J. N. F. E.—Med. T.—E. N. J. L. P. S.—W. S. W.—G. W. F.—E. J. T.—C. C. N.—J. G. & Son.—J. R.—L. E.—W. T. D.—D. C. D.—A. F.—J. D.—W. & J. E. J. L. T.—W. A.

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

Note.—The responsibility of signed articles, and papers read at public meetings, rests of course with the author.

Bath and other Building Stones of Best Quality.—RANDELL, SAUNDERS, & CO. Limited, Quaymen and Stone Merchants. List of Prices at the Quarries and Depôts, also Cost of Transit to any part of the United Kingdom furnished on application to Bath Stone Office, Corsham, Wilts.—[ADVT.]

Ashton & Green, Slate and Slab Merchants and Quay Agents.—Shippers, Merchants, and Contractors furnished with Price-lists of every description of ROOFING and MANUFACTURED SLATE, Railway-rates, &c. Agents for London and Country for the Sale of the celebrated WHITLAND ABBEY GREEN SLATES. Drawings and Prices of A. & G.'s RED RIDGE TILES, specially prepared for use with these Slates, on application.—Offices and Show-rooms, 14 and 15, Bury-street, St. Mary Axe, London, E.C.—[ADVT.]

Turret Clocks.—Mr. Streeter, 37, Conduit-street, London, W., Manufacturer of Turret Clocks (with gravity or dead-beat escapement) for Churches and Public Buildings. Estimates and plans on application. Price.—Village clocks, from 15*l.*; church clocks, from 40*l.* The wheel-work throughout these clocks is of best hard brass or gun-metal. No iron wheels used. Timkepping and durability guaranteed. Wholesale Entrance.—Burlington Steam Works [ADVT.]

FOR ILLUMINATORS, CHURCH ORNAMENTAL ALPHABETS, ANCIENT and Medieval, from the Eighth Century. By F. DELMOTTE. Seventh Edition, 50 plates, printed in colours, oblong royal 8vo. cloth, 4s. (postage 6d.) Also, the same Author, MEDIEVAL ALPHABETS and INITIALS. Third Edition, 25 plates, printed in gold and colours, small 4to. cloth, 6s. (postage 6d.) Also, the same Author, EXAMPLES OF MODERN ALPHABETS, Plain and Ornamental. Fourth Edition, 45 plates, printed in colours, oblong royal 8vo. cloth, 7s. (postage 6d.) A PRIMER OF THE ART OF ILLUMINATION; with numerous Examples, printed in gold and colours, small 4to. cloth, 4s. (postage 6d.) THE EMBROIDERER'S BOOK OF DESIGN: containing Initials, Cyphers, Ornamental Borders, Emblems, Ecclesiastical Devices, Monograms, Alphabetical Devices and Originals, National Emblems, &c. 10 colours, oblong royal 8vo. cloth, 6d. (postage 3d.) London: LOCKWOOD & CO. 7, Stinkard's Hall-court, E.C.

PERFECTION IN BOOKKEEPING.—Builders and others desiring a really good system, can have a SET OF BOOKS FOR BUILDERS BOOKS, BY DOUBLE ENTRY, to which was awarded the prize offered in "The Builder," No. 1186, and which has been adopted by many large firms. Also a modified Arrangement by Single Entry, suitable for small Builders.—Address, A. S. George's-road, Regent's Park, London.

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WANTED, by an experienced FOREMAN of MASONRY, a JOB in London or vicinity...

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The Builder.

VOL. XXX.—No. 1529.

*On the Origin of
the Element of Grandeur in
the Antique.*

THE actual conditions of life among the ancient Greeks directly tended, as we have attempted to show,* to produce that breadth and grandeur of character of which both the art and the literature of Greece give the faithful reflection. It is no less important to



investigate those details of physiognomical treatment, both of the face and of the form, which concur to produce the unrivalled beauty we speak of.

A critical analysis of the physiognomical characteristics of antique sculpture enables us at once to point out the main difference between the outline of the Grecian face and form, and the general contours both of the most civilised nations of Europe, at the present day, and of savage or even animal tribes.

If we describe, on the profile view of any face a circle, of which the centre is in the orifice of the ear, and the radius equal to half the height of the head, or, more accurately regarded, to one-sixteenth part of the whole height of the figure when standing erect, the radii of this circle will furnish apt means of comparative measurement.

In the negro profile, the circle thus described intersects the outline of the face at the brow. The bridge of the nose falls within the circle; but the lower part of the face projects enormously before it, the lower lip advancing beyond the arc by one-fourth part of the length of the radius. The longest diameter of the head is that which is taken at thirty degrees from the horizontal, or from the chin to the occiput. The same proportions, in a somewhat exaggerated form, prevail in the anthropoid apes; the chief difference being in the greater depression of the upper part of the nose in these animals.

A well-proportioned modern European profile approaches much nearer to a circular form than does that of the negro, although the centre of the limiting circle does not coincide with the metric centre in the orifice of the ear. If we cut out in paper a circle of the radius previously given, and fit it to the profiles of which we are speaking, we shall find that, in the negro, the skull proper is depressed and flattened, so as to come within the circular outline, while the entire lower part of the face, from the root of the wings of the nose to the angle of the jaw, appears without the disc. In the modern European head, the coincidence of the skull with the circle is approximately close, and the projection of the lower part of the face much less than in the African. But in the Greek head, the skull is compressed instead of depressed; the anterior and posterior

parts of the outline come within the limiting circle with which the upper part of the skull coincides, and only the extremity of the nose, and the chin, from the upper lip to the juncture with the neck, project beyond it. The diameters of the profile, taken at different angles through the ear, differ but little from each other. The longest radial line is that which is drawn to the upper part of the forehead, at sixty degrees from the horizontal. This is a seventh part longer than the radial height to the brow, which again exceeds that drawn to the outline of the nose. In the modern European head, the two latter radii nearly coincide, and are but little shorter than the distance from the ear to the top of the forehead. These details may be summed up by saying, that in the negro profile the mouth and jaws form the most conspicuous part; in the modern European profile the nose, eyes, and brow; and in the Greek the forehead, which thus casts a deep shadow over the cavity of the eyes.

The physiognomical interpretation of these great distinctive traits appears to be this. In the negro tribes the animal passions are so conspicuously developed, as to form, it may be said, the key to the character. In the modern European head, observation of the material world, and disposition to the energy of individual action, are indicated. In the Greek, we find reflection, imagination, and a superiority of the moral and intellectual development over that of either the passionate or the industrial and accumulative propensities. If we compare the doctrines of Plato with those of Adam Smith, we shall find a pregnant illustration of the truth of this comparison.

Such being the general character of the Greek head, the several types representing the different gods, heroes, and chief subjects of the sculptor's art, composed so many distinct varieties of the same general theme. In dealing with this branch of the subject, it is evident that the great Greek sculptors were bound by exact and well-considered laws. The physiognomical indications of certain ideal impersonations were arrived at by careful study, and, no doubt, by careful induction from observation. Once attained, the type became fixed. The Greek sculptors were not in the habit of producing in an undraped figure the copy of any casual model, and then indifferently naming it an Eve, a Venus, or Musidora. The vague lawlessness of modern sculpture was, happily, unknown in Greece. A definite idea, and, for the most part, a grand and beautiful idea, was embodied in every statue. The greatest sculptors wrought as men who had seen the gods. So brief was the period in which the sculptor's art arose, attained its zenith, and commenced its decadence, that it seems probable that adequate study may hereafter enable us to determine, with extreme precision, the date of all the most famous relics discovered, or to be discovered. The work of the sixth century before our era, as illustrated by the metopes of Selinus, and the Apollo of Tegea, was rude, rigid, and recalled very strongly the Egyptian type. By the middle or latter third of the fifth century B.C., sculpture had attained its utmost grandeur. The works of Phidias, in 432, and of Polykletus, some ten years later, comprise the most famous productions of the Greek chisel, and probably the most noble human works yet produced. The former sculptor, in addition to the grandeur of his conceptions, and the magnificent breadth of his style, possessed, in perfection, that scientific instinct of the sculptor which enabled him so to introduce into his work the equivalent of that which in drawing is called fore-shortening, as to adapt each statue to the position and point of view for which it was intended. In this religious period of the art, that which we may call chancel sculpture appears to have been little known, as far as least as full-sized works in the round are concerned. The story of the contention between Phidias and

Alcamenes, the work of the former receiving the chief applause of all when seen in the studio, but presenting no approach to the excellence of that of Phidias when erected in the place it was destined to occupy, is confirmed, in its main truth, by a seated figure from the pediment of the Parthenon now in the British Museum. The thighs of that grand statue,—thought with justice to personify one of the Fates,—are altogether out of truth if regarded from the level of the eye. It would have been well for some of the persons who have been so perplexed by the attempt to design a seated figure for the Hyde Park monument that should be other than atrocious, to study this great lesson left by the Athenian sculptor. Of Polykletus we have the tradition, not only of the grandeur of his work, but of the exact and exquisite geometric proportions of his canon of the form.

It is possible that the pathognomic expression of the face was carried to the highest pitch of excellence somewhat later than the age of Phidias. The Cupid discovered at Lo Cento Celsi, and now in the Vatican, is probably the most beautiful relic in the world, and there can be little doubt that it is a genuine copy of the famous Cupid of Praxiteles. The name of Enphranor is given by Pliny as that of a sculptor who gave greater proportionate size to the head and limbs than to the trunk. Something of this treatment may be traced in the Juno of Melos. With Lysippus, the contemporary of Alexander the Great, the very opposite style of variation was attempted, the head being made smaller than the canonical proportion. Of the influence of this school, the Venus de' Medici affords the most striking example.

During this grand and unrivalled age of art, while the modifications at which we have hinted were in course of development, the great characteristic that the sculptor worked by law, and not by chance or caprice, was absolute. We may detect the hand of a Roman copyist of a Greek statue as much by the slovenly inaccuracy of his proportions as by the less sculptural feeling thrown into the finish of the work. Such we lately noticed in the statue of a Greek handing a fillet round his head, recently purchased by the British Museum. In the Greek work, certain exact proportions are to be remarked. The various types of figure had each a normal law. The foot was the modulus of girth, and the proportion of the length of the foot to the height of the figure was thus the key to the character of the latter. Thus we find in the Venus de' Medici that the length of the foot is exactly the seventh part of the height of the statue, when reduced to the erect posture. In the Juno of Melos, again, the foot is very nearly 5.32nds of the height. But in each statue the girth of the waist is exactly three times the length of the foot. In the former, the girth of the shoulders and of the loins, which are less easy to determine in the latter, are each exactly four times that length.

From the detection of so unsuspected an exactitude, which has so long mutely testified to the possession by the Greek sculptors of geometric laws, and of physiognomical rules, now altogether lost or ignored, may be drawn an inference of a character yet more important than any discovery of a merely artistic character. The philosophy of Greece, its mathematics, physics, metaphysics, rhetoric, poetics, politics, were all not only wrought to system, and taught by sophists and philosophers, but were reduced, at least in outline, to writing. It is not too much to say that almost the entire outline of Western philosophy is based upon the works of Aristotle. But of the art of Greece no such record exists. Nor is it likely that the rules of art were ever thus placed within the grasp of the profane. This silence is not peculiar to Greece. It prevailed universally, almost to our own time. When, as in the more stable

* See p. 237, ante.

empires of old, occupations were hereditary, the value and the sanctity of the oral tradition of art may be readily comprehended. As the circle of innovation extended, and as the artist became able to adopt pupils, or to instruct strangers in the art, the mystery of each craft was not less rigidly guarded. In cases where written instructions, apart from example and actual training, are to a great extent in operation, secrecy can not be practised. We thus see how, among a highly-cultivated people, the functions of historic teaching were divided from those of oral tradition. Each had its appropriate province. Each has ever retained it. To fix the site of a battle, the name of a king, the authorship of an unsigned book, oral tradition has proved itself to be altogether trustworthy. Events can only be entrusted to the recording muse of history,—to the pen or to the chisel. On the other hand, any attempt thus to stereotype the living learning of art must fail. One of the few Medæval treatises of the kind that we possess, that of Pico della Mirandola, "Majolica," is already almost unintelligible, though written with the evident purpose of instruction. With the fall of the liberty or the autonomy of a country will perish not only its art, but the traditions of its art. It is only while the oral legacy is handed down, in the studio, at the forge, and at the bench, that art lives.

One of the most striking peculiarities of the sculpture of the purest Greek art is that of the pose of the figure, especially the inclination of the head. The contrast between heroic representation and Roman iconography is here most marked. The subject should be regarded not only from the pictorial or sculptural point of view, but as a physiognomical indication of no little value. We must not be induced, from distaste towards those dogmas of phrenology which are not only unproved, but, in the opinion of most persons competent to judge, opposed to physiological science, to overlook the great importance of the contributions which Gall and his disciples have made to the study of positive and of comparative physiognomy. No writer, with the brilliant exception of Camper, has done so much to elucidate this important branch of art, of philosophy, and of ethnology, as have several disciples of this school. The large collections of busts, including those of remarkable criminals, that have been made by phrenological students, have a value that has not yet been fully realised. No indication of this class has been more pregnant than those which regard what has been unfortunately termed the natural language of the organs of the head. All accurate observation, whether of man or of beast, proves the certitude with which emotion or thought is translated into visible expression by attitude. The position of the head is the most striking detail of the general pose. The habitual carriage denotes the ordinary habit of thought; the momentary pose, the ruling emotion of the moment. The stealthy crouch of the cat when about to spring, the timid glance of the hare, the broad gaze of the stag, the depressed ears of the horse when meditating mischief, are unmistakable. Scarcely less so are the steady, open gaze of the honest man; the sly, reverted glance of the coward; the sideway toss of the head of the vain person; the lofty bearing of the proud. In each of these, and in numerous other instances, the actual angle at which the head is borne on the neck is one of the most distinctive elements of pathognomical expression. In exterior nature, as in the mind itself, habit is formed by repetition of similar acts. The proud man or the courageous man, while more liable than the servile or the timid to the excitement of the respective emotion, and to its concurrent momentary expression, is likely to acquire a bearing habitually expressive of that tendency. There is not only a psychological, but a mechanical, mode of regarding this part of physiognomy. The position of the head, when at rest, is, as we have said, characteristic. It is also determined, to a great degree, by actual form. The projecting jaw and correspondingly elongated occiput of the Negroid races determine an habitual position of the head that throws the face towards the sky. The contrary form of massive forehead and rounded chin produces the opposite bearing, that downcast glance which artists have agreed with poets to call pensive. Camper, who first in modern times laid the compasses to the profile, has called attention to the question of form. But he has not sufficiently regarded the concurrent question of pose. In some of his diagrams he has attributed to the former what is actually due to the latter. He has given an

angle as anatomical, while it is, really, only habitual. For in the profiles which he draws to illustrate the facial angle of 100°, which he attributes to Jupiter and similar heads, it will be seen that the radial lines do not start from the orifice of the ear. The artist must be more readily guided by pose, than by form, independent of pose. The former strikes the eye at once, the latter requires investigation of a minute, or even of an anatomical, character. It is, therefore, with a double-truth that the pensive pose common to Greek heads reflects the grandeur of the Greek character. Achilles, nursing his wrath in his tent, listening with repressed longing to the distant din of war; Ariadne, and Andromeda, deserted and downcast; Jupiter, sitting silent while Thetis embraces his knees, and pleads for her son,—are impersonations wholly Greek. They are faithfully represented by Greek sculpture. Both the character and the plastic embodiment are foreign to modern life. We might as well expect to see Aristotle take the leadership of the House of Commons, or an endeavour to recall or to embody the ideas of the epic and tragic poets, or the epic and tragic artists, of Greece. Here is another element of antique grandeur.

What may be the future development of the personal beauty, of the intellectual vigour, or of the moral grandeur, of any branch of the human family, is a question for the elucidation of which data are altogether wanting. We can only speak of what is, and of what has been the case; and we decline speculation as to what may be in store. As matter of history there seems good reason for the opinion that races of men, like their predecessors in the animal kingdom, have passed through the phases of infancy, maturity, and decline; race replacing race, but no declining people ever regaining their earlier vigour. In what quarter to look for the hope of the present age it is not easy to say. Marks of decline meet us almost everywhere. In the most martial and most cultured of European nations the very general use of spectacles betrays an enfeebling of the reflective nervous system. In France stature has been reduced by many inches, in consequence of the wars of the first empire and other causes; nor is it the physical man alone that shows marks of extreme degradation of type. In Italy very wide-spread disease saps the brilliant beauty which yet lingers in certain narrowly-limited districts. In England, the prosperity of dentists, and other symptoms easy to indicate, tell of anything but a vigorous vitality, especially in the young. In Australia the English race has bloomed into a new and delicate beauty; but it is as fragile as it is attractive. In America, the hard, pained, drawn, expression of the native Red Indian tribes has been communicated, without intermixture of blood, to the descendants of the European immigrants. Of the one ancient race, which, in its own Syrian country, still possesses some relics of its former beauty, the European representations do not give any very hopeful promise. No human beauty is historically more famous than that of the royal and sacerdotal lines of Judah, of Benjamin, and of Aaron; but the prohibition of iconography, which formed part of the ancient law, and which is reflected by that of Islam, has left us altogether without the means of forming any adequate idea of that wonderful grace that was equally admired in the East and in the West, that was found fairest among the women of Persia, and that made Herod the Great tremble lest Mark Antony should behold the children of Antigonus.

On this view of the case, it follows that the great period of Greece was one of the culminating epochs of race, and that in the most beautiful race of which we have any graphic record. It is beside the mark to contend that in this or that detail we ourselves, or any other nation, are or are not immeasurably superior to Homer's heroes. Let it be so, or not, it does not interfere with the truth of the determination, that in the relics of the works of the great Greek artists, from Phidias to Praxiteles, we have the reflection of the highest human beauty, expressive of the utmost grandeur of human character, that iconographic history denotes as hitherto attained by any family of mankind.

Subsidence of Turnmill-street.—Mr. Clutton, the arbitrator appointed by the Board of Trade to inquire into the cause of the subsidence of Turnmill-street, which has formed the subject of a dispute between the Clerkenwell Vestry and the Metropolitan Railway Company, has mulcted the latter in 1,600*l.* damages.

A NEW HOSPITAL IN LIVERPOOL.

ON Tuesday last a new hospital on a large scale, which has been in course of erection between three and four years, and which has involved an expenditure of more than 30,000*l.*, was formally opened by Prince Arthur during his visit to Liverpool this week. The proceedings were of a highly interesting character, about a thousand invited guests being present. The foundation-stone of the building, which is situated at the south end of the town, in the immediate vicinity of the line of docks, was laid between four and five years ago by the late Earl of Derby. It is called the "New Southern Hospital," and its erection has been rendered necessary in consequence of the existing hospital having been found altogether inadequate to the requirements of the district. Before the opening of the building an address was presented to the Prince by Mr. G. H. Horsfall, the president of the hospital committee, after which he was conducted through four of the principal wards, upon each of which he bestowed a name, and then declared the hospital open. The address presented to his Royal Highness on the occasion was in illuminated vellum, enclosed in a silver casket, and bore the following inscription:—"Presented to H.R.H. Prince Arthur, on the occasion of his Opening the New Southern Hospital, May 21st, 1872."

The building, including airing-yards, occupies a piece of land, in the form of a parallelogram, 300 ft. by 80 ft., and has what may be termed four frontages, being bounded by Caryl-street on the west, Grafton-street on the east, Hill-street on the south, and Cameron-street on the north. The plan of the building is arranged on the "pavilion" system. The administrative buildings occupy the frontage to Caryl-street, with the principal entrance in the centre, and the pavilions (or wards) occupy the frontages to Hill and Cameron streets, leaving a space between the administrative block and the wards free for ventilation, and the distance between the pavilions of 100 ft., which is open to Grafton-street, and used for airing-yards. The general disposition and isolation of the building is best seen on the first floor, on which story the hospital proper may be said to commence, the spaces between the blocks on the ground story being filled up with one-story buildings, except the spaces left for areas and airing-yards. The building is of a simple Gothic character of architecture. It is constructed of grey brick, with stone sills and strings, the horizontal lines being marked with blue brick in bands. The entrance-porch is of stone, with a deeply recessed and moulded arch, having the tympanum left for sculpture. A certain form of ornament has been expended on this doorway, the carvings being composed of foliage designed from plants such as the poppy, and others having medicinal virtues. The gable is intended to be finished with the figure of an angel, and the tympanum with a bas-relief representing the parable of the Good Samaritan. The roofs form a good feature in the design, the ends of each ward having two towers each, and the centres also show high-pitched roofs, all finished with wrought-iron cresting and finials; and it is worthy of note that the roofs are not merely ornamental, but eminently useful, and important parts of the hospital. The administrative block is only two stories high in the centre, and three at the ends, so as to cause as little obstruction to a free current of air between the ward blocks as possible. It comprises on the ground floor a large entrance-hall, to the right and left of which are placed the medical and general board-rooms. Behind these a corridor runs parallel to the street, from which are entered, on the right, the senior and junior house-surgeons' sitting-rooms, and on the left, the house dining-room, and matron's sitting-room. The patients' entrance is at the south end of this corridor. On the first and second floors of the administrative block are the surgeons', students', matron's, and nurses' bed-rooms and bath-room, as well as several patients' wards.

The hospital accommodation provides about 200 beds, and consists of accident wards on the ground-floor, and three tiers of wards for twelve beds, and two for twenty-six beds in each pavilion, besides many smaller wards for special cases and private wards in the administrative building. The wards and beds are spacious, and attached to each ward adjoining the staircase, are nurses' sitting-rooms and sculleries, food lifts being provided from and to each scullery, and foul-linen shoots on each landing

to receptacle below on the ground-floor. On the ground-floor, on the east of the corridor between the ward blocks, are placed the *post mortem*, dead-house, dispensary, and laboratory, the access and exit from dead-house and *post mortem* rooms being so arranged as to be quite private. In the centre of the corridor to the east, on the first-floor, is the chapel, and to the west the operating theatre. The patients' food is prepared in the serving-room, in which there is a hot table, and from this the trays are supplied, and sent to each floor of the wards by "lifts." A hydraulic "lift" for patients from the ground-floor to each floor of the wards is also provided.

The architects for the building are Messrs. Culshaw & Summers, of Liverpool; the chief contractor being Mr. George Rowe, also of Liverpool.

MORE NOTES AT THE ACADEMY.

WANDERING through the eastern and less frequented quarters of the Academy galleries, the visitor comes with a sense of sudden refreshment upon the three pictures by Mr. Boughton, hung in a row in gallery VII.: "Spring-time," the "Flight of the Birds," and the "Coming of Winter" (579, 580, 581). This artist, pretty well known already by his pictures of English figures and manners of the period "when the first George was king," is one who has struck out a path of his own, wherein the present contributions show a marked advance, both in feeling and breadth of execution. These are of that type of work of which, in a quite different manner, Mr. Walker furnishes examples, wherein the feeling of landscape and figure is blended so that the one seems inseparable from the other in its effect on the mind. "Spring-time" shows as a single youthful figure in a nearly white dress, flowers opening in the grass at her feet, and in the middle distance a grove of trees with the early foliage beautifully indicated; the figure is charming in its fresh and simple grace. The companion picture, of the same type, is not less good in its way; but the larger one, the "Flight of the Birds," is still better. A wild moorland, a cold grey bit of sea on the left, two figures in the centre of the composition, one seated and the other standing, gazing with varied expressions of melancholy at the scene—these are the elements of a picture which is full of suggestive poetry, beyond its general excellence as a painting. Mr. Boughton has not struck so deep a tone before; we shall look with interest for his future works.

M. Alma-Tadema is another of the artists with a specialty, who travelled out of his usual path last year, and has acknowledged a comparative failure by returning to it in this year's Exhibition. He, at least, has lost none of the powers which gained him his reputation; and his Egyptian interior, "Komar, Period" (524), with a mourning party watching around the mummy, is as fine and highly-finished in its architectural detail and surface, and reflected light, as any of his earlier works; the large tropical plants, showing as a back-ground through the architecture, give a peculiar tone and richness, by contrast, to the warmer tints of the marbles, and a distinctive character to the composition. Among pictures showing a strong individuality in the treatment of a well-worn subject, is Mr. B. Rivière's "Daniel," standing with his back to the spectator, in the den, with a group of lions crouching before him with various attitudes and expressions of baffled rage and blood-thirstiness. As in his "Circus and Swine," last year, the figure is a comparative failure; the animals form the picture; the long bony form of the crouching lioness on the left is admirable. Of Mr. Watts's large picture of the "Curse of Cain," we could better speak if it were finished. We do not think either the subject or the treatment very happy, nor, so far as we can at present judge, the colour; there is some learned drawing in it. Among the few foreign pictures hung are one or two clever ones in the same room as the last-mentioned work; "Escadron de l'Armée de la Loire," by G. Reguany, is a clever thing, with a grim and certainly not patriotic humour in it; a row of extemporé cavalry soldiers in motley garbs, and mounted on scarecrow-looking horses standing with their backs to the spectator. M. Tissot has two pictures in his well-known peculiar light scale of colour, "An Interesting Story" (389), and "Les Adieux" (614); the latter, a tender leave-taking of two young people through an iron gate, is most successful; the face of the

young girl is charming in sentiment and execution. Among other figure-pictures of sufficient interest and originality to challenge remark, may be mentioned F. Goodall's "Bedouin Mother and Child," lighted by the "after glow" (of course: how tired we are getting of that expression!); Miss Edwards's "Goodbye" (651); "A Moorland Road in Brittany" (311), by Mr. J. Knight, a set of figures straggling up a road through a mist of heavy rain, very clever and suggestive; "Age and Infancy" (373), by T. Israels, a powerfully-painted old man and child, well worth looking at; and "Woman's Work" (1,089), a fine, impressive, though exceedingly simple picture, by Mr. J. D. Watson, of two (Breton?) women in the centre of a dark fat moor, laboriously piling up straw to cover some heaps of potatoes. We pass over sundry well-painted pictures, of Spanish subjects, by Mr. Burgess, an artist who is so far to be regarded, we fear, as an example of the fact that clever, careful, painstaking work will not in itself avail to give interest to pictures, unless the artist has something of his own mind, his own individuality, to give to them likewise. The one painting by Mr. Burgess, which has left its mark on our memory, is his single life-size figure, called "Hyacinthe," exhibited the year before last: cannot be put some of the same feeling and individuality into his more ambitious works, and render them something more than mere groups of figures in Spanish costumes?

"What is the object of landscape painting?" is a question to be suggested by the two paintings with which Mr. Millais has followed up his last year's *début* in this branch of his art. The crowds which the painter's good name draws around these are not discriminating on this point. "It is a landscape by Millais, and we must look at it," is about the extent of the criticism in most of these groups. If the object is merely an accurate transcript of nature, and nothing more, the success of one, at least, of these pictures, "Flowing to the River," and "Flowing to the Sea" (56 and 71), is complete. In the former the swirl of the swollen brook, the look of the drugged and straggling underwood, the damp from recent rain on the yellow leaves of the tree in the foreground, are given as well as any painting could give them, and with no look of labour or over-finish. The other picture is less striking in detail. In giving the trees on the further bank, the artist shows something of the same manner of painting the foliage in large, broad masses, with scarcely any attempt at breaking it up into "leafage," which some of the French landscape-painters have carried to perfection in middle-distance trees. Yet do we opine that these pictures do not quite fulfil what we really want from landscape art, or sniply what we shall yet get from Mr. Millais; that, while such successful reproduction of nature is both a difficult and a valuable achievement, it is valuable as a means rather than an end; and that the real end of landscape-painting is to create a sentiment, to speak to our feelings through the medium of pictorial representation. It may be said that a realistic representation gives us the same feeling as the scene in nature would impart. We doubt it in any case, because absolute realism is impossible, not to mention that the great element of motion does not exist in a painting.

Two landscapes by Mr. Raven, "A Hampshire Homestead" (84), and "The Monk's Walk" (657), are praiseworthy because they convey to us the poetry and the sentiment of nature rather than the material facts. In Mr. MacWhirter's "Isle of Skye" (248), an impression is sought as much in the choice of subject as in the manner of setting it forth; if the artist depended entirely on his powers in the latter capacity, his pictures would take a lower place in public interest than they do. With a taste for grand natural subjects, he has acquired a capacity for treating them with an accordant force of style which tells powerfully; but an artist with such a subject as this, the mere elements of which are so impressive, has an immense advantage over one who, like Mr. Raven, aims at rendering simpler and quieter subjects impressive: in the former case the individuality lies in the scene, in the latter it resides in the artist alone. This picture, however, is a fine specimen of Mr. MacWhirter's powers; it is worth noting how much, we might almost say how completely, the real power of the composition results from the introduction of the black angular mass of crag which juts up near the foreground, and forms the salient point in the painting. Mr. Vicat Cole, in his fine view

over an expanse of forest, "Noon" (110), has fortunately dropped that use of brilliant sunlight effect from one side of the painting which was degenerating into a receipt, and gave his pictures somewhat too much the look of a finely-conceived scenic effect; yet it may be doubted whether this picture can be regarded as entirely free from sensational treatment: there is a straining after an exaggerated effect of hot sunlight in the contrast between the golden lights and the strong blue of the shadows in the middle distance: every painter's eye will see hue in such shadows under such circumstances; but it never can be in nature so nakedly apparent as it is shown to be here. The artist's other quiet and less pretentious picture, "Dewy Eve" (550), though less generally admired at present, has, we think, more of the qualities which give permanent value to a painting. Mr. J. C. Hook is in great force this year; to comment on his four paintings would occupy too much space here, but we point to the best of them, "As Jolly as a Sand-boy" (390), not only as a capital example of this artist's powers, but as a notable illustration of doctrines advanced in our columns as to the necessity of "conventionalism" in painting, as well as in other arts. Mr. Hook's treatment of sea and sand is in reality conventional; but how? In this way, that no attempt is made for a moment to cheat the eyes of the spectator by minute imitation of texture; the water is not realistically like water, nor the sand like sand, but what he gives us is,—all that painting can fully and completely give,—the tone, the air-tint, the peculiar "run" of the sea, without any attempt at minutiae which cannot adequately be given in painting: the representation is really a conventional one, but through this conventionalism he achieves what is in fact the best and purest naturalism which painting of this class can arrive at. Mr. Peter Graham's "Cradle of the Sea-bird" impresses one at first sight as one of the greatest things its author has yet produced: an immense rocky precipice rising perpendicularly from the sea to the right of the painting, and going off in sharp perspective from the foreground; a second study suggests the doubt whether this is equal to some of the painter's former less startling productions; and here, too, there is not a *souçon* of the scene, painter's art in the composition and arrangement at least. There are some fine sea-pieces by Mr. Brett, about whose merits and defects of style there is likely to be for some time a division of opinion, to result, we anticipate (if the painter is true to himself), in universal acknowledgment of his remarkable ability. One other landscape, by a veteran artist, Mr. J. Linnell, compels attention from the very powerful effect of the sunlight which has been aimed,—"The Ford" (661). We cannot think this a success: the colour is true and fine, but the "light" element is wanting; it is palpably pigments, and not light.

Mr. Millais's figure-subjects are entirely confined this year to portraits, one at least of which has by this time been more written about, looked at, and discussed, than is the case with most portraits in these degenerate days. The painter seems determined to show how he can be, in manner of execution as well as in choice of subjects, the very reverse of the young artist who won his fame by a very different order of paintings. Those who thought at the time that the so-called pre-Raphaelite school was, in its most marked features, but a temporary aberration or exaggeration, may fairly accept the practical testimony of one of its original leaders to the same view. Whether in his present leanings towards full, free, and "thick" execution, this remarkable and admirable painter has not given up some of the qualities, in execution at least, which make the value of a painting (as a painting) may be questioned; distinction of texture, for instance, is less marked in the portraits of the Misses Armstrong than one could wish to see it in a picture so largely filled with stuffs and other accessories. The different characters of the three sisters are capriciously contrasted and discriminated, and the flesh tints, especially in the figure on the left, are a splendid success in the most delicate problem of colouring. In his other portraits, as in landscapes, Mr. Millais acts us thinking,—what is a portrait for? That of Sir James Paget (554) is one of the most purely realistic representations (and one of the most successful, as such) ever shown; viewed as a composition, exception would be at once taken to the unbroken expanse of lecture-board which fills the larger part of the canvass and

forms the background to the figure. The painter has aimed here at putting the able surgeon and surgical lecturer before his friends exactly as they have been accustomed to see him in the lecture-room, without any attempt at producing, either by costume, pose, composition, or colour, anything more of a picture than the real scene of his every-day work afforded. The portrait of the Marquis of Westminster (567) is very much in contrast to this, and is in fact almost more noticeable for its fine and unusual tone and harmony of colour than as a characteristic likeness. The first work would be valued chiefly by those who know the subject, and wish for a memorial of him; the second would be valued as a picture by those who did not know even whom it represents. On the whole, is not the latter principle the best on which to make portraits,—to make them pictures as well as portraits? We should have thought the question could never have admitted of one answer had not Mr. Millais in the *Page's* portrait so boldly and ably challenged admiration for pure realism. The question involved is, whether we are to make the representation of an individual the first object, or whether we are to use him or her, so to speak, as an opportunity and excuse for an impressive pictorial composition; whether, in short, humanity or art is to be the greater. Perhaps it will depend a good deal on the idiosyncrasies of the subject of the painting. Mr. Watts gives a very charming example of the poetic and idealised portrait in his likeness of Miss Dalrymple (215), sitting, in a green robe, by the side of a brook; but is there not here rather too obvious an attempt at effect, almost bordering on the theatrical? Mr. Watts is one of those artists upon whom benedictions should be showered, for that he has done much towards rescuing portrait-painting from the hopelessly tame compartments into which it had sunk with us, and which still form the majority in the Academy and elsewhere. But he has achieved the union of portraiture with high art, in other works, in a way not quite so ostentatious as this (if we may be pardoned the term). To blend the ideal with the real, to let the artistic fire shine through the verisimilitude of the sitter, as if it were a necessary part of the conception and inseparable from it,—that is the triumph of portrait-painting; a triumph which the artist referred to has achieved elsewhere, but not quite here. The "portrait" is merged in the "picture." This cannot be said of the portrait of "R. H. W. Dunlop, Esq." (266). Mr. Watts has been fortunate in his subject here, and has given us a remarkably good delineation of a striking and, in every sense, strongly marked physiognomy, which required little more than successful and bold realistic treatment to make a picture. The arrangement of the light, however, so as to bring out the subject in the most effective manner, is truly artistic. There are also the same artist's portraits of Mr. Prinsep and Mr. Calderon (the painters have taken to portraying one another of late), and Mr. Calderon in turn has painted Mr. Marks. Mr. Calderon's "Mrs. Cazale" (610), a full-length small-sized portrait, is the most powerfully painted work which the artist exhibits this year: the lady is represented standing by the fireplace in an interior, in a gown of mainly a strong deep-red tint; the effect is unusual, but scarcely pleasing. These, with one by Mr. J. P. Knight, are the noteworthy portraits of the year: and there is Mr. Sant's "Mrs. Haldane Chimney" (264), in a black dress and carrying a basket; painted with all the artist's usual good taste and refinement, but not in the whole his best portrait; the difficulty of the mass of black dress in a life-size portrait has not been quite got over. A characteristic and pretty child portrait is that of "Mauille. A. B., Petite-fille de l'Artiste," by M. Gallait (908); the little lady, about three or four years old apparently, stands, with one hand in the pocket of her pelisse, in an amusingly self-possessed and important attitude. Mr. Goodall's portrait of the "Right Hon. Sir T. McNeill" (545) is a successful painting of a fine, thoughtful, characteristic head; and many besides the readers of this journal will find interest also in the likeness "T. L. Donaldson, Esq., Past-President of the Institute of Architects" (584); a very good likeness by Mr. Charles Martin. The same painter has a striking portrait of "J. R. Planché, Esq., Somerset Herald," which is less successful as a likeness in the lower part of the face than the upper, where it is excellent.

On the whole, portraiture is well represented

this year, the proportion of portraits which are really interesting being greater than for two or three past years of the Academy Exhibition.

GOSSIP FROM PARIS.

THE *Exposition des Beau-Arts* opened on Friday, May 10th, to the public, with upwards of 2,000 works in painting, drawing, and sculpture; these being the selection made by the "jury" from the 5,400 sent in. The labours of the aforesaid jury must have been enormous; but all visitors to the *salon*, excepting the disappointed artists, will thank them for having so far diminished the feast they place before the public; for, rich as it is, it needs must satiate when in such excess of the powers of human nature to appropriate.

The Exhibition is very good indeed, as regards the works of art themselves: many of them are first-rate, and very few could well be spared; the building containing them, the *Palais des Beaux-Arts*, the shell of this rich nut, is not so worthy of commendation.

After two days spent therein, the impression left on my mind is, that it is inconveniently arranged, ill-cleaned, meanly decorated, badly lighted, and awfully draughty. I remember having felt exactly the same towards the French galleries in the great International Exhibition at Paris in 1867. To be sure, this said Friday was the wettest day of a wet week; but why have blinds that cannot be removed in dull weather? In a little conversation I had with the guardian of one of the rooms I remarked upon the bad lighting, and his reply was immensely characteristic of his nation: "Oh, no! it is the weather that is so bad." "Yes," said I; "but what a pity to have blinds that cannot be drawn back on a dull day." "No,—it is not the fault of the blinds," he insisted, "it is entirely the fault of the weather." "Any one or anything but yourself for the scapegoat," thought I; and as I remembered the ease and rapidity with which the glass ceilings of our English picture-galleries have their linen blinds drawn across them or removed as shade or sunshine necessitates, I felt that this was yet another example in which "they" do not "manago those things better in France."

But to return to the pictures, which we must take according to the alphabetical arrangement of the artists' names, this being de rigueur in a French catalogue. Allongé,—a charming "Vue de la Ville du Pay"; Alma-Tadema, who is *hors concours*, which means that the artists so specified are beyond receiving any medal save the *Médaille d'honneur*; "Un Empereur romain," exhibited in London last year, and a "Fête intime"; Anker, a clever and painfully true representation of Bonbrach's soldiers in a stable, and cared for by Swiss peasants; Antigna, "Aragonaises d'Anso," with its play of sunshine and shade on the fine head of the tall girl who leans gracefully against a wall; Armand, "Défense de St. Quentin," with cleverly-painted trees; Appian,—excellent effect of early morning light on "Flotille de Barques Marchands"; Asselberg, "Clever" "Coquelicots et Bluets"; Aubert, "Le Fil rompu," a young girl spinning her thread of life, when Love comes up suddenly and snips it in two; Baader, "La Toilette," an admirable old man clipping a large white poodle, and interrupted by a black intelligent-looking spaniel, which lays its paw on his arm; Bant, "Portrait de Mlle. N.," *dessin*; Baudry, "Portrait de M. E. About," very clear, but so flat against its blue background; Berteaux, "Arce eos Amis-là pas de Déception," a studio with the lay figures dressed as men and women; Berthon, "Loin du Pays"; Bertrand, "Folie d'Opédie," where she is dressed in white, and elose beside it, but black-robed; "Mort d'Opédie"; Betsellere, "L'Oublié," painfully real, the poor soldier having fallen insensible, face downwards, on the snowy, gory battlefield, he returns to consciousness, and half rises, to find himself left alone for dead; Bidau, "Le Printemps," charming lilac and other flowers; Bonnegrace, portrait of M. Despléchin and of Mlle. M.; Boungereau, "Faneuse"; Bréton, "Un Soir d'Hiver"; Broehart, *pastel*,—"Position Critique," a lady escaped from an *nspeet* carriage, in a very bandit-suggesting landscape, and carrying her child in her arms; Cabanel, "Giacinina," portrait,—*costume Florentin du 15me siècle*; Cambon, "Portrait du Marquis d'A.," Caraud, "Jeune Fille portant un Chat"; Cassagne, "Le Printemps dans la Forêt"; Castan, "Soleil couchant en Hiver"; Castres,

"Ambulance internationale par un Temps de Neige"; Chapuis, "Portrait du Capitaine L."; Charney, "La Leçon d'Équitation"; Chem, "La Visite de Noces,"—winter scene, the bride about to re-enter a country cart; Chintreuil, "La Clute du Jour"; Ciappori-Puche, "Notre Dame des Arts et des Sciences," beautifully draped figures,—*dessin*; Claude, E., "Curiosités"; and Claude, J. M., "L'Antichambre," sold for 1,500 francs; Clément, "Marchandes d'Eau et d'Oranges, Égypte"; Coeffier, Mlle. M., two portraits; Comte-Cailix, "La Leçon de Géographie," a youth of gentle blood, said to be the Comte de Paris, tracing PARIS on the sand for a pretty country maiden; Coninck, "La Pêche," an Italian boy, and a sweet-faced fair-haired girl; Cot, "Le Jour des Morts au Campo Santo de Pisa," the girl stooping to get a light from one of the lamps affixed to the graves; Couture, "Le Damoclès," in chains, surrounded by every luxury, a classic-looking fine thing; Daubigny, "Moulin à Dordrecht"; David, J., "Le Laissez-passer," *épisode du siècle de Paris, 1870-71*; Delort, "Une Embuscade," four brightly-dressed 16th-century figures at the foot of an old grey tower; Déportes, "Mon Portrait"; Dieudonné, a pretty young girl in white; Dubos, "Le Papiillon," a lady examining it through a magnifying glass; Dubufe, portrait de Mlle. H. S.; Faure, "Portrait de Mlle. J.," in puce silk dress and black lace; Feyen, "Les Glaneuses de la Mer," exquisitely delicate and minute; Feyen-Perrin, "Le Printemps de 1872"; Faucanourt, "Vae de l'Éterné"; Galliac, "Echo perdu," two men, possibly army surgeons, endeavouring to reach an ambulance to succour a poor *grèvement* blessé; Garnier, "Le Droit du Seigneur," the leading away a country bride who comes out of church with her newly-made husband; Girard, "La Porte défendue"; Glaise, "Spectacle de la Folie humaine," a long canvas, decorated with painted scarlet drapery like a theatre. In the front stands the exhibitor in a 16th-century black dress; to the left is a bright-blue notice-board, which says, "The pictures of human folly are continually changing." Those before the spectator are "Tueries Bibliques," where Jews are seen killing the Ammonites; "Tueries Chrétiennes," where Romans are the slaughterers; "Tueries d'Hérétiques," in which Catholics are killing seceders of all sorts; and, finally, "Charlotte Corday and others going in a cart to the guillotine." This said satire might well have had a fifth *tableau* added, "Communistes de Paris burning their own City." M. Glaise also exhibits "Mort de Saint-Louis" and "Portrait de M. Ferrier," both admirable. Goethals, "Le Général Ulrich à Strasbourg"; Gontier, a garland of lovely roses; Goubie, "Du Bœuf à Paris, Décembre, 1870," six emaciated horses and one donkey. This picture sold for 2,500 francs; but surely not to a Frenchman—would he not rather buy forgetfulness than a perpetual reminder of so melancholy an episode in his country's history? Goupil, "Une Nouvelle en Province," another war picture, with a wonderfully-painted Cacherie in it; but why the handsome girls are habited in rich satins so early in the day is a mystery to all but French *modistes*. Gudin, "Le Navire 'Le Lafayette,' dans la Nuit du 18 Août, 1871,"—*pastel*; Guès, "Jeunes Pages jouants"; delicate and minute as any miniature, so smooth is the surface; Hardon, "Une Allée du Parc de Courquetaine"; Hébert, "Portrait de Madame la Marquise de J.," robed in white satin, the large wide-open eyes looking straight out of the canvas, and into the far-away future; there is no ring on the left hand, which is somewhat ostentatiously crossed over the right, as if with intention. The necklace of large pearls, each encircled by diamonds, and the strings of pearls on the head, all marvelously reproduced, show that to paint jewelry is rather a *forte* with the artist; therefore the absence of all finger-rings is the more noticeable. Utterly unable to solve the mystery, we applied for information to a gentlemanly Frenchman, who assured us that wedding-rings are not fashionable in France now! What next, I wonder? This seems the strangest of all the strange vagaries of this strange people. Some years ago, when the insertion of the words "No cards" began to be general after the wedding announcements in the English papers, Punch took exception to the growing custom, and grumblingly said, "He supposing there would be no bride-cake and no wedding ring next." If marriages were solemnised in Paris during the siege, surely no bride-cake

could have been made or eaten; and now with the banishment of wedding-rings, the prophecy of our phallic contemporary is curiously verified. Another instance of "how many a true word is spoken in jest."

Helmich sends an excellent picture, "Un Coin du Feu, 16me Siècle," in which a monkey and a dwarf are seen fencing for the amusement of a young, handsome couple, seated side by side in one spacious arm-chair, while their pretty page leans against the jamb of the quaint old mantel-shelf. A portrait in sepia of a child by Mme. Hercholt is very charming; as is also Hirsch's portrait of Mme. M.—; Hublin's "Jeune Luthière Bretonne" has a very easy pose and pleasant face; Huo's "Manon Lescaut" and "Les Apprentis" are both admirable; as is also Mlle. Jacquemart's "Portrait de M. Thiers, Président de la République." About this last a little anecdote is told. When Mlle. Jacquemart went to the *salon*, she found the portrait surrounded by brighter-coloured pictures, which utterly annihilated the sallow face and snuff-coloured coat of M. le Président; so, on her own responsibility, she had them all removed and replaced by somnre-hued landscapes, and now her work shows admirably well; it certainly is a fine thing, so calm and quiet, and looking a most excellent likeness. A "Pommier en Fleurs," by Kreyder, reminds of Millais' "Apple Blossom;" but instead of the melancholy-looking holiday-making girls below, the French artist has filled his foreground with a mass of most charmingly-painted wild flowers. Lahalle's "Obstacles d'un Soldat français en Captivité en Allemagne" makes one think it was very good of the "spiked helmets" to pay their captives so much respect. Landelle, "Almé," a beautiful creature in thin black net-like drapery; Laurens, "Mort du Duc d'Enghien" in the ditch at Vincennes, looks ghastly and real; his brother and pupil sends two excellent works, "La Mosquée bleue," and "Jardins abandonnés," both scenes in Persia. A large picture, by Lavraud, "Brigands et Captifs," is said to belong to the English Government; but why? The male captive bears a striking resemblance to the Marquis of Lorne: again, why? Lechevalier-Chevignard has a very excellent picture, in the stiff, rich-coloured manner, "Antonello de Messine et Giovanni Bellini," representing the latter habited as a gentleman, and having his portrait painted by the former, in order that he might watch the process of painting in oil, by which means (and meanness) he discovered the secret of the Messinese artists. Leclair's picture, "Fleurs," camellias, and yellow damask drapery, is excellent; as is also Leloir's, called portraits, two young officers sitting on some felled trunks of trees. In "Le Bac japonais," Lenoir has hit upon quite a novel subject—seven swimmers, whose heads only are seen above the water, draw the boat along. Lesaul's "Le Dégustateur" is a charming little picture, most carefully painted, a young cavalier, with a beautiful face and handsome black and yellow slashed dress, is testing the quality of a glass of wine, which he holds in his hand. The late Matthias Leyendecker's "Pardrix grise," apparently hung up against a board, and Paul Leyendecker's "La Lecture," are both good; as is also Lobrichon's "Château sur le Sable." In her pair of water-colour drawings, "Avant, 1870," and "Après, 1871," Mlle. Loire shows the melancholy contrast of war and peace. In the "Avant," a young country lad is seen carving his love's name, Julie, on a beech-tree; in "Après" he is returning home with a wooden leg, broken down and used up at twenty years of age. Loyeux, "Un Mignon" is a sad but fascinating picture; the *mignon* exquisitely painted, and in a charming costume of pink satin and white lace, is sinking mortally wounded on the steps of a house—possibly that of his lady-love—and is stretching up his hand to the knocker which he cannot quite succeed in reaching. Méry, "La Force primo le Droit!" Five apes are seen robbing a beehive, and getting fearfully stung by the bees en revanche; the one who has overturned the hive bears a strong resemblance to Prince Bismarck. This is known to be intentional, and the human bees crowd around the picture, whispering and smirking. It is said that several of the works sent in were thought by the Government to be likely to prove offensive to German susceptibilities. On this representation being made to the gentlemen composing the jury of selection, they suggested to the artists to withdraw them, which they very wisely and patriotically immediately consented to do. This fact shows great good sense on both sides, and is

a step in the right direction of conciliation. Mesdag, pupil of M. Alma-Tadema, sends two charming water subjects, views at Scheveningen, reminding of E. W. Cooke in his best manner. Moorman's "Le Dessert," and Monillon's "Les Bids," are both good; as is also Parrot's "Portrait du Général B." In "Jacques Cœur," Patrois preserves a worthy and patriotic act. Cœur, who lived in the fifteenth century, had acquired a large fortune as a financier. When the troubles and losses of his country occurred, he gave back his fortune to the Government, thus enabling it to raise a new army, by means of which the lost territory was regained. Pierns has two pictures, "Sancho fuyant la Cérémonie du Lavage," very excellent, and with a wonderful marble floor; and "Une Dame peignant," who has a charming face. Perignon's "Portrait de Mme. la Comtesse Peppi, née Alboni," is very good; and Perrault's "Le Mobilisé, 1870," is painfully real and dreadfully true. In "L'Autoncu," Pille shows a cleverly-painted old man, in a doorway, looking out at a dance. "La Moisson," by Potémont, is another of those heart-rending war-pictures. Wounded soldiers in a field of ripe corn, being searched for by the Geneva cross wearers. Protais, in "La Séparation: Armée de Metz, 29 Octobre, 1870," shows a large group of saddened French officers on one side, while on the other, long files of soldiers are being marched off under German mounted escorts. Some few of them are turning to wave "farewell" to their departed leaders. This is just one of the great charges in the present trial of Marshal Bazaine, the military judges declaring that on no condition whatever should any officer consent to be separated from the men under his command.

Queneset's "Portrait du Docteur Lacroze" is clever; as is likewise Ravel's "Un Soldat, 16me Siècle." Richomme, in "Vergiss mein Nicht," probably means that the departed German donor of the love-flower has consigned the pretty French peasant as well as her country. Rodakowski, in "Sigismond 1er Roi de Pologne vaincu par les Séditieux des Nobles," gives some most careful painting and admirable colouring, as seen especially in the black velvet robe lined with crimson satin. Saintin, in "2 Novembre, 1871," has reproduced another touching episode of the war; a sweet young creature in deep mourning visiting a tomb at Père-la-Chaise, inscribed "Honneur et Patrie." Saintpière's "Bacchante," semi-reclined on a panther skin, has a charming little face. Schenck's "Chevreuil, Effet de Givre," is very good. Schlesinger's "Peine perdue," a Spanish-looking lady whispering to a sweet innocent *bourgeois* as they come out of a church; Schopin, "Derniers Instants de Duguesclin"; and "Vision du Cardinal de Richelieu à son Lit de Mort," in which skulls appear mistily on the wall beside him; Schreiber's "Premier Tableau, Premier Amour"; and Sebroun's "Cheminée de la Salle d'Audience des Magistrats du Franc de Bruges," are all very good. The subject of the latter picture will be remembered by many as that of one of Louis Haghi's favourite works in our English water-colour gallery years ago.

Sirouy has a noticeable picture, "La Fortune." The life-size nude figure is too materialised, as she stands aloft poised on her wheel; but the groups below are admirable: the king, who tightly presses his crown on his head, while a semi-nude, savage-looking creature clutches at it; the queen, who stoutly strives to protect her child and her treasure-casket; and so on, while the wheel of Fortune crashes over all alike. Thirion's "Épisode de l'Éruption du Vésuve," illustrating the description by the younger Pliny, well depicts hopeless horror, and bears an especial interest just now; "Les Semeurs de Nrenberg," by Ullmann, is a quaint subject admirably executed; Van Elven's brilliant picture, "Hommages rendus à la Statue de Strasbourg, Place de la Concorde, pendant le Siège de Paris," will be remembered in the International Exhibition of London last year. Venot's "Portrait de l'Abbé — de St. Denis," is very good, as is also Vetter's "Mazarin épousé par la Pègre," taking leave of his works of art. Villeneuve's "Portrait du Général du Cissoy" is a fine thing. Von Thoren has a beautiful sky in his "Souvenir de Bade, Hiver, Soleil couchant"; Wallberg some excellent water, in "Vue prise sur les Côtes de Bretagne"; and Wylie, an American by birth, has a clever picture in "La Sorcière bretonne."

Several good specimens of painting on porcelain and other materials are exhibited in the gallery, to wit:—"La Marée basse,"—*Jatence*,

by Bouquet; "La Naissance de Vénus,"—*porcelaine*, Mme. Delphine de Cool; "La Belle Jardinière," after Raffaele, by Mme. Amélie Duburg,—*porcelaine*; both these ladies were born at Limoges; and "Néride,"—*d'après Rubens*,—*porcelaine*, Mlle. Djina Gomez. A. F. de Courcy has a fine enamel portrait of Mme. de S.; and Froullé a shell-cameo of "La Sainte Famille." Two cameo portraits on agate-onyx, by Papillon, are excellent; as is also the "Tête de Janon,"—*creux sur onyx*, with its *épreuve en creux*.

Among the architectural drawings, a very curious triangular knocker is shown; it is designated "Hecutoir trouvé dans l'Église," the *édifice* being that of the "Abbaye (Église, Pyrénées-Orientales." Two suggestions for memorials of the Siege of Paris, are anything but commendable; it is to be hoped neither will be carried out. The one, by Thierry-Ladrangé, is called "Antel de la Patrie," and consists of a square pedestal (with bas-reliefs on every side), surmounted by a huge terminal figure, on the shaft of which names are to be inscribed; the other is by Vaudoier, and is still more ugly; the form is a circular pyramid, consisting of a series of steps, the front of each step to bear names or other inscriptions.

Among the engravings, copies by Blanchard of two pictures well known to Englishmen, catch the eye: Francia's "Dead Christ" in the National Gallery of London, and Holman Hunt's "Christ in the Temple"; in the latter copy, the figures look dreadfully dwarfed and stumpy. Descending to the sculpture-hall, we find the various works tastefully disposed in the glazed garden of the Palais de l'Industrie. The flowering plants are an exhibition by themselves: masses of azaleas and geraniums with, interspersed between them at regular intervals, green aloes, small cactaceous trees, palms, and other green-leaf-bearing plants. The introduction of these amongst the flowers is very admirable; but the custom of massing white round green, and then clustering all shades and colours of red together, likewise in masses, is anything but tasteful or artistic. Certainly the arranging of flowers and flower-gardens is best understood in England.

A very pleasing group of sculpture,—but only in plaster,—is composed of semi-figures of Erekman and Chatrian, the well-known authors. They are portraits; both of them face the spectator, and Erekman's left arm encircles Chatrian's shoulders; the group is by Bartholdi. Chatrouse, in his "Projet de Monument aux Martyrs de l'Indépendance nationale," has introduced Joan of Arc and Vercingetorix clasping hands. Vercingetorix was a chief of the Gauls in the time of Cesar, and was conquered and led in triumph; so that, besides the chronological muddle, his career is no good angry for the modern liberators, any more than that of Joan of Arc. He seems, however, to be the favourite just now, for there is in the gallery an elaborate design, with four diagrams, of a proposed monument to be erected to him near Clermont Ferrand.

The present garden of the Exposition occupies about half of the enclosed space. The large coloured window at the other end, that nearest to Paris, is dreadfully shattered by the Communique shot and shell; fully three-fourths of the painted glass is absent, but men were busily at work upon it. The rapidity with which all traces of the struggle in Paris are being obliterated is perfectly marvellous. A great deal has already been done on the beautiful Place de la Concorde in the way of restoration, but one of the eight colossal seated figures, representing principal towns in France, is still housed over; while of the pair of handsome bronze fountains, that nearest the Seine is entirely absent,—doubtless removed for extensive repairs. *Galignani* says the works of restoration on the Place de la Concorde alone have cost the Government 210,708 francs. To what sum the enormous rebuilding required throughout the city will eventually amount, it seems almost impossible to estimate. I see that the northern tower of Notre Dame is said to be under repair; several fissures in the walls having rendered it unsafe, whether this is part of the same fenshish work I know not, but within the venerable pile we saw workmen engaged repairing the steps and paving in front of the altar, which were shattered by the Communists.

The painted dome of the Panthéon is much injured, several obus having forced their way through it, and the exploded stonework having scattered about and done still more damage.

Some shells fell within the Hôtel des Invalides, but none struck the dome. How the Sainte-Chapelle escaped when Paris was fired by the Communists is a marvel. It stands in the hollow of a square of buildings, the Palais de Justice at the east end being within 9 ft. of the apse. All these were burning at once, and yet the chapel remained untouched. The old *gardiens* told us he was there the whole of that fearful time: he would not leave, but "resolved to die with his charge, if it were destined to perish." It is useless to write of the Ministère de Finances, the Grenier d'Abondance, the Hôtel-de-Ville, the Tuileries, and other sad heaps of ruin. Everything has been said that need be said; but what a fearfully interesting "Guide to Paris" has now to be written for future visitors.

The pace *soutane* of poor Archbishop Darboy hangs in the same little closet in the sacristy of Notre Dame, in which are preserved these of Monsieurs Affre and Sibour. His is pierced through with the bullet that entered his chest and passed out at the back, and it is all discoloured and mottled, with blood and with the damp of the grave into which he was hurriedly flung. Of eleven Archbishops of Paris eight have met with violent deaths.

Two other victims, and, indeed, the two first victims of the Commune, General Clément-Thomas and Lecomte,—who were shot by their own soldiers when vainly endeavouring to regain those fatal guns, 200 in number, carried off by the rebels to Montmartre,—are buried within the small military practising-ground close to where they fell. A black cross, with the name inscribed, in a small garden, marks each grave. Belleville looks peaceable enough now, and well-to-do into the bargain; but walls are seen loop-holed, and houses specked with shot-marks, as we drive along.

The beautifully laid-out Butte du Chaumont was sadly devastated by the Communists, who pastured their horses and bivouacked their men there; but with careful attention this charming garden is completely restored to its former beauty. On the opposite side of Paris, taking the road to Fort Valérien, we come upon vast destruction of houses, levelled to prevent them serving as shelter to the Germans, or *les Prussiens*, as the French persist in calling them. The Église St. Ferdinand now stands completely isolated, in a desert of brick-and-mortar rubbish. Farther on the houses are fearfully shattered. At Courbevoie, the statue of the first Napoleon, which was brought thither from the *Colonne Vendôme* in the present emperor's time, is missing from its pedestal. During the siege of Paris it was dismounted, cutting it in half, the Seine, in the night, by, it is said, M. Jules Simon and M. Jules Ferry, assisted by the painter Cornet, and others. How much of this assertion is to be believed, I know not; but that this (literally in-Seine) act was committed by some persons is certain. Continuing our journey to Mont Valérien, we plodded upwards to the entrance, but found an order from the War Minister was necessary to obtain admittance. However, we were well able to judge of the masterly manner in which the fort commands the whole country round—looking up the Seine, and reaching even to Paris. We remembered how the Communists marched in innocent confidence beneath its walls, flattering themselves the garrison was friendly to their views, and how its murderous guns opened upon the very centre of their column, cutting it in half, and spreading death and dismay in their ranks. Then we descended and continued our way to St. Cloud—poor ruined St. Cloud—along the bank of the Seine. The short drive is a most lovely one, with the brimming river on the left hand, and a succession of handsome residences, surrounded by lovely tree-filled grounds on the right. It is said of St. Cloud, that not a single house but was hit by shot or shell, or both. It was first fired on by the Germans, and then by the French; but, strange to say, in the midst of all this destruction and ruin, the church stands up unharmed. Many houses are restored, but many more still remain melancholy witnesses of the horrors of war. One gentleman, in rebuilding his handsome villa, has inserted shattered stone in the pediment, and replaced in the hole the huge obus that destroyed his former home.

The châteaen is a mere shell; remains of internal decoration—painting, and gilding, and sculpture—still cling to the walls, making the desolation still more mournful; and tall columns of rare marbles stand upright in their place, with huge layers flaked off from their shafts by the fervent heat. The gardens look still very lovely

in their springlike wealth of green; but the artificial ponds, formerly one of the great attractions of the place, are dry and dank, and their leaden lining is contorted out of all shape and use.

Returning to Paris by the Bois de Boulogne, we came upon a great scene of gaiety. Hitherto we had felt that the erst "gay capital" was much quieted down and depressed by its recent heavy trials; but this day happened to be the grandest of the race-days, and the myriads of vehicles that had conveyed the spectators were a marvel to behold. Fully three miles of road must have been filled with carriages, many of them very handsome ones too, crowded together as thickly as safety would allow; yet all down the Champs-Élysées they were just as numerous as ever; and arrived on the Boulevards, the loungers seemed in no way diminished. "Where do they all come from?" was our involuntary exclamation. The Bois de Boulogne looks much the same as before the war, and, excepting in some small portions, is very little injured; it has lost but an inconsiderable number of its trees.

Now that the Assembly holds its sittings at Versailles, the greater part of the palace is closed to visitors; a new, though painful interest is open to them, however,—namely, to enter the court and hear the Communist trials. The day we were there, a tall, youngish man, with rather a lang-dog look, and thick, light hair plastered sleekly down, was being tried for the murder of a simple citizen, named Roussel, and for robbing the body. He denied every thing, and pleaded "mistaken identity;" but the poor victim's brother came in as a witness, and the culprit's conviction appeared certain. We did not wait to hear the end, but from what we were told a week later on a second visit to Versailles and the Trianons, we believe he was condemned. Satory, the scene of these military executions, is within a very short distance of Versailles. I should have liked to see the spot where poor young Lieutenant Rossel suffered so meekly the penalty of his mistaken patriotism; but the miserable weather prevented us from farther extending our journey. These executions still go on; four Communists were to be shot on the morrow of our visit.

The new grand Opera House in Paris is finished as to the exterior, but the interior remains uncompleted for want of funds. The inscription running along the main façade, which formerly read "Académie Impériale de Musique," has had the letters *Nation* substituted for *Impériale*; this alteration is perfectly visible from the slightly different colouring and thickness of the gilt-bronze letters. The "N" from the medallion above, has likewise been removed. This same littleness has gone on everywhere. In the *Pantheon*, the gilt wreaths, each enclosing an "N," have been taken down from the four corners of the transepts, leaving ugly blank spaces. At the *Hôtel des Invalides* at one end of the library is the copy of David's famous—but false—picture of "Napoleon crossing the Alps" (on a prancing charger, when it is well known he threaded the pass in the only possible manner, namely, on a mule); opposite this picture a portrait of Napoleon III. used to hang; now, a dark-green curtain fills the frame. The same eclipse has come over the semi-length portrait in the *Galerie d'Apollon* in the Louvre; so that its companion picture, Louis XIV., enjoys the undivided honour of presiding over this beautiful saloon of wondrous art-treasures. All the public buildings, even to the churches, have the sinister "*Liberté, Égalité, Fraternité*," painted on them in large black letters; and all are inscribed "Propriété Nationale."

Commenting one evening to a quiet, calm French gentleman on the hot haste with which Parisians, immediately one of their chronic fits of revolution seizes them, rush to alter names of streets, and to demolish statues and inscriptions of their last, but now deposed, demigod, he replied "*Nous sommes des fous*," and I think he was right. As I said to him, "However much they may break down and destroy, they cannot wipe out of French history the nineteen years in which the third Napoleon has ruled over them; nor would they, if they could, give up the advance in commerce, wealth, and civilisation they have made under his guidance; and what Government do they want now? The Republic will never satisfy them." "Nothing will ever satisfy them for more than about twenty years at a stretch," said he; "each generation, as it grows up, thinks it can make a better Government for itself; and as a generation grows up in eighteen

or twenty years, so every eighteen or twenty years we have a fresh revolution. But now, things have come to such a pass no one knows what they do want; and Paris knows least of all." Two other well-informed gentlemen, one a Frenchman, the other an English resident in Paris, both said on separate occasions, "The Emperor has only to land to be welcomed, and if he were to come to Paris to-morrow it would be all right, and things would go on just as if all this had not happened." One Parisian gentleman certainly did say, "Why rebuild the Tuileries Palace? There is no use for it now." But so far as we were able to judge, from conversation with persons of various grades, the general opinion seems to be, that the Empire will be restored, and that it will be well for France when it is so.

The efforts of England to succour the famished Parisians when the siege was raised, do not appear to have left any very definite impression on the Parisian mind. To test this, I made many opportunities of saying how sad we English people were to hear of the hunger and suffering in Paris; but not from any one person, gentleman, shopkeeper, or valet-de-plaue, did I elicit the ghost of a grateful remark for our intervention. I know not if the sentiments of the upper classes are reflected in the behaviour of the lower, but if so, the following incident, unimportant in itself, bears some weight. One evening, at the Café, one of the women-boxkeepers came to ask if we had paid for the little wooden footstools that are placed in French theatres. She was behind us, and three or four rows off, so we did not at first perceive that she was addressing herself to us. Presently she exclaimed aloud, "*Oh! comme ils sont imbéciles, ces Anglais!*" My English blood fired up in a moment, and, turning full round, I replied to her, also aloud, "*Non, madame; ils ne sont pas imbéciles, ces Anglais, mais ils ne vous ont pas bien compris!*" She was ewed immediately. And a French gentleman and lady who sat close behind us never interfered to stop her insolence or explain the matter to the strangers. So much for Parisian politeness!

A more pleasing topic is the "Book of Gratitude,"—if I may be allowed thus to designate it,—now lying for signature in the Rue Vivienne. As is known, this book is intended to commemorate the exertions of England in behalf of smitten France, both in giving her food for her famished people, and grain to sow her devastated fields. The separate leaves of the book consist of large sheets of cardboard, each having a handsome engraved heading, and which are to be filled up with the autograph signatures of persons of all classes who benefited from, and are grateful for, the timely help England bestowed. The whole of the shop is given up to this purpose, and large legibly inscribed notices, in terms most gratifying to English hearts, announce the intention of the originators of the book. R. F. H.

SCHOOLS FOR THE LONDON SCHOOL BOARD.

COMPETITIVE designs for no fewer than six schools, and all by different architects, have been exhibited, for a couple of days, to the competitors and others in the top room of the Sunday School Union building, just opposite Nowgate, in the Old Bailey. Whether or not the School Board intended to keep out the press we can scarcely say. If so, it ought to be made clear at once, so that the ratepayers might have their say upon it. We can scarcely suppose that such a decision could be arrived at by a popularly-elected body, including, for example, Mr. Hepworth Dixon; but certain it is that, so far as we are concerned, we received no invitation from the Board to view the drawings, and a wonderful discussion, at a meeting of the Board, has been reported as to whether or not the designs for the Stepney School, already referred to in our pages,* had been seen by "a member of the press." The Board seemed all at sea on the point, as they apparently are on some other points. When, by accident, we went into the room in the Old Bailey last week, there were, not merely a member of the press, but at least four persons connected with a press of some sort or other, examining the drawings, including the acknowledged reporter of one of the daily papers, who appears to have been betrayed into a very one-sided account. The Board are about to spend, and we are glad of it, thousands upon thousands

* See pp. 361, &c., ante.

of the ratepayers' money; and they will discharge their duty if they do this on unseen designs, framed on unventilated principles. On these six schools alone some 50,000*l.*, at least, exclusive of the cost of land, will be expended, with about 1,100*l.* more for the Stepney School, already decided on; and it would ill become them to attempt to do this and all that is to follow, with the public in the dark.

That considerable obscurity on several points prevails is obvious. The Board say, in the Rules to be observed in Planning Schools issued by them,* that the lighting of class-rooms should, if possible, be chiefly from the side; and yet, acting on supposed instructions to follow the Prussian system, several of the competitors here, as in the case of the Stepney competition, place the children with the light to their back.

Again, the Stepney School is made to include, at a considerable increase of cost, a large general room, or hall, capable of containing the whole of the boys and girls at one time. If this be desirable, why is it not provided for in these six other schools? If not desirable, why is it provided at Stepney? These circumstances seem to us to show that inquiry and discussion are necessary.

We give the names of the architects who have sent in designs for the several schools:—

St. Paul's-road, Limehouse.—Mr. Phéné Spiers, Messrs. Slater & Carpenter, Mr. Bracebridge, Mr. Alfred Porter, Mr. A. Williams, and Messrs. Spalding & Knight. The tenders accompanying designs range (not necessarily in the order of the names) from 5,950*l.* to 8,450*l.*

Mary-street, Bromley.—Mr. Lacy Ridge, Mr. T. H. Watson, Mr. J. W. Morris, and Messrs. Milsam & Kennedy. Tenders from 4,900*l.* to 6,740*l.*

Old Castle-street, Whitechapel.—Mr. E. C. Rohms, Mr. Aldwinckle, Mr. E. Biven, Messrs. Tarring & Son, and Messrs. Habershon & Brock. Tenders from 6,750*l.* to 8,500*l.*

Battersea-road.—Mr. Edis, Mr. Gordon Stanham, Messrs. W. M. Toulon & Cronk, Mr. J. Toner, and Mr. Coldwell. Tenders from 5,850*l.* to 7,000*l.*

Essex-street, Tower Hamlets.—Mr. Charles Barry, Mr. Hennell, Mr. Quilter, Mr. T. Lewis Banks, and Mr. John Young. Tenders from 4,850*l.* to 8,000*l.*

Kender-street, Hotham.—Mr. E. Wyndham Tarr, Mr. John Giles, Mr. Joseph Gale, and Mr. J. P. Soddon. Tenders from 5,400*l.* to 7,920*l.*

SEFTON PARK, LIVERPOOL.

PRINCE ARTHUR has been in Liverpool, and on Monday last opened Sefton Park, which, as our readers may remember, has been in progress since 1867. There was an enormous crowd, and the enthusiasm was remarkable. The streets were gaily decorated, partly by voluntary efforts and partly otherwise. We learn that the decorative committee, which was appointed some time ago, and of which Mr. Paris acted as chairman and Mr. Holden as honorary secretary, by the aid of liberal contributions on the part of tradesmen and other inhabitants, did a fair share in the decoration of the streets, especially in the neighbourhood of the Town-hall, Castle-street, Lord-street, Church-street, and Great George-street. In order that the display might be as excellent as possible, they contracted with Messrs. Pigott, Brothers, of London, who did part of the work of decoration in London on the occasion of her Majesty's state visit to St. Paul's Cathedral, and some of the materials used in the streets of the great metropolis upon that day were brought into use in the streets of Liverpool in the reception of her Majesty's son. The committee also engaged the services of Mr. Edward A. Heffer, architect, to superintend the decoration. The materials used were Venetian masts, 40 ft. high, painted blue, each mast being decorated with a trophy of five flags and a shield, and a hammeret floating over the top. Suspended from the masts were festoons of coloured paper roses, which were carried over the lamp-posts along the sides of the streets, the length of festooning being one mile and a quarter. At various parts of the route arches (ten in number) were erected, which were also adorned with trophies of flags, and about 200 trophies of flags and shields were affixed to the fronts of buildings. Some of the large street-lamps were also decorated by the committee.

We leave the park itself for a personal view, and add merely some statistics from the *Mercury*.

* See p. 349, ante.

Under the Improvement Acts for Sefton and Stanley Parks, the corporation obtained power to raise 575,000*l.*, and of this amount probably more than 400,000*l.* will be devoted to the purchase and completion of Sefton Park. The cost of the land was 275,865*l.*, and it is fully expected that about 145,000*l.* will be expended on labour and materials before the park can really be said to be finished. The late Mr. Newlands estimated the cost at 450,000*l.*, but it should be remembered that many of the most costly items in the design on which that estimate was founded have been entirely erased from the plans, and the most rigid determination, as far as possible, to economise, has been enforced by the committee, in consequence of the outcry of the inhabitants against the alleged extravagant expenditure. It will be remembered that when Birkenhead Park was carried out the building sites around it were sold for an amount which almost recouped the sum spent upon the park. It was therefore determined to adopt a similar plan with regard to Sefton Park, and it was fully expected that the corporation would be reimbursed at least 200,000*l.* Building plots, containing in the whole about 120 acres, were arranged on the outskirts of the park; but although the sites have been twice offered to public competition, only ten of the plots have at present changed hands.

Messrs. André & Hornblower were the architects and designers; Mr. Samuel Campbell was contractor for sewerage, road-making, and the heavier excavation; Mr. Dickon for the formation of plantations, slopes, &c., and the subsoil ploughing; Mr. Pearson Lee for the stone plinth-ing; and Messrs. Pollard & Canlife, of Barnley, provided the iron railings. About two years since, however, a dispute arose between the architects and Mr. Campbell, one of the contractors, and the contract of that gentleman was determined. Shortly afterwards the Improvement Committee determined the contract with Messrs. Hornblower & André; but the modified designs of those gentlemen have been carried out. The works have since been carried on by Mr. Dickon, under the immediate supervision of Mr. William Pearse, who has officiated as acting clerk of the works since their commencement.

SCHOOL BOARDS.

Walsall.—Mr. Bidlake, architect, attended the last monthly meeting with plans and specification for the erection of the Board school at the Wisemore, which were approved, and advertisements were ordered to be issued inviting tenders for the building of the schools.

Heckmonditch.—It has been resolved to erect a school on a site already chosen in Baitry-street, to accommodate 200 boys, 200 girls, and 150 infants.

Dewsbury.—The building committee have reported that they have instructed Messrs. Holton & Connor to prepare plans and specifications for the Education Department for three schools, one at Dewsbury Moor, one in Boothroyd-lane, and a third in Carlton-street. The estimated cost is 6,800*l.*, and the architect's terms are 5 per cent. on this amount, and no commission for extras. The report was adopted.

Tymemouth.—The Committee of the Council of Education have approved of all the schools built in all the villages by this Board, and it has been agreed to seek power to borrow from time to time 18,000*l.* to complete these erections.

Cantebury.—The following tenders were received for the erection of the master's house: John Chandler, 371*l.*; Gaskin & Golden, 330*l.*; Cozens, Brothers, 422*l.* 15*s.*; W. Gentry, 431*l.* A difficulty arose in connection with the tender of Messrs. Gaskin & Golden, owing to their stating that they would perform the work as set forth in the plans and specifications for the sum named, this sum to be added to their tender for the schools without deduction.

Liverpool.—At the last meeting the Chairman moved the following resolution, which was agreed to:—

"That the rules to be observed in the planning and fitting-up of schools, and the conditions of competition for school-houses, the one for 700 and the other for 1,000 children, as passed by the school organisation and management and the sites and building committees, be recommended to the Board for adoption, and sent to the Education Department for their approval."

The Chairman also proposed:—

"That in future the sites and building committee be authorised to draw up the conditions and particulars for the erection of schools on the basis of the aforesaid rules, and to issue them to architects without previously submitting them to the Board."

Mr. Hulback said he should certainly object to any more schools being built upon the basis referred to. It be understood it might, in schools for 1,000 children the largest room would be for 120 children; and in schools for 700 children the largest room would be for 80; but he thought that it was desirable that in Board schools there should be a room where the great majority of the children attending school could be assembled together. A very great benefit might be conferred upon the children thus assembled by lectures and amusements; but if a school were cut up into a great many small rooms the advantage arising from having an opportunity of bringing all the children together was lost. The chairman said that the passing of the resolution would not take away from the Board the careful examination of the plans which would be submitted for selection and approval. The reason why the resolution was submitted was that they had now sites for two schools, and they were expecting very shortly to have another. The Board had only committed itself at present to erect schools for 6,000 children, and before anything could be done in the way of purchasing sites for the building of schools, the Board would have to consider how much further they would go in the erection of schools. They could not wait to see those two or three schools erected before they determined to erect others, and therefore the resolution was placed before the Board in order that there might be no unnecessary delay. As to the plans for schools, the Board adopted a system of triple classification, and that was the system adopted by the London School Board. By that system there would be a classification of infants, juniors, and senior pupils. Thus the power of division and separate teaching would be greatly increased. He could not conceive that any great advantage could be gained by bringing infants, junior, and senior children,—all of different ages and different degrees of intellectual attainment,—together in one mass for any one purpose whatever. On the suggestion of Mr. Yates the following words were struck out of the resolution:—"And to issue them to architects without previously submitting them to the Board." The resolution was then passed as amended.

TURNER'S DRAWINGS.

THE interesting particulars furnished in a recent number of the *Builder*, of the extraordinary amount in the prices realised by Turner's drawings at the Gillett sale, as compared with the sums originally paid to the artist for "Bam-borough Castle" and "I presume 'Powis Castle'" (though the title is not given) must have fairly taken away the breath of "J. H. M.," their original owner. An advance from the first probate sum of 170 guineas for the two pictures to 4,360 guineas, does indeed seem a leap almost fabulous. Yet, great as this difference is, its proportions were reached in the cases of several other artists whose works were sold in the same collection. The small picture by Müller, entitled the "Chess Players," realised no less than 3,950*l.*, and there is excellent authority for stating that the artist himself received only 35*l.* for his labour. Again, from the small prices known to have been paid to David Cox in his day, it is more than probable that the painter did not receive a higher reward for the picture of "Peace and War" than Müller obtained for his "Chess Players," yet its possession was keenly contested up to the purchase price of 3,430*l.* Turner's picture of "Sheerness and the Isle of Sheppey," formerly the property of Mr. John Newton Hughes, of Maidstone, was sold by Messrs. Christie & Manson, in 1848, for 565 guineas; resold at the Gillett sale by the same auctioneers, this picture sold up to 4,350 guineas. The names of many other artists might be cited, who, when in the flesh, barely obtained a competency, but whose pictures, now that their epitaphs are out in stone, bring fortunes to their lucky owners. All this is startling enough, but it becomes almost sensational when "J. H. M." informs us of the discovery he made that the drawing which he had purchased from Turner for "sixty or seventy pounds," "had greatly failed" "in perhaps a year" after it came into his possession. Yet some one of "the over-rich collecting people" was found wild enough to secure it at the Gillett sale at the modest advance of 1,210 guineas. "Those who knew me, at the time when I made the discovery of the fading of the drawing in question," adds "J. H. M.," "know that I made no secret of it, but spoke

out at once to my numerous Turner-collecting friends," to dissuade them from squandering their means, no doubt, on anything so ephemeral and valueless as the drawings of Turner must become. I do not doubt for a moment the statement of "J. H. M." that the drawing named has suffered from some influence or other; but the general condemnation involved—of the want of permanency in Turner's drawings, and, by implication, of water-colour art,—may be fairly questioned. No doubt many of the early works of the founders of the water-colour school have given way from causes now well understood. We have only to turn to the "Manuals of Instruction," and "Modes of Preparing Colours," published at the beginning of the present century, to learn the number of fugitive vegetable extracts that were then employed. With no better materials at command, anything like durability could not be expected. But, as the young art gathered strength, so the manufacture of colours improved; and, the painters themselves advancing in knowledge and experience, cast out from time to time the less durable colours, for the more permanent pigments which were gradually introduced. The practice of Dewint may be taken as an example. In his early time he was particularly fond of a mixture of Indigo and Indian red, or Payne's grey, which he used very freely. The result may be seen in many of his works—the blue has entirely disappeared, and the Indian red alone remains, in foxy granules, on the surface of the drawings. Later in life, the artist discovered the cause of this defect, and avoided it in the future. It is now well known to every water-colour painter, that a vegetable blue mixed with Indian red will not stand the test of time. But it cannot be fairly reasoned that inexperience, in particular instances, touches the general question of the durability, or impermanency, of an art which, in some form or other, is probably the oldest form of painting known. The MSS. of the twelfth and thirteenth centuries, illuminated on paper, are in excellent preservation, and the materials then employed appear not to have been very dissimilar to those now in use. Raffaele's cartoons, in water-colours, have existed for nearly 400 years; and we know how little care had been bestowed on their preservation up to the time when Rubens dragged them forth from the cellar into which they had been cast, to adorn the Palace of Charles I. It may suggest some curious reflections on the recent prices paid for modern works of art to know that Raffaele only received 15*l.* each for his cartoons, which were executed for Leo X., about the year 1515-16, as patterns for tapestries. No doubt, there are many drawings to be met with which have suffered from special causes,—Turner's, amongst others,—but there is so much fine work of his remaining, pure, beautiful, and unchanged, that it is fair to presume that the fading is not often independent of the careless way in which they have been displayed,—too frequently on damp walls, or exposed to the direct rays of a blazing sun. Of the numerous fine works by David Cox, or of those of William Hunt, most perfect of their kind, it would be difficult to recall a single example evidencing signs of decay. The question of durability, however, is one purely relative, and of degree. And if we turn to the contemporary pictures, in oil, of the painters, blackened, bony, and split into destructive fissures, as so many of their canvases now appear on the walls of South Kensington Museum, the painters in water-colours may take heart, and even point with pride to Turner's drawings, as being, at least, as free from change as Turner's pictures in oil.

J. J. J., Garrick Club.

THE INDUSTRIAL HOME FOR DISCHARGED FEMALE PRISONERS AT WAKEFIELD.

This home has been formally opened. It is oblong in plan, with a frontage bow near the orchard of 163 ft., and a depth of 39 ft. The principal portion, being three stories in height, is arranged on each side of a wide central corridor, lighted by a large window at the end and staircase windows at the sides. The staircases are of stone, the one in the centre of the building being for the use of the inmates and visitors; the other for the matron. The ground-floor of the house is appropriated to rooms in which the actual work of the institution is carried on. At the north end is the wash-house, which has an open roof, skylight, and louver ventilator at the top. Adjoining this is

the drying-room, with clothes-horses, made to draw in and out from a heating-closet. Next in order are the laundries or ironing-rooms. The inmates' dining-room, kitchen, and scullery occupy the remainder of the garden-front, with store-rooms and cook's pantry on the opposite side of the corridor. An office for the matron adjoins the entrance, and has full command of the ingress and egress of the inmates. On the first floor, near to the principal staircase, is a large day or class room and dormitory. On the floor are placed the committee-room, clothing-stores, lady superintendent's sitting-room, and visitors' bedroom. At the south-east end of the building is a dormitory, with bath-room adjoining. The second floor, with the exception of the chapel, is devoted to dormitories, and it is so arranged that about half of the inmates shall occupy single bedrooms, and the remainder be placed in large dormitories, with a matron's bedroom adjoining and opening into them. The chapel is 18 ft. wide, and extends the whole width of the north end of the building. The extreme plainness of internal finishing observed in other parts of the building is also carried out in the chapel. The roof-timbers are all visible, and are stained a dark colour. The east window and arc stained glass, from the works of Messrs. Hardman & Co., Birmingham. The style adopted by the architect, Mr. Swinden Barber, of Halifax, is in character with many buildings we see in this part of the West Riding which were built about the latter end of the seventeenth and commencement of the eighteenth centuries,—low-pitched roofs, long ranges of mullioned windows, and continuous strings being the leading features. The principal difference between this and the old buildings is, that the latter were always built of stone; whereas this is brick and stone combined. On the question of style of elevation being discussed, Col. Akroyd offered to defray the difference of cost between a perfectly plain elevation, like the old Home, and that which we now see. The result of this outlay of 300*l.* is the only evidence of decoration in the building. The work was done by Mr. Green, builder, Wakefield.

THE PHYSICAL COMMOTIONS.

During a recent thunder-storm the lightning struck the steeple of Wadburst Church, splitting the ball, shattering the lead at the top, and tearing off a large quantity of the shingle at the north side, scattering it all over the churchyard; some of it being thrown a distance of 30 yards. The damage is estimated at close upon 100*l.* On the same day the tempest raged with great severity in Romney Marsh (near Rye), and a young man's sheep and a horse were killed, and a young man's clothes in front of his body crumpled like tinder, and his chest had the appearance of having been acted upon by a mustard-plaster.

Great alarm was caused among the volunteers of Dorchester on Monday by a startling occurrence during the manoeuvres of the corps on an open spot near that town. A high column, known as the Blagden Monument, stands on the plain, and the corps was mustered near to it, when a heavy thunder-storm burst over them, in the midst of which a vivid dash of lightning, accompanied by a fearful crash, struck the monument. Five volunteers who were in rank near to it, were struck to the ground, and found to be much burnt, two of them so severely that they had to be conveyed to their homes.

At a farm named Lomax's, occupied by John Nuttall, at Pilsworth, about two miles from Bury, and on the estate of Earl Wilton, the chimney on the western gable of the farm was struck, and damage amounting to between 100*l.* and 200*l.* was the result. The chimney-stack was completely demolished, the roof was smashed through, and nearly one-half of the thick brick-work of the gable-end was ruinously demolished or shaken. Other damages were done.

There has been a supposed earthquake at Sunderland, testified from several parts of the town and neighbourhood, "unless it was an explosion in one of the neighbouring collieries."

Several violent shocks of earthquakes have occurred at Accra, in West Africa, causing considerable damage. Many of the houses were rent to pieces, and completely destroyed, whilst others were cracked in several places. Fortunately, the most serious shock was preceded by minor ones, which alarmed both the European and native residents, who had time to pack up and escape before the houses tumbled down, and consequently but few serious and no fatal acci-

dents occurred, although the earthquake took place in the middle of the night.

Letters from Aleppo give a distressing picture of the state of Antioch. The town where the disciples of Jesus were first called Christians is now a mere heap of ruins; and as shocks of earthquake still continued, and the soil was, as it were, quivering with volcanic movement all round, people were afraid to approach the site to remove the large number of dead who lay unburied. The Turkish Government had sent 3,000*l.* for the sufferers from the earthquake at Antioch.

It is to be hoped that the dominant cause of the commotions which were increased last year, as in 1867, has expended its force, whatever that may be. If so, the human race will be saved another catastrophe, this year, such as that of 1808. In the present instance, although California has again been shaken, the commotions appear to be more vigorously manifested in the Old World than the New.

SALE OF THE POULTRY CHAPEL AND SCHOOLS.

On Tuesday the Poultry chapel and schools, well known as one of the oldest blocks of property of its kind in the City, and which is freehold, were disposed of by public auction by Messrs. Debenham, Tewson, & Farmer, of Cheap-side. The property occupies an area of 7,440 square feet. The first bidding was 30,000*l.*, which was quickly followed by successive advances, and ultimately the property was knocked down for 50,200*l.*, representing about 7*l.* a foot. It was stated at the sale that the gentleman to whom the property was knocked down represented the directors of the London Joint Stock Bank, whose premises adjoin the Poultry Chapel, and that it is their intention to erect a new block of buildings on the site in connexion with the bank. The trustees of the chapel have secured a large site near the Holborn Viaduct, on which they are about to erect a new chapel and schools.

CHELSEA OLD CHURCH.

Sir,—I happened to see to-day the paragraph in your paper of May 11th, on the "Progress of the Chelsea Embankment," in which it is stated that "next week an important sale of property required for the new Embankment will take place." That sale has been accomplished, and I am informed that one of its conditions is, that the houses sold are to be cleared away within a fortnight.

A host of your readers must be aware that this property comprises the archway of the two little narrow streets going westward from the old church of Chelsea to Battersea-bridge. They will also be aware of the prominence which this removal will give to the well-known church, so long, I may say, buried in obscurity, without one decent approach to it. I have accordingly thought it my duty to appeal to the public to assist me in preparing this most interesting edifice for the new position it will hold. Not that I want to modernise it in any way; such an idea is as far from my mind as it could be from that of any lover of antiquity, for the great charm of this church is its character as the old village church, and as long as it stands it must continue to recall the past history of Chelsea, whose pages will always have an honourable place in the records of England's literature. Associated with the old church are the names of Sir Thomas More, of Swift, of Attenbury, of Littleton, of Sir Hans Sloane, and others in the same category. Within it are monuments to families of note such as the Duke of Northumberland (of the Dudley line), Lord Derby, Lord Daer, Lady Chelyne, and Sir Thomas Lawrence. In fact, there is no professed antiquary who would not find connected with this church a source of contemplation all-sufficient to repay a visit.

When I was appointed to the incumbency in 1855, I set to work to repair the church, and make it what I found it not, a proper place of worship. Since then, however, time has done its work, and there is need of some substantial repairs, as well as improvements internally for the comfort of worshippers.

I have, therefore, again made a move to get funds for this object, and if you will kindly permit me, through your pages, to make my efforts known, I doubt not some of your readers who are acquainted with the church and its history will come forward to help me.

R. H. DAVIES, Incumbent.

178, Oakley-street.

THE BREAKWATER OF THE FUTURE.

811.—Having had an opportunity of observing, during the last three winters, the manner in which the harbour works now being constructed in the Bay of Wick have been attacked by successive storms, and the manner in which the various modes of construction adopted from time to time have successively given way, in a great measure at least, before the fury of the storm,—in consequence of the disinterested liberality of the British Fisheries Society, the tentative process is still to be carried on as heretofore; but the probability is that the money at the disposal of those generous experimenters may be exhausted before sufficient experimental knowledge can be obtained to enable a fair start to be made with brighter prospects for the future, could sufficient funds be forthcoming when the experiments have been completed.

Attempts have been made to bind the upper course of stones by longitudinal and transverse bars of iron let into the stone and cemented over; but these efforts have been as futile as the attempt to bind Samson with the seven green withs.

The experiments, as far as they have been carried out, have resulted in establishing the superiority, over the present mode of construction, of large blocks of Portland cement concrete under low water, and concrete deposited in mass as soon as possible above low water to the required height. This, however, may or may not be acted upon, should the works be carried farther seaward.

It would appear that the next experiment to be tried is, "To deposit blocks of cement rubble, 80 tons to 100 tons weight, outside of the wall, which would not only protect the wall itself, but tend to tranquillize the water inside of the harbour." How these blocks, deposited outside of the wall, can tranquillize the water inside of the harbour is not stated.

To deposit a considerable number of concrete blocks to seaward of the wall will virtually be forming a sea slope to the upright wall, and, should this experiment succeed, which, for obvious reasons, is not at all probable, it would establish the principle that the upright wall from low water to the top must be abandoned, and a parabolic or cycloidal curve adopted for the upper portion of the sea face of the wall. The slope, however, must be an integral part of the work combined in a homogeneous mass, and not laid up against the work as a sort of independent shield which will be used by the waves not as a shield, but as a battering-ram or wave-hammer, to pulverize the brittle slaty stone in the sea face of the work. The waves in the recent storm are said to have been *thirty feet high*. This will take some of the students of wave-ology by surprise: a 30 ft. wave in 30 ft. depth of water will be looked upon as a modern discovery, or as a modern invention.

Any careful observer of the action of the recent storms against the vertical wall must regret that the experiments have not been sufficiently varied to decide the question of an upright wall as against a wall with the sea face above low water rounded off as above proposed.

In the recent storms, the waves dashing against the upper portion of the upright wall, sent a dense column of water to the height of some 50 ft. or 60 ft. This column of water is the resultant of the wave-blow, and the reaction of the blow against the upright wall, and its height, is the measure of the intensity of the blow; but if this blow were deflected by a plane oblique to the line of impact of the blow, the intensity of the blow would be diminished in proportion to the increase of the angle of incidence. Ask the captain of an iron-clad whether he would like the shot of his antagonist to be delivered perpendicularly to his broadside, or obliquely to it; he would certainly prefer the latter, and the more oblique the better he would like it; but the hydraulic engineer says, let me receive the motion of this monster 30 ft. wave by a direct negative—the blow is delivered, the water flies upwards, and the wall tumbles downwards.

It is a pity that these experimental works have not been directed more particularly to the solution of this unsolved problem.

These remarks may serve as a sort of practical introduction to the following proposal for the construction of a harbour of refuge, composed entirely of concrete blocks. I propose that the blocks should be hexagonal, with the exception that they lock into one another and break joint. After a careful deposit of the lower course, the blocks could easily be lowered into their place,

and form a compact wall. Indeed, the outer joints could easily be caulked, and liquid cement injected into the internal joints, so as to consolidate the whole into one compact mass. The blocks should not be less than 200 tons weight, and formed on inclined planes, above high water, and launched into the sea, to be laid hold of by the twin barge. This barge should draw as little water as possible when loaded, and should be propelled by steam, with twin screws or detached paddle-wheels, and also supplied with steam lifting appliances. The blocks, of course, may be made of any form, provided that they articulate well into each other, break joint, and are easily deposited. ALEXR. DOULL.

COLTMAN-STREET WESLEYAN CHAPEL AND SCHOOLS, HULL.

This edifice has been opened for Divine Service. The plans of the new building were made by Mr. Wm. Botterill, of Hull, architect. One-fourth of the total estimated expenditure was, according to the rules of the building committee of the Conference, allowed to remain as a debt on the premises, leaving 5,925*l.* as the total sum immediately required.

The site of the new building is near to the centre of Coltman-street, on the eastern side, with a frontage of 100 ft., and an area of 2,880 square yards. The structure is in the Decorated Gothic style, built of Gainsborough white stock bricks, with Ancaster stone dressings. It is placed 27 ft. back from the street line, giving a spacious area in front of the principal entrances, enclosed by a dwarf wall, with iron railing, gates, &c. The principal, or Coltman-street, elevation exhibits three entrance doorways, having moulded pointed arches, or polished Aberdeen granite shafts, with carved stone capitals. The entrances open into a spacious vestibule, from which are lobbies, for intercepting draught, communicating with the aisles on the ground floor of the chapel. The vestibule is flanked by staircases of ample width and easy access to the galleries. Behind the chapel, and connected therewith, but of somewhat plainer character, is a block of school and class-room buildings, vestries, &c. The internal dimensions of the nave of the chapel are as follow:—Length 90 ft., and breadth 47 ft.; the transepts are 25 ft. by 15 ft. 3 in. each. There are galleries on three sides of the chapel, with four staircases, giving facility of ingress and egress. The roof of the chapel is open to the collar-beam, and is of hammer-beam construction, with the ceiling boarded. The height of the wall to the springing of the roof is 27 ft. from the chapel floor, and 46 ft. to the ceiling over the collar-beam. All the pews and fittings of the chapel are in pitch pine, varnished, with the exception of the pulpit, which is a costly piece of workmanship in English oak, elaborately carved, being a memorial of the late Mr. Thomas Holmes. In rear of the chapel are schoolrooms 48 ft. 9 in. by 28 ft., and 48 ft. 9 in. by 38 ft., together with 13 class-rooms and vestries. The whole of the buildings are heated by Perkins's hot water apparatus, and the lighting is by corona and bracket lights of medicinal design. There is accommodation in the chapel for 1,200 persons. The cost of the whole of the buildings will be about 8,000*l.*, of which a considerable sum has been raised. The works have been superintended by Mr. James Griffith; Messrs. W. & J. Hall being the general contractors, except for the slating, which has been done by Messrs. Dauber & Son. The stone carving has been executed by Mr. Thomas Firth, and the wood carving by Mr. Matson; the gas-fitting by Messrs. Stone, Settle, & Wilkinson; the painting by Mr. W. Wardell; and the wrought ironwork by Mr. W. B. Leaning, all of Hull.

BUILDING APHORISMS.

I.
The richest crop, for any field,
Is a crop of bricks for it to yield.

II.
The richest crop that it can grow,
Is a crop of houses in a row. A. H.

The Natural History Museum, South Kensington.—The drawings for this structure, to be erected from the designs of Mr. Waterhouse on the site of the 1862 Exhibition building, are now ready, and the "quantities" will be issued in a few days to those intending to tender.

THE SOURCE OF SAND.

Those of your readers who are interested in geological matters will readily admit the importance of a hint that will assist them in determining the source from which a particular bed of sand or sandstone has been derived. How to discriminate between sand produced by the breaking up of quartz, and sand produced by the breaking up of flint, does not appear to be generally understood. Chemical analysis gives no assistance, and when examined microscopically by ordinary light, no difference can be detected. Polarized light, however, discriminates these two substances in such a decided way, that where they alone are concerned no doubt can remain for an instant as to whether a grain of sand consists of one substance or the other. The quartz, as of course everybody knows, is resplendent with prismatic colours, while the flint shows a cold, steel grey surface covered with a peculiar marking, which I am obliged to call a species of reticulation for want of a term more exactly descriptive. This marking I consider to be indicative of something in the structure of the organism replaced by the flint. When once seen it is readily recognised. Some species of chert,—that from the Portlandian beds, for instance, whose formation is probably due to a similar cause,—show the same marking as flint.

The proportion of flint to quartz in the Thanet sands, in the Bagshot sands, and in other deposits may thus be readily seen.

M. HAWKINS JOHNSON.

THE LIVERPOOL SEAMEN'S ORPHAN INSTITUTION.

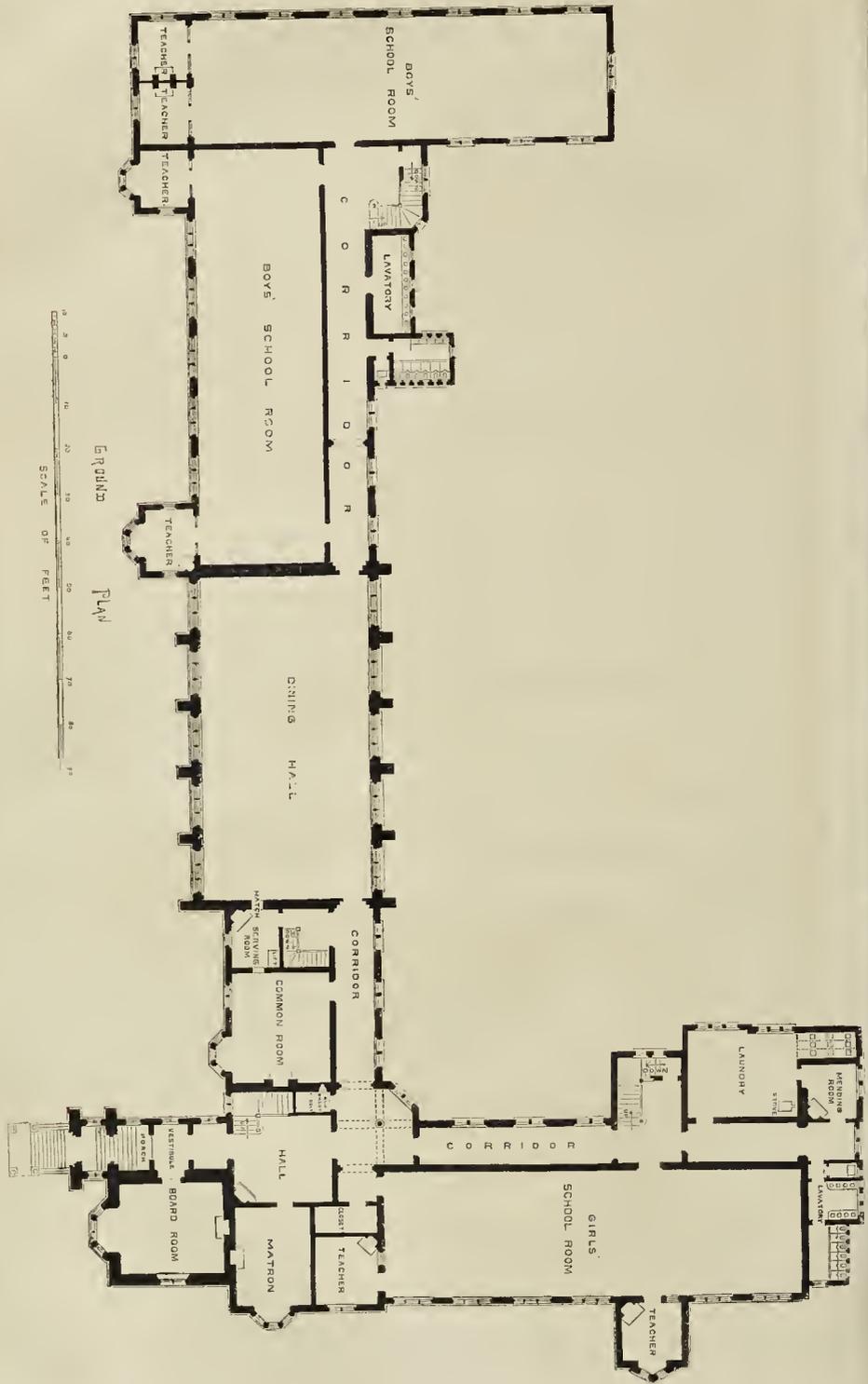
The new building, now in course of erection, for the Liverpool Seamen's Orphan Institution is situated near the eastern extremity of Newsham Park, upon a site granted by the Corporation. Its principal frontage, of nearly 300 ft., runs in a south-westerly direction towards the fine sweep of rising park-land which stretches in that direction towards the heart of the town.

The elevation is varied in outline; indeed, the architectural effect of the building will depend more upon its effective grouping than upon the elaboration of its details. At the southern extremity of the principal facade, and standing in advance of the rest of the building, will rise a tower, 25 ft. square, and about 120 ft. in height. Towards the centre of this front is the next most prominent feature in the elevation, the block containing the dining-hall, the principal apartment in the building. The roof of this block will be carried to a greater height than the adjoining roofs, and, to resist the thrust of the principals, buttresses will project between the windows. These windows are over 16 ft. in height, and are divided into three lights, both in width and height, the head of each light being trefoiled.

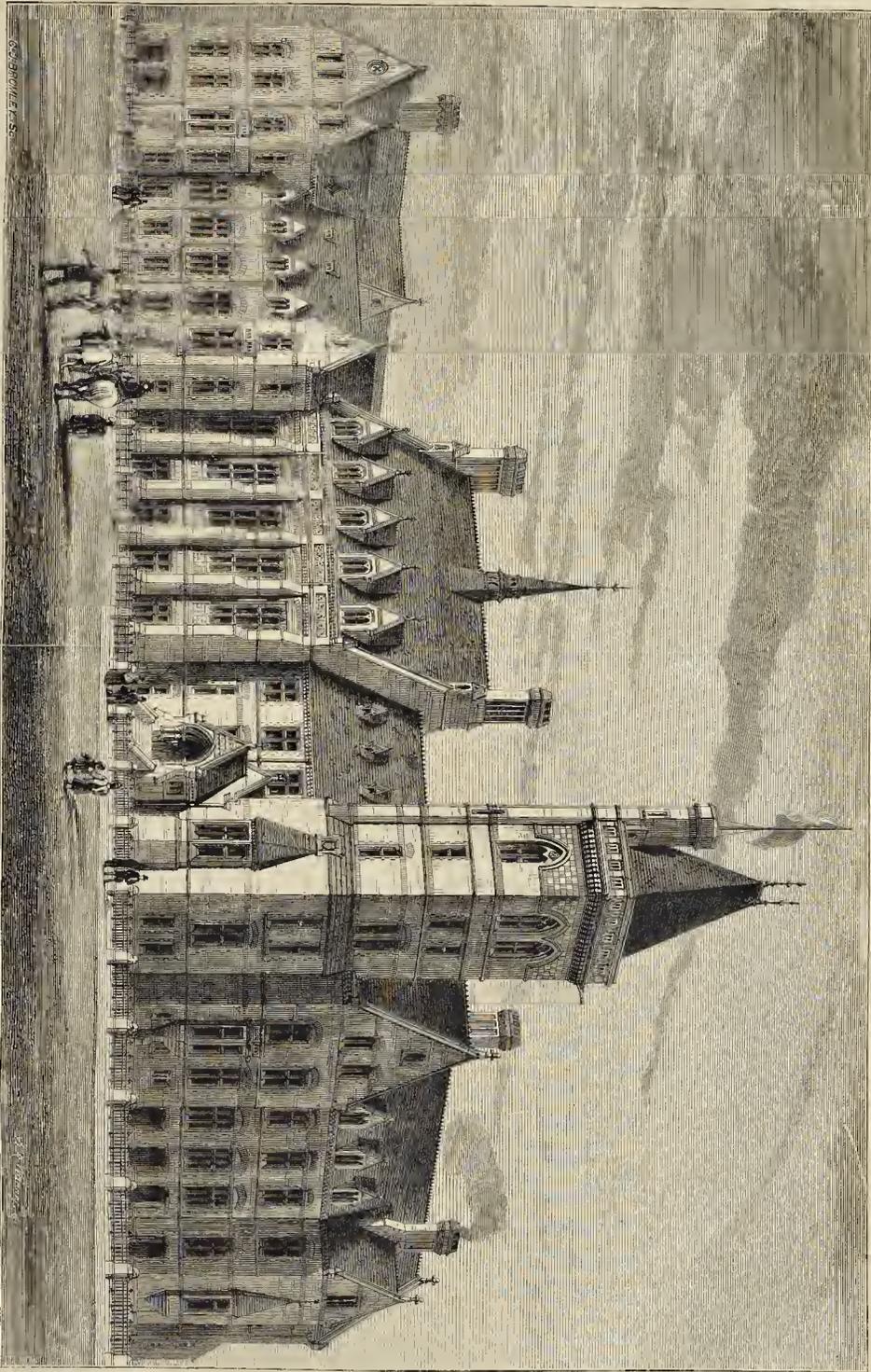
The materials used will be grey bricks, with red Runcorn stone dressings. Over the window-heads, which are generally square, there will be relieving arches in red bricks, and at the eaves of the roof a cornice of the same materials. The roofs will be covered with slates.

The building will be generally four stories in height, and will consist, roughly speaking, of a main block running parallel with the road, and at either end a wing at right angles with the main block. The basement floor, which it should be observed will be level with the surrounding grounds, will contain in the north wing a covered play-ground for boys, about 90 ft. by 30 ft., in the south wing a similar play-ground for girls, and the laundry department; and in the central block, the kitchen and other needful offices; a swimming-bath, and a boys' workshop of about the same dimensions as their play-ground. The main floor contains the dining-hall, 70 ft. by 86 ft., by 30 ft. high; two school-rooms for boys over their play-ground and workshop respectively; one similar school-room for girls, and the necessary accommodation for the administrative department. The first and second floors are mainly appropriated to dormitories, there being four dormitories for boys, and two for girls, each dormitory being capable of accommodating about seventy children.

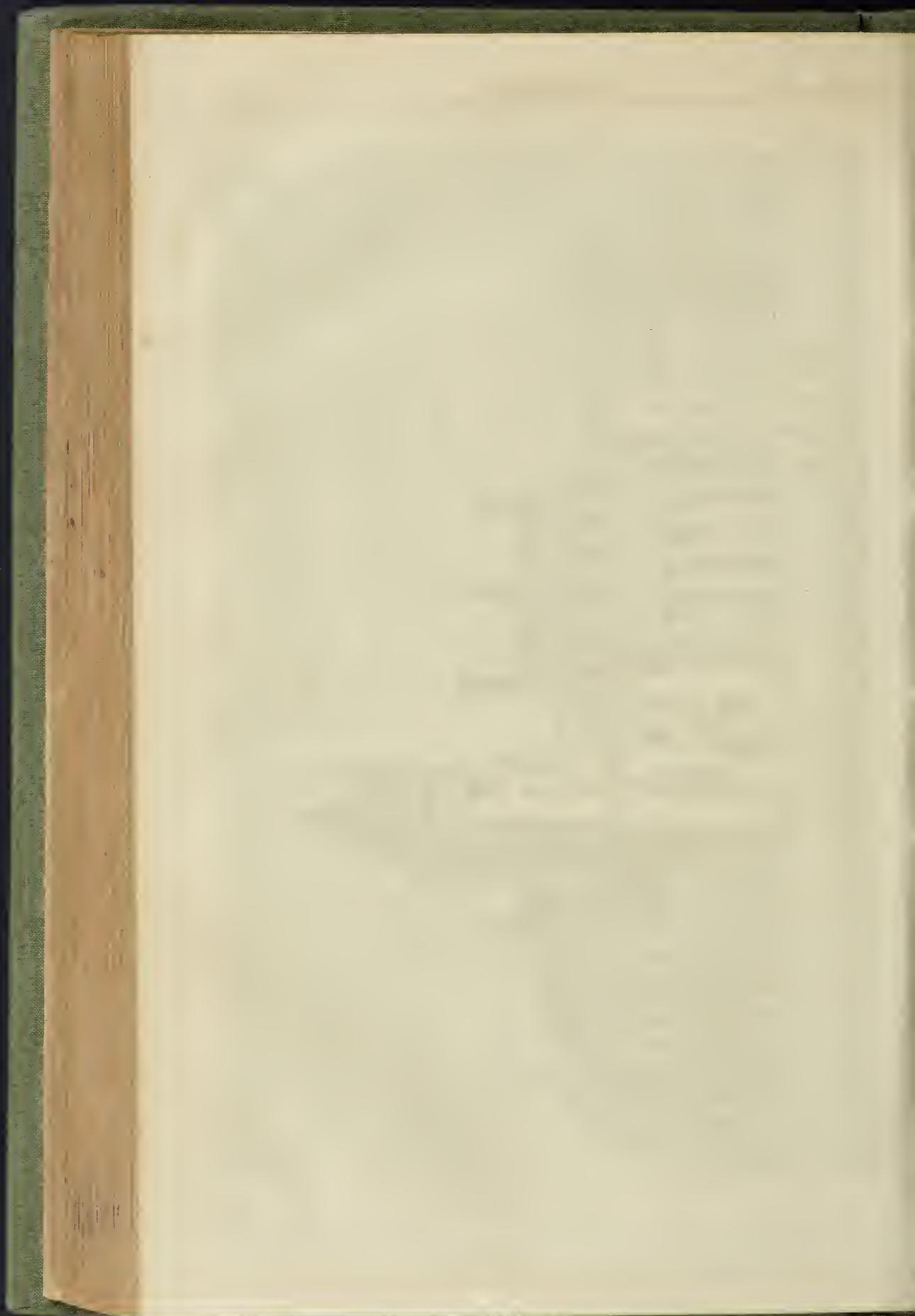
The cost of the entire structure will somewhat exceed 20,000*l.* The general contractors are Messrs. Haigh & Co. Messrs. Haden, of Trowbridge, will warm the building throughout by means of their hot-water system. The architect is Mr. Alfred Waterhouse.



THE LIVERPOOL SEAMEN'S ORPHAN INSTITUTION.—Plan of Ground Floor.



THE LIVERPOOL OLD SEAMEN'S ORPHAN INSTITUTION : NEWSHAM PARK.—MR. ALFRED WATERHOUSE, ARCHITECT.



THE TRADES MOVEMENT.

London.—On Saturday night last, a crowded meeting of delegates from the carpenters and joiners in the various London building firms was held at the Brown Bear, Bloomsbury, for the purpose of deciding upon the firms where the men shall be called out on the 1st of June next, in accordance with the resolutions adopted at the aggregate meeting of the trade in St. James's Hall, on Tuesday night last. Mr. Sadler occupied the chair. A report was brought up from the Nine-hours Committee on the present position of the movement, and recommending the names of several firms for the delegates to decide upon two out of the number, when action should be taken on Saturday, the 1st of June, unless in the meantime some overtures were received from the Masters' Association. After considerable discussion it was resolved that the workmen in the employ of Messrs. Jackson & Shaw, of Pimlico, and Messrs. Brass, of Old-street, St. Luke's, should wait, by deputation, upon their respective employers, and inform them that they should leave their employ upon Saturday, June 1, unless they complied with the terms contained in the men's memorial. The delegates from those firms stated it as their opinion that the decision of the meeting would be promptly complied with. It is stated that a meeting of the Associated Masters has been held since the meeting of the men, in St. James's-hall; and that after considerable discussion it was resolved to meet the withdrawal of the men from any particular firm or firms by a general lock-out so far as the firms connected with the Association were concerned. It is also stated that many of the members were in favour of a compromise by meeting the demands of the men for 51 hours per week at 9d. per hour, with a counter-proposition for 54 hours at 8½d. per hour, which would be a reduction of 2½ hours on the present working week, and 0½d. advance in the rate of wages per hour.

Sheffield.—The Sheffield masons, to the number of nearly 300, have struck work for a reduction in the hours of labour to 49½ per week.

Spwisch.—A meeting of master builders has been held. It being found that a large number of men would be unfairly dealt with by the resolution passed on the 9th instant, and taking into consideration the misunderstanding apparently existing between the masters and their workmen, it was thought best to submit the matter to arbitration, and that two gentlemen not connected with the trade should be appointed by the masters and two by the men, the mayor being invited to act as umpire. It was further proposed that Mr. P. D'Eve Burroughes and Mr. John Orford, jun., be requested to act on behalf of the masters, and that a deputation be appointed by this meeting to wait upon those gentlemen to solicit their consent.

Leamington.—The builders' labourers have struck for an advance of wages from 1d. to 4½d. per hour, equivalent to a rise of 2s. 4d. per week. The labourers had given notice, which had expired, and as the masters had not conceded their demand they refused to work. The principal builders held a meeting, and resolved to grant the required advance, and the labourers have subsequently agreed to resume work. The strike stopped the bricklayers and plasterers, and suspended business. Labourers received 18s. 10d., and will now have 1l. 0s. 2d.

CITY CHURCHES.

St. Mary.—Another City church is in progress of demolition, and in a very short time St. Mildred's, Bultry, will be a thing of the past. The difficulties in the way are said to have been very great. I would they had been insurmountable. It is that I pretend to think the loss great from an artistic point of view, but the Bishop of London has at the present time a Bill before the House of Lords to facilitate the destruction of City churches; and when once the Ecclesiastical Commissioners have tasted blood nothing will stop them. We have already heard from you of the danger that threatens St. Mary Woolnoth, and I shall not be surprised to hear that the quite campanile of St. Mary-le-Bow is to be removed, for the purpose of widening the passage. It is quite evident, from an observation made by the Bishop during the debate on the Bill, that a wholesale clearance will be made of the measure becomes law. His lordship is reported to have said that they must take care to be in too much of a hurry, lest the price

of land should go down in consequence of too many sites being thrown on the market at once. Let no one speak of the "narrow theological training" of our clergy after that. It shows that his lordship has a keen eye to business.

It is said that these churches are of no use, but the authorities of St. Lawrence Jewry have shown that they are of use if services at the right hours of the day are provided. I cannot help thinking that if the interior of Hawksmoor's church, above referred to, were altered, so as to be more in accordance with modern notions, and rendered less heavy than it now is, it might be made as useful as St. Lawrence Jewry.

Perhaps you will permit me to call your readers' attention to that most interesting specimen of Norman architecture in Smithfield. I am alluding, of course, to St. Bartholomew the Great. Perhaps they are not aware that this church is open every day from 11 to 4. I think that I am correct in saying that the restoration has been carried no further since the reopening in 1868, I suppose for lack of funds. I am, however, only speaking from memory, not having visited the church from that time until a few days ago. With the modern rage for "improvements," I should not be in the least surprised to miss the very beautiful archway (the entrance, probably, to the south aisle) which now stands in the line of the houses in Smithfield. It needs but a very little knowledge to see what this church would be if the restoration could be fully carried out. (See the *Church Builder* for 1863, p. 169.)

I am not an architect, but I derive a great deal of pleasure from the few remains which the City possesses. If things go on at the present rate there will scarcely be a house or building left to remind us that London has a history.

R. B. P.

"A GLAZED SURFACE."

A QUESTION such as we inserted in our last issue generally brings us replies that lead us a little out of our course. However, for once we submit. Messrs. Doulton & Co., of Grove-road, Victoria Park, offer an imperishable white glaze at 5s. 6d. per yard superficial. And Mr. Seacombe, of Acrefair, thinks there is no material of the kind for lining walls cheaper than his "Salt-glazed bricks," the same colour as a pipe, on rails at Raabon for 50s. per 1,000; the rate of charge to London being 15s. per ton, or 45s. per 1,000.

A MONUMENT FOR VIENNA.

Our advertising columns show that a committee has been formed in Vienna to erect there a monument to the late Vice-Admiral Tegethoff, and that it is inviting designs from artists of all countries. The competition is to be by models and three premiums; 300l., 200l., and 100l., are offered for the best three designs, irrespective of the arrangement to be made with the author for carrying one of them into execution. Some of our readers may find it worth while to look into the matter.

THE ARCHITECTURE OF GREAT CITIES.

Sir,—The *Pall Mall Gazette* recently contained an abstract of a letter by "a distinguished architect," addressed to the profession, on the self-evident failure of the materials at present mostly employed in the architecture of cities, and notably London; the various kinds of building-stone, of brick, cement, and terra-cotta, all yielding, sooner or later, either to the dirt-producing or destructive properties of a city atmosphere; paint being at present the only partial and imperfect means resorted to for meeting this and keeping up appearances. The expense of repainting, and the "essential meanness of paint," as Mr. Ruskin has it, from a fine-art point of view, make it less resorted to than occasion might seem to demand, architects preferring even to see their works become begrimed and decayed rather than to have them painted. The "letter" goes on to point out that in granite alone have we a stone capable at once of resisting the corrosive properties of a city atmosphere, and of taking a polish which presents a surface against almost all contraction of dirt and discoloration, or which would be almost self-cleansed by the weather, and completely so at very slight labour and expense. It is further

urged that in the employment of the different varieties of coloured granite we have a means of introducing a contrast and richness into our buildings, now very much a desideratum, and that it would give rise to a boldness of design, and simplicity of decorative detail, which would be a useful corrective of the present tendency to a profusion of somewhat bizarre carved decoration, which so quickly suffers, or becomes lost through dirt, weather, stains, and often actual decay. All this is very true and admirable, equally deserving the attention of the sculptor as of the architect, and there cannot be a doubt that much would be gained in all the essentials of durability, cleanliness, colour, and architectural effect, now so adversely affected by atmospheric conditions. Such instances as we have, whether in architecture or sculpture, seem thoroughly to bear out the superiority of granite in all the respects named. It is probable, however, that expense and other conditions would dictate its employment chiefly in large works, so that for the minor purposes of street and domestic architecture, we should be much where we are.

It has, however, long appeared to me that we are possessed of another material peculiarly suited to our climate, capable of the most extensive architectural employment, and which could be brought into use when granite could not. I refer to encaustic tiling (not of course in a highly-glazed form). In this we have a material not only defying the destructive influences of the atmosphere, and sufficiently durable in other respects, but capable of a various treatment as to architectural adornment in design and colour practically endless. Its use would perhaps involve the sacrifice of much on which the architect at present relies for effect in special features and carved decoration; but these would be more than compensated by the deliverance of our architecture from the dismal aspect occasioned by dirt and decay, and by the never-failing light, cleanliness, and variety of pleasing and artistic combinations of colour and design which might be secured, to say nothing of the change from the round of sameness in feature and detail in which we seem content to move. One building skilfully proportioned and designed for express adaptation to the encaustic tiling, with appropriate architectural ornamentation in design and colour, would very much recommend its adoption, and perhaps would even form the precursor of that "new style" whose approach has so long been heralded. It seems to present a wide field to our architects, and to be applicable through every gradation, from simplicity to the utmost richness. And, combined with polished granite for purposes of enrichment and relief by courses of elaborate coloured designs, or plaques in-laid, it might be made to produce beautiful and effective results, rivalling Giotto's famous campanile and the coloured marbles of Italy.

In regard to paint, on which for a long time we must more or less rely, it is surprising that so little is attempted to give it more life, by an artistic disposition of different shades.

NEMO.

ARCHITECTURAL ASSOCIATION.

At the meeting held on Friday evening, the 17th inst., after the ordinary routine business, the recommendations of the Conference committees were taken into careful consideration, in order to arrive at some distinct conclusions as to the views held on the various subjects by the junior practising members of the profession in London, who belong to, and are represented by, this Association. The discussion was understood not to be open to the public, so we are unable to give a report; except to state that the points of instruction to the delegates to the next conference have not yet been finally drawn out—the subjects coming on again for consideration at the next meeting on the 31st inst.

We have been informed that the excursion to St. Alban's, announced for June 1st, will probably be postponed, at least for a week, as a brigade drill of the Artists' Corps may prevent several members taking part in it. The detailed particulars of the excursion will, however, be announced shortly. It is to be hoped that the late spring-time may have then arrived, and call out a numerous party, to whom the use of their pencils shall not be made painful by chill winds. The central tower of the Abbey Church, now in great part cleared of its old patched and rotten cement coating for a thorough renewal of it (gaining greatly in apparent size, hy-the-bye, now the scale is given by the joints of the Roman

tile-work) is, at the present time, to be seen under circumstances necessarily fresh to many. The external scaffolds allow a close approach to almost every portion.

SYNTACTIC ARCHITECTURE.

EVERYTHING that is young in nature, or new in social economy, must be subject to strict rules to develop it and render it efficient. Young plants must be planted at regular distances, trained or nailed up to artificial supports. Children must be schooled and disciplined with regular hourly occupations, that they may grow up into men and women. Recruits must be drilled and disciplined to make them soldiers. The same principles apply to a new school in architecture, otherwise such a thing will never be developed. It must be syntactic, that is, must have its proper orders and ordinals. There is a fashionable piece of slang amongst architects of the last ten years called "feeling." I do not know what it means, but I suppose it means shutting our eyes and feeling our way in the dark. I am quite certain that it will not lead to what those who use it are so anxious to see: that is, a new school.

W. SCARLELL.

THE BRADFORD WATERWORKS.

THE new "Bryshaw Reservoir," at Horton Bank Top, constructed by Messrs. Fogg, for the Bradford Corporation, is now complete. It is situated some 900 ft. above sea level, and is supplied by water from Thornton Moor. It has cost £2,238l. 3s. 6d., and will furnish a supply of water to the high-level districts around Bradford. The immense storage reservoir, in course of formation by Messrs. Fogg, adjacent to the North Bierley Workhouse at Clayton, is making steady progress. The huge bank that will form in the water is being formed into a series of terraces. Up to the close of 1871 the sum of 45,241l. had been paid on account of this reservoir. The Oxenhope Tunnel is progressing under Messrs. Pearson's hands. When this tunnel is completed, the supply of water from Thornton Moor will be considerably increased. The works at Barden are progressing. Last year 17,030l. 15s. 7d. were expended at Barden; and the total expenditure so far on this costly work, which includes almost entire reconstruction, has been 121,057l. 18s. 9d. The Waterworks Committee recommended the Corporation to accept the tender of Messrs. Crabtree, Brothers, and Robert Sugden, of Kighley, for the formation of two compensation reservoirs at Leeming and Lees-shaw, Oxenhope, for 40,000l.

THE PROPOSED TRANSPORT OF CLEOPATRA'S NEEDLE TO THE THAMES EMBANKMENT.

IN our volume for 1851, pp. 478, 479, 480, is an elaborate article by the late Mr. Nathaniel Gould, in which he gave various plans whereby Cleopatra's Needle—a gift by the Pasha of Egypt to this country—could be removed to London, with estimates and various particulars. The *Times* took up the subject on the 9th of September, 1852, and Mr. Gould again wrote us as to it on 4th December, 1852, at a time when it was proposed to locate it at the Crystal Palace. These proposals, however, came to nothing. The Metropolitan Board of Works has just agreed to provide a site for it, and a renewed endeavour is to be made to have it transported to London, if it be still in a state worth removal, as it was in 1851. As to this there are differences of opinion, as well as in regard to its removal at all, even if worth the trouble. There can be no doubt, however, that it is now going to nter destruction.

Mr. Paley states the sum of one hundred thousand pounds for the construction of substantial, well-constructed buildings, suitable for the town. Considering that the population of the town does not exceed 20,000, and it is neither wealthy nor very thriving, I think this sum is very fair; and the very fact of the instructions stating that the front only must be in stone, the others in brickwork, is sufficient evidence in my mind that they did not wish for the erection of a costly building.

I certainly supposed that Mr. Paley's duty was simply to advise the commissioners in making the awards, according to the strict letter and meaning of the instructions, and that with the question of its cost he could in no way interfere, as that had already been decided by the commissioners, and observed by a great number of the competitors, whose designs were necessarily of a plain and unpretending character.

Mr. Paley assumes that 15,000l. is the least sum that would have been required for the purpose, and he argues that it is impossible to erect the buildings for the sum named; and then acknowledges that there are plans

removed; and, it is thought, would form a fitting ornament space near the Clarence Street Bridge, where it might advantageously be placed. The prostrate obelisk is 64 ft. in length, about 8 ft. square at the butt, and may weigh about 234 tons. A vessel could easily bring it over, towed, in fine weather, by a steamer. The engineer of the Board of Works, Mr. Barzalgette, C.B., has seen the plan in my possession for lifting and transporting the obelisk; but it was some time ago proposed by a foreigner, as the English did not seem to care for their gift, the prostrate obelisk (on which the hieroglyphics are well preserved), to break it up for building materials.

If the Metropolitan Board of Works would address the Government on the above subject, and ask that the obelisk be brought to England, the site on the Thames Embankment might perhaps be given.

On the motion of Mr. Runtz, it was agreed that Major-General Alexander be respectfully informed that the Board have no funds at their disposal for the conveyance of the obelisk to England; but if it could be brought independently of any cost to the Board, they would be happy to find a site for it.

"An Anglo-Egyptian," in the *Times*, in allusion to this letter, says,—

"In 1852 it was exposed and easily examined. It was found that the angles of the obelisk were more chipped than the hieroglyphics on one square almost entirely obliterated, and it was considered not worth the labour and cost of transport. It has since been covered up by the fortifications.

The only way to remove it would be that adopted by the French in the case of the Luxor Monolith (now in the Place de la Concorde)—viz., by removing part of the wall of the fortifications, and digging a canal deep enough to float a caisson, which must be built round it as it lies, and thus towed during fine weather to England. The east harbour is, unfortunately, shallow, and ships cannot approach within a quarter of a mile of its site, so that the transport and shipment of the Needle on board the vessel contracted with an opening to receive and a platform to carry it (as at the time proposed) would be matter of extreme difficulty.

On the whole, I continue of opinion that it is not worth the trouble in its present state, and I doubt if it is capable of restoration."

ST. MARY'S, NEWINGTON.

Sir,—In justice to myself, permit me to say that, owing to great pressure of business, I was compelled to postpone the preparing plans for execution till only a few days remained, and that no time was then afforded for more than sketches. These, however, represented a building that could have been honestly built for the money, and the drawings were correctly, though roughly, made.

WM. WINGLTON.

STONE MERCHANTS AND MASONS.

Sir,—The evil complained of in your last issue by "A Lover of Justice" arises principally from the masons themselves.

Probably quarry proprietors generally have little confidence in London masons, in consequence of non-punctuality in the settlement of small accounts; hence the trade has drifted into the hands of the merchants.

Railway facilities are now such that even small masons could hire direct from the quarries at a very great saving, if they had accounts opened with responsible quarry owners, and confidence established.

The masons in the Eastern Counties hold their own, and buy direct in truck-loads as cheap as the London merchants do in large quantities.

STEPHEN SEAL.

A TECHNICAL DICTIONARY.

Sir,—With reference to notes under the above heading, in your columns, may we be permitted to inform your readers that we have in preparation, under the able editorship of Mr. Robert Hunt, of the Museum of Practical Geology, a new and improved edition of the late Mr. Weale's well-known "Technical Dictionary of Terms in Architecture," &c. We hope to have this ready some time during the autumn, and we believe it will be found to supply the want felt by your several correspondents on the subject.

LOCKWOOD & CO.

THE CHORLEY TOWN-HALL COMPETITION.

Sir,—This competition is another added to the long list of competitive failures, with injustice to the competitors. My drawings were this week returned, on charge-paid, of course, but without thanks, or other acknowledgment of time and service rendered,—I may now say, wasted.

The commissioners have, however, presented the competitors with Mr. Paley's precious report an award of the prizes, as adopted by one-half of the commissioners who attended the special meeting for that purpose.

Mr. Paley states the sum of one hundred thousand pounds for the construction of substantial, well-constructed buildings, suitable for the town. Considering that the population of the town does not exceed 20,000, and it is neither wealthy nor very thriving, I think this sum is very fair; and the very fact of the instructions stating that the front only must be in stone, the others in brickwork, is sufficient evidence in my mind that they did not wish for the erection of a costly building.

I certainly supposed that Mr. Paley's duty was simply to advise the commissioners in making the awards, according to the strict letter and meaning of the instructions, and that with the question of its cost he could in no way interfere, as that had already been decided by the commissioners, and observed by a great number of the competitors, whose designs were necessarily of a plain and unpretending character.

Mr. Paley assumes that 15,000l. is the least sum that would have been required for the purpose, and he argues that it is impossible to erect the buildings for the sum named; and then acknowledges that there are plans

that had kept within the prescribed sum, but not one of them, with any claim to his consideration, can be carried into execution for the sum named, so that this most important condition as to excessive cost cannot be so used.

I think this argument will scarcely satisfy the competitors, who had a perfect right to expect the award to be made—as it can only be honestly made—according to the strict letter of the instructions, apart from the consideration or opinion of any person upon any design that may have been submitted, with full confidence of the commissioners at their abiding by their own adopted instructions and conditions.

Thus Mr. Paley complacently ignores the question of cost, and says he has carefully kept his views on the subject out of the contest, but what is stated in the instructions to the plan with the best appropriation of the ground, combined with a most suitable elevation (what about the 10,000l.?)

I am rightly informed by the notices of the plans which have appeared in the local papers, the designs which Mr. Paley considers the best appropriation of the ground, have shops in the Market-street front, with dwellings, back kitchens, yards, and back passage, through the most valuable portion of the plot, thus leaving an ugly unnecessary gap between the two blocks of building; and this is Mr. Paley's opinion of the utilisation of the best site in the town, which has cost some 7,000l. or 8,000l. to procure, and is similar to the arrangement suggested by the local architect, but which was stated in the instructions should not in any way interfere with or limit the full and free scope of the architect. The premiated designs have, however, failed to improve upon the general features of the most objectionable arrangement; but notwithstanding they have been approved by Mr. Paley, and adopted by the commissioners, who have probably spent as many weeks in examining the drawings as Mr. Paley has hours, and whose previous selection was totally different from Mr. Paley's award; and how they could be brought to approve of designs which were so much inferior to the public view recently and clearly given at a public meeting, I am at a loss to understand.

It is also to be noted that the drawings as they appear on the principal front, Market-street. The public accommodation varies from 700 to 1,300 in the large hall, when 1,300 was the number required in the instructions, and the cost of them can be executed for anything like 10,000l., and even supposing Mr. Paley's estimate of 15,000l. be correct, as the least estimate, it is more than probable that the cost will exceed 20,000l. in execution.

It may afford some satisfaction to the dissatisfied competitors to learn that it is not probable that any use of the premiated designs will be carried into execution, for there are sufficient reasons.

Mr. Paley's report is an injustice to those competitors who have kept the cost within the stipulated sum, and who, in the exercise of their own judgment, have selected the site that they have offices in lieu of backyards, kitchens, and back passages, and which arrangements, I believe, will be more commendable to the common sense of the public of Chorley than any showy elevation, with such interior defects as are said to exist in the premiated designs.

A COMPETITOR.

"EDWARD PEARCE."

Sir,—Can any of your readers inform me who was Edward Pearce, who published a work on Friezes, "sold by John Overton at ye white horse without Newgate, near the Fountain Tavern?" His name is not mentioned in Sadler's "Kinsler-Lexicon" nor Phillips' "Dictionary of Biographical Reference." The above work is copied in Cottam's style, and some of the letters and shades is much like Remond's school. There is no date to the treatise. Also, I should like to hear what is known of E. de Lorin, architect to James I. of England.

LEWIS SOLOZOV.

STAINING AND VARNISHING.

Sir,—I shall be greatly obliged by your allowing me to ask a question in your valuable paper, and shall be very pleased to see an answer to the same at once.

If an architect put in the specifications for the wood work to be stained and varnished, is it a usual thing to make always to give it one coat of size and one coat of varnish, and call it twice varnished? And would the architect pass it as *twice varnished* if he knew it had only one coat of varnish? One who WANTS TO KNOW.

* Certainly not, if he did his duty.

BUILDERS' BENEVOLENT INSTITUTION.

THE thirty-seventh election of pensioners in connexion with this charity, took place at Willis's Rooms, King-street, St. James's, yesterday (Thursday) afternoon, Mr. Joseph Bird, one of the Vice-Presidents of the Institution, in the chair. There were five male and eight female candidates, but the funds at the disposal of the charity only allowed of the election of one male and one female at present.

The names of the candidates were:—Males Francis Sandom (fifth application), Mark Minter (fourth application), Matthew Saich (second application), Daniel Thomas, and Richard Bibby Females: Frances Searc (sixth application), Jane Brothill (sixth application), Elizabeth Trevelthan (fourth application), Ann Budd (third application), Eliza Lambert (third application), Arabella Hambrook (second application), Sarah E. Bear (second application), and Ann William (second application).

Messrs. Thomas Stirling and Matthew Hall having been appointed scrutineers, announced the successful candidates to be Mr. Mark Minter and Mrs. Jane Brothill.

Mr. Walter Watson (Watson, Bros.) proposed and the Chairman seconded, a vote of thanks

be scrutineers. The motion having been carried, Mr. Stirling briefly replied.

The proceedings closed by a vote of thanks to the chairman, proposed by Mr. Thomas Smith, and seconded by Mr. Waldram (Hill, Kedwell, and Waldram).

The Institution has at present on its funds 42 pensioners,—19 men and 23 women,—the men receiving 24. per annum, and the women 20l. The amount of stock standing in the name of the institution is now 16,131l. 17s. 3d.

"CÆSAR'S CAMP."

I VISITED, recently, at Wimbleton, this relic of the olden time, which is denoted in the Ordnance Map as being placed about a mile to the north-west of the railway station. I walked round the embankment, which has not yet been altered by bricks and mortar. It is engraved in the *Archæological Journal*, vol. xxiii., and the area of the inclosure is stated to be about fourteen acres. Antiquaries seem to differ respecting this relic,—for Mr. W. H. Tregellas believed it to have been a British, Roman, Saxon, or Danish carthwork; Mr. Brayley deemed it to be British, as did Mr. Saul, the Rev. T. Hugo, and Mr. A. J. Kempe, F.S.A. Mr. Galo, Dr. Roots, and Mr. Bidon (see "History of Kingston"), believed it to have been a Roman camp; but a circular form is opposed to this idea. According to Mr. Lysons, Wimbaldis was a Saxon name, and this camp resembles the Saxon work at Mount Caburn, near Lewes. It is curious, and deserves inspection.

CHR. COOKE.

BRAMLEY UNION NEW WORKHOUSE.

THE new workhouse for the Bramley Union, comprising the townships of Bramley, Armley, Arncliffe, Gildersome, and Wortley, has just been completed and opened. Intended to meet the requirements of a district, with some 45,000 inhabitants, the works connected with the new buildings are necessarily upon an extensive scale. Sixteen acres of land constitute the workhouse estate, and situated in the high-lying district of Hill Top, near Armley, the block of buildings form a conspicuous feature in the landscape. The workhouse, which will accommodate some 220 inmates, has been erected, including the purchase of land, construction of porches, &c., at a cost of 15,500l. The opening of the building was celebrated by a dinner in the dining-hall, at which there was a numerous attendance of those interested in the construction of the new building. The accommodation provided in the workhouse is as follows:—Main building—Infirmen, 32; ditto, women, 32; able-bodied men, 10; ditto, women, 10; disorderly, 10; boys, 10; girls, 9; children, 8; married couples, spare bed-rooms, 10; ditto, 9—144. Entrance lodgings—Male probationers, 5; ditto, vagrants, female probationers, 5; ditto, vagrants, 6; Infirmary—Males, 22; ditto, imbeciles, 6; males, 16; ditto, imbeciles, 6; lying-in ward, 54. The outlay on the main building, bountifully, dining-hall, porter's lodge, board-room, offices, receiving and vagrant wards, and a necessary out-offices, is estimated at 9,275l.; on the infirmary and imbecile wards, &c., 55l. 10s.; on the entrance-gates, roads, architect's commission, and clerk of the works, 900l.; a total of 15,510l., or about 70l. per bed, including the site (2,579l.), but exclusive of about 500l. for furniture and fittings. The buildings generally are of plain design, with the walls in the Gothic style of architecture. The entrance is approached from the Bramley and Wortley road. Near to the entrance-gates has been erected a block of buildings 181 ft. in length, and containing porter's lodge, probationers' wards, vagrant wards, disinfecting apparatus (supplied by Messrs. Nelson, Leeds), offices for the clerk and relieving officers, and board-room. The main block of the workhouse consists of two stories in height, with a frontage of 13 ft., and a breadth of 47 ft. The principal entrance is surmounted by a turret or tower for a height of about 65 ft. The entrance divides the building into two wings, the left occupied by the males, and the right by the females. On each side of the entrance-hall are the apartments of the master and the women. From end to end of the principal passage runs a central corridor, from which the various wards are readily reached. On the ground floor are day-rooms and dormitories for the infirm, wards for children, lavatories, and other rooms; and on the first-floor other apart-

ments for the use of the officers and the accommodation of inmates. Opposite the principal entrance and in the rear of the chief block of buildings, is a dining-hall, the size of which is 50 ft. by 30 ft., and the height about 24 ft., the rest of the rooms being 11 ft. in height. It is intended to use this hall also for divine service. Immediately adjoining are a cooking kitchen, larders, and other domestic offices, the kitchen having been fitted up with one of Messrs. Benham & Son's (London), patent cooling-ranges. At the back of the building are paved and spacious yards, where the inmates can take exercise, whilst further to the rear is an infirmary, two stories in height. The architects are Messrs. C. S. & A. J. Nelson, Leeds and Derby. The contractors for the various works have been:—Messrs. Charles Walker & Co., Holbeck, bricklayers and masons; Mr. Jno. Tomlinson, Leeds, joiner; Mr. Jno. Senior, Leeds, plasterer; Mr. Jonas Grant, Wortley, painter; Mr. Edwin Thornton, Shipley, slater; Messrs. Sutcliffe & Wilkinson, Bradford, plumbers and glaziers; Messrs. Heaps & Robinson, Leeds, ironfounders. Mr. John Kershaw, of Bramley, has acted as clerk of the works.

THE POSITION OF ASSISTANTS.

SIR,—When there is so much talk of the professions of civil engineers, architects, and surveyors having a technical education, I think it should also be considered if the proper inducements are held out to secure that necessity.

For some time past the position of every member of these professions has been getting somewhat paradoxical; and sooner or later it will be the business of some of these big talking societies to untangle the mess, and lay down the law as to what a surveyor, or architect, or civil engineer really is, what is expected of him, and what he is to expect of his employers.

There is a class of men calling themselves civil engineers, architects, surveyors, and auctioneers, who will refuse nothing for money. There are men that will write a specification for a local Board's new broom, or stand up and sell fat cattle, undertake economical funerals, or large drainage works; they forget that any one of these branches, to be efficiently performed, is enough for one man.

SIR, there are carpenters and artisans that now get a little smattering of knowledge, and have never received any sound scientific training, who are literally undermining the market value of the genuine professional man, who has devoted his money and young days to make himself what an engineer ought to be, a natural philosopher. 20s., or 25s. per week is a very common remuneration as assistant for one like myself, who paid his 200 guineas for articles, and sat up night after night to study; and surveyors are actually offered 30l. or 40l. a year, by local Boards. What sort of professional experience do these Boards hope to get for this amount?

SIR, it appears to me that if a movement is not made by some protection society, or by such society as the Institution of Civil Engineers laying down definite rules as to the position and remuneration of each member, we shall be reduced to common artisans, as we assistants nearly are now.

ASSISTANT.

CHURCH-BUILDING NEWS.

Dunham Massey.—The re-decorating of the chancel of St. Margaret's Church, with the memorial windows that have been introduced, is now completed. The introduction of the two memorial windows in remembrance of the Rev. John Kingsley, the first incumbent of the church, left a surplus of nearly 60l., and it was resolved that this should form the nucleus of a fund for decorating the chancel. The entire cost has been about 500l., and the additional sum required was readily provided. The work of the windows, as well as that of the decoration of the church, was done by Messrs. Lavers, Barraud, & Westlake, of London and Manchester. The mural paintings consist of a series of angels and arch-angels, St. Michael, St. Gabriel, &c., at the east end over the east window, carrying legends, whilst those on the side walls are under canopies in the style of the edifice (Perpendicular). Between these, under the clearstory, there is a powdering of stars and flours-de-l'ys, and underneath these a conventional garden, with trees, each carrying a shield with some emblem of our

Lord's agony and death, and an enclosure to this garden is formed by a dado of red, diapered with an embroidery pattern such as may be seen in the old decorated screens of Norfolk and Suffolk. The roof is decorated with gold and colour, and the clearstory with a suitable powdered and diapered ornamentation. The work is pointed in a vehicle which is similar in effect to tempera, but said to be more durable. This necessitates some sacrifice of the bloom obtained by tempera work, but the artists considered that in such a humid climate, durability was to be attempted first. The reredos is gilded and picked with colours. The windows of the two lights, north and south of the altar, are also treated in the Perpendicular style of a rather late description. The subjects are placed under canopies of silvery white. The subjects represent, on the north, the annunciation of the incarnation by the angels, the salutation of the Virgin by Elizabeth, the birth of our Lord, and His baptism. On the south, are the Transfiguration, the Crucifixion, Resurrection, and Ascension. In one of the transepts a large window has also been inserted by the same firm. The subjects running through the upper lights is the charge to St. Peter; in the three lower, the angel and the three Marys at the tomb. This window has been inserted at the cost of Mr. Joseph Sidelotom, of the Beaches, Bowdon, as a memorial of his mother.

Mulling.—The memorial stone of a new chapel, to be built for the benefit of the inmates of the Malling Union, has been laid in the grounds of the workhouse by Lady Caroline Newell. The chapel will be built in the Early Decorated style, and the material used will be Kentish rag, with dressings of Box stone. Its roof will be open timbered, and covered with tile, and the building will seat 306 persons. The cost of the erection is estimated at a little over 900l. Mr. E. W. Stephens, of Maidstone, is the architect; and Mr. W. Church, the builder. The funds for erecting the building had been raised previously to within 100l. of the required amount, by voluntary subscriptions.

Brigg.—The consecration of Brigg Church has at length taken place. For some weeks it had been closed, and was undergoing considerable alterations and repairs. The old stained-glass windows at the east end have been removed and inserted at the west end of the church, and three new ones substituted in their places. A reredos has been erected over the altar, and is the gift of some members of the congregation. Above this, and on either side of the stained windows just mentioned, appear illuminated scrolls, with the words "It is Christ that died, yet, rather than be risen again, and is now on the right hand of God." These were the work of Miss Susan Paterson, of Brigg.

Ramsden.—St. James's Church has been opened for divine worship by the Bishop of Oxford. The church has been entirely rebuilt. Mr. Blomfield is the architect, and Mr. Groves, of Milton, the builder. The edifice consists of a chancel, with nave and south aisle. At the extreme north-west of the nave rises a tower and spire. The tower contains a chime of three bells, and it also forms the porch. There is accommodation for 300. All the adornments in the church are memorials of the late Mrs. Lowbridge Baker, wife of the vicar. The spire and east window are put up by the Rev. R. L. Baker. Relations and friends placed the reredos to her memory. A chancel window, executed by Hardman, of Birmingham, was put in by a brother. The parishioners contributed towards the erection of a small window in the transept, representing a figure of St. Thomas, executed by Messrs. Heaton & Butler, as was also the east window. The pillars of the font, which are of Cornish marble, are the gift of Mr. and Mrs. Borlase.

Bristol.—It is proposed, we understand, to close All Saints', Clifton, till about the first week in August, so as to allow of the removal of the temporary building over and around which the permanent stone nave has been built. The interior of the roof will be decorated from designs supplied by Mr. Street, architect of the church, and the whole of the windows, with the exception of two at the west end, will be filled in with stained glass, which is being prepared by Messrs. Hardman, of Birmingham, by whose firm the large east window was supplied. A reredos will also be erected of Caen stone, the subject of which is "The Saviour in glory, surrounded by saints." The gas fittings are by Messrs. Potter & Son, of London; and Messrs. Haden, of Trowbridge, are supplying the heating apparatus. The stone carving is being executed by Mr.

Earp, of London; and the encaustic pavement is to be laid down by Messrs. Godwin, of Lugwardine, who also laid the channel with tiles.

Mistead.—The restoration of the parish church is now shortly to begin. It will be enlarged and re-seated. The gallery will be taken away, and an old Gothic arch opened. The architect is, we understand, Mr. Butterfield.

Lincoln.—The new church of St. Martin is now advanced far towards completion. The tower is finished, and the steeple begun. The height from the tower to the top of the vane will be 80 ft., and the tower 76 ft., making the whole height 156 ft. This, with the position the church occupies, will make it a prominent object for miles. The interior is now nearly complete.

Dorking.—At a meeting of the committee it has been decided, in consequence of certain alterations in the architect's plans, that the builders who originally tendered for the work be invited to send in fresh tenders upon the reduced specifications. It is contemplated in the first instance to build the nave and transepts only, leaving the tower and spire to be completed at an after period, as funds accrue. The committee afterwards met for the purpose of opening the new tenders received for the construction of part of the proposed work, viz., the removal of the present tower, the rebuilding of the choir nave, and north transept, the addition of a south transept, and the laying the foundation of the new tower at the west end. There were in all seven tenders received, which may be classified as follows:—Messrs. Colls & Sons, Dorking, 8,367l.; Mr. Putney, Dorking, 7,514l.; Messrs. Gibson, Brothers, Southall, 6,391l.; Messrs. Wright, Brothers, & Goodchild, Croydon, 6,350l.; Mr. Shearburn, Dorking, 6,275l.; Mr. James Harris, Woking, 6,145l.; Messrs. Goddard & Sons, Farnham, 5,491l. The last tender being the lowest was therefore accepted, subject to the condition that the work be not commenced until the whole, or the greater part of the sum required for same be subscribed, and that the subscriptions already promised (amounting to about 4,050l.) be allowed by the donors to be appropriated forthwith to the completion of that portion of the work referred to. In accordance with this resolution, the vicar and churchwardens have issued a letter to the subscribers inviting their adhesion to the plan proposed. It is to be hoped the committee will be enabled to proceed continuously with the work to the completion of the tower and porch, for which, with the architect's commission, an additional sum of not less than 4,000l. will be required.

Books Received.

A Treatise on the Theory of Friction. By JOHN H. JELLETT, B.D., President of the Royal Irish Academy. Macmillan & Co. 1872. THE theory of friction, considered as a part of rational mechanics, has hardly received the attention which it deserves. Even in the most complete systematic treatises, the space accorded to its discussion is small compared with that bestowed upon questions in which the hypothesis of perfect smoothness has been assumed as the basis of investigation; and no doubt many students have been led to regard the discussion of this force less as a part of rational mechanics than as a correction to be applied before the investigations of that science can be made practically useful. It is under such considerations, and because the force with which this work is connected is subject to definite laws, as susceptible of mathematical expression as the force of gravity, that the author has made a distinct and separate treatise of it. The theory and plan of the work are stated in a preface.

VARIORUM.

"Statistics of all the Countries in the World." A compendious and valuable sheet table, containing numerous particulars as to area, form of Government, head of state, population, expenditure, debt, paper money, notes in circulation, standing army, navy, merchant vessels, imports, exports, chief products, money, weights and measures, railways, capitals and chief towns; compiled by Dr. Otto Hubner, director of the Prussian central statistical archives, has been prepared in the form of an English edition, with the sanction and co-operation of Dr. Hubner, by Mr. H. Sutherland Edwards, and published by Stanford, of Charing Cross.—"Criminal Returns: Metropolitan Police, 1871." The

usual returns of the number of persons taken into custody by the Metropolitan Police, and the results, in the year 1871; with comparative statements from the year 1832 to 1871 inclusive, have been issued in a printed form. Among the numerous tables is one showing the degree of instruction as well as the numbers of those convicted, the sex, &c., and, according to which, of 71,961 taken into custody, 48,306 were males, and 23,655 females; 8,741 males and 5,197 females could neither read nor write; 37,271 males and 18,329 females could read only, or read and write imperfectly; 2,225 males and 129 females could read and write well; and 69 males and no female had superior instruction. Of the whole 45,608 were summarily disposed of or held to bail, and 2,655 were tried and convicted, among whom were 1 female and 5 males with superior instruction.

Miscellanea.

American Plumbers.—A correspondent in the *Industrial Monthly* writes,—"The supply water-pipe which extends from the street, along the top of our cellar, to the sink in the kitchen, had a very small hole in one side, so that a stream of water spun out, not so large as a cambric needle. If I had known that the hole could have been remedied by placing the end of a tenpenny nail on the hole, and hitting it two or three light blows with a hammer, the knowledge would have saved me much trouble and expense; but I did not know that, and I had to get a plumber to stop the hole in a lead pipe can be stopped by baiting the metal just enough to close the orifice, therefore I went and called a plumber. Of course, he was employed by the day. He knew how to stop the issue in less than one minute; but he preferred to make a good job for himself and for his employer. He was too proud to be seen carrying his solder and tools along the street, hence a helper must be detailed to carry these appliances. His employer paid him 20 cents per hour, but charged 60 cents per hour for his services. He paid the helper 10 cents per hour, and charged 40 cents, whether they were loitering along the streets or at work. They looked around, lighted their pipes, smoked, and chatted, and used about 4 ounces of solder, for which the charge was 50 cents, and they reported they had used one pound. The plumber reported one hour each for himself and helper. Thus the cost of stopping one pin-hole cost me 1 dollar, 50 cents, when any one who can handle a hammer could have closed the issue in half a minute if he had thought of how to do it."

Opening of a New Police and Fire Station in Manchester.

—The new B Division Police and fire station in Golden-street, Rochdale-road, has been opened. The buildings cover an area of 1,480 square yards, and are bounded by Golden-street, Chadderton-street, Bannet-street, and Cross-street. The police offices, which face Golden-street, are 105 ft. long by 80 ft. broad. The portion occupied by the cells and the parade-room is only one story high. The superintendent's room, charge-room, and sergeants' room are likewise on the ground floor, but immediately over these the building rises to the height of four stories. In the upper stories accommodation is provided for six firemen and their families. The parade-room measures 61 ft. by 39 ft., and is lofty. The number of cells is nineteen. A ventilating shaft, 90 ft. high, and measuring 11 ft. by 8 ft., surmounts the buildings. The fire station is at the angle formed by Golden-street and Cross-street. The building measures 60 ft. by 20 ft., and is three stories high. On the ground floor are the firemen's room and inquiry office, with bath-room and store-room at the back. The total cost of the buildings amounts to 19,775l. The plans were prepared by Mr. J. G. Lynde, the city surveyor; and the contractors were Messrs. R. Neill & Sons.

Good News for Iron Masters.—The *Boston (Massachusetts) Globe* sounds a note of alarm at the threatening iron famine. It is stated that 2,600,000 tons were used in the United States last year, of which 2,000,000 were produced, and the remainder imported. A careful estimate of the increased consumption during the present year, and of the probable supply, demonstrates that there is too much reason to expect a very large deficit in supply. Prices of American and imported iron have advanced fully one-third within the last three months.

The Burning of the Theatre Royal, Melbourne.—By the Australian mail details have arrived of the burning of the Theatre Royal, Melbourne, on the 19th of March, as intimated in the *Builder* of the 27th of April. The Royal was the premier theatre of the Australasian colonies. On the eve of its destruction "The Streets of New York" had been performed, and shortly before twelve the vicinity of the dressing-rooms was found to be on fire. Alarm was instantly given, and help soon at hand; and at first there seemed a chance of saving the building, but the scenes caught the conflagration and the whole edifice was soon in flames. The *Melbourne Argus* says:—"The destruction of three large Australian theatres,—the Haymarket in Melbourne, the Prince of Wales's Opera House in Sydney, and now the Theatre Royal, in the brief space of eighteen months, seems a remarkable coincidence. The three events coming so quickly after each other have been a severe blow to the profession, and it is hoped that these disasters will lead to the introduction of an improved style of building for such places of entertainment. The Princess's is now the only theatre remaining in Melbourne, but it cannot be doubted that ere long a temple of the drama worthy the leading city of the Australasian group will rise in our midst to replace the leading theatre which now lies in ashes."

Restoration of Merton College Hall, Oxford.

—The Hall of Merton College is undergoing a restoration at a cost of upwards of 4,000l. Mr. Scott, architect, has been engaged to restore the building, and the whole of the work that Mr. Wyatt executed in 1790 has been cleared away. The design now prepared by Mr. Scott is in accordance with the original construction of the Hall, which is of fourteenth-century date. A new open-timber oak roof will be substituted for the present one, and the music-gallery and screens will be replaced at the west end, whilst at the east end there will be canopied seats raised upon a dais. The windows will be completely restored from the fragments which have been discovered of the original designs, and they will have seats in them the thickness of the wall. Mr. Scott has also designed new furniture, tables, and benches, to suit the period. The whole of the exterior of the hall will be renovated, and the sham buttresses have all been taken down, and new ones have taken their place. The Headington ashlar will be removed, and the walls will be refaced with Thynston stone. The porch will have new archways, with new steps and wing walls. The whole of the work is to be completed by the commencement of next Michaelmas term. Mr. Booth, of London, is the contractor, and Mr. Lee is the clerk of the works.

Charge of Perjury against a Building Inspector.

—At the Salford Town-hall, before Sir John Iles Manfell, Mr. Francis Drake, building inspector in the service of the Salford Corporation, was summoned at the instance of Mr. Joseph Blomley, joiner and builder, carrying on business in Broughton, upon the charge of having committed wilful and corrupt perjury on the 2nd of May. It seems that Mr. Blomley had been summoned on that date for a breach of the building regulations, and upon the evidence of Mr. Drake (the present defendant), was fined 50s. and costs. The prosecutor had recently erected some property in Broughton, and on his part it was sought to be shown that the defendant had made a false statement with respect to the length and dimensions of floor joists, in consequence of which he had incurred penalties for the represented infraction of the law. With the case was proceeding it was suddenly brought to an abrupt and unexpected termination by the inability of the clerk of court or any one to give evidence that Mr. Drake was sworn in the particular case in issue.

National Music Meetings at the Crystal Palace.

—It seems that the arrangements for these performances are now complete. The private preliminary hearings by the jury of each class of sopranos and tenors will take place on Wednesday, June 25. The contraltos and baritones will be heard privately on Friday, June 26. At these hearings (which are to be held in the concert-room of the Palace), those who are to compete in public will be chosen by the different juries. The public competitions will commence on Thursday, June 27. At two o'clock on that day the soprano singers will sing against each other, and after them the tenors will compete. At five o'clock a grand vocal and instrumental concert will be given, the programme of which will include the competitors.

London and Middlesex Archaeological Society.—A general meeting of this Society has been held in the newly-restored Chapter-house, at Westminster; the dean, in the absence of Lord Talbot de Malahide, presiding. Stained glass, he said, was absolutely necessary, both to make the building usable in bright summer weather, and to restore to it that solemn effect which in the Middle Ages it must have worn. A paper on the iconography of the Chapter-house, was read by Mr. J. C. Walker. A short paper was read by Mr. White, for Mr. John Franklin, who contended that we had an indigenous school distinct from that of Italy. Mr. Franklin criticised a more elaborate paper on the subject. A paper was read by Mr. Joseph Barré, on the records and Muniments of the Abbey, which, he said, were so numerous and complete that there scarcely a square foot of Mediaeval Westminster that might not be illustrated from them. The course of the afternoon the visitors were conducted over the Abbey, and interesting explanations were given by Mr. Scott, the architect of the Dean and Chapter. Amongst other well-known points which were visited, was a recently-discovered site of St. Catherine's pel.

National Safe Deposit Company.—A site, he said, having been secured in or about Lion House-street, a large building is to be erected, which shall be both burglar-proof and fire-proof. The building is to be ostensibly on, but something on the model of an armoured vessel. The walls will consist of a number of plates, varying in thickness from 1 in. to 2 in. These plates will be successively of hard soft metal (iron and steel), so as to render attempts of the burglar futile, and between the screw plates there is to be a packing material, of which latter material the higher parts of the building are to be mainly constructed. The packing between the armour plates will not only arrest the burglar but disperse the electric force in a thunder-storm should it strike the building. There are long corridors, one on the right and left, each marked and numbered. The simple act of withdrawing the key from the lock is described as locking each safe securely.

New Town-Hall, West Vale, Yorkshire.—Plans for the proposed public building at West Vale have been prepared by Messrs. G. H. Wardle, & Patchett, of Halifax. The principal front is to the Eiland and Saddleworth, and will be in two stories. The entrance is a porch beneath a tower 60 ft. in height, opening on one side a shop and dwelling-house, and on the other the public buildings. On the first-floor are six rooms to serve as local school-room, lecture-room, library, and classrooms for the Mechanics' Institute. A staircase, long by leads to the large room, which will be 30 ft. wide, 38 ft. wide, and 22 ft. high. At the end is to be a raised platform. The three-sided window at one side of the hall opens out on a balcony for out-door addresses. The basement story contains store-rooms, heating apparatus, and a fire-engine house, having large openings out directly to the road.

New Pulpit, Holy Trinity Church, Chester.—A new pulpit has been put up in Holy Trinity Church, Chester. It was designed by the architects, Messrs. Kelly & Edwards, and erected by Mr. Thomas Earp, of London. The pulpit, or rather open platform, is the gift of the late Dean Anson. It consists of a polished alabaster, the front being divided into three panels of open trefoil work, with scrolls in the centres. The panels are supported by green marble shafts, the capitals being part of, but standing out in bold relief from the alabaster cornice. In the middle panel a trefoil encloses a floriated cross of red marble, and the corresponding quatrefoils in the side panels, the sacred monograms "I.H.S." and "M.X.P." Above the base-moulding is a band of yellow marble, and the emblems of the Evangelists are introduced in the mouldings, the whole of the work is enriched by a gold leaf floor spar.

Pretty Portrait.—Messrs. Marion & Co. have published a charming photograph, by the late Robinson & Cherrill, from a medallion of Mrs. Scott Siddons, by Mr. A. Bruce. The accomplished original is at this time in the Theatre, in a clever, but curious piece, "Ordeal by Touch."

Mountain Railways in Yorkshire.—An experiment is to be made on the abandoned incline of the Whitley and Malton Railway, in Goathland. The road has been re-laid to a gauge of 3 ft. and 7 $\frac{1}{2}$ in., with a central rail laid 9 in. above the others, and edgewise. The object of the alterations is the testing of the first of a series of mountain-climbing locomotives built by Messrs. Manning, Wardle, & Co., of the Boyne Engine Works, Leeds. These engines are intended for a continuation of an existing railway in Brazil, and are projected to climb the mountains to the table-land of Rio de Janeiro, where the coffee is produced, and which produce is now only got to the seaboard on the backs of mules. The engine is limited to twenty-five tons, but contains two distinct actions, that of the ordinary locomotive, and a novel one having a direct action, by which four wheels worked horizontally can be put in use, grasping the edges of a horizontal rail at a pressure of forty tons when ascending an incline. By this means it is confidently expected that a load of forty tons can be worked up a gradient of 1 in 12.

Paper Car-wheels.—The *National Car Builder* describes railway car-wheels of paper. The material, it says, is straw-board, in all respects the same as that used in the manufacture of paper boxes, and may be made of wheat-rye, or oat straw.—"The wheels constructed of it possess some very requisite and desirable qualities,—a perfect form, considerable elasticity, great strength and durability, and a facility of repair which is entirely wanting in a chilled wheel. These points, together with the method of construction and the peculiar nature of the material, make these wheels worthy of attention." The tyre, however, is of steel, and covering the whole of each side of the wheel are two side-plates of Norway iron boiler-plate, which fit against a shoulder turned in the tyre. The paper framework is said to give elasticity to the cars in motion, and "deadens the jar." Trains have been run at the rate of thirty miles an hour with these wheels, which are said to be very strong and lasting.

The Patent Laws.—The Select Committee on the Patent Laws have agreed to a series of resolutions which they recommend as the basis of legislation on the subject. They do not suggest the granting of pecuniary rewards as a substitute for the temporary privilege conferred by letters patent, but they point out some instances in which the existing laws are defective and require improvement.—At a recent meeting of the Labour Representation League, Mr. R. M. Latham, the president, in the chair, the report just issued by the Select Parliamentary Committee on the Patent Laws was discussed. Much dissatisfaction was expressed with the report, and at the fact that members of the working classes had not been called to give evidence before the Committee, the constitution of which body was objected to on the ground that its composition consisted of two-thirds of manufacturers and parties representing interests antagonistic to those of inventors. It was also urged that a fair and complete inquiry into so important a subject as the Patent Laws could only be satisfactorily effected by a Royal Commission representing all the interests in the community; and steps were ordered to be taken with a view of insuring an exhaustive inquiry into the whole subject by that means.

Portable Railway for Common Roads.—Mr. Wm. Pidding, of Bedford-square, has, it is said, invented a system of portable rails, which secures to every carriage its own tramway, and which may be used with equal facility upon any ordinary road, whether macadamised, paved, or asphalted. The carriage wheels, which are only about 21 in. diameter, run upon the inside of the tyres of a second pair of wheels, of sufficient size to permit the small wheels to rotate below, between the tyres and the naves of the large ones. This larger tyre, which forms the portable railway, is made up of a series of long and short segments, each carefully shod with india-rubber, or which may be constructed of steel, formed into a hand chain, one or another portion of which is, of course, always in a position ready to receive the running wheel. The idea is not new, but this may be an improvement on the attempts made some years since to effect the object in view.

Monument to Mazzini.—The inhabitants of Syracuse are building a monument of white marble to Mazzini in the famous quarries in which 7,000 Athenians were confined after the siege of Syracuse by Nicias.

Wells and Sewers.—Last week a number of men employed in making a common sewer in Orr-street, Calton, Glasgow, came upon an old pump well which had been discontinued on the introduction of Loch Katrine water into the city, and since covered up. One of the labourers, Patrick Reid, went down the well to discover its depth, and after some time disappeared. Another labourer, becoming alarmed at his continued absence, went to his assistance, but he also did not return. Ultimately, a third man followed, and with a similar result. After a considerable time had elapsed, and none of the other men venturing to descend the well, grappling irons were procured, and by their aid the three men were brought to the surface insensible, and were with difficulty recovered. They stated that on descending they lost consciousness from the effects of foul gases. The incident is instructive.

The Artists' General Benevolent Institution.—The dinner at Willis's Rooms, St. James's, in aid of this very excellent and important charity, passed off with considerable éclat. The Marquis of Lorne presided with much geniality, and made a very sensible address. Mention was properly made of the liberal aid which has been given to the Institution by Mr. John Hengh, who replied in a feeling and manly speech. The treasurer, Mr. P. C. Harwood (to whom, in conjunction with Mr. Millais, hon. sec., the Institution is much indebted), announced that the subscriptions amounted in all to 2,552*l.*, including a donation of 500*l.* from a friend in the room whose name was not mentioned. The dinner was provided by Mr. Willis in excellent style, and formed a striking contrast with that furnished by the proprietors of St. James's Hall on a recent similar occasion.

St. John's, Hull.—The *Hull Packet*, in an able article on church restoration in that town, says it is contemplated to entirely remodel the interior of St. John's parish church, in accordance with designs prepared by Mr. Christopher Wray. The present cumbersome galleries are to be removed; the high-backed pews will be substituted by open benches of modern pattern, the ceiling raised, and the body of the church divided from the aisles by a colonnade of seven bays. The work, which is estimated to cost about 5,000*l.*, will, when completed, effect quite a transformation of the interior, which is now of the heaviest primitive style. The incumbent, the Rev. H. W. Kemp, is heartily supported by his parishioners, and trusts soon to bring the restoration to a speedy and satisfactory completion.

Proposed New Examination Schools, Oxford.—The delegates appointed by decree to inquire as to the advisability of building new schools on the Angel site, or of using that site for any other purpose, have agreed to the following, along with other resolutions, which are reported to Convocation.—That the only method by which the requisite accommodation, regard being had not only to the existing circumstances of the University, but also to the future, can be provided, is by erecting new schools on a separate site specially appropriated to the object. That the Angel site, though not so central as might be wished, is the only sufficient site which can be procured. That it is desirable to proceed at once to the building of the new schools on that site.

Proposed New Church at Crowthorne.—On Saturday afternoon last, a meeting was held in the School of Art, Wellington College, to consider the propriety of building a new church to supersede the present temporary structure at Crowthorne. Plans of the new church were exhibited and examined, and it transpired that the cost of the church will be 3,000*l.*, and that the architect selected for the work is Mr. Arthur W. Blomfield. Mr. John Walter, M.P., presided, and was supported by Dr. Benson, Head Master of Wellington College. Appropriate resolutions, promotive of the object in view, were unanimously passed, including the appointment of a committee.

The Sewage Works, Doncaster.—The foundation-stone of the irrigation works at the Holmes has been laid by the Mayor. His worship, after laying the corner-stone, jokingly remarked that finding that masons were continually reducing the hours of labour and increasing the amount of pay, and understanding that in a short time the masters were to do the work and the men receive the money, he thought the best thing that he could do was to join the society.

The "Anti-Mildew" Grain and Seed Protector.—The heating of corn in ships and warehouses, and of stacks of corn and hay, is a great evil; and to remedy this a simple invention by a Greek agricultural engineer, I. Metbodios Ioannides, late Greek Consul in Wallachia, has been patented in this country as well as abroad. It mainly consists of a cylindrical ventilator, with perforated branches which ramify through the holds, granaries, or stacks where the contents are liable to beat, and become mildewed.

Ice Machines.—The machines for manufacturing ice, either in small quantities for families, or on a great scale, by means of heat, with ammonia and chloride of calcium, seem to be ingenious and useful. They were patented in the United States by Messrs. Vaass & Littman last year, and are now sold in London by Messrs. Sladdon, Brothers, & Co. One pound of coal is said to produce three pounds of ice.

Civil and Mechanical Engineers' Society.—At a meeting held in the Rooms of this Society, Westminster-chambers, on Friday, the 17th inst. (the president, Mr. Arthur C. Pain, C.E., in the chair), a paper upon "Water-supply to Towns and Villages" (Part II.) was read by Mr. George V. Usell, F.M.S., Assoc. Inst. C.E., after which a vote of thanks having been awarded the author, a lengthy discussion took place.

Royal Architectural Museum.—A valuable addition has been made recently to the Museum by the gift of Mr. Charles Hudson of the large and fine collection of casts formed by his brother, the late Mr. Octavius Hudson, from the cathedrals of Salisbury, Chester, Lichfield and Hereford, and from other places visited by that gentleman.

The Surrey Theatre, Blackfriars-road.—Last week this property was put up for sale by auction, but no bid was made for it. The reserve price was understood to be 25,000l., 10,000l. less, if we are rightly informed, than its cost. The history of the rebuilding and the circumstances that grew out of it would be curious.

The New Dock, Berwick.—The Berwick Harbour Bill having received the royal assent on Monday night, it is expected that the work of making the new dock will be proceeded with almost immediately. Messrs. Stevenson, C.E., Edinburgh, are engaged in the preparation of the working plans.

New Act on County Buildings.—By an Act just printed county authorities may now borrow money for the purpose of building schools, halls, &c., and also judges' lodgings, for thirty years, instead of fourteen years, as previously provided.

Society for the Encouragement of the Fine Arts.—On Thursday, the 30th, a lecture will be given at Conduit-street, by Mr. G. Browning, on "The Poetry of Germany." Sir Digby Wyatt will preside.

Utilisation of Blast-Furnace Slag.—Mr. C. F. Claus, of Middlesbrough-on-Tees, proposes to treat blast-furnace slag so as to produce masses thereof of a cellular structure suitable for building purposes.

A Bright Idea.—A correspondent from one of the London districts tells us that the gas is so bad there that the inhabitants in some of the streets do not think it worth while to light it at all!

TENDERS

For a villa at Staplegrave, near Taunton. Mr. J. Houghton Spencer, architect:—

F. Fox	£1,452 16 0
C. Fox	1,431 0 0
Macey & Yandell	1,369 0 0
Hendell	1,350 0 0
Dinham	1,347 0 0
Woolfrey & Hartnell	1,325 0 0
Moss & Giles	1,320 0 0
Shewbrooks	1,253 0 0

For a school-house in Tangier, Taunton. Mr. J. Houghton Spencer, architect:—

Shewbrooks	£255 0 0
Moss & Giles	453 0 0
Manning	466 0 0
Dinham	390 0 0
C. Fox	395 0 0
Hawkins	394 0 0
Macey & Yandell	375 0 0
Woolfrey & Hartnell	355 0 0

For lodge at Corfe, Somerset. Mr. J. Houghton Spencer, architect:—

Davis	£378 0 0
Pollard (accepted)	312 0 0

For carpenter's work (labour only) for a farm-house at Sherford, near Taunton. Mr. J. Houghton Spencer, architect:—

Hartell	£120 0 0
Cosens (accepted)	115 10 0

Accepted for new bank at Blackburn, for Messrs. Brooks & Co. Mr. George Treadell, architect:—

Patteson (mason)	£8,066 0 0
Ward (plumber)	615 0 0
Jepson & Esherwood (plasterers)	223 0 0
Ashcroft (slater)	3 0 0
Calvert (bricklayer)	721 10 0
Duckworth (joiner)	1,393 0 0
" (scamanger)	1,011 0 0

For alterations and additions to the Holy Trinity parsonage, Blackheath-hill. Mr. Alfred Williams, architect. Quantities supplied by Messrs. Landsdowne & Pollard:—

Scrivener & White	£1,680 0 0
Stumpson & Co.	1,663 0 0
Longacre & Barge	1,637 0 0
Penny	1,617 0 0
Jerrard	1,354 0 0

For a rectory at Worthing, for the Rev. W. S. Lewis. Mr. George Treadell, architect:—

Smith (accepted)	£1,285 15 0
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For the re-erection of the Albion Inn, St. Peter's, Thanet, for Mr. Cramp. Mr. John B. Collett, architect:—

Barwick	£574 0 0
Smith & Son	796 0 0
Osborn	795 0 0
Elgar	695 0 0
Harrison (accepted)	685 0 0
Bugden	650 0 0

For works to mansion, No. 135, Piccadilly. Mr. Alexander Peebles, architect. Quantities supplied:—

Fish	£5,900 0 0
Emmet	5,340 0 0
Easton & Chapman	5,227 0 0
Bywaters	4,980 0 0
Howard & Sons	4,830 0 0
Benstead & Sons	4,893 0 0

For erecting temporary premises in Burnes-place, Chapel-street, Edgware-road, for Mr. D. B. Johnstone. Messrs. Bird & Walters, architects:—

Tender No. 1.		Tender No. 2.	
Newman & Mann	£450 0 0	418 0 0	
Henshaw	467 0 0	468 0 0	
Ebbs & Son	467 0 0	385 0 0	
Williams & Son	464 0 0	432 0 0	
M'Lachlan	490 0 0	490 0 0	
Nightingale	429 0 0	414 0 0	
Brown	412 0 0	387 0 0	

For alterations and additions to Albion Tavern, Picnic. Messrs. Bird & Walters, architects:—

Frown	£590 0 0
Henshaw	473 0 0
Williams & Son	463 0 0
Nightingale	440 0 0
Newman & Mann	305 0 0
Gutler	393 0 0
Ebbs & Son	292 0 0

For rebuilding shops, corner of Walbrook and Cannon-street, City. Mr. Wm. Thompson, architect:—

Brigman & Co.	£4,271 0 0
Henshaw & Co.	5,950 0 0
Relly, Bros.	5,632 0 0
Gannon & Son	5,612 0 0
Nightingale	5,599 0 0
Scrivener & White	5,537 0 0
Perry, Bros.	5,337 0 0
Comder	4,275 0 0
Newman & Mann	5,258 0 0
Sheppard	5,200 0 0

Alterations and repairs to Windsor Castle Palace-house, Victoria Park, Bishop's-road. Messrs. Bird & Walters, architects:—

Borall	£2,566 0 0
Nightingale	450 0 0
Henshaw	403 0 0
Williams & Son	397 0 0
Newman & Mann	381 0 0
M'Lachlan	314 0 0

For the erection of stables, Maiden-vale, for Mr. E. Jones. Mr. H. M. Burton, architect:—

Brown & Robinson	£657 0 0
Nightingale	599 0 0
Shurman	567 0 0
Timewell	546 0 0
Mitchell	545 0 0

For erecting a synagogue at Margate. Mr. Ernest Turner, architect. Quantities supplied by Mr. Thomas Dixon:—

Cullum	£4,865 0 0
Shurman	4,347 0 0
Stimpson & Co.	4,771 0 0
Higgs	4,710 0 0
Cunningham	4,610 0 0

For cottage residences at Long Ditton, Surrey. Mr. John Higgs, architect. Quantities by Mr. C. H. Goode:—

Hanks	£1,000 0 0
Cuttell & Co.	857 0 0
Hebb	850 0 0
Jocelyn	935 0 0

For back portion of business premises, Market-place Reading, for Messrs. Sutton & Sons. Messrs. Wm. & J. T. Brown, architects. Quantities supplied:—

Matthews	£2,259 0 0
Strong & Son	2,240 0 0
Sheppard	2,219 0 0
Barnicoat	2,200 0 0
Aitchison & Walker (accepted)	2,175 0 0

For the erection of County of Gloucester Bank at New Swindon, Wilts. Mr. W. H. Read, architect:—

Wiltshire (accepted)	£1,946 18 0
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For a new chapel at the Brentford Union Workhouse at Isleworth. Mr. Holmes, architect. Quantities supplied by Mr. Shrubsole:—

Hartell	£674 0 0
Hiscock & Son	655 0 0
Pierce	590 0 0
Dodge	577 0 0
Bransford	527 0 0
Nias	519 0 0

For alterations and repairs to the Somerset Arms Fulham-road, for Mrs. Pimble, exclusive of pre-erecting gas-fitting. Mr. W. H. Lamborn, architect:—

Marr	£357 0 0
Bachelder	337 0 0
Bigwood (accepted)	320 0 0

For the erection of a pair of semi-detached houses Bromley, Kent, for Mr. Lucas. Mr. W. Darrett, architect. Quantities not applied:—

Taylor	£2,637 0 0
Chesent	2,529 0 0
Elden	2,319 0 0
Penny (accepted)	2,345 0 0

For building the Ship Inn, Tottenham, for Mr. Filwell. Mr. T. J. Hill, architect:—

Sabey & Sons	£2,096 0 0
Rest & Brown	1,987 0 0
Linzell	1,775 0 0
Whilde	1,693 0 0
Chapman	1,450 0 0

For houses and shops, as recently advertised. A. Latham, architect. Quantities supplied:—

Dales	£5,385 0 0
Pesket & Taylor	4,980 0 0
Pollard	4,800 0 0
Wheeler	4,737 0 0
Cox	4,560 0 0
Coles	4,500 0 0
Williams	4,278 0 0
Wright, Bros. & Goodchild	4,395 0 0
Walkey	4,300 0 0
Johnson	4,150 0 0
Hollidge (accepted)	3,980 0 0
Dover	3,969 0 0

For the erection of Congregational Chapel in the village of Pyocombe, Sussex. Messrs. Gouley & Gibbins, architects:—

Hollands	£316 0 0
Patelting & Son	290 0 0
Howard	279 0 0
Hillades (accepted)	265 0 0

For the erection of the Julius Elliot Memorial School in Mount-street, Brighton. Messrs. Gouley & Gibbins, architects:—

Credit		Old Materials	
Nash & Co.	£2,280 0 0	280 0 0	
Cheeman & Co.	2,640 0 0	420 0 0	
Patelting & Son	1,837 0 0	15 0 0	
Lynn & Sons	1,890 0 0	15 0 0	
Hollands	1,872 0 0	15 0 0	
Lockyer	1,855 0 0	25 0 0	
Baker (accepted)	1,813 0 0	10 0 0	

For Catholic school and presbytery, Aldershot. Pownall, architect:—

Jones & Johns	£1,201 0 0
Hughes	1,185 0 0
Garland	1,180 0 0
Sharrington & Co.	1,140 0 0
Martin, Wells, & Co.	1,117 0 0
Slade	1,090 0 0

Refreshment Rooms, Battersea Park.—Messrs. Latham say their tender was for "390l." not 299l. as printed.

TO CORRESPONDENTS.

Arr.—J. H. S.—I. Figs.—J. J. L.—C. & Co.—Chris. Loding. Messrs. L.—T. W. A.—C. B.—W. W.—W. D.—A. & C. H.—G. B. C. C. H.—J. P.—S. T.—B. G.—C. H. G.—B. & J.—S. J.—L. T. J. H.—H. S.—G. & G.—S. S.—G. R.—G. L.—H. S.—E. G.—T. W. C. P.—T. S. B. (we always willingly acknowledge sources of information, but we do not always publish them, as our correspondents are working gratuitously, he can, of course, draw his own lines as to what he will give and what he will not. J. W. (thanks).—F. F. (the Royal Institute of British Architects the opportunity of distinguishing themselves to those students conform to the published regulations).—C. & G. (the list we published was sent to us officially).—H. F. (shall have attention).—C. G. (week).—Y. & C. (send the particulars after).—W. P. (P. T. week).

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

Notes.—The responsibility of signed articles, and papers not public meetings, rests of course with the authors.

NOTICE TO SUBSCRIBERS.

Advertisements cannot be received for the current week's issue later than THREE o'clock p.m. on THURSDAY.

NOTICE.—All communications respecting Advertisements, Subscriptions, &c., should be addressed to "The Publisher of the Builder," No. 1, York-street, Covent Garden. All communications should be addressed to "Editor," and NOT to the "Publisher."

WANTED, a SITUATION, by a good GRAINER, MARBLER, and PAPERHANGER. Address, E. 7, Lifford-street, Lifford-road, Camberwell, S.E.

WANTED, a SITUATION, as GENERAL FOREMAN, aged 35. Town or country. Good references.—Address, J. W. D. 1, North Cottage, Cottage-grove, Stockwell.

WANTED, a SITUATION, by an experienced PLUMBER and GASFITTER.—Address, W. B. 10, Adam-street, Harper-street, New Kent-road, London.

WANTED, a SITUATION as PLUMBER, &c. or good THREE-BRANCH HAND. Town or country. Five years' good reference.—Address, R. T. Post-office, York-road, King's-cross, London.

WANTED, a SITUATION, as SHOP FOREMAN, at a TANNING Job. Twelve years' experience. Good references from last employer.—Address, G. M. R. 18, Lambeth-square, Lambeth, S.E.

WANTED, a SITUATION, as SMITH, GASFITTER, and BELLHANGER. Used to hot-water work.—Address, C. B. 20, Mare-street, Hackney.

TO BUILDERS and DECORATORS. WANTED, a SITUATION, by a good PLUMBER, PAINTER, and LEAD LIGHT GLAZIER. Is well experienced in his trade. Good references.—Address, J. W. 20, Edgware-road, W.

TO BUILDERS and PLUMBERS. WANTED, a SITUATION, as THREE-BRANCH HAND. Painter, Plumber, and Glazier, and can make himself generally useful.—Address, R. H. 11, Euston-square, Euston-square, N.W.

WANTED, a RE-ENGAGEMENT as CLERK of WORKS. Well up in Gothic work. Joiner by trade. Four years' experience.—Address, A. B. 56, Harrington-street, Hampstead-road, N.W.

WANTED, a RE-ENGAGEMENT, in Town or country. Can prepare plans, specifications, estimates, measure, and superintend works. Good lead surveyor. Age 35.—Address, 58, office of "The Builder."

TO ARCHITECTS and BUILDERS. WANTED, a RE-ENGAGEMENT, as CLERK of WORKS, or GENERAL FOREMAN. Just finished a large job. Joiner by trade. Age 39. Good references.—Address, G. W. 15, King's-road, Chelsea.

WANTED, a RE-ENGAGEMENT as GENERAL FOREMAN or CLERK of WORKS on an Estate. Has just finished a large job. Is a good draughtsman, quantity taker, &c. Good references.—Address, A. B. 10, Albert-street, Watford.

TO BUILDERS and CONTRACTORS. WANTED, a RE-ENGAGEMENT, as GENERAL FOREMAN. Age 34. Carpenter and Joiner by trade. Town or country. Good reference and testimonials.—Address, S. M. 9, Grosvenor Park, Camberwell, S.E.

TO BUILDERS, DECORATORS, &c. WANTED, by a CLERK, in the above Office. Good book-keeper, runner, cost, and general office duties. Age 27. Good testimonials.—Address, Y. 4, Alfred-terrace, Britania-road, Fulham, S.W.

TO BUILDERS and DECORATORS. WANTED, a RE-ENGAGEMENT, as FOREMAN of PAINTERS (in Town or country). Has a thorough knowledge of his business. Four years in his last situation. Robust, willing, and obliging man. First-class testimonials and reference from former employers.—Address, J. COX, Post-office, New Cross, S.E.

TO ARCHITECTS and BUILDERS. WANTED, a RE-ENGAGEMENT, by a thoroughly practical CLERK of WORKS, or as a Builder's Foreman. First-class references and testimonials. Over twenty years' experience in all branches of the trade. Age 40.—Address, W. G. D. 81, Salisbury-street, Marylebone, N.W.

TO PLUMBERS, BUILDERS, &c. WANTED, by a first-class PLUMBER, a constant SITUATION or JOB. Willing to fill up time at other branches if required.—Address, C. E. DEAN, 10, Wiveton-road, near Totting.

WANTED, by a good PLUMBER, a SITUATION, on a Job or constant. Town or country. No objection to go abroad. Reference.—Address, 56A, Office of "The Builder."

TO PLUMBERS, &c. WANTED, by a good practical PLUMBER, a SITUATION, in a Fishing shop. Satisfactory reference.—Address, A. B. Mr. Dills, Stationer, 306, Gray's Inn-road, Epsom.

WANTED, by a good PLUMBER, a CONSTANCY. Does not mind filling up his time in painting and glazing. Town or country.—Address, W. F. 59, King-street, Epsom.

WANTED, by a good PLUMBER, a SITUATION or JOB. Well up in all branches of the trade. Town or country. Good references.—Address, J. L. No. 2, Homer-row, Marylebone-road, W.

TO PLUMBERS, BUILDERS, and DECORATORS. WANTED, by a first-class PLUMBER, a SITUATION. Thoroughly understands either Old or New Work. Town or country.—Address, PLUMBER, 18, Beoworth-road, Upper Westbourne-road, Apsal, New Town.

TO BUILDERS, CONTRACTORS, &c. WANTED, by an energetic and competent CLERK, a RE-ENGAGEMENT, in Town or country. Can prepare plans, specifications, and estimates, measure up and superintend works, and thoroughly acquainted with accounts. Age 30.—Address, 51A, Office of "The Builder."

TO ARCHITECTS and SURVEYORS. WANTED, by the Advertiser, aged 19, an ENGAGEMENT, as ASSISTANT. Five years' experience.—Address, W. WOODING, House Agent and Valuer, 267, Bethnal Green-road, E.

TO BRICK and TILE MANUFACTURERS. WANTED, by a middle-aged Man, of long experience, a SITUATION as FOREMAN. Is thoroughly conversant with the manufacture of red bricks and clamp-sticks, and fancy work. Good references.—Address, Y. Z. 32, Trevoston-street, Ledbrook Grove-road, Notting-hill.

WANTED, by a respectable Man, a permanent SITUATION as PAPERHANGER and DECORATOR. Willing to fill up time in painting. Country not objected to.—Address, T. J. 18, Conyngham-street, Regent-street, W.

TO ESTATE AGENTS, LANDLORDS, and OTHERS. WANTED, a constant SITUATION, by an energetic sober Man, as CARPENTER and JOINER. Age 38. Well up in all branches of the building trade. Terms moderate. Good references.—Address, A. B. 1, Air-master-street, Tottenham, N.

TO ARCHITECTS and SURVEYORS. WANTED, by a Gentleman, an ENGAGEMENT as IMPROVER in a good Office. Salary, 27. 10s. a Good reference.—Address, E. 17, Portland-gardens, Notting-hill, W.

TO ARCHITECTS, SURVEYORS, and BUILDERS. WANTED, by a good ARCHITECTURAL DRAUGHTSMAN, who has completed a moderate Saturday the 25th inst. a RE-ENGAGEMENT. Thoroughly understands the routine of office work, and is willing to make himself generally useful.—Address, K. Z. 15, City-street, F.C.

TO ARCHITECTS and SURVEYORS. WANTED, by a young Gentleman, who has served his articles in the country, a SITUATION as JUNIOR, in the office of a London architect. Salary not so much an object.—Address, 628, Office of "The Builder."

WANTED, by a young Man, a SITUATION as IMPROVER in the PLUMBING, PAINTING, &c.—Address, F. P. 42, Little George-street, Hampstead-road.

TO MASTER PLUMBERS, BUILDERS, &c. WANTED, by a young Man, a SITUATION as PLUMBER. Willing to fill up his time in painting and glazing. Has, from thorough knowledge of the business.—Address, J. H. care of Mr. Rippon, 15, Manning-street, Edgware-road, London.

WANTED, by a young Man, aged 24, a SITUATION as WHITESMITH, BELLHANGER, GAS FITTER, and FENCIBLE BARRACK CARPENTER. Is in the office of a London architect. Salary not so much an object.—Address, 604, Office of "The Builder."

TO CONTRACTORS and BUILDERS. WANTED, by a young Man, a SITUATION as GENERAL ASSISTANT and CASHIER on a large Job. Town or country. Good references. Salary moderate.—Address, 604, Office of "The Builder."

WANTED, by a young Man, a SITUATION as IMPROVER in the PLUMBING and GLAZING. Has had Five years at the trade. Can do all references. Apply, stating wages, &c. to T. TEMPLEMAN, Old Town, Chard, Somerset.

TO ARCHITECTS and CIVIL ENGINEERS. WANTED, by a young Man, aged 25, an ENGAGEMENT as DRAUGHTSMAN. Has had seven years' experience in coloring and getting out elevations, plans, sections, details, &c. in a large building. Under clerk of works. Has also a practical knowledge of joinery. Can give good reference.—Address, F. NEWELL, Railway, Malabar-street, Chelsea.

WANTED, by an experienced Builder's Clerk, a RE-ENGAGEMENT, well up in accounts, office routine, brickmaking, neat brickmaking, &c. Town or country. Five years in last situation. Good references.—Address, J. W. S. 21, Berwick-road, South, Fenchurch-street, London.

TO ARCHITECTS and OTHERS. WANTED, by an experienced ASSISTANT, an immediate ENGAGEMENT. Can prepare and fill up drawings from rough sketches, Indian style, and make out details. Has some knowledge of Gothic, and can make perspective drawings.—Salary moderate.—Address, J. M. C. Mrs. Hayes, 3, Iron-monger-street, Staines, Lincolnshire.

TO PLUMBERS and GASFITTERS. WANTED, by a thoroughly practical SCOTCHMAN, at present residing in Dublin, a SITUATION as MANAGER or FOREMAN in the above business. Thoroughly practical in all branches of the business. Age 38 years. First-class references from London and Scotch houses.—Address, A. B. 10, Mount Pleasant-terrace, Mount Pleasant-avenue, Rathmines, Dublin.

TO BUILDERS and CONTRACTORS. WANTED, by a thoroughly competent Man, MASON by trade, a RE-ENGAGEMENT as GENERAL FOREMAN or take entire Charge of a Job. Well up in setting out work and management of men. First-class references.—Address, A. Z. 29, Auckland-street, Vauxhall.

TO ARCHITECTS and BUILDERS. TEMPORARY EMPLOYMENT WANTED, by a first-class QUANTITY MEASURER, and DRAUGHTSMAN. Well up in estimating and building accounts. Twenty years' reference.—Address, R. A. 3, Langford-road, Haverstock-hill, N.W.

TO BUILDERS. TEMPORARY ASSISTANCE.—A most efficient MEASURER, ESTIMATOR, ACCOUNTANT, and STOCKER, capable of twenty years' practical duties. TEMPORARY ASSISTANCE on reasonable terms. Plans and specifications prepared, surveys made.—Address, 477, Office of "The Builder."

TO BUILDERS, CONTRACTORS, and OTHERS. THE Advertiser, aged 17, seeks a RE-ENGAGEMENT, in an office of the above, where he would have an opportunity of improving himself in the general duties of the office. He is willing to make himself useful.—Address, F. M. 7, Arple-street, King's-cross, N.

TO BUILDERS and CONTRACTORS. THE Advertiser, who has had nine years' experience in building and surveying, desires an ENGAGEMENT as ESTIMATOR and MEASURER. He will not object to take charge of the book-keeping, with which he is thoroughly acquainted. Salary required, 20s. per week.—Address, A. B. 11, Ashburnham-terrace, Chelsea, S.W.

TO CONTRACTORS, SURVEYORS, and OTHERS. THE Advertiser wishes to have a few EVENING LESSONS (two hours each, twice a week) in Taking out Quantities.—Address, with terms, to the care of Mr. Blake, Stationer, 141, Hampstead-road, N.W.

TO ARCHITECTS, HOUSE and ESTATE AGENTS, and OTHERS. THE Advertiser (who has been eleven years in an Architect's office) seeks a RE-ENGAGEMENT. Accustomed to manage household property, and versed in the routine of an Architect's office. Next to draughting and tracing. Terms moderate.—Address, A. HANDLEY, 8, Southdown-street, Regent-square, W.C.

TO MASTER PLUMBERS, PAINTERS, &c. THE Friends of a Youth, who has been two years at the trade as a journeyman, is in a good shop as an IMPROVER.—Address, Z. 16, Stanley-buildings, Old St. Pancras-road, N.

STAIRS.—A first-class STAIRCASE HAND is in WANT of 6S. either by Day or Piecework, as SHOP or OUT-DOOR FOREMAN. Labour only. Town or country.—Address, W. B. 1, Ingestre-lace, Broad-street, W.

PLASTERING WANTED by CONTRACT. In town or country. Labour only.—Address, J. S. Post-office, Clapham-common, S.W.

PLUMBING WANTED by a practical and experienced Man. References from Government Engineers can be supplied.—Address, Y. Z. 15, Conyngham-street, Regent-street, W.

TO ARCHITECTS and SURVEYORS. NOW OPEN to an ENGAGEMENT, an efficient ARCHITECT'S ASSISTANT, with great experience in town and country. Needs no special draughting. Well up in general office practice, and good colour and perspective draughting. References. Salary moderate.—Address, 668, Office of "The Builder."

REQUIRED, by a First-class Practical CLERK of WORKS, a fresh ENGAGEMENT with the highest testimonials.—Address, B. W. Meares, Nash & Spratt, 139, Chatham-road, S.W.

TO ARCHITECTS. QUANTITY-TAKER and MEASURER of twenty years' practical experience, offers TEMPORARY ASSISTANCE, on a large scale, on any contract.—Address, SURVEYOR, 25, Thornton-street, Brixton-road, S.W.

QUARRY OWNERS. A Gentleman having a connection amongst Builders, is open to an ENGAGEMENT as TRAVELLER, or to MANAGE a STONE QUARRY. Address, 8, care of Mr. Barlow, Albert-road, Aston Park, Brixton, S.W.

QUANTITIES, MEASURING, and ESTIMATING.—A Surveyor of great experience in Measuring, Estimating, and Quantities, will be glad to give TEMPORARY ASSISTANCE. Has had great practical experience in taking and arranging extra and omission. Would undertake the books and accounts of a builder.—Address, SURVEYOR, 116, Camden-road, N.W.

HOME or ABROAD.—A BUILDER'S FOREMAN requires a RE-ENGAGEMENT as CLERK of WORKS, Carpenter by trade. Well up in insuring, quantities, &c.—Address, S. B. Mr. Hine's, Rose Cottage, Ballynaught, Dublin, S.W.

A SURVEYOR, formerly of London, now and for some time past taking part in the direction of an extensive building work, on a nobleman's estate in the country, where he has been engaged in the purchase of land, the laying out, and wishes to receive an offer of EMPLOYMENT elsewhere, upon reasonable terms of pay.—Address, No. 668, Office of "The Builder."

A FIRST-CLASS ARCHITECTURAL DRAUGHTSMAN and COLLECTOR of plans, accustomed to abstracting and billing, quantities, and measured work, good ornamental and plain writer, requires a permanent ENGAGEMENT. Excellent testimonials from former employers. Age 58. Salary, 25 guineas per week.—Address, N. L. C. E. Post-office, Stockwell, S.W.

A FIRST-CLASS ASSISTANT, well versed in Gothic and classical work, and working draughtsman, offers a RE-ENGAGEMENT.—Address, ARCHITECT, Delany's Library, 385, Pall-mall, S.W.

A FIRST-CLASS ASSISTANT, commencing an engagement at the end of this week, is desirous of obtaining a RE-ENGAGEMENT immediately. Well up in working drawings, and competition drawings.—Address, No. 668, Office of "The Builder."

A FIRST-RATE QUANTITY CLERK and fair DRAUGHTSMAN wishes temporary EMPLOYMENT. Terms 18s. an hour for Drawing. Good references.—Address, B. A. H. No. 65, King William-street, City.

A FIRST-RATE DRAUGHTSMAN, who has his own Rooms on Moderate Terms, N.B. Perspective and Competition Drawings effectively and artistically coloured.—Address, 268, Office of "The Builder."

AN ESTIMATING, MEASURING, or GENERAL CLERK, who has had much experience in grand and small works, and is desirous of an ENGAGEMENT. Temporary or partial not objected to. Joiner by trade.—Address, LESLIE, 39, Sheepen-street, Ipswich.

An experienced Builder and Surveyor wishes to be EMPLOYED as GENERAL FOREMAN or CLERK of WORKS in London, or country.—Address, Mr. Budge, Bantle, Heywood, & Co. Solicitors, 23, Red Lion-square, London.

TO BUILDERS. AN OUT-DOOR FOREMAN (Joiner) of considerable practice, in carrying out buildings, wishes for an ENGAGEMENT for a JOB, or to manage a small shop and buildings. Good references.—Address, C. W. 29, Ann-street, Waterloo-road, Lambeth, S.E.

TO BUILDERS, &c. A FOREMAN, experienced in the general management of an ENGAGEMENT, offers to take CHARGE of a JOB.—Address, W. W. 5, Auldington Crescent, York-road, Lambeth, S.E.

RE-ENGAGEMENT WANTED, as CLERK of WORKS or GENERAL FOREMAN. Good references.—Address, B. B. 10, York-street, Covent Garden, W.C.

GRAINING and WRITING. A FIRST-CLASS GRAINER and WRITER is open to a JOB.—Address, B. YOUNG, 156, Vauxhall-bridge-road, Finsbury.

BUILDER'S ASSISTANT.—Temporary ASSISTANCE can be given by the Advertiser, who is well up in MEASURING, ESTIMATING, &c. and has a thorough knowledge of out-door work.—Address, A. B. Post-office, Ball's Pond-road, N.

TO BUILDERS and CONTRACTORS. CLERK or TIMEKEEPER.—WANTED, by a young Man as above. Has been in the Office two years and a half. Good book-keeper. Excellent references. Age 18.—Address, J. W. at Wilkin's, Stationer, 3, Onechurch-lane, Whitechapel, N.E.

AUCTIONS—see also page xvi. LEIGHTON BUZZARD, BEIS.—The Corn Exchange premises, Leighton Buzzard, with its magnificent and spacious hall, is usually open, committee room, ante-room, and necessary appurtenances; the Wine Merchant's Office, forming most valuable room for the sale of wine, and for the collection of duties on the PUBLIC HOUSE LICENSE; and other useful rights and privileges, will be SOLD BY AUCTION, by

MR. GOTTO, at the HALL of the CORN EXCHANGE, Leighton Buzzard, on TUESDAY, JUNE 25th, 1872, at THREE for FOUR o'clock. The building is well adapted for balls, concerts, public meetings, dinners, and gatherings of the order, and for such purposes, in addition to its use as a Corn Exchange. The same will be sold by auction, with the usual furniture, and other contents, capable of considerable increase. It is also capable of being converted for manufacturing purposes. Conditions will be printed in the Building Advertiser, and at the residence of Messrs. WILKINS, Leighton Buzzard. Messrs. BEIK & GREEN, Solicitors, Northampton, and Mr. GOTTO, Land and Estate Agent, The Cross, Leighton Buzzard.

RED-HILL, SURREY.—Important Property and Building Land, containing 100 acres, and situated in the parishes of Red-Hill, Surrey, is instructed to SELL BY AUCTION, at the MARKET HALL, Red-hill, on WEDNESDAY, the 29th of JUNE, at TWELVE o'clock, in three lots, an estate of 100 acres, more or less, situate in the parishes of Red-hill, Surrey, and for such purposes, in addition to its use as a Corn Exchange. The same will be sold by auction, with the usual furniture, and other contents, capable of considerable increase. It is also capable of being converted for manufacturing purposes. Conditions will be printed in the Building Advertiser, and at the residence of Messrs. WILKINS, Leighton Buzzard. Messrs. BEIK & GREEN, Solicitors, Northampton, and Mr. GOTTO, Land and Estate Agent, The Cross, Leighton Buzzard.

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The Builder.

VOL. XXX.—No. 1530.

The Sefton Park, Liverpool.



SEFTON PARK, in Liverpool, which was formally opened the other day, as we have already mentioned, by Prince Arthur, is, of course, still in a comparatively embryo state, only small portions being yet planted, and the whole wearing the raw aspect which always belongs to a newly laid-out park, and which it is the work of a good many years to wear off. Sufficient, however, is apparent of the general design of the grounds to indicate that this park, if adequately completed, will be a very successful piece of work, and form, perhaps, one of the most interesting and picturesque suburban pleasure-grounds in the kingdom. The general arrangement may be best indicated by saying that it includes an inner and outer "boulevard" surrounding the park, not however in regular circles, but in irregular curves, the two lines of drive occasionally meeting; the centre space, interior to these, being occupied partly by ornamental water, shrubberies, and foot walks to the west of the water, and open ground, to be used apparently as building land, towards the east and north. By a happy advantage taken of the natural dip of the ground at this point, the two boulevards form on the west side of the lake parallel promenades on different levels, the foot-walk by the lake-side forming lower down a third promenade below these, reached by steps from the inner boulevard: when the sloping banks above the lake-side are well planted, the effect, on a *fiête* day, of these three tiers of promenades rising one beyond the other (the two upper ones admitting of the passage of carriages) would be very gay and animated. The water in this, the southern extremity of the park, forms a large open irregular lake, intended to be devoted partly to the display of model yacht races. From the north end the water comes down to the principal lake through a series of smaller ponds and rivulets, falling occasionally in small cascades over artificial rocks, winding round islets occupied by flower-beds, and appearing to issue, at its source, not, like Coleridge's sacred river,—

"From caverns measureless to man,"

but from a pillared grotto sufficiently spacious to be a delight to children and nursemaids. All this is really very pretty, however, as a picco of ornamental gardening, and a very pleasant mimicry of the process of nature, if only the channels and cascades can be supplied with abundance of water; otherwise it will be, as at the time of our visit it appeared, an unfortunately ambitious attempt to do more than can be done for the money. It is to be hoped this will not be the normal state of things, lest the artificial river should echo the complaint of "Bruar Water" in Burns's poem,—

"That by a bard I should be seen,
"Wi' half my channel dry."

The arrangement of the lake side-walks, by the way, may be open to question: there is a natural impulse in the popular mind, certainly,

to get close to the edge of the water in a park, and there are effects of reflection to be had thereby, too, not otherwise attainable; but these will not quite compensate for the beautiful effect obtainable by carrying green shelving banks and foliage right down to the water's edge, after the manner to be seen in the park on the other side of the Mersey, at Birkenhead, laid out originally by Paxton. The general arrangement of the walks and contours of the ground is such as to be available, where the trees are planted and properly grown, for producing pleasing surprises of vista, and giving to the visitor that idea of extent which adds so much to the value of the space occupied in a park: this is not done, however, so completely and happily as we have seen it accomplished in some smaller works of the kind; but it may have been thought that with so much space at disposal any such attempt to increase the apparent extent were of minor importance. Of architectural embellishment the park has nothing as yet, except the abutments for a good sized bridge to carry the inner boulevard over one of the hollows; let us hope the bridge is not to be a "thing of beauty" of the modern engineering type, the reverse of "a joy" for ever. The smaller adjuncts, such as gate piers and railings, do not show any particular taste or novelty of design; and we saw with regret, dispersed about the grounds, those ludicrous travesties called "rustic" iron seats, or seats carried on cast-iron imitation of twisted branches and twigs. Is there no one to tell the corporation of Liverpool that such things are ridiculous, and an offence against common sense and artistic sense alike? That body have now, we understand, taken the oversight of the park into their own hands, from those of Messrs. André & Hornblower, who gained (and well merited) the first premium in the original competition. The reasons of the change we are not concerned with; but it is to be hoped the corporation will find some competent person to act for and advise them in matters (especially) affecting the architectural embellishment of the park. Much may be done in this way either to improve or to spoil a site which contains most of the materials for making a very beautiful suburban place for residence and recreation.

THE STRENGTH OF BUILDING MATERIALS.

THE paper recently read at the Royal Institute of British Architects, "Our present Knowledge of Building Materials, and How to Improve It," by Captain Seddon, R.E., contains some valuable matter. We print portions of it, and advise those who are interested in the subject to obtain it for themselves from the Institute.*

Engineers have, to a greater extent than architects, been compelled to study the nature and strength of materials, and especially of iron, which (used as it is by the former for every kind of work) has to be dealt with so as to economise both weight and material to the utmost, and to make the best possible use of its enormous powers of resistance to strains of every description. In fact, the extensive use of iron for constructive purposes may almost be said to have given birth to the profession of civil engineering as distinct from that of architecture, the result of which has, I think, been a tendency to too exclusive a cultivation of art on the one side, and of science on the other, to the manifest disadvantage of both professions.

Inasmuch as the architect aims at the beautiful in his constructions, as well as the useful, his profession is of a more elevated character than that of the engineer; for by assisting to cultivate the public taste he leads towards the source of all beauty and purity. Engineers confining themselves too closely to one idea—namely, the theoretical perfection of their work—have fully met the want that gave them birth, have shown how maximum results may be obtained from a minimum expenditure on labour and materials;

but in mastering science they have too much neglected art, and even at times justified the absence of any aim at the beautiful, by affecting to rise above such ideas into the regions of the stupendous and the grand; but, unfortunately in minor undertakings, in little works which cannot aspire so high, we still find the same absence of any attempt to please the more cultivated feelings of our nature; or if the attempt is there, it is mostly too evident that a given sum has been expended upon purchasing a mask to hide not the loveliest of structural details below.

The question which I mean to raise is, whether we are yet sufficiently acquainted with the properties and strength of the different materials in common use for building purposes to enable us to employ them to the best advantage, or to allow of our calculating with accuracy the amount of material necessary, in every part of a structure, to meet the different stresses called into play?

It may be said by some, What more information do we want than that already within our reach? There are handbooks enough, in all conscience, with copious tables, giving the strength of all kinds of materials under every description of stress, and formulae for calculating the requisite dimensions of beams, columns, &c., of different forms and under varied conditions: surely we are in possession of all the information any one could possibly require. Nevertheless, I think it must be admitted, on a little reflection, that the present state of our knowledge in these matters is, in face of the boasted enlightenment of the nineteenth century, by no means so satisfactory as at first sight might be imagined; or in any way sufficient to warrant our resting content without making any further researches.

Most of the data upon which calculations have hitherto been based, have been derived from experiments made on picked specimens, too small in size, and too free from such ordinary defects as are sure to occur in larger specimens, to give us very reliable grounds to go upon; the result being that we are forced to supplement our defective knowledge by using large factors of safety; or, in other words, by not straining the material used to anything like its estimated powers of resistance.

Timber.—Taking the subject of Timber first, I cannot perhaps do better than quote from a valuable little treatise lately published by Mr. B. Baker, C.E., "On the Strength of Beams, Columns, and Arches." At page 127 he says:—

"Unfortunately, most of the careful experiments of Tredgold, Barlow, and other early investigators were made on small pieces of timber, straight-grained, and free from knots and other defects; a condition favourable, it is true, to the comparison of the results of mathematical investigation with those derived from direct experiment; but, on the other hand, leading to errors of much greater moment in actual practice, since (as every workman knows) a piece of timber uniformly sound throughout can never be reckoned upon." He then goes on to show the percentage of loss of strength due to the inevitable defects in large scantlings, as follows:—A piece of English oak, 9 in. and 1 in. square, gave a result equivalent to a breaking weight of 8½ cwt. applied at the centre of a 1-in. square bar supported on bearings 12 in. apart, giving a calculated stress on the extreme fibres of the bar equal to 7½ tons, or 17,021 lb. per square inch, a surprisingly high, and, as far as practical cases are concerned, a palpably exaggerated result. Whereas, taking a larger scantling of oak, 11 ft. 9 in. long and 8½ in. square, the calculated stress on the extreme fibres, when rupture took place, was only five tons, or 11,200 lb., instead of 17,021 lb. per square inch; and a larger beam still, 24 ft. 6 in. long, 12 in. deep, and 10½ in. wide, gave a result equivalent to less than one-third of that given by the small selected piece. He then says:—"This reduced amount shows that the average strength of the timber in this large beam was less than one-third of that in the small selected piece; and we think no further illustration is required to show the necessity of neglecting the majority of experiments made on small scantlings of oak, when deducing rules for practical application. We find the same conclusions hold good with reference to Riga, Memel, pitch pine, and other soft woods; the standard bar, 12 in. by 1 in. square, giving a maximum stress on the fibres of 3½ to 4½ tons per square inch, whilst experiments on a beam 15 ft. long and 12 in. square give a maximum stress of only 2½ tons per square inch."

If we turn to Molesworth's "Handbook of Engineering Formulae," and Hurst's "Architectural Surveyor's Handbook," both of which are books purporting to supply all the latest information brought up to date each year, we find the value of the constant to be applied in the formula for beams under transverse stress, given as five for English oak, 5 cwt. being taken as the central load required to fracture a standard bar, 12 in. long and 1 in. square; although the tensile strength of oak in pounds, in Molesworth's Handbook, is given as 17,000 lb., which would give 8½ cwt. instead of 5 cwt., as the central breaking load. Professor Rankine, in his "Rules and Tables" gives 10,000 lb. to 19,000 lb. per square inch, as the tensile strength of oak, and 12,000 lb. to 14,000 lb. for fir or pine.

* Sessional Papers, 1871-72, No. 10.

Now let us glance at the crushing strength of timber, as given by different experimenters.

Rondelet gives the crushing strength of pine as 54 cwt. to 62 cwt. per square inch, and that of oak as 45 cwt. to 54 cwt.

Tredgold took 36 cwt. for both.

Rennie gives the strength of pine at 14 cwt. and of elm, as low as 11½ cwt. per square inch.

Hodgkinson gives 92 cwt. for elm, 90 cwt. for oak, and about 54 cwt. for pine.

Lastly, I have here the results of some experiments made by Mr. Kirkaldy, on two logs 20 ft. long about 13 in. square, one of white Riga and the other of red Dantzic fir, which show, in the first case, a resistance to crushing of 175 cwt., and in the last of 155 cwt. per square inch. Both balks failed by crushing, the lateral deflection not exceeding ¼ of an inch in either case. These results approximate closer to those made by Rennie than any of the others.

Here is a mass of conflicting evidence, notwithstanding the apparent simplicity of the subject; and yet it is by no means as simple as it seems. The conditions were, no doubt, very different in each set of experiments; the apparatus employed was different, there were different observers, and therefore it is not to be wondered at that the results arrived at differ. In fact, the seasoning alone of the specimens would at once account for a great part of the difference; for green timber, from the moisture in it reducing the lateral adhesion of the fibres, has not more than half the strength of dry timber, and yet if artificially overried, a considerable loss of strength would be the result.

With regard to the transverse strength of timber beams especially, though the same remarks apply to those of iron or any other material, what would appear to be an important element in their strength, though hitherto omitted from all calculations, is the lateral adhesion of the fibres to each other.

Iron.—I now come to the subject, and a most important one, of iron. Notwithstanding the great advance which has of late been made towards a more perfect acquaintance with the properties of irons of different classes, and notably by means of the numerous experiments made by Mr. Kirkaldy, and the stimulus which has been given to the manufacture of high-class irons, by the rival contests between iron guns and iron shields, it must be admitted, even by those who have made it a subject of special study, that there is very much yet to be learnt about iron; whilst, if we except a small circle, whose special employment has caused them to follow with interest in the track of every experiment which could throw any light upon the nature and properties of the material with which they are chiefly called upon to deal, there is a general lack of knowledge about the whole subject; besides much misconception, which the clear proof of practical experiment will alone be able to sweep away.

As a building material, iron is day by day forcing its way everywhere, and many, who not long ago would have set their faces against its use in structures aiming at a high class of art, no longer hesitate to call in its valuable assistance in order to solve constructive problems which would be beyond the reach of wood, brick, or stone,—at any rate, within any reasonable limits of expenditure. Such being the case, it is essential that its properties should be thoroughly understood by all those who are likely to make use of it for constructive purposes, and that they should not merely order a girder, for instance, to carry a given load, leaving the designing of it to the manufacturer or his agent, whose interest it is to run up the weight, and hence the price, at the expense of quality and good workmanship.

It may safely be said that there is no material so dangerous to trust to, without a full knowledge of its behaviour under different conditions, than iron; whilst there is none which varies so much in quality, or in the manufacture of which there is more knowledge, experience, skill, and care required, or which admits of more deception being practised upon the unwary by unscrupulous and dishonest manufacturers.

Now I think that, beyond the difference between cast and wrought iron, and the inferiority of the former, when exposed to the effects of sudden shocks, there is very little accurate knowledge on the subject of the properties and powers of resistance of different classes of iron under varying conditions of stress. Their behaviour under different circumstances, such as tension, compression, shearing, bending, torsion, either suddenly or gradually applied, varies so widely according to the description of the iron under

trial, that the strongest proof which could be adduced of the necessity for a far wider acquaintance with the subject is given by the ordinary formulae in use for calculating the strength of iron girders, &c.

* * * * *

Stone.—Passing on to another material, let us see whether we ought to rest satisfied with what we know about building stones.

Here again the majority of experiments made have been upon very small specimens, such as small cubes under compression, whilst the recorded results vary with each set of experiments, according to the amount of accuracy capable of being arrived at by the machinery made use of, as well as the skill and care with which the experiments were made and recorded.

If we take a stone which has been more largely used perhaps than any other, namely, Portland, we learn from Barlow that its crushing strength ranges from about 1,381 lb. to 4,000 lb. per square inch, whilst in the experiments made by this Institute, and recorded in your sessional papers for 1851, the mean resistance to crushing, per square inch, arrived at was, for 2-in. cubes, 2,576 lb.; for 4-in. cubes, 4,099 lb.; and for 6-in. cubes, 4,500 lb.

According to Romo its crushing strength may be taken as 3,729 lb. per square inch, which has been followed by Molesworth in his "Handbook," whilst in Hurst's "Handbook" it is given as 2,022 lb. per square inch.

Now the many varieties of Portland stone, apart from and different method or course pursued in making the experiments, and the amount of seasoning the blocks had undergone, all points which should be carefully recorded, would fully account for the manifest discrepancies between these results; in addition to which, the direction of the natural bed of the stone, which in a small block of Portland might escape detection, would no doubt make a considerable difference. For instance, turning to some experiments by Mr. Kirkaldy on the resistance to thrust of Donling stone (a Somersetshire dolite),* which I believe to be the only known experiments on this point—if we except two on York paving and Bramley Fall stone, recorded by Rennie, in which the crushing strength both with and against the strata are given as precisely the same, a coincidence too good to be true—the advantage of laying the stones on their natural beds is considerable, increasing rapidly with the increase in height of the block, in proportion to its sectional area; which, I think, is what we should naturally be led to expect, if we look upon the block as approximating, more or less, according to the amount of lamination in the stone, to a number of thin columns placed side by side. More experiments, on a larger variety of stones, are much wanted to throw additional light on this subject.

With regard to the supposition that the crushing strength of stone increases with the size of the blocks under trial, there has yet been too little proof put forward on which to lay down any law. In fact, the few experiments made by Mr. Kirkaldy, bearing on this subject, some of the results of which have been placed at my disposal, go to prove that there is no increase in the resistance to crushing, consequent upon increase in the size of the blocks.

With regard to another of the dolites, namely, Bath stone, there is, I think, a good deal of misconception, which a careful series of experiments would soon clear up. For instance, Parleigh Down, being a little more expensive than Box Ground stone, is very generally looked upon as the best and strongest description of Bath stone for outdoor use, and is accordingly very often insisted on in specifications, the fact being that, on account of the stone being more difficult to get out of the quarries, especially in large blocks, the price runs a little higher, whilst in strength or endurance it is not known that it can claim any precedence over Box Ground stone. From the experiments already referred to as recorded in your sessional papers, it would appear that Corsham stone is considerably stronger than Box Ground, though this is opposed to the results of other experiments. The durability of Bath stone mainly depends on its being placed on its natural bed, which can only be detected by an experienced eye, or by working the stone, though when not so placed it soon reveals the secret, especially where exposed to the weather, by its cracking and peeling away on the face.

Much also depends on its being well seasoned,

or air dried, before being put into the work; therefore the stone should only be got from quarry-owners who keep large stocks of seasoned stone on hand. If quarried in the spring of the year, and stacked at open order during the summer weather, it is doubtful whether Corsham stone is not well able to resist the weather, though it is generally considered only fit for indoor work.

Artificial drying, which has sometimes been resorted to, should not be allowed. In one case a large quantity of picked Bath stone, which had been dried by heat, had to be condemned, and, I believe, led to a lawyer's bill, in consequence of the breaking up of the stone under exposure to the weather, owing, I fancy, to the unequal contraction and expansion of the dried and hardened surfaces, and the soft and green interiors of the blocks. I have seen stone, which had worn well exposed to the weather, crumble away on being shifted to the inside of a house.

With regard to sandstones, the information contained in architectural and engineering handbooks is next to nothing; in fact, in Molesworth the whole subject of sandstones is comprised in the information that their crushing strength is 5,000 lb. to the square inch, which, being an easy round number to remember, might with equal reason be adopted as the crushing strength of all stones.

Very little is known with regard to the transverse strength of different kinds of stone, though there is no doubt that some are much more capable than others of taking a bending stress.

Stone is a material specially resorted to resist any stress except compression, and it is the true appreciation of the nature of stone as a building material, by the almost exclusive use of it to the best advantage, namely, under compression, by the Medieval builders, that, to my mind, marks their great superiority, as scientific builders, over their predecessors of more refined classic ages.

In practice, however, we constantly find stone subjected to loading stress, and that farther information under this head is required, struck me very forcibly some little time ago on seeing some stone stairs, two stories high, being carefully propped up with wood, many of the steps having split right across close up to the wall. The steps were feather-edged, of Portland stone, 1½-in. treads, and 6½-in. risers, and had been exposed to the ordinary traffic of an office for about sixty-two years. The treads being much worn, a mason had been at work cutting them down at the top, preparatory to fixing an iron nosing, and filling the treads up level with asphalt, when the step he was at work on cracked close up to the wall, probably from the jarring caused by the strokes of the chisel; shortly after, several of the steps above cracked too, being no longer supported by those below, and being evidently unequal to do the work suddenly thrown upon them. Stairs with the steps only supported in the wall at one end are of constant occurrence, and serious accidents have sometimes occurred from their sudden failure.

Enough has been said, I think, to prove that more knowledge is required as to the special qualities of different kinds of stone, and their applicability to particular uses; but there is still another point about which there is not at present any certain knowledge, namely, to what extent the shape to which stones are cut, and the manner which they are bedded, affects their strength.

I have the details of one or two interesting experiments to ascertain the effects of lead placed, as is frequently done, between the joints of cut stone columns, &c., with the object of distributing the stress uniformly over the beds of the stone. The experiments were made upon circular blocks of Bath stone (Box Ground and bottom-bed Corsham Downs) 3 ft. long by 10½ in., and 15 in. diameter, or one set twice the area of the other; the lead being cut 2 in. less in diameter than the beds of the stone themselves. The results point to the conclusion that lead so placed between the beds of the stones, reduces the bearing strength of a column to considerably less than that of a column, of only half its sectional area, in which the stones are completely bedded. On examining the sheets of lead used in the joints, they seem to have been under compression at a very few points only, and not to have in any way tended to equalise the pressure over the area of the joints. These experiments also seem to indicate that raking out the joints of cut stone work, to save the arises in cases of any compression of the joints, when bedded in mortar, should not be carried too far. Such questions are, at any rate, worth investigation.

* Given recently in our pages.—Ed.

In all experiments upon stone, it is essential to quarry the exact description of the stone, the quarry it came from, and, if possible, the particular bed in the quarry. The time the specimen has been quarried should be stated, as some stones when green will stand very little stress, but harden considerably, in a longer or shorter time, when exposed to the air. If the specific gravity, or weight per cubic foot, of the specimen were given, it would afford some clue to the state of the specimens experimented on.

While on the subject of stone, I may refer to an artificial stone, widely used in the present day, viz., concrete. I think you will agree with me that a series of carefully-made experiments on the strength of different kinds of concrete would be of great value, under varying conditions, as to the nature of the lime and cement used, the description of ballast, proportion of large and small stuff, and mode of mixing.

With good Portland cement, well burnt and well ground, I should use with confidence for ordinary foundations twelve ballast to one cement, provided I was sure of its being properly mixed; but with ordinary workmen, not properly drilled in mixing the materials, ten to one would probably be more advisable. It would be well to know how much the strength of concrete is affected by the different methods of mixing in vogue. For my own part, I should insist upon the mixing being performed as follows:—A yard-measure to be half-filled with ballast, then the measure of cement to be added, and the yard-measure filled up to the top with ballast. On removing the measure the ingredients get partly mixed, and the cement does not get blown about so much as when placed at the top of the heap; it should then be turned over twice dry, and shovelled into a third heap, each shovelful being sprinkled from the fine rose of a watering-can as it is thrown on the heap, whence it may then be removed to the trenches. This block has been broken with a pick out of a newly-built dock-wall, in which 12 to 1 Portland cement concrete, mixed in the manner described, was employed, and I think it is strong enough for any foundations. In making experiments, the mixing should be done in bulk, at least half a yard cube, being mixed at a time, and not in small quantities, which are more carefully prepared than would be the case in practice; and the blocks should be at least 12 in. cubes.

Passing from concrete to mortars, the results of some experiments made for the Patent Selenitic Mortar Company show that, in mortar made with common stone lime,—Burham, or grey chalk lime, similar to Dorking lime, was used,—3 sand makes a stronger mortar than only 2 sand, and stronger again than 4 sand; which is probably due to 3 to 1 being about the point at which more sand would weaken the cohesive and adhesive properties of the mortar to a greater extent than its setting or hardening would be promoted by increasing its porosity. With selenitic mortar, 5 sand was the best mixture to resist thrust, then 4, than 6 sand; but for adhesion and to resist tensile stress, 4 and then 6, and then 5 sand. From which we gather that 3 to 1 is the best proportion of sand to stone lime in common mortar, and 6 to 1 in selenitic mortar, since the latter gives a mortar possessing double the strength of common stone lime mortar. However, in using the selenitic mortar at Chatham lately, 6 to 1 was not found to give such good practical results as 4 and 5 to 1, which is being now used. Although the 6 to 1 mortar set very hard, it was so short that it took longer to work, the loss of time outweighing the saving of sand. The proportions now being used are 4 to 1 for exterior work, and 5 to 1 in the body of the walls. Mr. Street has, I believe, had some further experiments made with the selenitic mortar in connexion with the New Law Courts.

Results of Experiments to ascertain the Resistance to a gradually increased Thrusting Stress of Four Columns of Bath Stone.

"BOX GROUND."

Ex. 577.—

Diameter { 10.41 } = 10.57 in.
 { 10.73 }

Area, 87.70 square inches. Length, 35.06 in.*
61,730 lb., or 27.56 tons = 704 lb. per square inch. Cracked at both ends of column, and very rapidly extended the whole length; part of lead at one end not marked.

Ex. 578.—

Diameter { 14.97 } = 15.00 in.
 { 15.03 }

Area, 176.71 square inches. Length, 34.52 in.*
10,680 lb. = 570 lb. per square inch: very slightly cracked.

113,950 lb., or 64.25 tons = 815 lb. per square inch. Cracked in all directions; lead at both ends uniformly marked.

Ex. 579.—

Diameter { 14.94 } = 14.96 in.
 { 14.98 }

Area, 175.68 square inches. Length, 34.92 in.*
97,920 lb., or 43.71 tons = 556 lb. per square inch. Very slightly cracked.

120,730 lb., or 53.00 tons = 687 lb. per square inch. Only one half of circumference cracked. Markings on lead prove that the ends had not been formed quite true.

Ex. 580.—

Diameter { 10.55 } = 10.57 in.
 { 10.59 }

Area, 87.70 square inches. Length, 34.92 in.†
122,250 lb., or 54.60 tons = 1,394 lb. per square inch. Very slightly cracked at one end.

130,810 lb., or 58.99 tons = 1,499 lb. per square inch. One end uniformly cracked all round, the other end but slightly.

The last two experiments reveal the startling and important fact that a column properly bedded is very considerably stronger than one of double the area improperly hedged.

THE FRENCH AND FLEMISH EXHIBITION.

The gallery in Pall-mall shows this year less of brilliant and striking achievements in cabinet painting than usual, but not less than usual of solid and admirable workmanship, as well as originality of conception, in the part, especially of some of the French contributors. The most important of the larger works exhibited is, however, neither French nor Flemish, but the work of (if we mistake not) a Russian, Mr. Munkacsy, though illustrating a French subject, and painted in a French manner. "The Time of War—making Lint for Hospitals" (452), is a long composition of figures seated along a table engaged in lint-making, but with their attention more or less directed from the work in hand by the interest with which they listen to a wounded soldier seated at one end of the apartment, on the left; this arrangement of the composition gives opportunity for a very varied display of interest and expression in the faces, one behind another, nearly all turned towards the narrator, or giving otherwise evidence of their attention. A fair-haired young girl in black is the most prominent figure among the listeners. Between her and the soldier sits, on the other side of the table, a boy of almost idiotic vacancy of expression, mechanically going

* Bedded with 4 lb. sheet lead, cut 2 in., less diameter than column according to instructions.
† Bedded with pine 1 in. thick, cut to same diameter as column, as always recommended by me.

on with his task, behind whom stands a fine-looking elderly gentleman, with thoughtful countenance, taking in every word of the story: the four form an admirably contrasted group; there are other figures that will well repay attention. The colour is low, which is perhaps suitable to the feeling of the subject; a little more concentration of the light would not have been amiss. Not far from this, "Faust's First Sight of Marguerite," by A. Liezenmeyer (140), gives us a beautiful and, in some degree, original treatment of the old story, which so many painters have vied with each other in illustrating. Marguerite, a sweet, modest-looking country girl, walks from the porch on the left, close in the foreground, her quiet graceful figure brought out by contrast with the disagreeable-looking old people who leer spitefully at her, behind; in the centre are Faust and the tempter—the latter a comparatively featureless, as usual, and looking rather mischievous than coldly scornful; Marguerite is in a dark dress, Faust chiefly in red, the colour-effect being rich and harmonious; the subordinate figures are painted in very flatly, in thin, low tints; the architectural background even more slightly, but with sufficient attention to form and light and shadow.

Among the leading and well-known French names, that of Gérôme is represented by an able and finished a painting as one could wish to see,—“A Street Scene in Cairo” (44),—though in this case the interest is rather in the verisimilitude of the representation than in the subject itself. The woman in a dark robe, with a veil of lemons, and backed by another in a blue robe, is, however, a splendid bit of colour. The little painting called “A Dispute” (56), on a very small scale, showing two men, in gorgeous Eastern costumes, disputing with a dark man, in a white linen dress, as to the lure of a camel, has more artistic interest, and is a masterpiece in composition as well as in execution. The light from the little traceried window, seen at the end of an arcade, really sparkles. The same painter's marvellous picture of “Eastern Women” is still on view in the upstairs-room, and looks as well as it did last year. Meissonnier has a “Vedette” and a “Standard Bearer” (47 and 61), in his usual manner, and with his usual finish. “The Doubtful Answer,” by Willems (79), a lady, in red jacket and white satin, with pen held thoughtfully to her chin, we notice, not only for usual technical execution of the costume, in which this artist, in every sense, “shines,” but for the pleasing fact that there really is character and expression in the face (a plain one), and that the figure is not here a mere clothes-horse to hang silks and satins upon. Aubert's “Miranda” (80), next to this, illustrates amusingly the total incapacity of the French native to deal with a female character so natural, fresh, and simple as Shakespeare's exquisite creation. Miranda is certainly “translated” here into French, and fares accordingly. The street Arab who “lives by his wits” (8) looks as if he had plenty to live by. This is a first-rate study by L. Knaus, apparently from life. It shows, however, what we may call the ostentation of dispensing with colour which a certain school of Continental artists affect: a red cap, or something to give a point of colour amid the prevailing dirty brown tone, would surely have done no harm. “Echoes of the Sea” is one of Bougereau's pretty peasant-girls, not equal to some we have seen. “He loves me; he loves me not” (54) is another single-figure subject, by G. Max,—a young girl sitting on a bench, in a pink pelisse, who has apparently resolved the question into a negative, for her eyes are closed sadly, and the flowers drop from her hand. The figure is “supported” by two white tree stems behind; there is much quiet beauty in the work.

“Market-place, Constantinople” (38), by Pasini, is another of the very minute paintings of which the French school furnishes so many examples, and is an admirable bit of composition, the light comes from the top at the left hand and falls upon a group of small figures arranged pyramidally towards the right; the colour increasing in warmth to the right; this is perhaps, rather too like composition by rule, but there is something in it very satisfactory to the eye. The same artist's larger work, “Up the Valley of Sweet Waters” (72), shows a motley crowd of figures of all nations, on the same minute scale, starting for the journey up the Nile (we conclude); it is a brilliant thing, full of glow and heat and sunshine. “Familienstück” (67), by J. Flüggen, is the largest picture in the room, and should really be looked at, it is such a comfortable exhibition of “domestic bliss” of the heavy-German school, breathing in fact all the moral virtues, but not (unfortunately) the

Results of Experiments to ascertain the Resistance to Thrusting Stress of Six Cubes of Red Sandstone (bedded with Pine 1/2 in. thick).

Test No.	Quarry.	Dimensions.		Base Area.	Cracked slightly.			Crushed, Steelyard dropped.		
		H. L. B.			Stress.	Persq.in.	Persq.ft.	Stress.	Persq.in.	Persq.ft.
Ex.		Inches.	Sq. ins.	Lbs.	Lbs.	Tons.	Lbs.	Lbs.	Tons.	
1,882	"O" Ormside	5.98 5.95 x 5.93	35.29	85,270	2,416	155.4	118,160	3,349	215.3	
1,891	"O" do.	5.95 5.95 x 6.00	35.70	84,200	2,359	151.5	117,720	3,298	212.1	
1,883	"O" do.	12.00 11.96 x 12.02	143.76	346,620	2,411	155.1	443,930	3,088	198.6	
				Mean...	2,394	154.0	Mean...	3,245	208.6	
1,895	"D" Dufton	5.94 6.00 x 5.98	33.89	83,520	2,328	149.7	93,870	2,617	168.3	
1,894	"D" do.	5.90 5.94 x 6.00	33.64	81,270	2,280	146.6	92,580	2,595	167.1	
1,896	"D" do.	12.00 12.00 x 11.90	142.80	323,880	2,268	145.9	358,230	2,509	161.3	
				Mean...	2,292	147.4	Mean...	2,575	165.6	

artistic ones. "On the Road to Naples" (93) is a picture every one will pause before on account of its individuality of subject and tone; it consists mainly of a nearly white sandy road going from the spectator and a yellow Noah's-Ark-looking *diligence* which seems to have come to grief, and to be "on the road" only in the sense that Gilpin's celebrated hat and wig were said to be. Lesompté's "Minnchaha" (99) is a fine life-size study of an Indian woman with a richly-coloured garment bound sash-wise around her; there is little character in it, however. Goupil's "Pleasant Reflections" (110) is in the painter's best way both in execution and expression; a richly-dressed golden-haired lady is seated in an easy chair, before a fireplace with a sumptuous red marble chimney-piece; the texture of the hair, among other things, is excellently and minutely rendered without degenerating into ropiness. Moreau's "Fireside" and Perrault's "Baby Brother" (115 and 118) are each interesting as specimens of their two very different styles. "The Cigarette" and "The New Song" (76 and 82) should be examined as specimens of a new manner,—new here at least; they are Spanish subjects, and by apparently a Spanish name, B. Madrazo. The latter is the larger, and shows an interior of a gorgeously tapestried room, a girl in yellow satin is singing "to the lascivious pleasing of a lute," two men in rich Spanish costumes listening with a kind of free-and-easy admiration; another equally richly-dressed young lady in the background looks on with a smile of jealous sarcasm. The style of execution of these paintings is remarkable, and in its way brilliant in the extreme; the general tone is very light, with much white, something like what we see in Tissot's pictures, but the execution is the very opposite of his, the colour being laid on in such thick masses as in some cases (in the coal-black hair of the male figures for instance) to produce almost an effect of relief; the jewels and ornaments of the dresses are given with the most hard and brilliant reality. The style and feeling of these pictures are anything but elevating, certainly; but it is impossible not to recognise the talent and originality displayed in their execution, and their thorough realisation of Spanish character and nationality of a certain type.

THE INTRODUCTION OF THE ANGIO-ITALIAN STYLE UNDER INIGO JONES AND SIR CHRISTOPHER WREN.*

THE first of the two names to which I desire to direct your attention is that of Inigo Jones, to whom we owe the introduction of Italian architecture in England. He was born in 1572. It has been said by one of his biographers that he derived his Christian name, Inigo, from some Spanish merchants settled in London at the time of his birth, and who had dealings with his father, who carried on the trade of a tailor, within the sound of Bow bells. Some have said that Inigo was apprenticed to a joiner; while others affirm that he was carefully educated for professional pursuits. All are agreed, however, that in early life he manifested a decided talent for the fine arts, and produced some very good landscape paintings, which are still preserved. To these high talents were united a character for great honesty and general intelligence, which gained him the confidence and patronage of several leading men of the time, among whom are mentioned the Earls of Arundel and Pembroke. By the latter he was sent to Italy to study landscape-painting about the close of the sixteenth century, where he profited greatly by the study of the master-pieces of that country, the cradle as it then was of the revival of the arts of painting, sculpture, and architecture. He proceeded to Venice, where the works of Palladio inspired him with a love for the study of architecture. Nor can we wonder at this, when we picture to ourselves the city of Venice, as it then appeared rising from the blue waters of the Adriatic, glowing with marble palaces, churches, and other stately buildings. When Inigo visited Venice, Palladio's name was paramount in architecture through Italy, if not throughout Europe, though he himself had been laid quietly in the grave some twenty years before, his works lived, and were becoming each day better known and more admired. Architects from all lands made pilgrimages to the shores of the Brenta and the Adriatic to inspect the

masterpieces of his genius,—a genius which appears the more astounding when we recollect that he had for his immediate predecessors such men as Brunelleschi, Leon Batista, Alberti, Bramante, Balbazan Peruzzi, San Michel, and San Gallo, all of whom had stamped an individuality upon the architecture of their country; but Palladio preferred to go back for his inspiration to the original fountains of antiquity, rather than to follow the fashion of the day, and pander to the growing thirst for novelty and elaboration that culminated half a century later, under the fanciful but meretricious pencil of François Borromini. The wealth and taste of the Venetian nobles and merchant princes found an exponent in the palaces erected by Palladio with so profuse a hand in and around the fair City of the Waters.

Under his hand a bare and uninteresting island became a shrine of art and a dream of the imagination for ever. Those who visit Venice now in its decay and desolation, can form but a meagre notion of what it was at the time of our architect's visit, flashing back the sunshine from its gilded spires, and, by its colour, and the beauty of its architecture, presenting a thousand pictures, which such a mind as that of Inigo Jones could so well appreciate and enjoy. Of Palladio it has been said, and said with justice, that "None of his predecessors, in imitating the antique, had so happily steered the middle course between exactness and pedantry, and given us severity without rudeness, liberty without license, and so well succeeded in popularising the ancient architecture of Greece and Rome, and drawing it in to serve the wants and desires of his own age and country." This does not apply to Italy alone, for it was from the works of Palladio that both Jones and Wren, both Gibbs and Chambers, drew so largely in their English buildings during the seventeenth and eighteenth centuries. Not alone in Italy and in England, but soon throughout Europe, the taste of Palladio became predominant. We can well understand how much our architect profited by his visit to Venice, then glowing, as we have said, with the gorgeous and beautiful works recently completed by that master-hand, a master who had also enriched the literature of his profession by a treatise on architecture, which proved his erudition to be equal to his artistic powers and antiquarian researches. This splendid hook went through three editions, and was translated into all the languages of civilisation.

Inigo Jones would doubtless also visit Rome, and see the grand frontispiece of St. Peter's, proceeding under Charles Maderne, and the many noble works then in progress by Domenico Fontana, much employed in the Imperial City, and the architect of the Palace of St. John Lateran, but in none of these works at Rome, or Venice, can we now trace anything which has been directly copied by Inigo Jones in his own productions.

During his stay in Italy, Inigo Jones attracted the attention of King Christian IV., of Denmark, by his great abilities, who thereupon became his patron, and invited him to his country, and on the occasion of Christian paying a visit to his brother-in-law, James I. of England, in 1606, Inigo Jones accompanied him, where he was induced to remain, having received the appointment of architect to the Queen, and subsequently to Henry, Prince of Wales. He was engaged in London until the death of Prince Henry, in 1612, when he decided again to visit Venice. At this period a new architectural star of that Republic was undoubtedly rising in the person of Vincenzo Scamozzi, who was employed to complete the unfinished works about the ducal palace, commenced by Sansovino, and also some of the master-pieces of Palladio.

Scamozzi had a brilliant intellect, which became developed at an early age. At seventeen he produced beautiful designs for the Counts Godi. He constructed a splendid country mansion for another Venetian noble when quite a young man. The Church of Our Saviour, just finished under another architect, was found to be insufficiently lighted. Scamozzi was called in to remedy the defect, which he accomplished in a most skilful manner, by the introduction of a lantern and three cupolas upon the roof, without at all interfering with the majestic proportions of the interior. Scamozzi, like Palladio, was a thorough archaeologist. He went to Rome, and made most careful studies of the Baths of Diocletian, and of the Flavian Amphitheatre, for the restoration of which he prepared a complete set of drawings and he stated that in the two years

he was occupied in measuring the works of antiquity among the ruins of the Imperial City, he learnt more than in ten years devoted to other studies. Scamozzi designed the Proscenium of the Olympic Theatre, at Vicenza, left unfinished by Palladio, but which his son and successor Sylla, was unable to complete for lack of special knowledge, and Scamozzi owes his ability to perform this difficult task entirely to his studies of the great Roman remains above referred to. The fault of Scamozzi seems to have been that of undertaking work in different localities, which he was unable to direct in person; hence his designs, beautiful and graceful in themselves, were often mutilated and caricatured in execution under unskilful hands. Even in the buildings opposite St. Mark's there seems to have been a change and falling off in the details as the work proceeded towards completion, mainly for want of due vigilance and supervision. He was an indefatigable writer on the history and science of architecture, versed in the ancient as well as the modern languages, and well fitted for the task of translating Vitruvius, which he successfully accomplished. Inigo Jones, in studying the buildings and books of such men as those we have referred to, and probably enjoying the society of many other artists of note, who then made Venice their capital, became thoroughly prepared for the great undertakings with which he was occupied on being called home about the year 1618 to fill the appointment of surveyor-general, which had just become vacant. You will doubtless remember the duties and emoluments of the surveyor to his majesty's works at the period now under notice, viz., to keep the royal residences in repair, at a daily wage of 8s. 4d., with 46l. a year for house rent, and a suit of livery once a year. I suppose a kind of beef-eaters' gold and lace historical costume, which possibly he was not compelled to wear, excepting on state occasions, and at the splendid pageants of which he was the designer.

James I., who had given him his appointment, loved masks and shows, but being poor, wanted them run up cheaply, and the fertility of Inigo's invention made him a useful and ready man for that kind of work. But the king also encouraged Inigo to plan out great and sumptuous works of architecture, that, unfortunately for the architect's fame, the king's purse could not compass, and the nation's would not; however, as architects, we cannot blame the enthusiasm which encouraged Jones in the production of his splendid design for a majestic palace at Whitehall, for these drawings remain to show us more than any of his executed works the grandeur and holdness of his genius. We should have mentioned that Jones, when appointed surveyor-general, displayed both tact and magnanimity, for the Privy Council having discovered that the former surveyor-general had left them encumbered with a heavy burden of debt, sought the advice of Inigo as to the best means of getting it liquidated. He, with a public spirit that does honour to his memory, immediately offered his own services gratis, and went further than that, for he persuaded his coadjutors to remit their emoluments also for a season, by which means the debt was soon entirely wiped out. Reverting again to the magnificent designs for the palace at Whitehall, we are not aware how these were received by the nation, but certainly, judging from the fact of so small a fragment having been carried into execution, we may fairly conclude that the idea was too great either for the taste or purse of the age, or both. In some recent investigations respecting the autograph drawings of renowned architects, certain facts have been educed proving the scarcity of such remains in the great museums and among the archives of learning abroad. We may presume that when the designers saw their parchment visions moulded into the realities of marble, stone, or brick, they cared little for the first draughts in miniature, that to us no means, now that many of their buildings have been swept away or perished, would possess more than ordinary interest and value. Then of those gorgeous pageants upon the production of which the genius of architects, painters, and sculptors were so freely lavished, we possess scarcely one scintilla of graphic evidence, for the magnificent decorations of the old imperial cities were swept away when the excitements which gave rise to them were over, and the talents of the designer became only an item, though certainly a beautiful one in the memory of the actual spectators. What a choice *répertoire* for coronation days, royal

* By Mr. H. H. Vale. Read before the Liverpool Architectural Society.

marriages, and public thanksgivings would emanate from Raffaele's, Michelangelo's, or Bernini's sketches prove! but alas, they are now beyond reach; sack and pillage have trampled them in the dust, or fire reduced them to ashes, long ago. Inigo Jones does not appear to have been equally gifted as an archaeologist as he was an architect and painter, for the treatise which he prepared in 1620 upon the remains of Stonehenge, at the king's instigation, has not been endorsed either by contemporaneous or subsequent authors. Jones seems to have been a man of his day entirely, and no lover of old Gothic forms, and no archaeologist. It is our private opinion that he thoroughly detested everything belonging to the English Pointed styles, otherwise he would never have placed that certainly sumptuous but most incongruous frontispiece of his in place of the splendid west end of old St. Paul's, which cathedral was, from all accounts, a marvellous piece of middle-age work, and in its design and the vastness of its dimensions, in our opinion, far too good to become food for powder, as it did shortly afterwards, during the surveyorship of Sir Christopher Wren. It was the old story: ideas of expediency arose, abetted by the voice of fashion, and the old crumbling cathedral disappeared for a worthy although thoroughly different successor, viz. the great master-piece of Sir Christopher Wren. But for the views of Holzer, no modern Gothic would never have been able to appreciate the correct taste of old St. Paul's; from these views, with all their stiffness, crudeness, and faulty characteristics, we may still eliminate subtle beauties and niceties of form and design, which may be of great assistance to us in our modern compositions.

To go back to Inigo Jones, who, we said, must have been a rare "good later" of everything Gothic. Of his frontispiece to St. Paul's, a leading foreign critic has written as follows:—"If the mixture of two kinds of buildings be discordant, above all, that of the Gothic taste united with the regular systematic ordinances of the Grecian, and put into opposition with the systematic irregularity of the former, could not fail to wound the spirit and offend the vision." It was not until after the death of James, and during the reign of his successor, Charles I., that Inigo Jones was enabled to realise even that small executed portion of his great Whitehall scheme, the designs for which had been made, as we have seen, under the patronage of the former monarch. He was continued in his office, and encouraged by the new king and his queen. We will not here attempt a description of the great scheme for the Whitehall Palace, the designs for which have become so well known by the published drawings. Palladio and his own early "antient studies" were doubtless fresh in the memory of our architect when he produced the designs and details for so great a master-piece; (so the Palazzo Pitti, at Florence, by Ammannati; the Château de Caprarola, near Rome, by Vigola; and the Picturesque Villa Pia, at Rome, by Pirro Ligorio, all new and beautiful at the time of Inigo Jones's visits to Italy. We do not mention these architects, and their picturesque designs by way of disparagement, for imitate though he might, Inigo Jones was always original; and here lies the essence, the secret of his power, and of the power of all great architects, both ancient and modern. He imbibed every line of his copy, but loved it far too much to become servile; he copied to revere and admire, not to appropriate by intention, and here lies all the difference between small and great natures. When we see niches, or windows, or capitals taken wholesale from books, and placed in modern buildings here and elsewhere, we smile at the poverty of the ornament thus unwittingly paid to the original designer, but our architect copied, in quite another fashion, other men's thoughts on passing through the medium of his refined and vigorous intellect, he came, by the subtle chemistry of taste, transmuted into forms both new and beautiful. As well as many other buildings of his, Inigo Jones conceived the original idea of Greenwich Hospital, which was carried out by Webb, his pupil. It was designed at first as a palace, either for King Charles or the queen mother. William III. caused considerable additions to be made to it, in the shape of a replica of a pendant, and appropriated the whole to its present uses. We will not stop to criticise this or any other of Inigo's productions too narrowly, but may only say of Greenwich Hospital, in passing, that although bold and vigorous in conception, it appears rather crude and hard in detail, and, after the choice fragment of the hau-

queting-hall, it is not required to perpetuate the fame of the architect. Kent made a collection of the designs of Inigo Jones in 1727 and 1744, as Ware and Leoni have since done. From these collections, however, it is not easy to discover which were executed works, and which merely ideal conceptions; but they all evince talents of a very high order of mind, and when we consider that it is exactly 220 years since Jones died, we are surprised to find how very suitable to the wants, and acceptable to the taste of the present day, his productions remain. If we compare the well-known front of the Travellers' Club-house, by the late Sir Charles Barry, with the front of the banqueting-hall, these facts will be better understood, for if we take away the portico and bay window from the former building, and the lower tier of columns from the latter, the two fronts become almost identical. Inigo Jones lived through part of the evil days of the English revolution, by which he suffered severely as a Royalist, and for his religious faith. Taking another look at that charming front in Whitehall, appealing to our sense of beauty and proportion as it ever does, are we not reminded once again that true genius lives not for an age, but for all time?

In addition to the buildings we have named, Inigo Jones designed old Surgeons' Hall, the plan of Lincoln's-inn-fields, Coleshill, in Berkshire. Colham-hall, Kent, Castle Ashley, Stoke Park, Shaftesbury House, and many other buildings in and out of the metropolis. The civil wars embittered his last days, as he could not brook the treatment of the Roundheads, who regarded art as idolatry. It has been said that he was often seen, when past seventy years of age, in the neighbourhood of Whitehall and St. Paul's, gazing sorrowfully at his unfinished works. He had now nothing left to live for. Cromwell's Protectorate was no protectorate of art; so in 1652 the old man went quietly to his rest.

The following verse, applied originally to Jacques Germain Soufflot, the architect of the Church of St. Geneviève, Paris, will apply to Inigo Jones:—

"Pour maître dans son art, il n'eut que la nature:
Il aimait qu'un talent on joignît la droiture;
Plus d'un rival jaloux, qui fut son ennemi,
S'il eût connu son cœur eût été son ami."

PAINTED METALLIC HANGINGS FOR MURAL DECORATION.

At the Society of Arts lately, Mr. George Clarke brought this subject before a meeting of the members. Mr. Clarke said, the mode of house painting I wish to make known to you is so simple that a short description will explain it. An easy way to bring the nature of it home to the comprehension is to compare it with paper-hangings, the form and application of which are familiar to all.

In justice to our intelligent neighbours across the Channel, I wish to mention that the new art, of which you see the beautiful specimens around you, is a French invention. The first conception of the principle was the idea of a journeyman painter, who saw damp walls, intended to be painted, covered with tinfoil, but he was unable to realise and give a practical form to his crude idea. A gentleman of mechanical genius, who aided the painter, imagined and produced the tools, and invented the *modus operandi*, without which the work and production could not be economically done. An eminent Parisian decorative painter associated himself with the undertaking, and brought his experience to bear on its practical application. Their combined industry, intelligence, and perseverance brought to its present state of perfection the invention, of which a description follows.

Tinfoil in sheets, the thickness of ordinary writing-paper, is the material on which this new style of mural decoration, including gilding, is executed. Tinfoil is pliable and supple, sufficiently tough not to be easily torn, and offers a smooth and uniform surface. It forms an excellent base for the work executed upon it. It also possesses the advantage of being water-proof, a property well known to architects and builders, who frequently use it to cover damp walls, on which without that covering any decorative work would soon perish.

The process of executing the painting on tin offers no difficulty. The sheets are manufactured of a width and in lengths suitable to their application on the surfaces to be covered. At

the manufactory in Paris the ordinary widths made use of are from 30 in. to 40 in., and the length 5 metres, or rather more than five yards.

The following are the processes, as I saw them carried out in Paris at the works of Messrs. Daniel & Co., Rue de Roeroy:—

A portable frame, corresponding in length and width to the dimensions of the painting intended to be produced, is placed on a solid table, made as true and level as a billiard-table. For the perfection of the work, the face of this frame is required to be perfectly level, hard, and smooth. A sheet of glass presenting these advantages in an eminent degree was at first made use of, but as this material is fragile and not safely removable, stiff card-board of the finest texture has been substituted for glass; and, after successive improvements, by using double card-boards of considerable thickness, with stretchers and braces between the two boards, an appropriate frame has been produced well adapted for the requirements of the manufacture, presenting a level, hard, and smooth surface, and conveniently portable. The sheet of tinfoil is carefully laid on and extended over the frame from end to end, and is smoothed down to the surface of the frame with a suitable tool, being secured at both ends to stretch and keep it from shifting. The coating of ground colour, whatever it may be, is laid on the tin sheet with a brush in the ordinary way of painting, so as to cover the metal with a good coat of paint.

This process being completed, the frame is removed into a drying-room, where a regular temperature of 80° to 90° Fahr. is maintained by a system of heating, which sends a current of hot air through the room, and speedily dries the coat of paint. For the next process, when the paint is quite dry, the frame is taken out of the drying-room and placed on the table before described. The execution of what may be termed the decorative coat of paint is produced by mechanical means, which may be familiarly described as stencilling and printing by means of sheets of tin copper for the former, and rollers for the latter, much after the manner of staining paper-hangings.

The exact nature and the mode of producing these two kinds of tools, which are the most important instruments for the artistic perfection of this new decorative work, I will presently describe; but to give an idea of the celerity and precision with which the process is effected, it may be mentioned that the stencil plate, of the same width as the sheet of tin, is placed over the ground coat, and the painter produces the pattern by painting with the brush over the stencil plate. Or if the roller be used, it is charged with colour, and being passed over the ground coat, produces in like manner the required pattern. Both these tools are sometimes alternately used to produce certain patterns or effects, but, as a rule, the imitations of wood are stencilled, and those of marbles printed. No grainer, however skilful, could attain the same perfection, or do the work in a tythe of the time. The best graining is not an imitation of nature, it is a conventional representation of wood or marble, but could hardly be taken for nature itself. Whereas the imitations are so exact that skilful judges might take them for reality. The frame is now again conveyed to the drying-room, and when sufficiently dry is brought back to the table, and the paint is covered with a coat of varnish; this again being dried as before, the painted sheet of tin is ready for use. If more highly-finished work be required, as in the case of imitations of the finest woods and marbles, a second coat of varnish is laid on, and this, again, after being dried, is brought to the highest state of finish by being polished on the frame. The painted sheets, of any degree of finish, are removed from the frame, and after being dusted with soap-powder, are rolled on cylinders, being now in a merchantable form ready for sale and application with the same facility as paper-hangings. But it is well here to observe that the difference between painted metallic hangings and paper-hangings is, that on the former the decoration is oil-painting, and when applied to any surface is more durable than painting on such surface by the ordinary method, whilst the base or lining being metal, the painted decoration is effectually protected from damp. These advantages make it superior, not only to ordinary painting, but, in a much higher degree, to paper-hangings, which are stained with water-colours of much shorter duration, and subject to the effects of damp both in the walls and externally.

The application of the painted metallic hangings to either wood, stone, plaster, or iron sur-

* To be continued.

faces, offers no difficulty. The operation is somewhat similar to putting up paper-hangings, with this difference, that with the latter the paper is pasted over at the back before being hung, and with the former the surface to be decorated is covered with a thin coat of adhesive varnish, on which, after it has been left to dry partially, the painted tin is affixed with great ease. So little is the difficulty that any skilled paper-hanger can, after a few hours' practice, do the work successfully. From the extreme flexibility of tin-foil, mouldings and cornices are covered with the metallic hangings in the most perfect manner, and with a smoothness of surface and sharpness of outline at the edges and mitres which the painter's brush cannot rival.

These last effects are obtained by covering undulating surfaces with the painted material, of dimensions slightly larger, say $\frac{1}{2}$ in. to $\frac{1}{4}$ in. in length and width, than the superficial measure. By this contrivance, when the painted tin-foil is affixed on any surface with the varnish, the excess of length or width is cut away along a straight edge with a sharp knife, which leaves the edge of the work clean, and invisible where two edges meet. It is thus that the close joints are obtained in mouldings and mitres as in the specimens exhibited.

The varnish used for fixing the material is of the nature of gold size, but more adhesive. Being of itself "hydrofuge," it adds to the protection of the paint against damp.

DOINGS IN DUBLIN.

THE opening of the Exhibition on the 5th of this month is looked forward to with interest by many, and an indifference by others. A feeling of dissatisfaction has already found vent through the pages of more than one journal in consequence of some unfavourable arrangements as to space allotted to native exhibitors, and particularly affecting the coach and carriage builders of Dublin. Fault is also found with the general manager and committee for giving or allowing most of the preparatory work of statuary, painting, decoration, and fittings to pass into the hands of London houses, without giving any chance to the Dublin firms by a competition, limited or otherwise. A grievance in Dublin is certain to win support, particularly when it is of the nature alluded to.

The exhibits of various kinds are still arriving, and it is not unlikely that as many objects will have to be admitted after the opening, to compensate for the rather tardy response that signalled the intending and half-hearted contributors in the beginning of the season. Sir Arthur Guinness, one of the promoters, contributes a good collection of china; and Earl Spencer's collection of similar ware is expected to be arranged before the end of this month. The loan collection from South Kensington has arrived, containing specimens of ancient china and gilt copper vessels. The Royal portraits are placed in position, as also are a number of the old masters.

The decorations are all but completed within, and the pleasure-grounds and gardens without are undergoing still further improvement.

There is one matter which will constitute a great drawback on the first and succeeding days after the opening,—the want of a catalogue. We are told gravely that it will be impossible to have the catalogue in readiness, from the number of items to be enumerated. There seems to be no valid excuse for its delay, and it is little less than bungling, or bad management, to open the Exhibition without having a printed catalogue to place in the hands of the visitors and exhibitors. There should be one, however incomplete it might be, and even though it necessitated a second edition, or an appendix.

The Corporation has allotted a site in Foster-place, College Green, for an intended statue to the late Field Marshal Lord Gough. We may expect to hear of its erection in another ten years. O'Connell has been dead exactly a quarter of a century, this month. Subscriptions were raised immediately after his death. Ten years ago a site was allotted, and Mr. Foley, the sculptor, was commissioned to execute the statue. Well it is but a little more than half finished, and it is now announced that it will be completed in three years more. The year 1875, when this statue of the "liberator" it is supposed will be finished, will be the centenary of O'Connell's birth.

The Convalescent Home, the want of which is

so severely felt, and which resulted in an indignation-sympathy meeting, some two or more months ago, is not yet commenced. The Corporation are in no hurry.

The Sanitary Works (Ireland) Bill is an attempt to exempt the Corporation of Dublin from paying rates for the water-works. The Bill is in reality no sanitary measure at all, and it professes to deal with matters which had better be left alone than treated in the manner they are. We cannot see how the ratpayers will be benefited; and if the Bill were passed, the exemption claimed by the Corporation would only embolden that body to pursue a more ruinous and extravagant scheme of taxation as soon as they were relieved. Every attempt made by the Corporation of Dublin during the last decade professedly to relieve or lighten the taxation of Dublin is said to have resulted in increasing the rates. The city is at present sinking under a taxation of nearly 10s. in the pound.

OPENING OF THE FINE ARTS EXHIBITION, IN NOTTINGHAM.

THE Midland Counties Fine Arts and Industrial Exhibition, in connexion with the South Kensington Exhibition, has been formally opened by the mayor, at the Exchange Hall, Nottingham. Since the preliminary opening, when the mayor gave three *conversazioni*, the display has undergone some modification, many things having been added and others removed. The ante-rooms, which were set off for the purpose of enhancing the appearance of the building to give a festive effect, have undergone an entire change. The floral and drapery embellishments have given way to objects of interest in the museum, so that what is lost in ornamentation is compensated for in sterling worth. Mr. Cole, and Mr. Wallis, of the South Kensington Museum, and most of the members of the corporation, as well as many of the principal gentlemen of the town, met in the mayor's parlour, and walked in procession with the mayor to the Exhibition.

After the mayor's address, Mr. Cole said they in Nottingham had a School of Art at the head of all other art-schools in the country; and it had seemed to him that they were bound to have a permanent museum. They had now got it, and he heartily congratulated them on having done so. He declared he never saw anything equally successful. It was altogether to see that those who had taken an interest in it had acted in such a catholic and admirable spirit. He had seen the museum at Lyons, and, in the way of lace, they had made in Nottingham as good a beginning in their own way as Lyons, with its hundred years' experience. It was true that South Kensington was becoming the storehouse of the country, and there were other public institutions which he hoped might also become storehouses. He trusted that the National Gallery would furnish an institution like that, with a great many of its superfluous pictures, and that the British Museum would send objects of art and science, for they were smothered with things that could not be seen. But it was all very well to bring these objects to the town, they must find a building to hold them. They had found a most excellent one, and, although it was small, it would lead to a much larger one whilst they had the guardianship of the chamber.

PICTURES BOUGHT BY THE ART-UNION OF LONDON.

THE following are the principal works already selected by prizeholders:—

From the Royal Academy.—Repairing the Old Boat—South Coast, J. W. Oakes, 262l. 10s.; A Love Spell, Fredk. Chester, 200l.; Through the Coverts of the Deer, W. Laker, 150l.; A Peep of Ban Venue, N. E. Green, 45l.; Caught in a Squall, W. J. Rolfe, 45l.; The Spindlo Rock, D. Cameron, 45l.; An Autumn Afternoon, W. Laker, 40l.; A Sunny Morning—Ullswater, A. Powell, 40l.; A Sunny Walk in Knowle Park, Sevenoaks, J. W. B. Knight, 35l.; A Stormy Day, J. B. Smith, 35l.; On the River Tamara, Cornwall, A. B. Collier, 31l. 10s.; An English Brook, J. Adam, 30l.; The Pet Lamb, J. Henzell, 30l.; The Path through the Wood, Cobham, Kent, M. E. Dockree, 25l.; Moonlight on the Adur—Lancing College, R. H. Nibbs, 25l.; The Swale, near Richmond, Yorkshire, C. Smith, 25l.

From the Society of British Artists.—Mill on the Lowther, Cumberland, Jas. Peel, 100l.; the

Secret Despatch, J. Gow, 75l.; A Summer's Morning—Early Sunrise, T. F. Wainwright, 73l. 10s.; Into Port—French Coast, J. J. Wilson, 60l.; Lullworth Cove, J. Danby, 45l.; The Gleaner, E. J. Cobbett, 42l.; A Passing Glimpse, A. Glasgow, 40l.; Hard at Work, G. A. Holmes, 40l.; Fisher Children—Sussex Coast, W. Hemsley, 35l.; A Country Lane in Hampshire, W. H. Hopkins, 35l.; Snowdon from Llyn-y-cwm, S. R. Percy, 35l.; Market Day—Winter, G. A. Williams, 35l.; A Summer Shower, T. F. Wainwright, 31l. 10s.; Fruit and Bird's Nest, C. T. Bale, 30l.; An American Autumn, J. C. Thom, 30l.; Lyn Peris, Llanberis, North Wales, J. J. Currock, 25l.; Patchwork, R. C. Green, 25l.; View on the Llugwy, Bettws-y-coed, North Wales, E. H. Holder, 25l.; A Spanish Lady, J. C. Waite, 25l.; "Turf" on the Eze—Entrance to Exeter Canal, J. H. Dell, 20l.; Mill at the Head of the Creek, near Gerran, Cornwall, W. Pitt, 20l.

From the New British Institution.—Kilchurn Castle, T. O. Hume, 25l.; Great Expectations, H. H. Coultery, 21l.; A Flower of Scville, T. K. Pelham, 20l.

From the Society of Painters in Water Colours. Green Hill, Borrowdale, Cumberland, P. J. Naffel, 40l.; A Mountain Stream—Morning, North Wales, C. Branwhite, 35l.; Farnyard, Serk, Paul J. Naffel, 30l.; Canale del Fonteco, Venice, W. Callow, 26l. 5s.

From the Institute of Painters in Water Colours.—Summer Afternoon—Low-tide, F. J. Skill, 42l.

From the General Exhibition of Water Colour Drawings.—Play-time, Edwin Bale, 25l.

SCHOOL BOARDS.

London School Board Competition.—With reference to the competitive designs received for seven additional schools, Mr. W. G. Goldwell has been appointed architect to carry out the Battersea-road schools; Mr. Joseph Gale, to carry out his plans for Kender-street, Hatcham, schools; and Mr. Lucy W. Ridge, to carry out his plans for the Mary-street, Bromley, schools.

Worcester.—The clerk read the minutes of the meeting of the Sites and Building Committee, held on the 13th instant, for the purpose of opening the tenders for the new school buildings, from which it appeared that a resolution was carried to the effect that the tender of Messrs. Wood and Sons, at 4,987l. 10s. 50d. for materials, be adopted. The following tenders were received:—

	Old Materials, Net.
S. Clerk, Bath	£5,069 .. 475 .. 24,994
E. Taylor, Worcester	5,000 .. 118 .. 4,972
Brown & Davies, ditto	5,365 .. 100 .. 5,265
Wood & Sons, ditto	4,987 .. 50 .. 4,937
J. Evers, Malvern	5,105 .. 100 .. 4,905
Thos. Dixon, Worcester	6,367 .. 100 .. 6,267
T. Hartley, Birmingham	5,590 .. 100 .. 5,490
T. S. Morland, Gloucester	5,087 .. 75 .. 5,012

The vice-chairman thought it necessary to state that the cost of these schools was somewhat greater than they had anticipated. In the first place, the short-hours movement and the advance of wages had contributed to this circumstance; and there was very little doubt that their difficulties subsisting between employers and their workpeople had prevented many of them from sending tenders. The clerk laid on the table the filled-in form required to be forwarded to the Education Department, containing exhaustive particulars respecting the accommodation of the new schools, together with the expenditure to be incurred by their erection, from which we make the following extract:—

Cost of site	£1,795
Legal costs and expenses of conveyance	175
	£1,970

Cost of building, including boundary-wall, outbuildings, and internal fittings, from the tender it is proposed to accept	4,987
Architect's commission, and other expenses of superintendence	382
	£7,289

It was explained that the original estimate did not include matters which have been recognised in the latter sum.

Southampton.—The Works and General Purposes Committee's Report stated that the plans of the architect (Mr. Howell), in respect to the Bevois Town schools were agreed to, and it was resolved to bring them before the Board for approval. The report was adopted, and the plans ordered to be proceeded with.

Derby.—A letter received from the Education Department was read, approving of the plans of

the Gerard-street schools, and recommending the Public Loan Commissioners to lend to the School Board a sum not exceeding 4,500*l.*, the repayment of the sum to extend over fifty years. The letter was received, and it was resolved to instruct Mr. Bridgart, architect, to commence operations immediately.]

Wolverhampton.—The first business of any importance was with reference to the proposed erection of new Board Schools on the Dudley-road, and after a short conversation it was decided to forward the plans and specifications, as prepared by Mr. Bidlake, to the Government Educational Department for approval, and with a view to save time it was also decided to announce advertise for tenders for the erection of the schools.

Scarbro.—Plans were submitted by the following architects for the schools to be erected at Falsgrave,—Messrs. Stewart & Barry, Scarbro; Messrs. Smith & Brodriek, Hull; Messrs. Alley & Wilson, Manchester; Mr. Wm. Watson, Wakefield and Doncaster; Mr. David Oldfield, London; and Mr. E. Egan, Loughton, Essex. The consideration of the plans was deferred, and it was ordered that in the meantime they be laid in the board-room for inspection.

Driffield.—The Board examined and considered the school plans as further altered and modified by Mr. Paul, the architect, to meet the views of the board. In the letter accompanying the plans, sections, and perspective, Mr. Paul stated that the arrangements were now simple and good, and as the Board required a plain type of building, he hoped the plans would now be approved of. It was arranged to have a meeting with Mr. Paul before sending the plans to the Educational Department for approval.

Lpswich.—The clerk read to the Board the minutes of last meeting, the latter part of which was held in committee in order to discuss the plans sent in by the competing architects. It appeared that the plan of Mr. Butterworth for school on the Wherstead-road site was provisionally accepted by the Board; a committee was appointed with reference to the matter. The clerk was instructed to write to Mr. Butterworth, informing him that his plans were accepted on the understanding that the building could be constructed in a sound and satisfactory manner for the sum he had estimated (2,500*l.*), and that such alterations as the Board might require might be made without the cost being increased. The plans of Mr. H. M. Eytton for schools on the Argyll Estate site were accepted in similar conditions, and a committee appointed. Mr. Eytton's estimate is 1,875*l.*

THE OPENING OF THE GREAT EASTERN EXTENSION RAILWAY TO STOKE NEWINGTON.

The opening of that portion of the Great Eastern Company's City Extension line between Bethnal-green and Stoke Newington, which took place on Monday last, brings into active use no less than six new stations lying between these two points. These stations are respectively Bethnal-green Junction, Cambridge Heath, London Fields, Hackney Downs, Rectory-road, and Stoke Newington. Some of these stations, more especially Cambridge Heath, Hackney Downs, and Stoke Newington, are large and handsome structures. The trains will for the present run from the Bishopsgate Station to the Bethnal-green Junction, but ultimately the extension line will run to the intended new station in Liverpool-street, altogether avoiding the Bishopsgate-street station, which it is said is to be converted to a goods station. We understand that the remainder of the extensions north of Bethnal-green, making in all about nine miles in length, will be opened in about a fortnight or three weeks.

ADGURATION OF STATUE AND BATHS AT BARROW-IN-FURNESS.

A BRONZE statue, by Noble, of Mr. Ramsden, mayor of Barrow-in-Furness, has been unveiled at Ramsden-square, in that town, by the Duke of Devonshire, amid great rejoicings. Baths, valued at a cost of 2,000*l.*, were on the occasion sent to the town by Mr. Ramsden, and a banquet was held in the Town-hall, under the presidency of the duke, supported by the Bishop of Carlisle, Lord Frederick Cavendish, M.P., F. S. Powell, M.P., Mr. Childers, M.P., &c. The portrait of Mr. Ramsden, by Mr. Knight, R.A.,

is to be hung in the hall. Mr. Ramsden, it is said, will shortly be knighted.

The first course of the pedestal of the statue is of grey granite, dressed, and is 10 ft. square by 2 ft. 5 in. thick; the second course, of similar stone, polished, is 7 ft. square by 1 ft. 10 in. thick; and the third course, weighing about 8 tons, being the heaviest stone in the pedestal, is of red Peterhead granite, and is 5 ft. 6 in. square by 3 ft. thick. The die is also of red granite, and is 4 ft. 10 in. square by 3 ft. 11 in. thick; and the capital, of a similar description of stone, is 6 ft. 2 in. square by 2 ft. 10 in. thick. The total height of the pedestal is thus 14 ft. The first course of the red Peterhead granite and the die are of an irregular octagon shape, and the cornice is moulded with a "blank and space" ornamentation. The total weight of this basis for the statue is about 50 tons. In the centre of the second course of the pedestal a bottle was deposited, containing the current coins of the realm, a printed statement of the reasons which induced the inhabitants of Barrow to erect the statue, &c.

The statue has been executed in bronze. It has been placed on the pedestal facing the west,—the docks,—and represents the mayor in his municipal robes and other corporate insignia. It is said to be a good likeness. To the right of the figure is a small pedestal, depending from which is a *fac simile* of the Charter of Incorporation, of date 1867.

A statuette, in white marble, a *fac simile* of the bronze statue just unveiled, also the work of Mr. Noble, is to be presented to Mrs. Ramsden.

THE MID-LONDON RAILWAY PROJECT AND THE LONDON AND NORTH WESTERN COMPANY.

It is confidently stated that the directors of the London and North Western Railway Company have resolved to use their influence in support of a motion which is about to be made for a recommitment of the Eastern Section Bill of the Mid-London Railway, being that portion of the project from the Marble Arch to Whitechapel, and against which the committee over which Mr. Harcastle presides decided on the ground that no satisfactory proof had been given that the large capital required for carrying out the scheme would ever be practically available.

ECCLIESIASTICAL DILAPIDATIONS ACT, 1871.

It was thought by some of the diocesan surveyors that it was very desirable to have a meeting, in London, of all the surveyors appointed under this Act, for the purpose of discussing the Act, and promoting uniformity of practice, and for discussing fees, and so on. A preliminary meeting was accordingly held on the 20th of May, at which were present the diocesan surveyors for Canterbury, the diocesan surveyor for Winchester, the diocesan surveyor for Oxon, the diocesan surveyor for Chichester, and the diocesan surveyor for Ripon; and it was determined to hold a meeting of diocesan surveyors at the Rooms of the Royal Institute of British Architects, on Tuesday, the 11th of June, with the view of forming an association of diocesan surveyors, and discussing the working of the Ecclesiastical Dilapidations Act.

DESTRUCTIVE EFFECTS OF LIGHTNING.

THE parish church of St. Mary, Beeston, Norfolk, has been set on fire by lightning, and destroyed. It was a specimen of fourteenth-century work, and contained carved and painted screens of that date.

The spire of St. Martin's Church, Birmingham, has been struck, but not very much injured. The flashes were painfully vivid, and the peals appalling. A man, while passing along New-street, was struck, and rendered speechless. Another man has been killed while going home from work: he was twice struck. In Great Russell-street another was knocked down by the lightning. Six men engaged in drainage-work at Frodingham, near Beverley, were struck by lightning on another occasion. One was killed, and the others were seriously injured.

Loss of life and injuries by lightning have been unusually frequent of late in various parts of the country. An old man was killed in a field near Guildford. At Tetford four sheep and

five lambs were killed while taking shelter from a storm; and at Sackley a ewe and a lamb were killed under similar circumstances. A barn has been burnt by lightning at Ufford.

The extent and frequency of fires last year and this may have had something to do with the active or ozonic state of the oxygen of the atmosphere during the prevalent physical commotions. Ozone is believed to be just as electrified oxygen.

Two hundred houses in the Russian town of Witepsk have been destroyed by a fire which lasted three hours. This town, of above 25,000 inhabitants, had only three fire-engines. By a great fire in Yedo, Japan, on the 3rd of April, 50,000 persons have been rendered homeless, and 250 to 300 have perished. Four square miles of the city (a very wooden one) and 10,000 houses have been devastated. In Scotland there have been destructive fires on a small scale. Explosions, sometimes unaccountable in their causes, have in this country also been occurring.

THE WORKS ON THE CHELSEA EMBANKMENT.

MR. WEBSTER, the contractor for the Chelsea Embankment, is pushing the works forward with much activity, and during the past few weeks considerable progress has been made, and sufficient has already been done to indicate what a great improvement it will be when completed. At the Old Brewery and at the Chelsea Hospital end the Embankment is almost finished, and the ornamental coping has already made its appearance in several places. Proceeding along the staging the facing of the embankment is seen just peeping above the water, with the rear filled up with concrete. A little beyond the brewery are the stores, where the granite, the concrete, and the other materials are kept; and here the large blocks of concrete which serve as the foundation are made. The existing embankment, near the Chelsea Bridge, will look small and unpretending by the side of the one now in course of construction.

THE TRADES MOVEMENT.

London.—The Builders' Society had a meeting on Thursday, in last week, at which the questions raised as to the "nine-hours movement" were discussed, and it was resolved to meet a deputation of the carpenters and joiners, at their request. The impression was that the state of trade does not warrant any advance of wages, but the employers were prepared to discuss the question in any form the workmen may desire. The feeling of the meeting was that if, pending these negotiations, any of the members should be struck against, the other members would do everything to support any one so attacked, even if it went so far as to involve a general lock-out, which, of course, they were most anxious to avoid.—The adjourned general meeting of delegates from the London Carpenters and Joiners was held on Saturday night last, in Bloomsbury; Mr. Sadler, the president of the nine-hours committee, in the chair. There was a crowded attendance, many delegates attending for the first time with the adhesion of their constituents to the movement. The chairman said the immediate object of the meeting was to receive the reports from the firms of Jackson & Shaw, and Brass's, with the result of interviews held with these firms by their workmen, conveying to them the information that, in accordance with a resolution of the delegate meeting, the men would leave their employ on Saturday next, unless they in the mean time conceded the terms claimed by the men in the memorial, and endorsed by the aggregate meeting of the trade held in St. James's Hall. The delegate from Jackson & Shaw's firm then stated that Mr. Jackson said he considered the demands of the men were unconscionable, but declined to enter into any discussion upon the subject, inasmuch as the Masters' Association, of which the firm were members, had appointed a committee to meet a deputation from the men to consider the whole question. The whole of the men in the firm, both those working in the shop and at the out-door jobs, were prepared to leave work on Saturday next, if it should become necessary. The delegate from Brass's firm made the same statement. Mr. Brass informed his men that he was appointed one of the committee of masters who were to meet the men's deputation. Mr. Matkin, the secretary, in reply to a question, stated that the number of men (carpenters and

joiners) who would cease work at the above two firms on Saturday next was about 300. After some discussion a deputation of seven delegates, with the chairman and secretary of the committee, were appointed to meet the masters' committee, if officially requested to do so. Another discussion ensued upon the instructions to be given to the deputation, and it was finally resolved "That the deputation have no power to refuse or accept any proposals made by the masters' committee, but to report the result of their interview to a special delegate meeting for its consideration."

Ipswich.—The Workmen's League have appointed Mr. A. A. Watts and Mr. F. J. Bugg to act as arbitrators on behalf of the League, and these gentlemen have consented to act. The men on strike have declined to return to their work in the mean time.

Sheffield.—Two hundred stonemasons have struck work at Sheffield, in consequence of their masters deciding not to reduce their working hours to fifty per week. They have been gradually obtaining employment, however, on their own terms.

Preston.—A meeting of the master carpenters of Preston has just been held, to consider the application of the men for shorter hours. After a short discussion it was resolved to reduce the working hours five hours a week.

Hawick.—Several of the journeyman masons in Hawick have struck work, in consequence of the refusal of the masters to concede the nine-hours limit. The strike, however, is not universal, and some of the masters retain nearly their whole complement of hands. Those who have struck are mostly young men, and many have left the town to seek work where the nine-hours system is in operation.

Cupar-Fife.—Most of the builders in Cupar-Fife and neighbourhood have now complied with the demand of their workmen for an advance of wages from 5s. to 5½d. per hour. With the exception of a few who had left the town, all the men employed when the demand was made are now re-engaged. The building trade in the district is at present in a very dull condition, and owing to the rise of wages and materials, a number of buildings intended to be erected this summer are to be delayed till another season.

Dundee.—A meeting, attended by delegates from Forfar, Arbroath, and other neighbouring towns, has been held at Dundee, at which it was reported that the nine-hours movement in Edinburgh, Glasgow, and throughout Scotland generally, was being carried on energetically, and that the petition in favour of Mr. Mundella's Bill had been very largely signed.

Glasgow.—A crowded meeting of operative masons of Glasgow and neighbourhood has been held in the Trades' Hall, Mr. Robertson in the chair. On the motion of Mr. D. Ferguson, seconded by Mr. A. Duncan, it was resolved that the unprecedented rise in the price of tools, since the last advance of wages was obtained, justified the request lately made to the employers for an advance from 6½d. to 7d. per hour. The meeting, on the motion of Mr. A. Boa, seconded by Mr. A. Easton, pledged themselves to use every legitimate means to obtain the introduction of weekly pays. The representative committee was empowered to carry out these resolutions.

America.—A telegram from Washington states, the strikes in favour of the eight-hours movement continue, and the trades are generally joining the Eight Hours League. The master masons, the carpenters, and the bricklayers have already acceded to the demands of the men.

THE CITY GUILDS.

I BELIEVE that many of your readers have read with much pleasure the articles in which from time to time you have noticed the "City Guilds." I for one have hoped that you would see your way to an expository statement, in a condensed form, of the purposes, sources of income, administration, and actual working result of the building guilds, and of one or two others that may be deemed fair samples of the rest.

The existence of these wealthy corporations, with considerable land and house property well held in hand and improved (in rentals), is probably mainly known by their fine large halls of meeting, by their vigorous insistence on the rights of ownership, and by their "magnificent banquets," and the "presentation of freedoms of

the company in handsome caskets of choice design and workmanship;" "of fine gold executed in the short space of a fortnight, and reflecting the highest credit on the producers, Messrs. —" &c. Members, and occasional visitors, in no Quixotic mood, chuckle with very natural satisfaction over these banquets, though some are stirred by a little innocent amazement at times when distinguished statesmen, and brave warriors, and royal and semi-royal personages, are among the receivers of mysterious documents; and the takers of bold "pledges to observe all the rights and mysteries of the company." Mr. Gladstone, it is true, hoped that his sense of duty would never require him to do anything that might not be usual in a respectable—shoemaker, let us say. Perhaps the state of parties, and of political life generally, may not allow it to-day or to-morrow, but surely sooner or later an inquiry must be ordered as to the functions and resources of the fully-owning trustees of the private public corporations, who have long been in frame of mind to cheerfully endorse the recent becoming language of the Duke of Cambridge at "a banquet," respecting "the maintenance of institutions which have made us what we are, and that will keep us what we are if we are only true to ourselves."

How can the withholding of the fullest information from the public be justified? In the case of "insurance offices, banking corporations, and other business companies," cited by a correspondent in the last number of the *Builder*,—the same secrecy is not observed. I need only mention "The Life Assurance Companies Act, 1870." A more striking parallel case would seem to exist in the pending inquiry as to the administration, revenues, &c., of the ancient universities,—against which hardly a voice has been raised, so thoroughly is the necessity of investigation recognised in these (wisely) "suspicious and searching days" when investigation is not made for insult, for idle curiosity, nor even for the sake of gibbering misdeeds in the past,—but in order that the accurate information may be accumulated on which alone legislative action or inaction can safely rest. Mr. E. Nash's judicious communication before alluded to defends the action of many of the companies, but omits any remark as to the necessity and duty of publicity; and one hopes that a slip of the pen only is responsible for the sentence:—"Individuals are allowed to give expensive dinners, &c., . . . if they do it with their own money,"—the conclusion pointed at apparently being that corporations also can "do what they like with their own." It would open, entirely unnecessarily, a tremendous question to state what looks like good reason for wishing little legal interference with private ownership; notwithstanding that, according to the best teachers, the riches of each man are *in foro conscientie* to be considered as held in trust for the least trustworthy and self-helpful brethren of human kind. But a corporation, taking to solid property in right of fulfilment of some special duties at one time of much moment, holds in the view of most of us,—not only this sort of trusteeship, but also one more tangible and formal, that is properly liable to criticism and to severe scrutiny: if not perfectly within the reach of this, by form and rule of law, they should be vigorously and speedily made so. But who, except a privileged and well-informed member, could take any action now? It is true one remembers the unimpeachable drollery of the law-suit, gravely maintained in our courts some years ago, against a vitreous company for damages for deprivation of valuable dinners,—and its lame conclusion. It is not often, however, that the bonds of amity are broken in these leagues.

The last sentence of Mr. Nash's letter also deserves a remark:—"reform where reform is needed is desirable, but change where change is not needed is revolution." Let us not habitually make an outcast of a word that may yet have chances to redeem itself from all its bitter taints. It becomes us least of all, in a country where, as we proudly boast, our *revolutions* are made peaceably by even process of law. May I, too, imitate the language of copybooks and moral primers, saying,—changes wisely planned and thoroughly carried out are, in important matters, properly deemed the best kind of revolutions. Revolutions are of all sorts.

But, perhaps, this after all, may be called mere word-fencing. The immediate point is that certain corporate bodies, said by some to be well governed, are by others subjected to (let us say) unworthy suspicion. In order to assist these bodies in their own justification, the well-mean-

ing, ignorant outsiders call for public statements or for complete inquiry. Those who confess they do not understand thoroughly the institutions of which they are talking,—who see behind the curtain the movements of mysterious shadows, accompanied by the jingling of equally mysterious money,—will at the conclusion of such inquiry, render back the old, and give fresh honour if need be. Or they may have to ask that, what were candidly termed by a distinguished person a few days ago, "the relics of old institutions, the importance of which, and their actual uses, to some extent, have passed away," shall be treated to reconstruction with definite objects and schemes for attaining them. Or it may be necessary that their existence shall be wholly terminated, and that the funds for centuries gathering in these reservoirs, may be led in fertilising streams, where the present generations of Englishmen may obtain the needed material for better nurture in those useful arts which so firmly maintain the habits of civilised life, which, eventually, if not made matters of mere mechanical routine, may become almost invariably the sources of pure unalloyed pleasure to all who engage in them. X.

THE RIVER ALT DRAINAGE.

IN consequence of the recent repeated flooding of the low lands drained by the Alt, the River Alt Commissioners engaged Messrs. Rendø & Goodison, civil engineers, of Liverpool, to report upon the condition of the drainage under their jurisdiction.

The result of the survey is embodied in a report just printed, which states that the general condition of the drainage is most unsatisfactory, and that the bed of the river is from 2 ft. 6 in. to 3 ft. 6 in. higher than it should be, along a considerable portion of its length. As a large tract of low-lying land between Liverpool and Southport is dependent upon the efficiency of the river, the consequence of this silting up of its bed is serious.

The course of the river being much affected by the north-west wind and sand-drift, the engineers think that special means will have to be taken to guide the river into a shorter channel, and afterwards preserve it from working back into its old course. They suggest, in the formation of the new channel, that the south bank should be protected with sheet piling for a considerable distance on the foreshore.

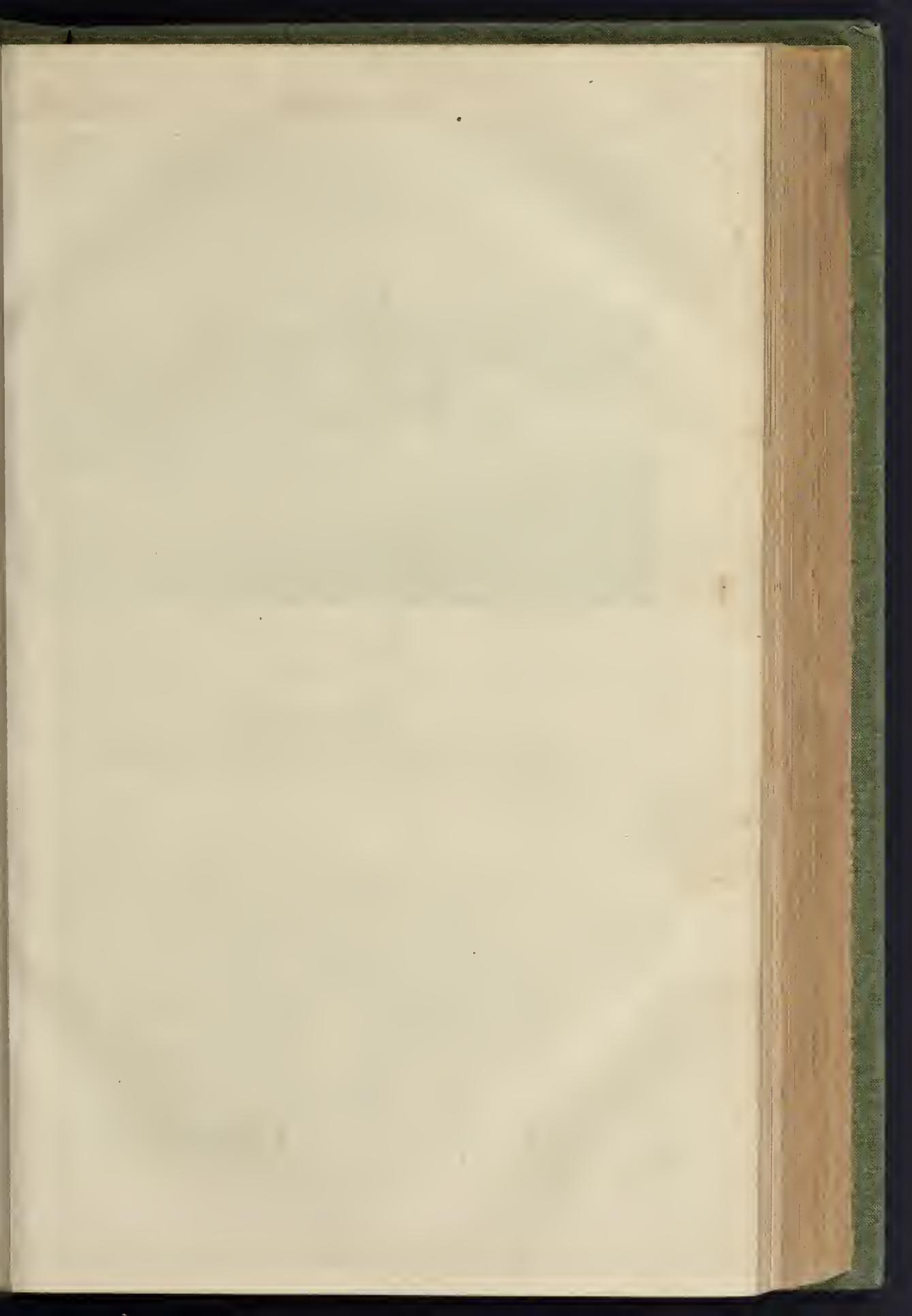
In connexion with this alteration, they also propose to make a new cut from the flood-gates, to the Alt Bridge, by which the present objectionable range of sand-dunes along the river, dividing it from the Altar Rifle Range, will be avoided, as well as the course of the river shortened inland about 6,000 ft. Machinery for holding back the water above the flood-gates, and using the power thus stored for flushing out the foreshore channel at low water, is also considered absolutely necessary.

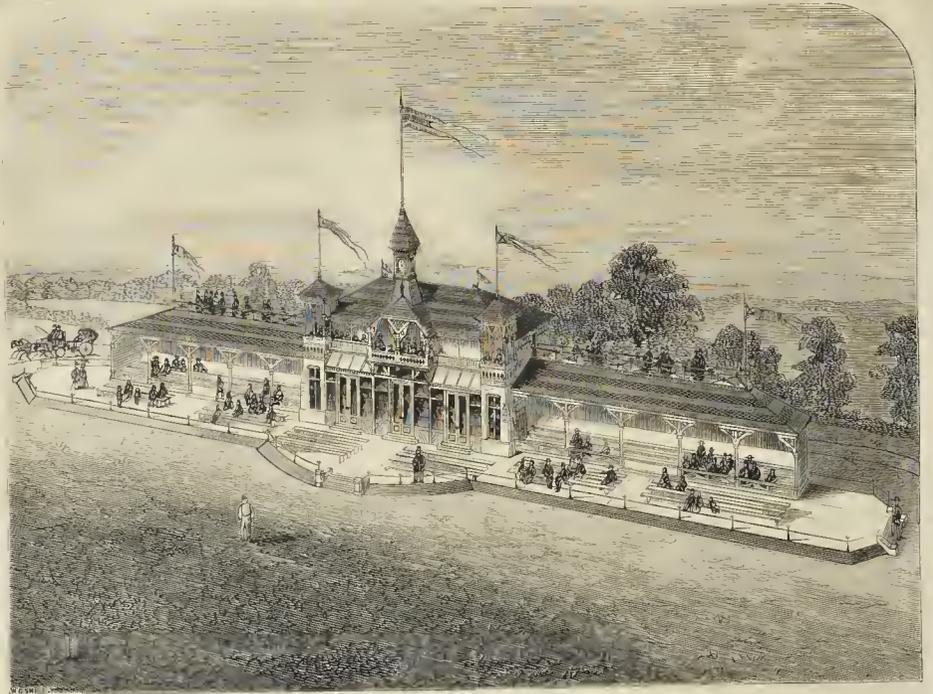
THE PROPOSED NEW PAVILION AT THE TRENT BRIDGE CRICKET-GROUND, NOTTINGHAM.

THIS building, intended to be erected from the design of Mr. S. Dutton Walker, F.S.A., will render the Trent Bridge Cricket-ground very attractive, and will be a great convenience to the subscribers and their friends. The central feature in the design is the Pavilion, two stories in height, the ground-floor being arranged for the purposes of dining and refreshment generally.

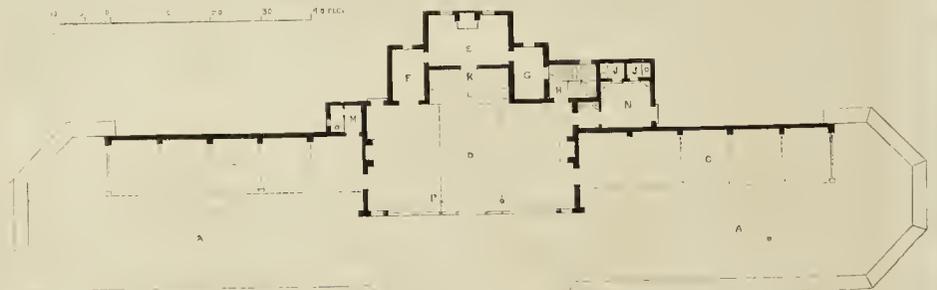
The upper apartment will form a balcony, from which a very excellent view of the whole cricket-field will be obtained. The covered wings on either side of the pavilion will be used when a match is being played, and will serve as excellent shelter from cold winds or rain. It is proposed to devote one wing to ladies. The seats in the wings are raised one above another as galleries. The front seats may be removable if required. In the rear will be kitchen and cricketers' dressing-rooms. A fine view of the cricket-field will also be obtained from the open galleries over the roofs of side wings, the floor of which will be on a level with the floor of the balcony.

Society of Engineers.—Mr. C. W. Harrison having resigned the secretaryship of the Society of Engineers, Mr. Perry F. Nursey, C.E., has been appointed to the vacant post.





CARRIAGE DRIVE

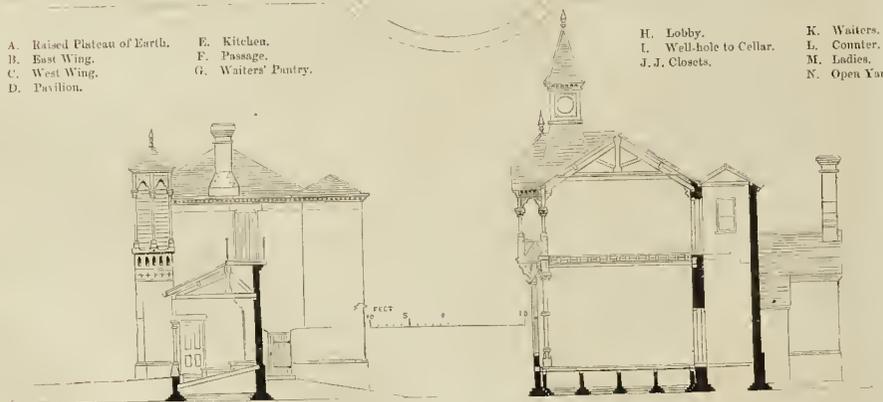


A. Raised Plateau of Earth.
 B. East Wing.
 C. West Wing.
 D. Pavilion.

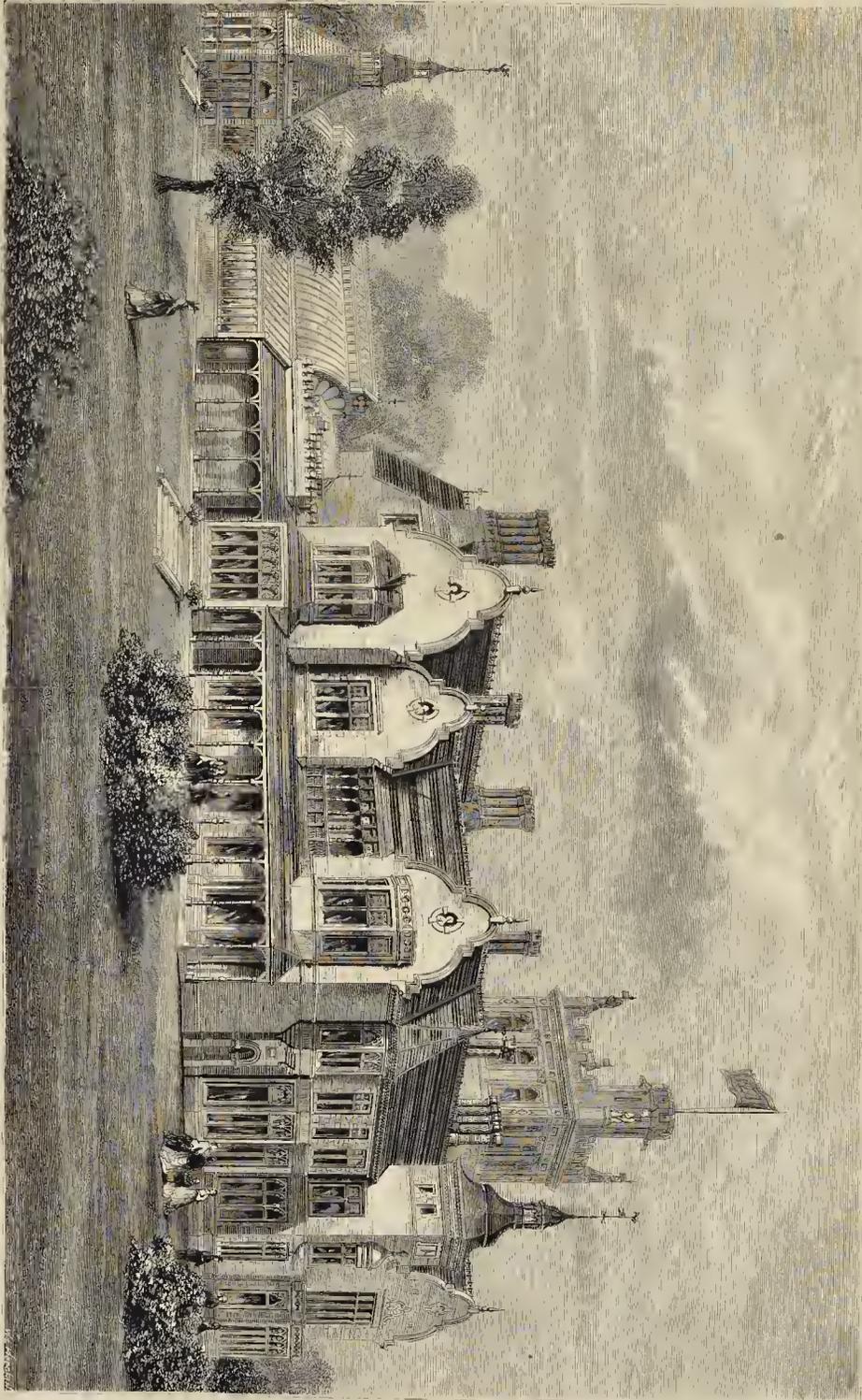
E. Kitchen.
 F. Passage.
 G. Waiters' Pantry.

H. Lobby.
 I. Well-hole to Cellar.
 J, J. Closets.

K. Waiters.
 L. Counter.
 M. Ladies.
 N. Open Yard.



PROPOSED PAVILION AT THE TRENT BRIDGE CRICKET-GROUND, NOTTINGHAM.
 MR. S. DUTTON WALKER, ARCHITECT.



CAEN WOOD TOWERS, HIGHGATE.—MESSRS. SALOMONS & JONES, ARCHITECTS.

CAEN WOOD TOWERS, HIGGATE.

CAEN WOOD TOWERS, erected at Higgate on the site of Fitzroy Farm and Duffryn Lodge, is the seat of Mr. Edward Brooke, nominated by the Lord Mayor to fill the office of sheriff of London at the next election. The plan of the house and a view of another part were published in the *Builder* of June, 1870. The building is faced with red Loughborough bricks, with sunk joints in black mortar, and dressings of Donkington stone. The chimney-shafts are of ornamental bricks of various patterns, from old examples moulded by Mr. Gunton, of Cossey, near Norwich. The roofs are covered with ornamental tiles in various patterns, and laid in bands. All the internal woodwork on the ground-floor is wainscot, and on the bed-room floor pitch pine. The doors and dado of halls and staircase have carved moulded panels on the solid. The floors are of parquetry. The ante-hall is laid with black and white marble. In the ante and inner hall are richly-carved chimney-pieces, executed by Mr. J. B. Philip from designs by the architects, with varied coloured polished marble shafts and dog-grates. The ceilings of dining-room, halls, morning-room, and library are of paneled wainscot, moulded and carved, with an elaborately-carved chimney-piece in the dining-room, also of wainscot, working up into the ceiling. On either side of the dining-room chimney-piece are windows looking into a conservatory, with fountains. The upper portions of windows above the transoms are fitted with stained glass, geometrical pattern. The staircase is of wainscot, covered with standards for gas on the newel, supplied by Mr. Verity, of Covent Garden. The staircase windows are filled with stained glass, the large one with the armorial bearings of the Brooke family for eighteen generations; the side lights, with subjects from Tounyson's poems.

The billiard-room windows are also fitted with stained glass, indicating different sports, such as hunting, fishing, coursing, shooting, croquet, archery, and so on. In the inner hall and upper landing leading to bed-rooms the windows are fitted with stained glass, with subjects from well-known fables. All the stained glass has been supplied by Messrs. Heaton, Butler, & Bayne.

The morning-room is lined with old Cordova leather, brought from Antwerp, and which was put up in a mansion there when Antwerp was under Spanish rule: it is in a fine state of preservation. The ceiling of this room is decorated to agree with the leather; the upper portions of the windows being fitted with stained glass, with designs of the seasons; the frieze of the cornice having heads modelled by Mr. J. B. Philip from Scriptural subjects. Off the dining-room is a picture-gallery leading into a conservatory, 80 ft. long, in ironwork. At the end of the conservatory is a pavilion with decorated roof, covered with ornamental pattern zinc, 50 ft. high to the vane,—the vane, a Mercury, in zinc. The floors of the conservatory, pavilion, and verandah are laid with ornamental tiles by Simpson & Sons, of the Strand. The drawing-room ceiling is paneled work, and decorated by Mr. Pollitt, of Manchester. The furniture throughout the house is made to agree with the architecture of the several rooms; the dining-room of pollard oak, the drawing-room of ebony and ivory, the morning-room of walnut.

The whole of the work, including the furniture supplied by Mr. Lamb, of Manchester, has been carried out from the designs and under the superintendance of Messrs. E. Salomons & J. P. Jones, architects; Messrs. Jackson & Shaw were the builders; and Mr. George Simmonds was the clerk of works.

AUCTIONS AND AUCTIONEERS.

SIR,—In reply to the statement that auctioneers' and estate agents' charges generally are ridiculously high in comparison with the knowledge or skill required, I would say, since houses have multiplied to such an extent, and are generally of such an inferior stamp to what they used to be when I first knew the business, it requires twice the skill to induce a man to trust his wife and family within some of them, and much more to induce him to pay the rents demanded and adhere to the surrendering clauses of present style of leases. It would be a capital thing if commissions were done away with altogether, and we were obliged to take out a licence at 25*l.* to enable us to practise, and then that we be permitted to charge for letters, attend-

ances, and some other portions of our business after the same scale as solicitors. All sales could be agreed for at a set sum, and I am sure our profession would not grumble, while your friend would have gained his point, and at the same time have given a deal of satisfaction to a very respectable class of the community. The *Builder* did not say whether architects get any pickings beyond the 5 per cent. mentioned. Do they put in ornamental work in plans that they know must be obtained in certain quarters? And what arrangements are previously made in those quarters? Perhaps it would be as well to inquire. AUCTIO.

SIR,—Can no remedy be found to purify auction sales, and suppress "knock-out" conspirators, who, by themselves and penniless hirelings, prevent private ladies and poor but honest dealers from buying?

At present, I avoid entering into the incompetency of many, who, forsaking their original callings, actually take out licenses as general auctioneers, but leave you to imagine how little these persons can possibly know of the value of property, in furniture, or stocks-in-trade, and how their clients' goods must be at the mercy of their dealers and buying brokers. We hear occasionally of the rostrum buying, selling, and money-leading, and of the absurdity of a heavily-furnished house being hammered down in two small rooms. Many buyers are in the front hall, unable to enter or see the auctioneer's eyes, and few indeed can glance at or handle the lots. Again, can any auctioneer, however skilled, upright, or strong-nerved, undergo the fearful fatigue of a long sale, the smothering dust of carpets and beds, the stench, heated rooms, the jeers and insults, without (from sheer disgust and exhaustion) being occasionally victimised by the low mob surrounding himself and clerk?

The remedy, I think, is easy. Let priced catalogues be sent to all (priced in plain figures) to be sent some days before the auction, to enable professional gentlemen and merchants, before and after office hours, to purchase peaceably, and save the fees wasted on officious and unscrupulous brokers. This plan would save the hard wear and tear of brain and body on the auction-sale, and enable the poor widow or needy owner to realise something, approaching fair second-hand value for oftentimes cherished goods parted with solely through death or debt.

My advice also is, employ only auctioneers bred to the profession—as a prey, to their honourable men,—and leave prices entirely to their skilled judgment and experience.

Make a small charge for the catalogues sufficient to defray cost of printing, paper, and compiling, otherwise, if gratis, improper parties would ask for and waste them. W. P. T.

THE BUILDING TRADE.

SIR,—Will you allow me space to make one or two remarks with reference to a letter that appeared in the *Builder* of the 15th ult., from the firm of Cox & Son, on the dispute in the building trade? I have no doubt the letter was written with the best intentions, but it is certainly calculated to leave wrong impressions, inasmuch as it is made to appear that the delegates are the only obstacle to an amicable settlement of the question. As a delegate representing the joiners of one of the largest firms in London, I do not think it is paying a very high compliment to the intelligence of the men to insinuate that they are prevented from accepting terms that they may deem satisfactory by a professional representative, who is working among and in daily intercourse with them. What the writer is pleased to call professional representatives are real representatives, elected by the men from amongst themselves in their shops and jobs. That the delegates are anxious for an amicable settlement is sufficiently shown by their endeavours to meet the employers by negotiation or effect such settlements, but it was unnecessary to do so, as the meeting at St. James's Hall sufficiently demonstrated. I am glad to see the firm of Messrs. Cox & Son so far admitted the justice of the claim for a reduction in the hours of labour as to immediately concede two hours and a half per week, with an equivalent advance of wages, with the understanding (I am informed by men in their employ) that they themselves would give the 9*l.* and nine hours as soon as other firms gave it, and entered into an agreement with the men to that effect.

The memorial referred to as coming from the Joiners' Society is an error, as it emanated from the delegates representing the carpenters and joiners of the principal building firms in London, embracing both society and non-society men, and may fairly be said to represent the collective opinion of the trade. A DELEGATE.

SIR,—I quite fell in with the remarks of "A. B.," the "Suggester." I found in your valuable paper of the 15th ult. I thought the practice of it would be fair and honourable towards the two classes; namely, those who are for the reduction of the time to 9*l.* or 8*l.* per hour, and those (and their name is legion) who advocate that number of hours which we think is a good, safe point of proportion from the minimum to the maximum of the time of labour. Excess is always dangerous; and, as we approach danger, the higher we go towards the maximum. It is best to stop at ten hours; and that number having been so long in practice, and by working hardy and ourselves and our employers, by the aid also of well-managed machinery, I feel certain (and I have had twenty-nine years of it) that no physical harm can arise from the custom. I am paid 8*l.* per hour; and, sir, looking at the state of society, the power of capital, the rights of masters, the difficulties of competition through the freedom of importation of joinery, and the low moral standard for jobs of some capitalists, which places great moral difficulties in the way of high moral exaltation who look to the lasting safety of their firms, I do think that 8*l.* per hour at my age of forty-nine is a beautiful wage, taking the market rate of labour into account. I do not like the idea of the reducing the hours of labour under the plea of (false labour) it is degrading, degenerating, drawing backwards, towards the minimum of time of labour; and *this is the plea to produce more leisure for the man employed*, at the expense of the capitalist. My fellow-workman in employ may indeed be filled with benevolent feelings towards his poor fellow-man who can get no

work to do; but he is not beneficent enough to give 8*l.* per day, or 8*l.*, to carry out into practice his benevolence. No; but he turns round and demands nine hours at 9*l.* per hour. I must exclaim with a master builder, "The plea is all moonshine!"

If sir, master builders grant an extra wage of 1*l.* per hour, with a promise of a future rise, then I think, with the suggester, that it would be fair to the one party and the other to let those go after nine hours or nine hours and a half, if they please, and those who are for the maintenance of ten hours' work to work that time.

I am certain that all unjust demands upon the employer tend to the injury of the employed. For my own part, I have always experienced goodwill, justice,—indeed, all that was right,—from my masters, and it has been my greatest delight to do all that I possibly could that was just and right between master and man. Do excuse the liberty I have taken. I thought it might cause some to think, and ask themselves, is the demand reasonable, moral, and just? JOHN ANDREW PARKINSON, Joiner.

SIR,—When will employers of labour take a hint from the acts of their own workmen, and by combining together meet the present strike mania on equal terms?

By an extensive system of amalgamation and mutual support, working men are enabled to bring the whole power of their union to bear on any one district, rendering individual opposition impossible. Even the Masters' Associations, as at present constituted, seem powerless to check the growing evil, simply because they have no organisation by which pecuniary support can be extended to the members during the prevalence of a "turn-out." It has occurred to me that the difficulty might be overcome by the establishment throughout the country of a masters' union, which should discuss all matters connected with the labour market, and compensate for losses during a strike against their decision.

If any one will calculate the sum total of the profits made by manufacturers, &c., throughout the country, he would at once perceive that, on the principle of fire insurance, a fractional per centage only would be necessary to meet all ordinary demands. Each policy would have, however, to be in itself a share to provide for any great strain, and, on the other hand, that it might receive back interest in the shape of dividend.

If this plan were adopted, masters would soon be able to have a word as to the regulations of their workshops, the character of their men or their foremen, the employment of free labour, and the worship of "Mary Ann."

J. J. A.

* We must let all sides speak; but the banding of class against class has no attraction for us.

SIR,—Will you allow me, by means of your paper, to suggest to the Master Builders' Association the necessity of their making generally known their address, there being a great many builders anxious to become members, who are prevented by the want of this information; and also to say that if the unreasonable demand made by the workmen is to be successfully opposed, it is necessary for the whole of the masters to act in unison, and to close their workshops immediately any firm is selected to be stopped. A BUILDER.

STAINING AND VARNISHING.

SIR,—Thanks for your answer last week to my question. Will you please allow me to ask another, viz., is it a universal practice with architects to allow the work to be done before varnishing, without stating the same in the specifications? Therefore size must always be used.

ONE WHO WANTS TO KNOW.
* Certainly not. If the work is to be thoroughly well done, size ought not to be used.

OBLIGING.

SIR,—If you can find a corner in your valuable paper for the enclosed, architects will be able to see how obliging their clients are. Is there no remedy for this? H. B.

* I have architect's plans of a very comfortable house, containing dining, drawing, and four bed rooms, kitchen, scullery, cellar, iron and back stairs, cost 500*l.*, which I should be pleased to lend to any reader of *Exchange and Mart*.—W. G.

THE RESPONSIBILITY OF RAILWAY COMPANIES.

SIR,—No doubt, many of your readers have had considerable experience in the transit, per rail, of materials used in building. Would some one of them kindly say what they find to be the usage of railway companies where a considerable quantity of the goods sent are found missing on arrival at their destination,—say one-third,—it being allowed that they were sent at "owner's risk," as was this entirely exonerate the company from all responsibility? I am specially referring to a case of stone-ware pipes being the articles conveyed. J. D. P.

COMPENSATION CASE.

A SPECIAL Petty Session has been held at the Police-court, Whitehaven, for the purpose of deciding the amount to be paid as compensation to the Whitehaven Cal and General Paving Company, and to Messrs. Shepherd & Leach, shipbuilders, by the trustees for the town and harbour, for the compulsory sale of a portion of the cab-company's premises, and the shipbuilding yard of Messrs. Shepherd & Leach, which are required for the wet dock about to be constructed at Whitehaven.

Mr. McKelvie opened the case on behalf of the Cab Company, who claimed 185*l.* 10*s.* 2*d.*, and afterwards called, as witnesses, among others, Mr. Wylie, architect, valuer, &c., Birkenhead; Mr. H. Hodgson, contractor, Workington; Mr. J. Shepherd, Joiner, Whitehaven; and other gentlemen, who gave evidence in support of the claim.

Mr. Howson addressed the magistrates on behalf of the trustees, and then called Messrs. Vevers (of the firm of Myers, Vevers, & Myers, Preston), and Job Buntley,

Kendal, who estimated the total amount to which the company was entitled at £4,381 10s. 10d. The magistrates decided to award the company 1,320*l.* As the company had made a large claim originally without substantiating it, and as the trustees had made no offer to settle the matter without referring it to arbitration, each party would have to pay their own costs. The claim of Messrs. Shepherd & Leech, shipbuilders, was afterwards gone into, and at the close of the hearing the magistrates awarded them 1,050*l.*

"CÆSAR'S CAMP."

Your correspondent does not overrate the interest attaching to this fine entrenchment; the title annexed to it, however, is a misnomer, for it is certainly post-Roman, and of different construction from British encampments.

The fullest account that I have met with calls it "Bensbury," or, more fully, "Cneben's-bury": *cneben* = knave, cf. Ger. *knabe*; A.S. *cneapan* = youth. It is a Saxon camp, and named after the said *Cneben*, who was one of Ethelbert's captains, killed here in battle with Ceawyn, or Cealwyn, of Wessex, A.D. 568.

It stands on Warren Farm, at the south-east corner of Wimbledon Common, in a commanding situation, immediately facing Combe Wood, on the rise of Kingston-hill. The outline of the embankment is marked by a circular grove of young oak-trees, the interior being used for grazing, and overrun with blackberry-bushes and yellow gorse now in full bloom. But, alas! Mr. Cooke has raised his *io pean* too soon; for I see by the papers that the whole area has been let, on building lease, for ninety-nine years, and is now being staked off in allotments.

I take this opportunity to direct attention to an older entrenchment, Romano-British in construction, that lies within easy reach of Town: it is called Arnesbury Banks, situated about one mile south of Epping, on the main road, facing Copped Hall. The place is little frequented, the whole site being thickly covered with a dense overgrowth of small bushy trees, that screen it from observation. It is not likely to tempt the cupidity of an avaricious landowner or building speculator.

It is very anomalous to find that while one rich man may be willing to expend thousands in providing an object that shall interest the present generation, and instruct posterity, his neighbour will be as willing and as ready to destroy such objects of interest as Providence has placed in his possession, derived from the industries of a former age. A. HALL.

A GLAZED SURFACE.

SIR.—This is a question that admits of more ventilation than appears on the surface. It is futile to plaster walls where steam or smoke is. You may whitewash your kitchen, laundry, and scullery every six months, and you never can have it clean; and you must, moreover, replaster it every three years. The perpetual heat of a kitchen or laundry rots, blisters, and breaks the flooring. I have never seen anything equal to vitrified bricks, which wash and clean like a good linen rubber. They have only one drawback, namely, the expense. They are excellent, too, for stables, as they do not absorb the ammonia as plastered walls do. I have seen fire-bricks tried to line stables, but they are almost useless for the purpose under consideration. What we want is a cheap lining that will repel steam and ammonia, and can be washed. I fear 5s. 6d. a square yard in town will hardly meet the emergency for the country.

ONE WHO BUILDS.

COMPETITIONS.

Worcester Guildhall.—Some time ago the Town Council advertised for plans for the reconstruction or rebuilding of their Guildhall, at costs which were stated in the conditions of competition to architects. Nine sets of plans have been received in response to this advertisement, and the Guildhall Committee have met to decide what steps should be taken relative to three of these sets which had arrived after the prescribed time. After some discussion it was agreed that the plans in question should be received, subject to the condition that if a premium were awarded to either of the three, the one should rest with the author thereof of proving that his plan was despatched in time to reach its destination, as per the conditions, in the ordinary course, and that the delay was due to detention by the rail-

way companies or others, for which the sender could not be justly made accountable. It is to be hoped that the town-council, who will have to settle this point, will rigidly adhere to their own conditions.

CHURCH-BUILDING NEWS.

Stratford-on-Avon.—Luddington Church has been consecrated by the Bishop of Worcester, in the presence of a large assemblage of clergy and laity. Some 800 years since a church stood here, and tradition reports that in it Shakspeare married his wife. The key and the font of the church are still extant; the former in the museum in Henley-street, and the latter in the graveyard attached to the church at Luddington. Two years since, Mr. Pickering, of Wilcote, Oxon, a native of the hamlet, expressed his intention to give 1,000*l.* as a building and endowment fund. It was equally divided, and Mr. John Baldwin, a resident of Luddington, set to work with such hearty goodwill that about a year since the Marchioness of Hertford laid the chief stone of the church. It has been erected from designs by Mr. John Cotton, of Birmingham. The style is Early Gothic. The inside is profusely decorated. The painted glass windows are all gifts of Mr. Pickering, Mr. Baldwin, and, one to the memory of the late vicar, the Rev. G. J. Graville. The font, of Armscott lias stone, was the gift of the Marchioness of Hertford. The plan of the edifice is in the form of a parallelogram, except that the projections of the chancel, porch, vestry, and bell-tower, break the exact uniformity of the figure. The church is placed upon the site with its axis almost due east and west. The blue lias limestone of the district, obtained from the Binton and Wilmoote quarries, has been used for the building, finished internally with trowelled stucco on a lining of brick. Corsham Down stone, which in colour contrasts with the blue walling stone, has been used for dressings to the windows and doors throughout, and for the tracery, which is of geometric character. The roof is covered with brindled Broseley tiles, with bright red and partly ornamented ridge cresting. The benches and woodwork of the church are stained in two tints, and varnished. A bell-turret, with slated spire, rises at the junction of the chancel with the nave, to a height of 60 ft., and is surrounded by a cross and gilded vane. The bell-stage contains three steel bells, which are rung from a recess in the lower part of the tower. These bells were the gift of Mr. John Baldwin. The east window, in stained glass, represents the Crucifixion. On the south side of the sanctuary is a window representing the Resurrection. The words below it are, "Why seek ye the living among the dead?" The two windows on the north side of the chancel were presented—one by Mr. Baldwin, of Christ blessing Little Children; and the other by Mrs. Baldwin, of Christ feeding the Multitude. All these windows in the chancel were produced by Messrs. Lavers, Barrand, & Westlake, of London. The stained-glass windows in the nave are the production of Messrs. Holland & Son, glass painters, Warwick. The western illustrate the events described in the 24th chapter of St. Matthew's Gospel, of the storm upon the sea, Christ walking upon the sea to His disciples in the ship, and His saving of Peter when sinking through want of faith. They were presented by Mr. J. Baldwin, to the memory of his brother. The south-west lancet window of the nave was given by Mr. William Sugden Armitage, of Manchester, and represents the good Samaritan pouring in oil and wine. The builders of the church were Messrs. J. & G. Callaway, of Stratford-on-Avon.

Woodhurst.—The Church of St. John the Baptist has been restored and re-opened for divine service. It is an edifice in the Perpendicular style, dating from about 1500. It consists of nave, chancel, small square tower, and south aisle, with a porch. The church was closed for the work of restoration last Midsummer. The architect was Mr. White; the contractors were Mr. J. Saint, of St. Ives, and Mr. Bunting. The north wall has been entirely rebuilt, a new roof erected to the south aisle, a new east window, and chancel fittings. The interior has been rescaled. The tower is a "bell cote," and has been covered with oaken shingle.

Sherfield-on-Loddon.—The parish church has been re-opened. It was in a very dilapidated condition. The rector took upon himself the duty of partially restoring the edifice. He subsequently decided to build a tower for the bells,

and to make it large enough to hold two more bells, thus increasing the number from four to six; and also to add a spire. The two new bells are the gift of Mr. Bramstone Stane, and the whole of them will shortly be placed in position. The works now completed consist of a tower and a spire, 95 ft. high, the latter being covered with oak shingles. The principal entrance to the church is through an archway in the tower, and the original doorway has been removed from the south wall, where it was shrouded by a miserable brick porch. A vaulting of stone forms the basement of the tower in the porch, in which is a carved tablet recording the fact of the rector having built the tower as a memorial of his brother. A carved figure of St. Leonard, in whose name the church is dedicated, is placed in a niche above the outer archway, and eight coupled belfry windows finish the tower. The rose-window has been removed to the north wall of the nave, and in its place a 3-light window has been put in, filled with stained glass, representing a baptismal subject, by Messrs. Clayton & Bell. The old font has been replaced by one standing upon a triple base, with eight Devon marble columns surrounding a central one of stone, with moulded bases and carved capitals. The western end of the nave, in which the organ lately stood, has been fitted up with benches in the north side, the font occupying the south-west angle. From the north-eastern angle of the nave a chamber has been erected, and in it the organ is now placed. The crowning work is the erection of a roodloft which is composed of Caen stone, with Devon marble shafts. In three panels above the Communion-table are the supper at Emmaus, and two attendant angels. In the four side panels are figures of the Evangelists. These panels are all of Salvati's mosaic. A variety of emblematical carving is introduced in the roodloft. The architect was Mr. J. West Huggall, of Oxford, and the works have been carried out by Messrs. Wheeler, builders, Reading.

Yatton.—The Church of St. Mary, at Yatton, after being closed for nearly two years, to undergo restoration, has now been re-opened. The principal items of the work are the rebuilding of the chancel; a new floor throughout the church, of wood and tessellated pavement; new west and other windows; new nave roof and parapet; new doors, seats of modern character, oak screens and stalls in the choir, communion-table and pulpit, and heating apparatus. The outlay has been about 3,000*l.* The aisle roofs and two chapels have still to be restored, but the work is postponed for the present for want of funds.

Burford.—The nave of Burford Church has been restored under the superintendence of Mr. G. E. Street, and a sum of nearly 3,000*l.* has been expended upon the work. There yet remain to be completed the restoration and the opening of the lantern tower, the restoration of the north and south transepts, and the chancel with its aisles, &c. About 4,000*l.* are required to finish this church. At present the work of restoration must stop, and the edifice be reopened, owing to lack of funds.

Eaton.—The foundation-stone of Christ Church, Eaton, has been laid by the Mayor of Norwich. About 1,600*l.* have been subscribed, but between 400*l.* and 500*l.* more are required to furnish the church with all needful fittings, and render it available for divine service. The foundations of the chancel have been laid, but for lack of funds this part of the church cannot at present be erected. The building is to be in the Gothic style of architecture of an Early period. It will be of a cruciform plan, and when complete will consist of a chancel, nave, transepts, and aisles, with organ-chamber and vestry on either side of the chancel, but it is at present only proposed to build the nave and transepts. The walls will be built externally with flint facing and Bath stone dressing, and internally stuccoed and relieved with bands and arches of stone and brick, and supported by buttresses. The window and door heads are to be in plate tracery, glazed with tinted cathedral glass. The roof is to be open-timbered, and covered with slate, and the floor laid with Staffordshire tiles. A light perforated stone spire will be erected for the bell on the south-east corner of the church. The execution of the work is undertaken by Mr. W. Wright and Mr. J. W. Lacey, builders, Norwich, from the designs of Mr. J. H. Brown and Mr. J. B. Pearce, joint architects, Norwich.

Chirbury (Shropshire).—The parish church of St. Michael was re-opened on the 22nd ult., after restoration. The church, built by the Austin

Friars, consists of a wide and lofty Early English nave, with narrow north and south aisles, extending to within 5 ft. of the east end, and a western tower of later date. There is no sign of a separate chancel ever having been intended; in fact, it is evident that a modern chancel arch, put in when the small brick chancel was built in 1733, occupied the place of the old east window, which was then removed into it. Previously to the recent restoration of the church the south aisle walls were in a dangerous state, and huge round-headed modern windows disfigured the walls; the flat roof over the nave, as well as those of the aisles, was concealed by a modern ceiling; there were high pews and a west gallery; also the small chancel arch with plaster moldings marred the effect of the interior, and the east gable of the nave above the wall-plate level consisted of a lath-and-plaster partition. A wide and lofty stone chancel arch has now been substituted for that described and various other works done, and a chancel has been formed by taking in the easternmost bay of the nave, and this is marked by a pierced stone screen next the nave, and high oak screens next the north and south chancel aisles; in the former of which is placed the organ; the latter is occupied by the school children. There is provision for 370 persons. The architect is Mr. E. Haycock, of Shrewsbury, and the builders are Messrs. Bowdler & Darlington. The glazing of the windows was executed by Messrs. Done & Davies; the carving by Mr. G. Landucci; and the warming apparatus was provided by Mr. W. Dodwell, of Shrewsbury. The total cost of the work is about 1,700l.

Uxcomb.—The restoration and repair of the parish church have now been completed, under the superintendence of Messrs. Slater & Carpenter, architects, London. The plan for the restoration included nave, chancel, with a south aisle, continued eastwards to form a chantry chapel, and westwards, to form a vestry, which constitutes a feature in the building, also a chapel on the north side of the chancel and nave called the Wandesford Chapel, a tower at the west end, and a porch on the south side. The Wandesford Chapel is separated from the chancel by oak parloises cut between two arches. The church is from twelfth to fifteenth century date. The tower is of the Kentish type, with an octagonal turret rising above it. The materials of the church are flint and rag stone. The new works comprise new roofs throughout, reseating, and repaving with tiles made from the designs of the Rev. Lord Alwyne Compton. The chancel is fitted up with oak stalls, and an organ has been presented. The total cost of structural works was 1,470l. 11s. 6d.; fittings, 900l. 14s. 7d.; architects' legal and incidental expenses, 229l. 0s. 9d.; total, 1,790l. 6s. 10d.

SCHOOL-BUILDING NEWS.

London.—The opening of St. Mary Magdalene Schools, St. Pancras, took place on Thursday, 15th ult. They adjoin the south side of the church; the building was originally a Dissenting chapel, called "Albany Chapel." It has been bought and converted to its new use, and is now capable of accommodating 1,000 children. The infants' department is on the basement, where there is also a large industrial kitchen, &c. The boys are on the ground floor, and the girls on the upper floor. Here the original coved roof, with its moulded beams and ribs, have been retained; the windows have, however, been changed from long lancets to two-light square-headed windows. The exterior is necessarily plain and unornamental. Mr. Allen is the builder engaged under the architects, Messrs. Slater & Carpenter.

Findon (Sussex).—A new school is being built here under Messrs. Slater & Carpenter, as a mixed school for boys and girls. It is constructed with flint, in cement walls, faced with hopped flints on the outside; the gables and dressings are of Caen stone, and the chimney shafts of red brick. By the special wish and help of the Marchioness of Bath, the details are of a rather more ornamental character than is absolutely necessary. The windows are of three cusped lights, with cusped circles and gables over each window, with burge-boards, &c. The eaves are of oak and lead, with a shingle spine; and the roof is open, with arched and cusped principals, and is plastered between the rafters. The builder is Mr. Barnes, of Brighton.

Codrington.—The memorial-stone of new parish schools has been laid here. The old school will be that of the more modern structure.

A plan, it is said, has been drawn by an architect, representing the new building to consist of two wings and a small centre spire. It is estimated that the cost of the work will be about 800l.

Acklam.—A new school has been opened at Acklam. A site was given for that purpose by Mr. Hustler, at whose expense the building, consisting of a school-room, with separate playgrounds, &c., for boys and girls, and a residence for the master, has been completed. The plans of the schools were by Mr. J. Sturdy, Middlesbrough, and the work was executed by Mr. J. Johnson, builder, Middlesbrough.

Lower Broughton.—The foundation-stone of St. Andrew's Schools, which are now in course of erection in Hough-lane, Lower Broughton, has been laid. The schools will contain a large room (64 ft. by 20 ft.) for 160 infants, and a mixed school-room (33 ft. by 17 ft.) for ninety boys and girls, besides class-rooms, porches, &c. There are two play-grounds. The style adopted is Gothic, of a plain character, with high-pitched roofs, small buttresses, and pointed windows. Internally the schools will be fitted in the usual manner, with desks and benches, the infant school having, besides, two galleries. The main roof-timbers, carried on ornamental stone brackets, will be stained and varnished, and the ceiling will be bordered by a small wood cornice, also varnished. Between each room, a principal ventilator will be placed. Mr. Tully is the architect, and whose superintendence the schools are being erected.

Southport.—Mr. John Fernley, of Southport, is building a school, to present to the Wesleyan Methodist Conference, at a cost of about 8,000l., to be devoted to the education of the daughters of Wesleyan Methodist ministers.

Newport.—The foundation-stone of new National Schools, to be erected at Newport, Salop, has been laid. The schools will be in connexion with the Church of England. The site is towards the south of the town, and consists of about an acre. Mr. Ladd, of London, was selected as the architect; and Mr. John Turnbull, of Cheswardine, as the builder. The schools will be built to accommodate 250 children—boys, girls, and infants. They will consist of a boys' school-room, 41 ft. 6 in. by 19 ft.; a girls' school, 33 ft. by 18 ft.; an infants' room of the same dimensions, with two class-rooms, and suitable offices. In addition will be a master's house. There will be a large playground. The premises will be built in domestic Gothic style. The facings will be of pressed bricks from Donnington Wood, with white and blue bricks for the bands and arches. The school-rooms will be faced inside with white bricks from Coalbrookdale. A prominent feature of the building will be a bell-turret. The amount of the contract is 1,493l., but incidental expenses and contingencies will, it is expected, bring up the total cost to 1,700l.

Southwick.—The foundation stone of new schools connected with the Roman Catholics has been laid by the R.C. Bishop of Hexham and Newcastle. The design is by Mr. J. Tillman, architect, Sunderland, and is in the Gothic style of architecture. Its length is 85 ft., and breadth 33 ft.

Highfield (Sheffield).—The eighth elementary school erected in connexion with St. Mary's Church has been opened in Alderson-road, Highfield. The site, valued at 700l., was given by Mr. Henry Wilson, and the scheme includes boys', girls', and infants' schools. At present only the infants' school has been erected, and for the time being it will be used as a mixed school. It is built at a cost of 800l. The large room is 34 ft. by 49 ft.; and there is a class-room attached, 18 ft. by 15 ft. There is also a large lobby, which will be used as a cloak-room for the children. Accommodation is provided for 240 scholars. The architect was Mr. Mitchell-Withers; the builders were Messrs. Chibley & Stringfellow; and the joiner was Mr. G. Oxley.

FROM SCOTLAND.

Edinburgh.—The Government are about to build new barracks for the married soldiers stationed in Edinburgh Castle. The site selected is on the south side of Johnstone-terrace. The building is to be of stone, with a slated roof, and iron verandahs overlooking the Grassmarket. The barracks will have three floors, and on each floor there will be accommodation for eighteen families, or a total of fifty-four families. Each family will have the entire use of a room 16 ft. by 14 ft. At present several families are accom-

modated in one large room, separation being secured only by screens. The upper floors will be approached by an iron staircase from the centre of the building, and each room will be fitted with a ventilating grate and cooking oven. Provision will be made for ventilating the rooms by means of fresh-air louvred inlets, and extracting shafts for foul air. A washing-house and laundry, provided with improved drying-closets, will also be built on a vacant piece of ground nearer the Grassmarket; and a portion of ground is to be laid out for bleaching and drying greens. The plans have to be yet approved of by the Dean of Guild Court.

The Prince Consort Memorial.—Since the selection of Charlotte-square as the site of the Prince Consort Memorial, arrangements have been in progress with a view to the satisfactory completion of this national undertaking. The square is intended to be laid out anew for the reception of the memorial. Instead of the present circular form of the enclosure, a square, with the angles splayed off, will be substituted. The memorial will be erected in the centre of the square, with the figure of the Prince looking towards the south, so that the leading object in the monument may be seen in profile from George-street. It was originally intended that the pedestal of the monument should be of free-stone; but during the progress of the work the committee came to be of opinion that granite could alone consort with the dignity and grandeur of the design. A subscription was accordingly opened for the purpose of securing a granite pedestal. It was stated at a recent committee meeting that his Grace the Duke of Buccleuch had guaranteed 2,000l. to the fund, and this had enabled the committee to commission a granite pedestal from Mr. Macdonald, of Aberdeen. A letter was read from the Marquis of Lorne stating that her Majesty had allowed the Princess Louise to subscribe 300l. to the pedestal fund, and it was agreed to add his lordship's name to the committee. It is expected that Mr. Macdonald will have the pedestal ready in about a year; and long before that time Mr. Steell will have finished the statutory portion of the memorial.

Musselburgh.—The want of a golf-house for the Musselburgh Golf Club has long been felt, but will soon be supplied. Plans have been prepared by Mr. Brown, architect, Edinburgh, for a building, which is to be erected at Musselburgh Links, a few yards to the north of the house belonging to the Hon. Company of Edinburgh Golfers. Consisting of two stories, the structure will be of a plain character, and will contain all the apartments requisite for a first-rate golf-house. The ground-floor will be taken up with the club-room, which is to be 37 ft. long by 18 ft. wide, dining-room, kitchen, lavatories, &c., while the upper floor will be set apart for a reading-room, two large and airy parlours, house-keeper's-room, and servants' rooms. The back wing of the house will contain a coal-cellar, larder, pantry, &c. There will be a sufficient number of windows to afford ample light to the whole. The building, which will have a projecting roof, with a window facing the east, will be so constructed that, in the event of increased accommodation being required at a future time, another wing can be easily added. The contracts are all taken up and operations commenced.

Glasgow.—The statue of the late Dr. Thomas Graham, Master of the Mint, by Mr. Wm. Brodie, R.S.A., destined to occupy the south-east corner of George-square, Glasgow, as a companion monument to that of James Watt in the south-west corner, has just arrived at Mr. Brodie's studio from the foundry of Messrs. R. Macfarlane & Co., Chelsea, where it was cast in bronze. The statue, which is a gift to Glasgow by Mr. Young of Kellie, represents Dr. Graham sitting in an easy, contemplative attitude. The massive head leans slightly forward; and the robe of a D.C.L. falls in sharp folds from the shoulders. The weight of the statue is 2 tons, and it was cast at one operation. It is finished, says the *Scotsman*, like a bronze for a mantel-piece. The statue is about to be placed on its pedestal.

Helensburgh.—A monument of Aberdeen granite is about to be erected on the banks of the Clyde at Helensburgh, in memory of the late Henry Bell, who first applied steam to navigation on that river. It consists of an obelisk 25 ft. long and 3 ft. square at the base, being the largest ever produced at the works from one stone. The block, which came from Messrs. Macdonald, Field, & Co.'s quarries at Stirlinghill, near

Peterhead, weighed 17 tons in its rough state, and, as now shaped and polished, it has a weight of 11 tons. The chelisk is to be set on a series of steps of the same material; and, with dado and plinth, the total height of the monument will be 34 ft.

Aberdeen.—Mr. J. Dickinson Brnnton, the inventor of the channel-tunnelling machine, says the *Scottsman*, having recently obtained a patent for a granite-turning apparatus, Messrs. Macdonald, Field, & Co., of the Aberdeen Granite Works, have purchased the patent for the large district north of the Forth and Clyde. The new machine has been started in the Aberdeen granite-yard. The patent proper is confined to a revolving steel disc, with sharp edge, inclined diagonally to the stone. There are two discs, one placed at the front, and another at the back of the stone. Each cuts off from $\frac{3}{4}$ to $\frac{1}{2}$ of an inch at a time, and moves over about 2 ft. per hour. The two discs thus applied to the stone—the one a little ahead of the other—reduce its size by $1\frac{1}{2}$ in. to 2 in. in an hour. It will do as much turning in a day as a mason can accomplish in a week, and the mason's tool-marks being avoided, the work comes out with a smoother surface, so much so that the first process of polishing is almost saved. The machine is capable of working stones of 16 in. diameter and under, but arrangements are in progress for extending its application to work of larger dimensions. Balusters, vases, pedestals, and all sorts of circular moulded work are said to be done very satisfactorily.

Books Received.

Air and Rain: the Beginnings of a Chemical Climatology. By ROBERT ANGUS SMITH, F.R.S., &c., Inspector of Alkali Works for the Government. London: Longmans, Green, & Co. 1872.

THE author of this work acknowledges that it is not one of a nature to be made interesting to general readers without sacrificing the large number of its facts. It is a strictly scientific work of its sort, but may be followed by another of a more popular character on the same subject. Many of the facts here recorded are of importance in the attempt to lay the foundations of a chemical climatology. Some of them show how short of the truth it was to say at one time that chemical experiment could not distinguish the air of Manchester from that of Helvellyn. There are indeed curious differences in the chemical and crystalline residual products at least of airs from different places—very different even to the eye, as in the engraved illustrations given by Mr. Angus Smith. Even the atmosphere of a railway carriage has been found to differ from other air, inasmuch as it was full of brilliant notes, which turned out in the microscope to be rolled or twisted plates or filaments of iron-dust, derived, no doubt, from the friction of the rails and wheels of the train, according to the yielding softness or resistive hardness of the iron or steel of which they may have consisted.

On the effect of the atmosphere on stones, bricks, mortar, &c., there is only a single page; but we shall quote this, although even it is a quotation from the author's own previous work "On the Air of Towns":—

"It has often been observed that the stones and bricks of buildings, especially under projecting parts, crumble more readily in large towns, where much coal is burnt, than elsewhere. Although this is not sufficient to prove an evil of the highest magnitude, it is still worthy of observation, first, as a fact, and next, as affecting the value of property. I was led to attribute this effect to the slow but constant action of the acid rain. If it affects the substance with so great an excess of silica, it is not to be expected that calcareous substances will resist it long; and one of the greatest evils in old buildings in Manchester is the deterioration of the mortar. It generally swells out, becomes very porous, and falls to pieces on the slightest touch. Some mortar in this condition, from a building behind the houses of the Literary and Philosophical Society of Manchester, was examined. 9.18 grs. of this gave 7.57 of BaSO₄, or 23.33 per cent. of sulphuric acid = 33.16 per cent. of sulphate of lime. It is not to be wondered at that iron oxidises readily, and that galvanised iron is valueless in a district where the acid rain converts it at once into a battery. It will be observed that this style of roofing is preserved in exact proportion to its distance from manufacturing districts. Iron by itself also becomes readily oxidised in this acid atmosphere. Bronze, too, is rapidly blackened, and articles of brass become affected to a great depth, losing their strength. I suppose the sulphurous acid forms on the surface a coating of sulphide of copper, whilst a sulphate is washed away if exposed to rain."

In treating of coal-smoke and the comminution of coal, the author says:—

"It may be asked why the vapour of water does not decompose in the presence of carbon, red hot as the carbon is, we suppose, before it issues in a black condition. There is a mode of consuming smoke which consists

in simply blowing into the furnace a jet of steam. The effect is instantaneous and remarkable. A clear flame is produced in a few seconds. This circumstance has probably induced many persons to attempt to burn steam. It certainly has the appearance of burning; but these people do not consider that water is already burnt. It is a product of combustion; chemically speaking, it is an oxide, and can burn as little as ashes can burn. The cause of the appearance is easily imagined. The water is decomposed by the heated carbon, whilst hydrogen and carbonic oxide, both combustible gases, are formed. These again come in contact with air, and then burn readily and clearly. The consequence is that no carbon appears in the smoke: it is burnt by halves,—by two processes instead of one; and the flame extends itself forward, as a little time is required for these operations.

By one method of employing steam there is a large amount of air supplied at the same time. The steam, however, without the excess of air brought by it, produces, as it appears to me, good results, but that must be in cases where there is already abundant air and heat.

Still the question arises, Why does not the steam formed by the coal prove sufficient? I confess this is not clear to me, and a little more information is required. The excess is an absolute mystery, as we can readily imagine an insufficient quantity to be one cause and the want of good mixture another. We do know that air and smoke may rush together through a fine tube unmixt for some time.

It may now be asked, What is the result of this? It is seen that the manufacturer's interest is not to make black smoke, because it is expensive. The public are interested in its removal, because it adds an unwholesome gas to those gases and solids already contained in ordinary smoke.

The excessive amount of air used entails an enormous waste of heat. This has not been calculated."

That there is a hitch in the chemistry of carbon and smoke consumption does seem to be evident. Chemists require to turn further attention to the subject; and, indeed, already certain not quite orthodox ideas as to carbon and its combustion are being ventilated. Dr. H. Vohl, of Cologne, supposes he has proved that the carbonic acid obtained by heating charcoal is not derived from the charcoal itself, but is carbonic acid occluded by that substance, being derived from the atmosphere. He states that charcoal freed from carbonic acid, and made to absorb oxygen, does not tend to 850 deg. Fahr.

The omission of the subject of ozone altogether, by Mr. Angus Smith, in treating of air and rain, in this "beginning of a chemical climatology" is surely a strange one. The author says he has not been able to make certain projected trials; which would have been a better excuse, we should think, for postponing the publication than for issuing the book without it. Exclusive of a due consideration of so essential an agent in all that relates to the air, what are experiments and facts relating to it worth, even from Mr. Angus Smith?

Hand-Book of Eastern Counties. London: John Murray.

WE have held back the *Hand-Book* last received from Albemarle-street, intending to check some of its statements and to find out a few of its weak points, but the opportunity has not come and the touring time has; so that we shall probably best serve our readers' purpose by at once mentioning the scope of the volume. It treats of Essex, Suffolk, Norfolk, and Cambridgeshire, is full of interesting matter, and is evidently based on personal knowledge. It includes a general map of the counties named, with separate plans of Colchester and Cambridge, and will be found the travellers' best companion in those districts.

History of the Old and New Trent Bridges, Nottingham. By M. O. TARBOTTON, Engineer. Nottingham: Allen & Son. 1871.

WHEN we illustrated the old and new Trent Bridges, we gave our readers some idea of the story attaching to the former, and described the construction of the latter. Mr. M. O. Tarbotton, the engineer of the new bridge, aided by Mr. S. Dutton Walker, F.S.A., has recently published a history of these bridges, and illustrated it with photographs. It makes a pretty volume, and will, doubtless, be found interesting by others besides the inhabitants of the district around the Trent, "the mid-barrier of England."

VARIORUM.

THE 1872 volume of Mr. John Timbs's "Year-Book of Facts in Science and Art" includes an engraved portrait and memoir of Sir William Thomson, F.R.S., the president last year of the British Association. The contents of the volume are selected, condensed, and arranged with Mr. Timbs's usual discrimination and skill; a permanent home is thus given to much information that would be otherwise fleeting, and the result is an interesting volume that can scarcely be taken up without advantage.—The same industrious author has produced a number of little books, such as "Characteristics of Eminent

Men," "Oddities of History," "Thoughts for Times and Seasons," under the general head of "Griffin's Stilling's Manuals, edited by John Timbs" (Stationers' Hall Court). We have found much to interest in these little books, especially in "Thoughts for Times and Seasons."

—The *Leisure Hour* tells its readers that,—"Montaigne House is on the point of being modernised; in other words, of parting with those characteristics which give it its historical value. We recall the days when it was the nursery of letters, the centre of fashion, the rendezvous of wit, the temple of the Muses, dedicated to the votaries of art and literature, the sons and daughters of genius—the daughters, perhaps, especially, as its ruinous walls were organised and presided over by a woman whose gifts and graces, whose taste and intelligence, while they fitted her to be the friend and companion of authors, statesmen, and politicians, impelled her to gather round her, with a generous contempt for the petty heart-burnings of rivalry, all the most distinguished and brilliant of her sex. Here Lord Lyttelton, Gilbert West, Johnson, Burke, Young, Mrs. Thrale, Mrs. Vesey, Miss Carter, Mrs. Boscowen, Mrs. Chapone, Mrs. Delany, Lord Oxford, and his daughter the Duchess of Portland, Sir Joshua Reynolds, and among a host of others not less eminent, Cowper, who has immortalised Mrs. Montaigne's "Feather Treasury," Hannah More, who versified the "Bas Bleu" club, and Benjamin Stillingfleet, whose blue stockings, it is said, gave their name to these unique reunions, habitually met, conferred, conversed, exchanged their ideas, reciprocated each other's sentiments, sharpened each other's wit, grew in each other's esteem, enjoyed each other's society—perhaps envied each other's successes—these floors have received their very footprints, these walls have contained their individualities, these mirrors have reflected their very forms, these precincts have witnessed their minutest actions, and echoed their spoken words."

The *Garden*, before describing the new cemetery in Philadelphia, says:—"The most creditable city improvements yet effected out by the Americans are their noble cemeteries. These are as great an advance upon ours as it is possible to conceive. They are in some cases as large as national parks, and as full of flowers and trees as a choice garden. Even small country villages have followed the example of the cities, and instead of the old-fashioned 'God's Acre,' where those who had been friends and neighbours in life were not separated in death, we see imitations of Greenwood, Laurel Hill, or Mount Auburn, with their drives, walks, and avenues; their select lots, railed in with stone and iron; their costly monuments, adorned with sculpture, and with other devices to rob the thought of death of somewhat of its gloom. In many respects the change is a beneficial one, especially in the matter of healthfulness. Nevertheless, when, about thirty-five years ago, the idea of such cemeteries was broached, it encountered great opposition. This soon gave way, and now, as we have said, every large city, and almost every growing village, in America has its cemetery. Many of the leading cities, indeed, have more than one. There are half a dozen or more within driving distance of New York; and now Philadelphia has lately consecrated that of West Laurel Hill, in addition to the old Laurel Hill Cemetery, which is one of the finest cemeteries in the world, and occupies a beautiful and commanding site."

Miscellaneous.

Employment of Children in Brickyards. At the Hull Police-court, Mr. Rickards, inspector of factories, applied to the police magistrate for an expression of his opinion with reference to the employment of children in brickyards. The work was let by the proprietors of the fields to persons who employed whom they thought proper, and it was desired to know who would be responsible for contravening the Act of Parliament, which provided that no children under ten years of age should be employed. In the matter, some of them only seeing their premises once a week. Mr. Travis said he had no doubt as to the decision he should give. All trades must be conducted according to law. The persons in whose behalf the application was made were manufacturers, and whether the work was carried on under their own supervision or not did not matter. The contractor to whom the work was let would also be liable.

The People's Gardens, Willesden.—The opening of these gardens for the season took place on Saturday, when about 500 persons, all members of the People's Garden Club, or visitors especially invited, were present, and passed a very enjoyable day and evening. These gardens, the property of an association of working men, known as the People's Garden Company, are about fifty acres in extent, situated on Old Oak Common, about five minutes' walk from Willesden Junction Station. The gardens are now laid out with flower beds, terraces, and gravelled walks. There are also cricket-grounds and croquet-lawns. Refreshment pavilions have been erected in various parts of the gardens, besides a large banquetting-hall, capable of dining from 800 to 1,000 persons, and which is also used as a tea-room. Swings, a gymnasium, and steam roundabouts have also been fitted up. A theatre, concert, and lecture-hall is in course of erection. The leading feature of the gardens, however, at present is its dancing platform, with orchestra in the centre, erected at a cost of about 1,000*l*. This platform is said to be the largest dancing platform in Europe, and is one-eighth of a mile in circumference.

Conversazione of the Institution of Civil Engineers.—On Tuesday evening last, Mr. Hawksley, the president of the Institution of Civil Engineers, and Mrs. Hawksley gave a *conversazione* at the International Exhibition, with the special characteristic of ladies attending. It was held in the British Picture Gallery and the machinery court. These departments of the International Exhibition building were prospectively decorated with plants and flowers. The company could not have numbered less than 1,500 ladies and gentlemen. Among the gentlemen were most of the leading engineers, artists, and literary men of the day. Mr. and Mrs. Hawksley received their guests at the northern entrance to the British Picture Gallery. Temporary refreshment-rooms, supplied with iced drinks and wines, were created on the outer gallery, the whole length of which, as the night wore on, was utilised as an open-air promenade. Other tables were spread in canvass compartments off the machinery floor; the Bior Garten was thrown open for smokers; the workpeople at the machinery were at their posts; and to the ether music was added the grinding of the machines. It was a brilliant entertainment.

Wingfield Convalescent Home.—This institution has been formally opened by Archbishop Clarke. The site of the building is joining the road leading from the Warwood asylum to Shotover, and about a mile from Oxford. Nine acres of land were secured for the purpose by the promoters of the undertaking. The building is erected to accommodate eight persons, four men and four women, and is so arranged as to be capable of enlargement at any future time if necessary. The designs were furnished gratuitously by Mr. Wilkinson, architect, Oxford, who added his personal superintendence to the work. The house comprises, on the ground-floor, a day-room each for the men and women, rooms for the committee and steward, separate apartments for each individual, laundry, kitchen, and the necessary offices, besides rooms for the matron, spare-room, &c. On the first floor are separate bedrooms for each. The walls are built with red bricks, and covered with osesley tiles. In front of the building is a paddock, for the accommodation of the patients. The contractor was Mr. Thomas Jones, of Oxford, and the cost of the building was 1,075*l*.

Oxford Architectural and Historical Society.—The members and friends of this society have visited All Souls' College, principally for the purpose of seeing the recently discovered in the chapel, which is now undergoing restoration. The company, which numbered about 100, met at two o'clock in the hall, where they were cordially received by Professor Burrows, one of the Fellows of the college. The President of the Society (the Rev. Mr. Trinity) said that at their present visit All Souls' College he had no doubt that they had received a great deal of instruction and assurance from the account Professor Burrows had given them of the chapel. Professor Burrows then read a paper on the history of the chapel. The company then proceeded to the chapel to inspect the retables, when Mr. James Carter addressed them. They then inspected the paintings that were recently discovered in the roof of the chapel, and the library of the college.

Brunel Outdone.—It is stated that a Mr. Burros, of Wisconsin, has issued a scheme for a railroad from the Atlantic to the West, to be built with a gauge of 30 ft. The road is to run from the East by the most direct line to Lake Erie. When it reaches the lake the road is to be built out into the water about 25 ft. below the surface for some distance, and thence end. It is to be operated with a machine which will navigate the water as well as traverse the land. When this amphibious locomotive arrives at the jumping-off place at Lake Erie, it is to slide gracefully into the water, and by slight transposition of its machinery, become a steam-boat. When it has arrived at Monroe it resumes its character of locomotive, and rolls off another broad-gauge road to Lake Michigan, whence it is to take water for Chicago. The machine is to be sufficiently large to carry a vessel of 500 tons, so that all necessity for ship canals will be done away with. The inventor expects to attain a speed of 25 miles per hour on land and 25 miles in water.

International Prison Congress.—Under the auspices of the Social Science Association, an International Congress for the Prevention and Repression of Crime, including Penal and Reformatory Treatment, will meet in London on the 3rd of July next, and will probably continue a fortnight. The object of the Congress is to collect prison statistics, to gather information, and to compare experience as to the working of different prison systems, and the effect of various systems of penal legislation, to compare the deterrent effects of various forms of punishment and treatment, and the methods adopted both for the repression and prevention of crime. The proposal to hold it comes from the Government of the United States. The English committee includes in its list persons belonging to all political parties, who are acquainted with, or interested in, prison questions. Contributions towards defraying the expenses are solicited, and may be forwarded to Mr. Edwin Pears, 1, Adam-street, Adelphi.

British Archaeological Association.—At a meeting, on May 22nd, the Rev. S. M. Mayhew and Mr. E. Roberts, F.S.A., exhibited interesting Roman and Medieval objects lately discovered in the excavations in Old Broad-street, City, and amongst the papers read was one "On the Origin and Early Use of Envelopes," by Mr. G. R. Wright, F.S.A., in which the writer sought to trace the use of covers and cases to decrees and letters from the days of the Egyptians, quoting in support of this theory various passages from the books of Kings, Esther, Job, and Nehemiah, down to Classic and Medieval times, when knights and ladies enclosed their epistles to one another in envelopes of silk and leather, bound round with ribbands (ribbed hands), tied in "love-knots," and oftentimes secured with a seal, thus proving that the use of a wrapper or envelope for royal despatches or letters was not the modern practice so generally supposed. The congress of the Association will be held on the 5th of August next, to the 10th, inclusive, at Wolverhampton, co. Stafford, under the presidency of the Earl of Dartmouth.

Improvements in Telegraphy.—At a recent meeting of the Inventors' Institute, Mr. F. H. Varley, F.R.A.S., read a paper on "Inventions relating to Telegraphy." After explaining the early attempts to establish telegraphy by Sir Francis Ronalds, and its practical introduction by Sir F. Cooke and Sir C. Wheatstone; referring to the improvements of Mr. Cromwell Varley in insulation, some of which were exhibited; and after attending to various systems of telegraphs, instruments of an entirely new construction, invented by the reader and his brother, Theophilus Varley, were exhibited, comprising a new form of key instrument for transmitting messages. An improvement in the ink-writing Morse instrument was shown, which consisted in the substitution of a self-feeding and repointing pencil, rotating by clockwork for the ink wheel arrangement.

Carving at St. Mark's, Leicester.—Mr. do Szymanowicz says, he "never felt so surprised in his life" as when he found that, in our notice of the works at St. Mark's Church, Leicester, we had not stated that he executed all the wood and stone carving there. We add this piece of information to our notice, and wonder whether Mr. Szymanowicz will say that he never felt so pleased in his life as when he found we had done so! The carving includes eight figures of considerable size.

Bursting of a Canal Bank.—The Birmingham and Worcester Canal has burst through its banks in the neighbourhood of Edgbaston, Birmingham. The end of the embankment gave way to the extent of about 60 ft.; and through the chasm 40 ft. deep the water poured into the field below. Several trees were carried away by the force of the flood, which swept onward across Whitley-road, over some other meadows into Pakenham-road. Here also several gentleman's villas, and against these the water broke. This was at a distance of nearly a quarter of a mile from the embankment. Eventually the water was dammed, and a large party of men at once set to work to build up a wall in the broken embankment.

New Lecture Hall, Working Men's Club, Wisbech.—Three years ago a committee of members of the Wisbech Working Men's Club and Institute was formed to carry out the erection of a new lecture-hall. On the extinction of their debt, in 1870, the committee invited designs, and those of Messrs. Adams & Son, of Wisbech, being selected, a contract was entered into with Mr. Girling, builder. The amount of the contract was 945*l*., half of which has already been paid. The new hall is 50 ft. in length by 31½ ft. The rooms on the ground-floor are intended to be set apart for a reading-room, a reading and conversation room, and a gymnasium. The hall has been opened for use.

A Submerged City.—The *St. Augustine (Florida) Press* gives an account of the discovery of a submerged City in that State.—During heavy gales which prevailed last Fall, it says, the tide was driven so low in the North River that a remarkable discovery was made. The remains of an ancient city were disclosed. Several wells, walled in with coquina, are now visible under water, but the foundations of the houses can only be felt with a pole. Further investigations have also brought to light a coquina quarry on this same site, but in the midst of a dense hammock. The rock is of a quality equal to any on Anastacia Island, and the quarry has been extensively used.

Fall of a Stand.—During the progress of the Ormskirk athletic sports, on Saturday, the 25th ult., an accident happened of a serious nature. A windmillor allowed about 200 persons, at a small charge, to occupy the stage round the mill. The stage suddenly gave way, and about fifteen persons fell to the ground, from a height of at least 30 ft. The spars and flooring of the stage fell upon them. The wounds of the injured were dressed, but several persons had received some of an internal nature. There were fourteen persons injured, six of them seriously.

Threatened Destruction at Tenby.—We have already condemned the proposal to destroy the interesting old gateway in Tenby, known as the "Five Arches," and were in hopes that the project had been abandoned. Another endeavour, however, to destroy the relics is to be made, at a meeting of the Town Council towards the end of this month, and we trust that those who know the value of such memorials, and the interest with which they invest a town, will rally their friends, and resist to the utmost the unwise endeavour.

The Proposed new Vegetable Market in the City.—A special meeting of the Common Council has been held to take into further consideration a report of the Markets Committee, suggesting the reconstruction of Farringdon-market at a cost of 150,000*l*.. A long discussion took place, resulting in the passing of a motion virtually shelving the recommendation of the committee, and leaving the whole question open for further deliberation.

The New Board-room of the City of London Union.—The guardians of the City of London Union held their first meeting on Tuesday in the new board-room, which, together with offices, has been erected in Bartholomew-close. The building, with its accommodation, is a great improvement upon the old offices in St. Mary Axe. In the evening the guardians celebrated the opening of the new building by dining together.

Statue and Vase found at Lucera.—A statue of Venus, of the best workmanship, has been found at Lucera, near Foggia, besides a vase 9 yards in circumference, and a mosaic floor. The usual dolphin is at the feet of the goddess, which measures 7 palms in height.

A New Bell for Cologne Cathedral.—The Emperor of Germany has just given to the Cologne Cathedral twenty-two cannons, taken from the French, which weigh over 50,000 lb., worth 90,000 francs. The bell which is to be formed from this will be 17 ft. high, and 13 ft. diameter at the base. It is to be called the imperial bell, and will be the largest in Europe, except the great bell of Moscow.

Fall of a Building.—On Saturday morning, the 25th ult., a large wing of the Clyde Steel Works, Sheffield, in the occupation of Messrs. Charles Osborn & Co., which is built on piers over the River Don, fell through the breaking of one of the metal girders. Fortunately only six men were in the place at the time, and they escaped with comparatively slight injuries, as the greater part of the roof went with the outside walls into the river.

Kensington Vestry Hall.—Last week the roof of this building was discovered to be on fire, but any great mischief was fortunately averted. Considering that this is the third time within the last two years, according to the vestry clerk, that a similar occurrence has taken place, it is necessary that immediate inquiry be made into the cause of such fires, and also to consider what steps should be taken to insure the future safety of the hall.

A Painted Window for Westminster Abbey.—The Captain Memorial Fund Committee, which was established at Portsmouth, has resolved to place a painted window in Westminster Abbey, commemorative of the terrible disaster off Cape Finisterre on the night of the 6th of September, 1870. The proposal has been sanctioned by Dean Stanley. It is to be hoped that an artist will be employed.

Purchasable Land in England.—Complaint having been made that there is very little land to be purchased in England, a correspondent of the Times states that one week's advertisements in that journal displayed announcements of the sale by auction of about 62,000 acres during the current season in twenty-four English counties and in Wales. This is exclusive of many small properties and of building land.

Sham Stained Glass.—A local paper describes in glowing terms the transcendent beauties of a window set up in All Saints' Church, Sheffield, by an oil and colour merchant of that town in memory of his father. It is produced by what is called the Diaphane process, and in its present position is simply an abomination.

Crystal Palace, Sydenham.—A new fountain has been opened in the broad space in the central transept of the Crystal Palace. It throws up a high jet, and the water falls in a graceful shower, which, when the sun shines on it, has a fine effect. This fountain is surrounded by flowers and foliage plants.

Southwark Bridge.—It is stated that 150,000l. are about to be spent in altering the gradients of Southwark Bridge, and considering the uncertainty that prevails as to the future requirements of the locality, it is urged by several parties that it is injudicious to incur such an expenditure, and that the work would doubtless have to be done over again before long.

A New Green Colour.—A new green has been discovered, which is said to be brilliant enough to replace the poisonous colour produced by arsenic. It is composed of twenty parts of oxide of zinc and one of sulphate of cobalt, mixed into a paste with water, and exposed to a red heat.

A Marine Aquarium for Manchester.—It is proposed to build a grand marine aquarium at Manchester, the funds for the carrying out of which are to be raised by a company. The building will be rectangular in shape, 120 ft. long and 70 ft. wide.

Royal Architectural Museum.—This museum will be open free to architects and their friends daily from ten a.m. to seven p.m. during the forthcoming architectural conference. On Thursday, June 6, at four o'clock, there will be an adjourned meeting of the council and employers of art workmen.

Opening of the Cottage Hospital at Savernake.—The cottage hospital just erected on the Marquis of Ailesbury's estate at Savernake, near Marlborough, has been opened by the Bishop of Salisbury.

International Exhibition.—Mr. Henry Casolari says that he designed and made the cartoon for the painted tile panel commended by us in speaking of a reredos No. 1,053. We followed the catalogue.

Ludgate-hill.—We understand that the carriage-way of Ludgate-hill is to be paved with American wood pavement, at an estimated cost of 2,247l.

TENDERS

For the erection of lace factory, with engine and boiler house, and other outbuildings, at New Basford, near Nottingham. Mr. Sydney R. Stevenson, architect:—

Fish & Son	£5,150 0 0
Mariotti, Wharney, & Scott	5,020 0 0
Wood & Son	4,980 0 0
Stevenson & Watson	4,960 0 0
Dennett & Co.	4,800 0 0
Vickers	4,550 0 0
Booker	4,540 0 0
Wilson	4,510 0 0
Middleton	4,312 0 0
S. & J. Cargill (accepted)	4,040 0 0
All exclusive of Messrs. Goldard & Massey's separate tender of 454l. for ironwork.	

For the erection of premises, 34, Cornhill, for Mr. W. Nash, Mr. T. T. Smith, architect. Quantities not supplied:—

King & Son	£3,360 0 0
Jacobs	3,335 0 0

For alteration, 111A, Aldersgate-street, for Mr. J. McCarthy. Mr. Sextus Dyalal, architect. Quantities by Mr. J. E. Orme:—

Cole & Son	£1,040 0 0
Kelly, Bros.	1,017 0 0
Paik	975 0 0
King & Son	923 0 0
Morier	882 0 0
Perry, Bros.	867 15 0
Browne & Robinson	837 0 0
Merritt & Ashby	815 0 0

For alterations to house and shop, Wadsworth-road, Messrs. Glasier & Son, architects:—

Watson, Bros.	£293 0 0
Cullum	450 0 0

For alteration and repairs at 55, Great Titchfield-street, for Mr. Budge:—

Stirling	£295 0 0
Watson, Bros.	197 0 0
White	185 0 0

For building and alterations, Easton-road. Mr. W. F. Petter, architect:—

Perkins	£1,067 0 0
Williams & Son	1,053 0 0
Kelly, Bros.	1,050 0 0
Watson, Bros.	1,048 0 0
Ayllett	940 0 0
Collins	908 0 0
Parks (withdrawn)	679 10 0

For alterations, Great Ormond-yard, for Messrs. Smith & Gale. Mr. F. Borcham, architect:—

Crabb	£359 0 0
Vaughan	247 0 0
Messrs. Budge	246 0 0
Blackmore & Morley	228 0 0
King (accepted)	179 0 0

For National Schools, Fawkham. Mr. F. Borcham, architect:—

Blake	£300 0 0
Tomlin	297 0 0
Leonard (accepted)	262 0 0

For the Wimbledon contract, sewers, &c.:—

Thompson	£877 18 0
Jones	602 0 0
Chandler & Son	589 5 0
Muston	620 0 0
Harris	619 0 0
Hancock	597 16 0
Peach	498 4 6
Wilson	487 10 0
Hulbard	481 10 0
Cole	481 10 0
Robins	430 0 0
Gregory	424 0 0
Woodham	421 0 0
Pazzy	395 0 0
Messrs. Budge	383 0 0
Jackson	375 0 0

For erecting villa residences, stables, and lodge, at East Sheen, Surrey, for Mr. E. W. Catt. Mr. Burden, architect. Quantities supplied by Mr. A. F. Gate:—

Parsons	House and Stables, Lodge, £2,780 0 0
Stonor	2,715 0 0
Carless	2,710 0 0
Stimpson & Co.	2,659 0 0
Servenot & White	2,635 0 0
Sims	2,600 0 0
Adamson	2,578 0 0
Cooke & Green (accepted)	2,442 0 0

For alterations and additions to Derwent Lodge, Roslyn Park Estate, Hampstead, for Dr. Underhill. Messrs. Spalding & Knight, architects. Quantities not supplied:—

Watts	£147 0 0
Servenot & White	904 0 0

For the erection of warehouses and business premises, at Guildford, for Messrs. Gill & Carling. Mr. Henry Peak, architect:—

Contract A.	
Swayne & Sons (accepted)	£504 2 0
Contract B.	
Loe	£376 0 0
Moan (accepted)	815 0 0

For a small house, at Guildford, for Mr. E. Williams	
Mr. Henry Peak, architect:—	
Strudwick	£244 0 0
Mason	243 0 0
Garnett	233 0 0
Pollard & Son	231 0 0
West	212 10 0
Swayne & Sons (accepted)	205 10 0

Laying out and forming roads on the Greenhill Estate, Hampstead, for Mr. G. H. Errington. Messrs. E. Fox Bousfield, surveyors:—

Watts (accepted)	£741 0 0
For new stabling, in Essex-road, Islington, for M. S. Norman. Quantities not supplied:—	
Taylor	£247 0 0
Strudwick	235 0 0
Smith	190 0 0

For completion of four semi-detached residences, on the Waldgrave Park estate, for Frances, Countess of Walgrave. Mr. Arthur E. Taylor, architect:—

Kilbey	£250 0 0
Morier	391 0 0
Palmer (accepted)	323 0 0

For Howell Harris Memorial Chapel, Trevecca College, South Wales. Mr. R. G. Thomas, architect:—

E. Williams	£3,126
Pritchard	2,800
Parry	2,652
Richardson	2,332
Moreland	2,368
Evan Williams (accepted)	2,050
J. Williams	1,712

For building a villa residence, at Dulwich, for Mr. Smith. Mr. Dudley, architect:—

Murray	£1,199 0 0
Sabey & Son	1,117 0 0
Saynell	1,099 0 0
Watson, Bros.	1,083 0 0
Stanley & Webster	1,043 0 0
Jarrard	1,009 0 0
Reed	949 0 0

Forschloe and master's residence, Warnham, Sussex. Inskip (accepted) £1,550 0 0

For alterations, &c., to premises, Bar Garden, Southwark, for Mr. Moss Isaac. Mr. J. D. Hayton, architect:—

Templey	£718 0 0
Baughey	735 0 0
Conter	735 0 0
Phillips	670 0 0
Cohen	625 0 0
Cooke & Green	620 0 0
Cressel	600 0 0
Nightingale	599 0 0
Dove, Bros.	565 0 0
Sawyer	578 0 0
Richardson	568 0 0
Elliot	567 0 0
Landfield	548 0 0

Proposed completion of works, Holy Trinity Church, Wadsworth. Mr. J. M. R. Halsar, architect:—

Parsons	£3,174 0 0
Higgs	3,070 0 0
Meyer & Son	3,083 0 0
Avis & Son	4,800 0 0
Nightingale	4,738 0 0
Perry & Co.	4,773 0 0
Jackson & Shaw	4,700 0 0
Dove, Bros.	4,675 0 0
Adamson & Sons	4,535 0 0

For rebuilding premises, for Messrs. Spencer, Turpin & Boldero. Mr. R. Parker, architect:—

Patman & Co.	£2,161 0 0
Longacre & Hargreaves	3,929 0 0
Merritt & Ashby	2,908 0 0
Temple & Foster	2,885 0 0
Nightingale	2,600 0 0
Morseman	2,594 0 0

For alterations and additions to Kirkbeck School, Kingsland. Mr. R. Walker, architect:—

Wood	£1,213 0 0
Crabb	1,195 0 0
Devoral	1,157 0 0
Silurmar	999 0 0
High	823 0 0
Kilby	817 0 0

For completion of residences on the Wellington Colliery estate, Berks, for the Rev. J. W. Sprinng, M.A. Edwin Clare, architect. Quantities supplied by Messrs. W. Wymouth & Son:—

Hill & Sons	£2,354 0 0
Dove, Bros.	2,125 0 0
Mansbridge	2,025 0 0
Rankin	1,830 0 0
Freedy & Son	1,850 0 0
Sawyer	1,839 0 0

TO CORRESPONDENTS.

W. F. P. (please send drawing or tracing, and answer she returned).—J. I. (not usually; but it would depend on circumstances).—G. L. (we decline recommending. The use of the w. h. it is desirable to have an inside handle to the doors of rail carriages).—H. S. (apply to patentee).—B. C. H. (we decline to take. Our correspondents must go their own way).—S. R. S.—Ed. T. M. R.—Ed. C. T. A.—S. M. B.—F. V. H. I. Builder.—A. J. J.—C. O.—H. K.—T. S.—W. B.—N. L.—E. G.—J. C.—H. V. L.—C. G. W.—Mr. L.—W. B.—R.—W. C. B.—A. G. T.—F. & M.—Mr. H.—P.—P. N.—A.—& Co. Messrs. W. C. C.—B. N.—H. I.

We are compelled to decline pointing out books and g. addresses.

All statements of facts, lists of tenders, &c. must accompany the name and address of the sender, not necessarily publication.

Note.—The responsibility of signed articles, and papers for public meetings, rests of course with the authors.

The Builder.

VOL. XXX.—No. 1531.

Masters and Men in London.

AN nothing be done to avert the threatened disruption of the building trade in the metropolis? A terrible crisis seems to be imminent, and it behoves every man who has the slightest influence to weigh the matter well, and to aid in bringing about a right conclusion by harmless means. The daily papers have made widely known the present position of parties. Let us briefly say that the delegates of the workmen, finding the Master Builders' Association declined to yield to their terms, called out the men employed by Mr. Brass, of Old-street (whose principal work is the New Post Office, St. Martin's-le-Grand), and by Messrs. Jackson & Shaw, who are

thus provided for. The argument is absolutely worthless. Carry it a little farther,—use it, as it may equally well be used, to justify working only five hours a day,—and this worthlessness becomes more strikingly apparent. The more straightforward assertion, "Our masters are making large profits, and we think we ought to participate in them," is less easily answered, excepting in the shape of counter-assertions, and these are not wanting. The cost of building in London and its neighbourhood has become very great, so great as, according to the master builders, to check it materially. Any further increase, they argue, is therefore to be deprecated, even admitting that it must be paid by the public and not by themselves; because it will further prevent building, or will drive it into the provinces, where wages are somewhat lower. As an example of this it is mentioned that the contract for the additions at the National Gallery has been taken by a country builder, who will prepare the work at a distance from Town, and send it up ready for fixing. It is reported that one of the deputations of joiners who met the Builders' Association said, when this probability was pointed out to them, "Very well; then, we must follow the work."

Putting out of view, the entirely selfish aspect of this observation, which ignores the fact that the London masters have large shops and establishments which they cannot easily remove, the trained operatives of the metropolis cannot wish seriously to destroy the London trade; the more clear-headed and sensible of them can scarcely believe that any advantage would result to them from such a course.

The diminution of the hours of labour and the increase in wages have been progressive. Some somewhat erroneous statistics having been published, an esteemed member of the trade, who remembers the lock-out of 1834, and that of 1859 (when the workmen unhappily starved themselves and their families for some twenty-five weeks, and gained nothing), has kindly looked through his books, and supplied us with the following correct particulars:—

	Working hours were per week.	Wages.	Per Hour.
40 years ago	60	27. to 30.	5½d. to 6d.
1847.	Left off at 4 o'clock	58½	30.
1853.	Advanced to 5 ½ a day	69½	33.
July, 1861.	Payment by the hour was introduced	56½	33.
Sept., 1865.		56½	35½
May, 1866.		56½	37 8

An advance in wages is not an unmixed good, and might go on simply bringing ruin to all. This has been found out in America. The recent report of the Massachusetts Bureau of Labour is regarded as affording a fair illustration of the general condition of labour in the eastern or manufacturing States; and in this view the facts embodied in the report are certainly not reassuring. The industrial classes are by no means represented to be in the prosperous condition that some of our politicians and legislators would have us believe. If they receive large wages, they are no better off for it, as they are compelled to pay them out again in increased prices for the necessities of life. The report seems fully to confirm the assertion that American workmen are now worse off than ever before, and are able to save less, and obtain fewer commodities, in exchange for their labour, than at any former period. The Tariff Laws, which are chiefly defended on the ground of their supposed protection of labour, injure rather than improve the condition of the working men, and the artificial enhancement of wages is more than neutralised by the increased cost of living.

So in England the rise in wages has necessarily led to the increase of the cost of commodities, and might be such, as we have suggested before, as to place England at a considerable disadvantage in competition with other countries

without corresponding advantage to individuals. However, we are by no means about to assert that the wise limit is yet reached; we are seeking simply to state quietly, dispassionately, and without one spark of partizanship, some considerations which deserve to be weighed by those who are about to commit themselves to a wasteful, costly, and barbarous struggle of endurance, from which, end as it otherwise may, all parties will inevitably retire losers.

And now what have we to suggest in order to prevent the national loss and the personal damage and privation that would result from a lock-out? We advise **COMPROMISE**; in other words, mutual concession. The time at present worked is 56½ hours, at 8d. an hour, bringing 37s. 8d. per week: the programme asked for by the men is 51 hours at 9d., or 38s. 3d. a week,—an increase merely of 7d. a week, so far as money gain to the men is concerned, though entailing a large increase in the cost of production, at least 12½ per cent. as regards the masters. What we propose is that men and masters should mutually agree to let the working hours per week be 54 (the hours agreed upon by the engineers), at the rate of 8½d. an hour. This would give exactly the same money result, 38s. 3d., and would more nearly follow the previous progressive improvements observable in the statement given above. Whichever side first proposes this concession will secure and deserve the sympathy and support of the outside public. Its joint acceptance would maintain good feeling, save money, and lead to the avoidance of much sorrowful sacrifice.

INDUSTRIAL DEVELOPMENT IN AMERICA.

An article in the *Penn Monthly* on the Census of Industrial Employment, Wages, and Social Condition in Philadelphia in 1870, shows in a remarkable manner the extent to which purely productive industry has been developed there, and asserts that an almost entire exemption has so far been enjoyed from the agitations and conflicts that have occurred elsewhere. No matter how large or how small the establishment, there is rarely or never an occasion for difference between employers and workmen. Some of the greater iron works almost approach the co-operative system in the harmony of masters with workmen, and in the frequent exchange of acts of kindness and substantial benefits.

Taking last year, 1871, it may be roundly stated that a city of 800,000 people produced four hundred millions of dollars' worth of actual fabrics, exclusive of all mere sales or exchanges; and that on this mass of fabrics produced, the net profit, in the sense of values realised above the cost for values paid out, was nearly one hundred millions of dollars.

The world, generally, has concerned itself with the profits of mere trade, far more than with the interests and profits of creative industry, and it is thought that wealth increases satisfactorily when a city is made a point through which exchanges pass. This is a mistake. The values produced here in manufactures pay a profit not drawn from the consumer; it is a created profit, the creation of the active brain and the skilful hand. It is the direct wealth of powers which might, but for such opportunity, have been wholly wasted in idleness. For this reason it becomes conspicuous for the benefits it confers, and it makes itself seen and felt in a thousand forms that are not consumed with the day's demand.

No adequate discussion of the true relation of wages to national prosperity has yet appeared, but we assume that no other single fact has such permanent and overruling importance; nothing is so vital to the prosperity and endurance of a highly-advanced nation, as that the productive industry of its people shall be fully employed, and at the same time liberally paid. To be fully employed, for the time, at wages merely sufficient to maintain existence on the part of the employed classes, is to place its interests on the very border of a gulf of disorder and of suffering.

The census details show amongst other things that, speaking of the commonest factory labour,



building the New Colonial Offices in Downing-street. In the case of the latter all have left, but at Mr. Brass's the men who work at machines remain. On this occurring the committee of the Builders' Association held a meeting, and, after a long deliberation, resolved to convene a general meeting of the trade for (this) Friday, June 7th, at the Freemasons' Tavern, Great Queen-street, when a general lock-out will be recommended unless the workmen return to the two firms named on the existing terms. This, we are told, was determined unanimously, not by hasty show of hands, but by written vote. It is easy to believe that the builders came to this determination with the greatest unwillingness: the loss to them will be terrible. One firm tell us they estimate the loss to them would be 100% a week. A second say 200%. Interest on capital embarked must be paid, rent, clerks, foremen, and others. They are most anxious, we can well understand, to avoid the general lock-out if possible, but they see no way out of the difficulty, believing that the advance asked for is not justified by the position of business, and feeling, moreover, that they have no security against a further demand next year. The men on their side profess themselves determined to listen to no compromise, and so the difficulty grows greater and greater. It would be agreeable to us if, following the impulse of feeling, we could conscientiously say to the masters, give the men "the nine hours" and give them the 8d. But would this feeling, would this saying enable the masters to do so, or make the act a wise one? We fear not. The large builders assert that they are not busy, and that there are plenty of men out of employ who have been anxious to come into their shops. The men themselves make it their argument for shortening the hours of labour that large numbers of artisans are out of employ, and that if they themselves only work nine hours instead of ten, and the same amount of work is to be done, a large number of those now unemployed must be taken on, and will

one young woman now attends two power-loom, weaving 10,000 yards each of dress goods per year; who formerly one person of greater physical strength, attended one hand-loom, weaving not more than half as much each per year, or one-fourth as much in all; and show that the improvements of the past fifteen years have fully doubled the productive power of every person employed, and, what is better, have enlarged the basis of employment so that twice as many can be effectively employed.

There is nothing heard of strikes, or of hostility between proprietors and workmen. There are 92,112 adults, or full men, in the lists of persons employed at wages in manufacturing pursuits in this one city; a productive force really enormous, working as it is with over 2,000 steam-engines, of the aggregate power of 50,000 horses. "Almost unconsciously to most of our citizens, this vast machinery does its daily work, making fabrics of iron, wood, and textile fibres largely exceeding 1,000,000 dollars in value for every working-day in the year.

Wages fell somewhat heavily in 1868 and 1869, from the high figures of the war, but since 1869 they have advanced rather than receded further. Many classes are paid 21 dolls. per week, or 3-50 dolls. per day; many other classes more than this, and skilled persons at piecework earn even 5 dolls. and 6 dolls. per day. Mere labourers, of course, decline to 12 dolls., 10 dolls., and 9 dolls. per week, which last is the lowest rate paid to any labourer assuming to do a man's work. All skilled labour is really high, showing that the door is open to a scale of wages affording abundant means of living to all who have the capacity to work with skill at all.

There is little or no living in rooms, or in tenement houses, except on the part of some wholly unskilled labourers. This city is conspicuous for its great number of dwellings of abundant neatness and comfort, owned and occupied by single families whose whole maintenance is from manufacturing industry. And these houses, if rented, pay 15 dolls. to 25 dolls. per month, and, if owned by the occupant, taxes, interest, and other expenses represent a close approach to the same annual expenditure. That all this, with the current cost of living and the frequent expenditures for other than mere necessities, is easily borne by our mechanic and workman, is sufficient proof that his resources from wages are comparatively ample. It is asserted that at least fifteen or twenty leading articles, in which the values made here now exceed half a million dollars each yearly, have been won in the last ten years absolutely as against foreign competition, and that the markets of New York, as of all other cities of this country, take now no other than the supply sent from Philadelphia manufacturers.

Reference is made to an iron-mill where the power of 800 horses and 1,200 men is directed to the production of a single description of wrought-iron work, exceeding 3,000,000 dollars in value in a year; and to another where 1,800 men and 600 horse-power finish a powerful railway-locomotive every working day of the year. In a third establishment nearly 800 power-loom, with 900 attendants, manufacture worsted goods at the rate of 10,000,000 yards per year; the aggregate value counting as many millions, nearly, as of the iron-works first cited. More than twenty establishments exceeding 1,000,000 dollars in annual production exist within the city, and at least ten exceed 2,500,000 dollars each, the highest closely approaching 5,000,000 dollars.

The writer claims that these establishments are essentially distinct from and beyond European establishments in all the characteristics of better-paid, more intelligent, and effective labour, and greater results in productive power. One of the proprietors spent a few months in England recently, visiting the districts and establishments making his own class of goods, and says that everywhere he found defective machinery, unintelligent workmen, and want of improvement very striking, in comparison with his own. "This contrast in progress is due to the fact that neither man nor master here stops to embarrass the other by needless contests, and neither rests for a moment in a routine of work that he may, by any ingenuity or any expenditure, improve. The whole body of productive establishments is full of life and progress: new and magnificent structures are daily rising to be filled with new machinery and better forms of labour." There ought not to be an hour's difference between employer and employed; but if the dead-level of starvation-prices is the basis, there can be no

rest: if there is no skill and no intelligence developed to be observed and rewarded and to stimulate the workman, there is also no rest or peace.

There is surely matter here for both men and masters in Great Britain to note and think over.

A SKETCH OF THE EARLY HISTORY OF RAILWAYS.

The introduction of the railway system into the United Kingdom is a subject of very considerable interest, both to the professional and the general reader, for it was rapid, and within a very few years it worked very marvellous changes. Under it not only was the whole breadth of Britain covered with works of construction of a magnitude and boldness before unheard of, but it revolutionised our whole social system, and paved the way to changes which have made the thirty years from 1830 to 1860 more memorable than any corresponding period in the material history of our country. With facilities for travel and transport came the penny post, free trade, telegraphy, practical knowledge of sanitary science, and vast changes in the residence and daily habits of the classes engaged in commerce and manufactures,—changes affecting the social, political, commercial, scientific, and financial progress of the country, all of which were prodigiously developed within that period by the agency, direct or indirect, of railways. Even our military and naval resources, our Colonial government, our tenure of India, our foreign loans, our trade with the extremes of East and West, have been pushed forward and expanded by the introduction of a free, cheap, and rapid intercourse between the several parts and dependencies of our own empire and of the world.

"Men" have "run to and fro," and "Knowledge" of many kinds "has been increased."

These developments, however, from whatever source derived, belong rather to the history of the period and of the country than to that of railways; but these, in their strictest and most narrow sense, have also their history, and one full of peculiarities, of anecdote, of interest, always of an amusing, and often of an instructive character, arising out of the sudden collision between the new and old ideas and persons,—those who pushed and those who resisted the change,—especially in the rural districts of the country. The success of the Liverpool and Manchester railway was so complete, and the speed acquired upon it so utterly unexpected, that the attention of all England was called to the subject, and the energies of the promoters and opponents of the system were strained to the utmost.

Also the demand for engineers and surveyors and others employed in the preparation for and construction of the lines of railway that were at once brought forward, was far in advance of the supply. The London and Birmingham, the London and Southampton, the Grand Junction, the Great Western, the Greenwich, were all brought forward, or all under construction about the same time; and, of the whole staff employed, there were scarce a score who possessed any practical experience of a railway, or who knew anything, even in theory, of the accommodations to be supplied, or the dangers to be provided against in construction. The Liverpool and Manchester, the Stockton and Darlington, and even the Canterbury and Whitstable lines were the subject of close attention by all whose duties allowed them an occasional absence.

Moreover, the men who were sent out to prepare the plans and take the levels found themselves among people of the deepest agricultural dye, for the most part vehemently hostile to the proposed undertaking, and resting their opposition upon the most extraordinary and baseless notions of what its effects would be. The landowners dreaded competition with their produce; the rural clergy feared lest men should run to and fro and secular knowledge be increased; heads of schools and colleges, especially of Eton and Oxford, predicted the destruction of discipline and the demoralisation of youth; sportsmen declared that game would be frightened from the coverts, and hunting become impracticable; the peasants were jealous of the high wages paid to the staff men; millers feared for their water-courses, and with farmers, corn-dealers, and maltsters formed themselves into associations to oppose "the Bill"; and all prepared to give evidence against it before the Parliamentary committees.

Most amusing were the stratagems had re-

course to effect or prevent the necessary surveys. The squire and the parson were usually the leaders in availing trespass, and the surveyor often had to work by night, or to observe what he could from some contiguous road or canal-bank, or some footpath traversing the demesne. On one occasion a Dorset squire and M.P., celebrated for his monosyllabic nicknames, captured a whole staff of surveyors and chainmen, and kept them all night in custody within a barn. Another time, it happened to be of vital consequence to the success of a Bill to have an accurate survey of a very complex demesne round a nobleman's house, in a county in which the Ordnance map was inaccurate, and afforded little aid. The tytho maps were then unknown, and the parish terrier was in the rector's study. There was no friendly canal, no convenient footpath, and all were on the alert. What was to be done? Time pressed, and the enemy were well aware that an error in the representation of the manner in which the railway would affect the house would be fatal. The chief engineer,—a man of more energy than taste,—waited on the peer, assured him first that the viaduct would not be seen, or that if seen it would be ornamental, and then offered to cover it with ivy, to paint it yellow, or with his lordship's arms upon each span. All was in vain. There was, however, a church with a very lofty tower, near the mansion, and a second, of equal altitude, about a quarter of a mile distant, beyond it. Early one summer's morning two innocent-looking antiquaries called at the two rectories for the keys of the churches, and were accompanied in one case by the rector, in the other by the clerk, to see the building. Questions were asked as to the date of the bells, and details of the tower, which were opened, and then, while the showmen were engaged in the chancel, the whole band entered the tower, wedged up the door, drew up the ladders, pitched their theodolites on the loaded roof, and proceeded to fix the principal points of the demesne, and to sketch in the details. The success was complete. The tower remained in a state of siege all day. The peer himself and his keeper visited the spot, but the door was strong, the tower high, the garrison well victualled, and when, after dark, they descended, the ground was left free, for resistance had become needless.

The Ordnance map, save those of Essex, in the counties north of London, was usually tolerably accurate, and of great use in laying down the general course of the line, but it afforded no aid towards obtaining the levels, or, as they were technically called, the sections. Here the canals were of great use, for the level of each pond was known and accurately laid down upon Bradshaw's celebrated canal map, the sale of which increased enormously. From the canal where access was denied, the levels were brought up to the nearest open ground, and then men were sent in at full speed to set up their stakes which were at once read, before the keepers could come up. Sometimes a shed of brick stood near, and the courses could be counted. Sometimes, to avoid suspicion, a man had a sea of feet pasted right up one leg and his back, and did duty as a staff. Once, where it was very important to get the height of one special and well-watched spot, in the midst of a grass field a horse happened to walk across the line of sight, and his shoulder to intersect the horizontal wire of the telescope. Boys were sent to pelt him off the field. The quadruped made for a gate. He was there attracted by a supply of apples caught, and measured, and the required level obtained, possibly with more ingenuity than accuracy! but the surveyor could declare upon oath before the Lords that the section had been actually taken.

The Great Western met with very vexatious opposition from the leading landowners near Marlborough, who were justly alarmed at the diversion of the Western traffic from the turnpike trusts and private property along the Bath road. It was proposed to punish this opposition by the conversion of a very celebrated, ancient and much-prized local monument, a white horse not the white horse, into a locomotive, the very idea of which was an abomination to the neighbourhood. Sketches were taken to scale, a large down fifty surveyors at nightfall to peg out the outline on the grassy slope, and then scraping away the turf, to transmit the quadruped into a magnificent engine, bearing G. W. R. in large letters on its boiler. The squires never knew how near they were to this dishonour. Fortunately for their peace of mind, the opposi-

was withdrawn in time, and the project fell through, to the intense disgust, if not of the original deviser of the joke, yet of the executive, one of whom, a well-known Bristol man, a retired naval officer, was the leader in all sorts of fun, as in all hard work. Of lesser mischief, such as painting gates red, serving false notices, and pranks somewhat in the Theodore Hook line, there was no lack, but in truth the opponents were so violent, and so seriously overstated their own case, that their account of their real grievances was not always credited.

Once, near Malmesbury, in the midst of a most bucolical district, the late George Hennet, while taking sections across a green, was pestered by a mob of girls, who, half from curiosity and half from love of fun, much impeded his operations. Calling the leader of them, he let her look through his glass, where she saw the staff-holder inverted. "There," said he, "if you do not go away I will turn my spy-glass upon you all, and see you on your heads, and then where will your petticoats be?" They all shrieked out and ran away, to the great delight of Mr. Hennet, who was very proud of his idea, and quite unaware that Niebuhr had got rid of the Arabs in the same way.

There is, or used to be, the mistress of a great establishment at Stroud, who was thrown into a state of serious agitation when told that the railway would be carried some feet above the roof of her brewery. The effect upon the town was also serious, and the fear of what might happen to their much-loved tittle was one of the causes of a local riot at one of the promoters' meetings. It was at Stroud that the Cheltenham railway lost most of its local support, by the statement of one of the engineers, that a tunnel would be driven through Saperton-hill much longer than the canal tunnel, and several feet below it. The thing seemed to the rural mind impossible.

The plans and sections were required to be deposited with the several clerks of the peace by midnight on the 30th of November, and great were the exertions made to secure this. The Bristol and Exeter railway, about seventy miles long, was proposed, a company formed, and the plans completed in about six weeks, the actual survey occupying about a fortnight. Fortunately the country was mostly level, and with few enclosures, and those of large area; but the line passed by Taunton, Bridgwater, and Wellington, and near to these towns, as to Bristol and Exeter, the work was intricate and laborious. Brunel was the engineer, and Gravatt, a man of great energy and skill, his chief assistant. Surveyors were brought from all parts, even from Lancashire; a central office was established in the great room at the Bridgwater Hotel, and there as fast as the work was knocked off, it was put together. The levels were checked by an instrument of unusual size and power, which read at very great distances. During the whole fortnight no man went to bed; they surveyed by day and plotted their work by night, sleeping as they could in postchaises or armchairs, and sometimes over the drawing-table. The day after the deposit the staff had a sumptuous dinner at Bridgwater, and several fell asleep at the table before the dishes were removed. The survey held good, though attacked by a very powerful opposition, led by a certain well-known Rev. Proctor Thomas, and by Mr. Merivale, whose residential property near Exeter was interfered with.

The Taff Vale, Brunel's only narrow-gauge railway, was also started upon short notice. There the work was put together at the Cardiff Arms, at Cardiff, and about eight o'clock on the night of the 30th, a serious discrepancy was discovered in the levels near Newbridge, eleven miles distant. Brunel was present. Instantly lanterns were purchased, chains ordered round, and twenty surveyors and staff-men bundled into them and sent off to Newbridge. On the way Brunel explained to his chief assistants what he wanted. Each man marched off to his post, fixed his staves and lanterns; Brunel himself ran over the ground, about a mile, with his level; the error was discovered and corrected, and the plans were deposited that night at Cardiff with six minutes to spare. It was upon this railway, opposed in committee with the utmost keenness by Lord Granville Somerset, that upon some suspicion of an error of section an eminent ironmaster proposed quietly to alter the ground, a cinder-tip, since the deposited plans could not be altered.

These combinations of rapidity and accuracy, and the reckless expenditure of money, bewildered the old-fashioned surveyors. The level was an instrument then but little known. Drain-

ing operations, not then very common, were carried on with an ordinary spirit level with two sights, and accuracy to within an inch was considered sufficient, whereas the new men levelled to three places of decimals. The most accurate land surveyor thought little of height. It is recorded that a well-known Welsh squire, descending upon his complete knowledge of his estate to a scientific officer, was asked, "Oh, you know Mynydd Garth, do you?" "I should think I did," quoth the squire, "and all about it." "Indeed! pray what is its height?" "Ugh!" grunted the discomfited squire, in a half aside, "What a question to ask of a gentleman!"

Architects, as a body, were in those days very ignorant of engineering knowledge, and incapable of calculating the strength of a beam or the thrust of an arch. The setting out of the lines for a skew bridge was an operation quite beyond them, or, with better excuse, the laying out the curves of a railway. In a suburb of London, rather an eminent architect came one day to the resident engineer of a railway, in great trouble: he was to build a crescent, or rather a semicircle, and his only notion of setting it out was by means of a long cord from a central peg. Unfortunately a church had already been built over the centre, and hence the difficulty.

The theodolite also was an instrument entirely unknown, even by name, save to the royal engineers, and a few of the leading civil engineers. On one occasion the late Colonel Everest was visiting a Warwickshire peer, and exhibiting and explaining what the ladies called his "theodolite." With t he mentioned that he had surveyed large tracts of country in India. "Indeed," said his host, "and can you survey a farm?" "Certainly," was the answer. "Then, colonel," said his lord, perfectly serious, "as you don't shoot, would you oblige me by surveying my home farm while we are out this morning?"

The construction of the book of reference in which each field or house was scheduled and described was claimed by the solicitor, who was, of course, more or less dependent in the matter upon the engineer. The solicitor, or rather his clerk, sometimes an underbred and rather presumptuous person, found little favour with the engineers' assistants, who were often gentlemen, fresh from a public school or college, many of whom took to their work half for the fun of it. On one occasion a clerk of a leading London firm, himself a thorough Cockney, was sent into Wales to make up the book of reference, whilst the survey proceeded. He thought the place and time suitable for a splash, so he came down to the inn in dandy costume, ordered a horse for his work, and, dining with the young engineers, boasted of his new boots and steel spurs. Unfortunately he put his boots outside his door. There they were of course filled with boiling water, and by no exertions could they be drawn on in the morning. The box-spurs were useless, and the gentleman had to set forth in shoes and stockings much crest-fallen.

On another occasion a short line between two western towns had been surveyed and was all ready save the book of reference. On the afternoon of the 28th this omission was discovered by the engineer in London. The attorney was out of town, so an assistant engineer was despatched by mail with directions to look up the local solicitor and land surveyor, and by hook or by crook to get the work done. It was a tough job, but the plans were good ones, the local information was very good, and the book was made and deposited by the prescribed time. The sub-engineer returned to London, and meeting the attorney, boasted how he had saved the project. The attorney was furious. "I wish, sir, you gentlemen would mind your own business," and then it came out that he had absented himself on purpose, wishing to postpone the project for a year, when he expected to be less occupied. On another occasion this gentleman, who was the head of a very important firm, came to a well-known and most upright Parliamentary agent, now a Queen's counsel. "I hear," said he, "B., that you have given the Speaker some advice about diminishing the expense of private Bills." "I have," was the answer. "Then, by G—d, I am ashamed of you. Here are you and I and some half-dozen of our friends coining money by the present system, and you must need go and knock it on the head." "But," said B., "the Speaker himself sent for me and asked my candid opinion. What else could I say, as an honest man?" "Candid opinion! honest man!" exclaimed the

lawyer, mad with rage; "what business have you, with a wife and children, to take such views?" and out he flounced.

No doubt, the temptation to safe dishonesty was in those days very great, and much given way to by all parties concerned in railways. The writer was once asked by the degenerate son of a great father which way it was proposed to carry a proposed line, in order that he might buy a farm on the route, and get compensation for the injury. On another occasion, a railway was to run within sight of the country house of a well-known man of influence. He was upon the Parliamentary committee, and determined that the Bill should not pass unless he got his compensation, some thousand pounds, for residential injury. The rest of the committee knew this, but were not honest enough to thwart him. The compensation was agreed to, and the Bill allowed to pass. Next year, being stronger, the directors came to Parliament for amendments, and, among others, for a deviation into tunnel off the claimant's land, and, of course, out of sight of his house. "Well," he said, "I do not care. Of course, you pay me my compensation." "No," they rejoined; "we do not injure you and shall not compensate." "You are a pack of rogues," said he. "You know very well that the money was not to cover an injury, but to buy off my Parliamentary influence." And no doubt he spoke the truth, though rather more plainly than most men would have had the assurance to do. Upon the Great Western, Lord Holland was one of the very few peers who took no advantage of his position, though for this he was rather laughed at than imitated. There was a peer, on the line of the Midland, under whose name it was proposed to carry a tunnel. He came to a director, a neighbour, and complained bitterly that the trembling of the ground would destroy his best pleasant preserve. The director wishing to oblige him, said nothing, but represented the case at his Board, and in committee it was decided to avoid the peer's land altogether. When he heard this, nothing could exceed his wrath, and it then turned out that his communication was by no means intended to get the line shifted, but to prepare the way for a claim for heavy compensation.*

ENGINEERING WORKS IN PROSPECT.

ADMIT that few, if any, great railways remain to be made in the United Kingdom, still, vast undertakings wait the attention of the engineer in the colonies and in foreign states. Proceedings have been already commenced, indeed, with some of these. At Auckland, New Zealand, Messrs. Brogden have commenced the construction of a railway that, as the Liverpool and Manchester was in this country, is destined to be the commencement of a complete system of railway communication for that prosperous colony. The prodigal waste of capital that has marked the tangled maze without a plan in the railways of the Great Britain of the north will, doubtless, be avoided, in laying out the lines of the Great Britain of the southern hemisphere, which will have, it may be hoped, a railway system worthy of the name.

Great things in railway construction are also to be accomplished, it appears, in Egypt. Last summer Mr. John Fowler, C.E., on the invitation of the Viceroy, went out for the purpose of advising his highness as to the railway or other engineering works best fitted to develop the resources of the country. Mr. Fowler is not a man of "timid counsels." A first result of his visit was to take out a staff of about thirty engineers, and assistants, and to put them to work upon the survey of a line of railway of about 600 miles in extent. The survey has been completed most satisfactorily; the plans and sections are being drawn; and there is the strongest probability that this great work will in due time be executed. The line will commence at Wady Halfah, on the second cataract of the Nile, and in 22° N.L. To Old Dongola, 18° N.L., the line will be on the inner edge of the valley of the Nile, and at an average distance of about three-fourths of a mile from the banks of the river, and so laid out as to be above the level of the annual inundations, in which the waters rise more than 30 ft. at some points. From Old Dongola, or a little to the southward, the line will strike across the desert of Bayda, keeping, with slight deviations, to the caravan-track. The distance across the desert is about

* To be continued.

160 miles, and the object in taking this route is to avoid the great bend in the river between Edah and the sixth cataract. In the latter locality, about 16½° N.L., the railway will again take the valley of the Nile, and proceed in a direction almost due south to Khartum, at the confluence of the Blue with the White Nile. Future extensions will probably be to the fertile valleys of the Blue Nile, and its numerous tributaries in Senaar and Fazoula; and in another direction, probably, to the south-west, to the provinces of Darfur and Kordofan.

But there are numerous other notable engineering projects on foot, some of which apply illustrate the felicitous speech delivered recently by Mr. Gladstone, at the annual dinner of the Institution of Civil Engineers. The Premier, addressing his hosts, said that they differed advantageously from her Majesty's ministers; in that the benefit of their performances was unanimously acknowledged. "There is," said he, "but one personage who, if she were gifted with a tongue, would raise her voice against you, and that is your ancient Mother Earth. Whatever benefits you have conferred upon her mankind, on her you have inflicted cruel suffering. The guilt of the matricide is great, but your iniquities are greater still, for you have mutilated and mangled your first parent without putting an end to her existence."

"The cataracts of the Nile are no longer secure. I believe the next step will be a railway across the Great Desert of Africa." We have just shown that the regions of the cataracts are to be invaded by the fire-fed iron steed, and that one of the lesser deserts is to be crossed.

The accusation might have been brought against the engineering profession for liberties taken with Father Ocean, as well as with Mother Earth. Mr. Fowler, by his international communication project, proposes to convey railway trains across the sea; by another scheme, "the Honduras Ship Railway," it is proposed to convey ships, 200 ft. long, weighing, with their cargoes, 2,000 tons, across the dry land! This proposed ship railway is to connect the Atlantic and Pacific Oceans. The carriage on which the ship is to be transported is to have 240 wheels, running upon six rails, of 120 lb. weight to the yard, and placed 5 ft. apart from each other. The carriage is to weigh from 600 tons to 700 tons, is estimated to cost 20,000l., and to require from four to ten powerful locomotives, according to the state of the rails, to draw it and its load. The capital required to attempt this wonderful feat, is fifteen millions sterling, the whole of which is wanted on or before the 10th September next; those who subscribe it would need the best advice of the most skillful and experienced engineers, and the counsel of the most astute and trustworthy financiers.

But engineers have more practical, practicable, and useful fields of enterprise open to them than sea-railways or land-navigations; and, happily, there are symptoms of awakening to a sense of the unspeakable importance of their cultivation. The number of projects for new railways in the United Kingdom is smaller than it has been; but the demands for an abundant and cheap supply of the prime necessities, gas and water, are becoming constantly more numerous and clamorous; and, as regards the cleansing of towns, communities are becoming impatient of the pernicious influence of matter that Lord Palmerston referred to as being "the right thing in the wrong place." Sanitary engineering presents an almost illimitable sphere for beneficent and profitable action to the profession,—a sphere that embraces almost all people and climes. In the present session of Parliament, Bills for sanitary objects occupy an unusually prominent place. At the commencement of the session there were petitions presented by corporations, local boards of health, and other local authorities, for twenty-eight Bills, most of which contained provisions for improved gas or water supply, or for a system of sewerage, some of them including all the three objects. In addition to these were petitions for seven sewerage Bills, and for thirty-six gas Bills, water Bills, or for gas and water combined. None of the Bills that have reached committee in the present session, the Mid-London Railway Bill excepted, have occupied nearly as much time, or excited anything like as much interest, as the sewerage Bills of Birmingham, Bury, and Rochdale. The sewerage-doctors are far from being agreed, it is true, but contention is better than stagnation, and continued discussion and agitation may be expected to settle satisfactorily, and ere long this conveyance and utilisation of sewerage ques-

tion, that so vitally affects health and disease,—even life and death.

There are at present other gratifying evidences, in addition to the number of Bills with sanitary objects before Parliament, of the growing attention and the sense of importance attached to sanitary questions. In these days many projects obtain Parliamentary sanction under general statutes, that formerly required special separate Acts. Of such are some pier and harbour, and tramway Bills, which are embodied in one Provisional Order Confirmation Act in each session. Numerous projects are also brought before the public and joint-stock companies are formed with limited liability, to carry such projects into effect, under the powers of the Joint-Stock Companies Acts of 1862 and 1867. There are ebbs and flows at irregular intervals, falling and rising to varying depths and heights, in the speculative tides upon which private Bills and joint-stock companies are floated. The flood-tide indicates that money is easy, and commercial confidence firm. Some of the projects launched at such times indicate, it may be added, that the credulity of capitalists is excessive. It is curious to notice, when there is a plethora of capital, what a number of "good things" are offered, at a price, to those who are ready to part with it, in the hope of a good return. Railway-ships and ship-railways, mines, rich as those of Golconda, and far more extensive, yielding profusely all sorts of useful minerals and precious metals; wharfs, foundries, warehouses, printing concerns, manufactories of all kinds, are pressed upon the acceptance of the public; and the peoples of the colonies and the foreign states make tempting offers as to the interest they are ready to pay for a share of the redundant capital. Some of the projects that have been announced in the course of the last ten days are curious alike in their names and objects. Taking them at random: there is a Welsh anthracite coal company that needs 100,000l. for its due development; a North of Ireland iron ore company that needs 200,000l.; a wagon company for the manufacture of railway and tramway plant, and agricultural implements, that desires to raise 100,000l.; a Welsh coal and iron company, that requires 550,000l. to work the minerals under 10,000 acres of freehold and leasehold land, to work 13 collieries, 9 blast furnaces, 115 puddling and mill furnaces, 4 forges, and 7 rolling-mills; the Knight, Treverbyn, and Resugga Haematite Iron Ore Company wants 105,000l.; the New Zealand Kupanga Gold Mining Company needs 100,000l. for investment in a field of enterprise that has achieved "marvellous success," to work an "exceedingly valuable piece of auriferous ground," from which "enormous dividends may be expected, that will yield 'astounding productions';" the Ruby Consolidated Mining Company proposes to raise 325,000l., and promises wonderful results from the Bullwhackery, the Dunderburg, the El Dorado, and other silver lead mines; the North Custerfield Gold and Antimony Mining Company, and the London and St. Arnaud Gold and Silver Mines of Victoria, require 50,000l. each; and the Great North Caradon Silver, Lead, and Copper Mining Company, of the parish of Advent, Cornwall, invites capitalists to invest the modest sum of 30,000l.; and the Mendota Mining Company, of Lake Superior, can put 750,000 dollars to good use. Mining operations involve engineering, but there are many speculative projects at present before the public that only indirectly, or slightly, "requisition" the engineer, civil or mechanical. Among such are the Patent British Asphalt, the Trident Marine Insurance, the National Printing and Publishing, the Patent Cotton Gunpowder, the Butler's Wharf, the National Safe Deposit (for the custody of valuable property and documents), Pavy's Patent Felted Fabric, the Anglo-German Express Transit Companies, and others. The city of Quebec bids 6 per cent. for a loan of 100,000l., and the Philadelphia and Reading Railroad Company offer the same interest upon 3,000,000 dollars. The Plymouth Kankakee and Pacific Railroad Company want 2,000,000 dollars to complete works, the investment to yield over 8½ per cent.; and the Porto Alegre and New Hamburg (Brazilian) Railway Company wishes to raise 292,500l., for which 7 per cent. is guaranteed.

The new companies proposed include several for sanitary and cognate objects. Amongst these are, the new Gas Generator Company, with a capital of 250,000l., to be raised for the purchase and working of certain patent rights, the handsome price of 100,000l. being proposed to be

paid for the English patent rights, and 120,000l. for the rights for foreign States, India, and the Colonies. The inventions must be valuable indeed, if they are worth even half the money. The British and Foreign Water and Gas Works Company, with a capital of 800,000l., has for its object the carrying out of water and gas works, and any other works in connexion therewith, in those cities and towns where the introduction of gas and water is demanded, and is certain to be attended with profitable results. It is not intended to lock up the capital of the company in the permanent retention of any of the works undertaken. Among the other new sanitary companies proposed are, the General Sewage and Manure Company, to work Dr. Anderson's system of precipitation, the British Chemical and Agricultural Manure Company, and Lawe's Chemical Manure Company.

Sanitary improvements are among the most urgent and important social requirements of our day; and it is a gratifying sign of the times that increased attention is given to them. On the engineering profession devolves mainly the duty of action as the champions of the people against pestilence. Let them enter the lists bravely and, hopefully, against an enemy of great might, with far-reaching outposts, and strong supports. Let them fight ever so good a fight, generations will pass away before they are reduced to the condition of Alexander the Great, of sitting down to weep because they have no more worlds to conquer.

"ARCHITECTURE."

An obliging correspondent has sent us some interesting arguments and conclusions drawn, as he states, from the last number of the *Seaguardian Review* (April 1st, 1872). As they have probably escaped the attention of others besides ourselves, we take this opportunity of presenting some portions of them to our readers, who may not otherwise have a chance of seeing them. The general resemblance, especially in the oburgatory details, to certain now well-known very remarkable productions may indicate something beyond the mere foundation and the earliest stages of a new school of art criticism. On this, however, it is difficult to speak with precision. The subject appears to be "The present State of Things in general."

Wherever we turn, the exhibition is melancholy and hopeless, almost without exception,—a complete *inferno* and a national disgrace. In politics; in diplomacy; in army reconstruction; in navy management; in the church, with its clergy without common sense, goodness, ability, learning, or eloquence; in the law, blasted by the learned-unlearnedness of lawyers; in medicine, given over to empiricism, routine, and endless innovation,—we should be able to show such samples, and even such combinations of inaptitude, inexperience, ignorance, and absurdity as it would probably be impossible to find on the face of the globe. Why need we complete the dismal tale of utter futility, by pointing out the existence side by side of elaborate show, and staring vulgarity, and despicable meanness? Literature we find given over to the intolerable self-assertion of authors, intensely eager for applause, writing down to their readers; or else their minds, being weakened by subordination to a vain imagination, become the feeble worshippers of their own poor work. In painting are shown the clear evidences of mental delinquency; in sculpture, a class of gashers for commissions, whose productions are a curse to the nation, and in various degrees of vileness a travesty of art.

We cannot, in the course of this paper, take each separate division of our national life, and show fully the shortcomings, the palpable failures, the ineffectiveness, and imbecility that, as we have stated above, are everywhere discernible to the instructed eye. There is, however, an art, of which similar things may be said with equal truth, that, for various reasons, may suitably serve as first body to be used in such an exposure. The profession of Architecture being weakened by internal strife and dissension, and long considered a mark for the almost constant assails of all other special professions and trades, the sympathetic condition seem in existence that will render quite unnecessary any manifestation of that weighing and deliberation, and that precise adjustment of praise and blame which weaken the utterances of which they form

a part. Delicate, almost imperceptible touches may produce a delineation that shall enable any eye to see things as they really are, or may even, by lifting the veil (so to speak), make evident unperceived, and therefore unvalued, excellencies; but a far grander and at the same time less difficult task is undertaken by the hand that, with boldness, broadens and deepens the shades and shadows; still, Rembrandt far outdone, luminous shade shall be in turn superseded by a terrible intensity; and, by evenly-spread layers of pigment from which no light can be reflected, is shown the unmistakable semblance of ebon night,—unflecked even by a single borrowed lunar beam, or by the faintest traces of a dawn to come. Thus, in the remarks which we feel it our duty and pleasure to make, we are mainly anxious to strike hard and home; and are influenced by no personal or professional reasons for reticence in doing so. This would indeed be out of place in a matter so far removed from consideration of individuals, as a living art practised by living men. In order to treat the subject adequately, a standpoint is required from which all the ages may be viewed, and, of course, all the prominent human objects, pray though they be, appear in long trains of shadow under the blinding light that the observer must throw upon the nearer portions of the scene, in order to reach at all its further boundaries. It will be necessary to carefully pick out special examples for pointed condemnation from the numerous works that have been produced of late years, in order to bring our work into narrower compass, and to secure support by the selection for comment of those that seem most likely to tell in favour of our aim, excluding all others. The buildings must be by men who are accepted as "eminent" (holding high position) in their profession, and of well-known personal ability, which will naturally suggest presumption of a certain kind to the discerning reader; they must also be familiar by name, and otherwise to everybody—a pair of conditions that limit us to some of the best known public works. Any generally acknowledged partial or entire failure will be particularly suitable, as it can be dealt with, if desirable, in a specially curt, decisive way. We shall also be the better able in such cases to readily suggest modifications, amounting in some instances to complete reconstruction. The ease and comfort of this part of our task will be added to, by taking care that execution and any subsequent unfavourable criticism shall both be well beyond probability.

For the sake of effective contrast it will be desirable to paint some minor subjects in bright and cheerful hue; which, placed in the midst of, and thus bordered by, the prevailing sombreness, may divert attention. Pictures of the workmen who produced our old national architecture, will be very serviceable for this purpose. In the absence of such autobiographical or other revelation, or of such fiction or drama, as would be an authentic guide—we can only fall back on our inner consciousness, and make good use of that most effective implement of investigation, with its really infinite possibilities, if thoroughly applied. Though not of modern discovery, nor little used in previous ages or other countries, some of the dominant influences of the present period of intense literary production have brought its use into more universal recognition. Like a tropic temperature acting on a plant too often stunted in growth by destructive chills and adverse circumstances, the warm popular breath has driven off and rendered harmless the blighting influences of undue caution or plodding precision. The mingled moan and whine of querulous discontent craving quoted authorities has, happily for us, become only a tradition of a base past now well forgotten.

We find it necessary that the handicraftsmen of old days shall all be men of high culture and powerful mind, and we are therefore bound to conclude that "their work was simply a delight to them,—the outward form and expression of minds sympathetic and serious, but not in the slightest degree superstitious or debased." Their method of working shall be similarly evolved. Let us regard in imagination for a moment "a village church where there is not even an external plinth, but the rudest, unsophisticated walling; a stumpy, 'ungraceful,' but very sensible and useful tower, and scarcely a moulding or ornament about the building." Here is no trace of stunted power, of incapacity to realise, or unwillingness to aim at a perfected art. The whole is, in truth, complete evidence of the

sympathetic circumstances of the workman. If by chance we see the single detail that gives some refinement and dignity to such a work, we see at the same time that it is clearly the work of the village mason, who also drew the plan, and executed with his own hands the walling around. We know from intuition that it cannot be from another hand fresh from the masonry of the great abbey on the way to the rebuilding of a cathedral choir. On this basis of fact we are able to decide that, in the golden age, the here and there)—perfection in its kind awaiting each almost effortless touch of his practised hands,—found absolutely no Gibbonites around him. We are thus able to confidently overcome any natural misgivings as to the universal prevalence of all the virtues, and most of the talents in one special age. The happy social surroundings and private life of the old workman, in such strong contrast with those in our own days, might be enlarged on at any length, if expanded in the fullest detail; but the result will be, for all practical purposes, the same, if for the sake of brevity we trust to each reader's fancy. We have preferred to treat of the mental and moral consciousness,—which is, after all, the most important matter, since they are always independent of all mere external accidents.

It is necessary, however, that a few words at least be devoted to the apparent consideration of our ostensible subject; though, in fact, by the use of simple nomenclature our purpose would probably be more easily carried out. All right-thinking people strongly dislike the system of division of labour, so bespattered with praise by the soulless chattering of the pseudo-science of political economy. The results of the existence of distinct occupations,—even though the persons who engage in them are specially educated and well fitted for their work,—superceding the necessity for each man's personal attention to all his various needs, require of course no condemnation. If we could recur to the period of pastoral life and single households, and the manufacture in each family of all its necessities, we should have gone far towards the realisation in the present of the dream-like happy past. And to this we can approximate more or less nearly, even if we find it practically difficult to bring it about in all its noble simplicity. At least we can denounce with all our might the existence of the several specialities,—the so-called "professions,"—ignorantly stated to be called into existence to suit the needs of our people, and that are maintained and obviously strengthened day by day. If some of these weeds of dainty egotism must remain to suit the insensate folly or the base ostentation we find so prevalent, let us as much as possible eradicate new growths, and crush,—or at any rate injure, if we can,—those that have not yet taken too firm a root. That a man should arrogate to himself the title of "a healer," and endeavor to undervalue or supersede the health-promoting habits of self-doctoring,—in better times the almost universal rule,—may admit to some minds a partial justification; but the right-minded will safely leave him to his pretentious attempt to limit the occupations of his fellow-men; and, in the worst event, will no result more painful than premature decay or crippled limbs. The same rule holds good throughout the whole of the affairs of life. Honest personal work would render us in all things equally independent. An architect is, however, so often represented as the combined artist and man of business, by nature and training the contriver of fitness and beauty, and by habit and knowledge able to set agencies to work so as to realise his schemes, that people are leguiled into scnering or sanctioning his employment, forgetting in their inconsiderateness that even in law any man may wisely be his own client. Let such be warned in time, and avoid the pitfalls in which they may otherwise find themselves.

If a man does not know his real wants and is anxious to obtain skilled advice thereon, he should rather in truth begin by learning well for and by himself. Life would thus be answering its main end in affording scope for mental and moral discipline. If in this way ignorant he should first become well informed,—just as the diagnosis of disease, at least, should never be the work entrusted to "the healer," but should be undertaken solely by the patient. . . . If eager to begin to build after slowly resolving, as, indeed, usually happens, why should he not commence at once without too close a care for

details,—even in a structure that will be considered fitting and complete only if it supplies provision for all the artificial wants of a feverish over-civilisation? His first eagerness will be certain soon to exhaust itself; and by patient abiding effort all may be brought into wonderful harmony—by a resort to emendations, to partial destruction and reconstruction if need be. The features by which such changes of intention are announced, or by which original defects are to some degree overcome, will always be interesting to the student of architecture in after generations,—showing those signs of growth that are always so charming. When that is found, the evidence of incapacity to conceive and to weld together at once a perfect whole is by all good judges accounted as mere dust in the balance.

Let any man of special tastes and with well-defined wishes endeavour himself to give them substantial existence. Failure will be more honourable thus, than success with the assistance of an "eminent professional man"; who, though tried by a high standard of course a miracle of dulness, may by practice and pains be able to produce verisimilitude in a masquerade,—but only by the sacrifice of all that is really valuable,—in other words, of that special refinement belonging to the work of the "amateur" or lover of anything. . . . Any one possessed of much good sense would probably not ask advice from us, perhaps not ask it at all. Knowing that "a true artist works mainly to please and satisfy himself, and that this is really the only sound method of practice,"—he might he actually disposed to accord a generous confidence to—, but we really need not extend our remarks. Our whole meaning is surely by this time as plain, and at least as well known, to our readers as it is to ourselves.*

STONEHENGE, AND MAN AS AN ARTIST.

In these days of rapid change, and in view of a so very uncertain artistic future, it is not a little interesting, and sometimes consoling, to go back in memory to primitive days and to simple ways of man's work, and to see how things were actually and in reality then done. We live in an age of printing and books, and to be civilised a man must be "book learned" and full of book knowledge and experiences; but the time was when books were not, and the knowledge and experiences of men were to be got, if got at all, from other sources than books. This may be fairly said to be a paper age in contradistinction to that old geological age which has been called the "stone age." Men now write upon paper, but then they wrote upon stone. The rude stone monuments of various countries take us far back into the past beyond the reach of books and printing, and even letters, but still not actually beyond writing of some kind or other, if it be but of the very rudest hieroglyphics or picture-writing. We have pondered a good deal on this interesting matter at divers times, and have still a few thoughts on it, and the result, crude as it is, and, indeed, must be, is that any theory which makes all these works modern must be wrong. It may help towards the understanding of this matter if we call attention to one or two facts hardly hitherto noted. It may also afford a hint or two in modern practice. We may remind the reader first, and it is important to bear it in mind, that the history of human society may be broadly divided into three epochs or phases; the *savage* state, like that of the North American Indian of the present day; the *barbaric* state, like that of the Chinese and Japanese; and the "*civilised*," as it is termed, of which we may consider ourselves as a type, if not the type. But Nature does nothing in vain, and certainly gives away nothing. Some sort of equivalent is demanded for all that Dame Nature ever bestows. If the civilised man is a great gainer by the fact of his civilisation, we may be quite sure that he loses something by the change from the barbaric to the civilised. Art, for instance, has never flourished so entirely as among what have been termed *semi-civilised* or "*barbaric*" people. Outward and visible show, as expressive of inward thought and feeling, is always necessary in such a phase of human existence, and outward and visible show it is that creates art and perfects it. The savage state has art too, and sometimes very expressive art, but rude and unpolished, but still real and true. It has remained for an advanced civilisation to "*manufacture*" art, and hand it over to

* Some more hereafter.

the dead machine. But what is the gain, wo may ask in passing?

The whole subject is not a little complicated, for not only must we distinguish between the "civilised," the "barbaric," and the "savage" states of human existence, and accurately define them, but we must consider as well that this primitive state of things and primitive stone building have come of many natural causes: geologically, from the facts of the existence on the surface of the ground, and so ready to hand, of the "boulders," or blocks of unshewn stone left there by the forces in operation at the *Glacial* epoch. No savage tribe of men, however rude, could be insensible to the influence and constant presence of these huge and isolated blocks of stone: *to see them was to utilise them in some way or other.* Next there was a theological cause at work, for these works were essentially Pagan, and that simply means that no authoritative revelation had been vouchsafed to the rude and simple men whose lot cast them into Paganism. Man was left to himself to find out, as Mr. Carlyle would say, "a something to wonder at," to adore, and to invent. A vast isolated block of rude stone in the centre of a barren heath would be certain, in the very nature of things, and in the very nature of the mind of man, to excite feelings of awe and wonder, as, indeed, they now do, and could not but become venerable and sacred. Next, and this is a most important consideration in such a rude state of society, there must be outward and visible evidence for everything, and for every thought, and hence it is that we find among all rude tribes of men a primitive and simple veneration for all natural and striking objects,—for stones, trees, water, rivers, even sand, the sun, and moon, and stars, indeed, almost every natural object has found somewhere or other its worshippers. To our mind this is a singularly attractive subject to contemplate; it is to get rid of one's prejudices, and to find a way for oneself, as these rude men were obliged to do. The earth, and what is on it, and the elements round it, are alike open to all to read as they will or can; and it would be difficult indeed to find a spot whereon to think out better such primitive and dark mysteries than among these colossal stones. People wonder why Stonehenge was built, but there is no need for wonder; it was, and must have been, the natural expression of the minds of thoughtful though savage men. Before there was amongst them any "architecture," in the usual acceptation of that word, there were the mental causes and necessity for it, and a feeling for some constructed work huge enough to fill the minds of rough men. Architecture became a want. Stonehenge is not peculiar to these islands, the huge stone circles are to be found everywhere, and they take us back not to the fifth or the sixth century, or to the tenth or the first, but to pre-historic times, far remote, indeed, from all written records, or even unwritten song and legend. In the very nature of the case it must have been so, for as soon as man on this earth began to think at all—and books are not necessary for this—he must have begun to express himself somehow or other in material. The thoughts and feelings of the very earliest of the race of men must have been much the same as our own, but differently expressed. We express our religious feelings through and by means of cheap churches, and, if that be possible, chamer chapels, with a minimum of material and labour. The old stone circle men evidently thought no stones of memorial huge enough, and no labour long enough, through which to express their superstitions or their religions. And a very strange thought it is that as you go back in time and get nearer and nearer to "ignorance," as it is called, you somehow or other get into grander and grander architecture or building, if that be the better word, and you may thus fairly start from the cheapest and the flimsiest of modern improved church and chapel buildings, back to Middle or Dark Age cathedrals; to Egyptian and Hindoo temples; and from them to stone circles, and monolithic memorials. All true work is religion, says a modern prophet. *Laborare est orare.* Work is worship! Of such was Stonehenge; and it is a great subject for calm contemplation.

There is one other point worth a moment's thought, as it carries us back not only to the earliest simple stone monuments, but to the earliest written records, to stone "writing,"—it is that of some discoveries recently made in a remote corner of tropical America, wherein are to be found rocks covered with concentric rings and other characters typically identical with those

found on British rocks. This guides us to a notion of old dates, for these identical markings go far to show that the men of America and the men of Britain were, at some enormously remote date, of the same race; and this could have been only at a time when the disposal of the land and water of the globe were somewhat different from what they now are. Dr. Berthold Seeman has given a most interesting account of these curious matters,—too long to quote,—in his book on "Nicaragua and the Mosquito Shore." To it we must refer the reader; but it may be interesting to note how soon man must have begun his artistic career. Nothing can well be ruder than these drawings or stone cuttings, carved on the smooth surface of rocks, and evidently meant as memorials,—writings,—the origin of writing indeed almost infinitely remote from this present time, but still identical with it; for writing is writing however it may be accomplished. There can surely be nothing more interesting than these records of a past time, so unlike the present, yet so like it; for man is always the same, with the same instincts and feelings, with the same soul and body to provide for. But here a thought occurs, and which may lead to some practical hint, for may not a great architectural lesson be learnt from rude and antique work? The primitive houses of those who built these huge stone circles were sufficiently rude, and were wanting, doubtless, in all those "comforts" on which the modern man so prides himself; in other words, the indoor life of the builders and thinkers of the Stone Circle Age must have been of the roughest, though not so entirely void of comfort as may at first view be supposed; but their outdoor life,—we are speaking, of course, of that part of it which made the stone circle a useful and practical necessity,—must at the same time have been characterised by grandeur and dignity of thought, and by a feeling for much that is always artistically interesting and attractive. The huge stone circle, as at Stonehenge, was built of the largest masses to be found, selected, as we must suppose, because they were the largest, and because by size only was that impressiveness to be found which the minds of our great, though rude, ancestors demanded. The aspirations of such men must have been great and noble, and have produced a truly noble architectural thought in such small works and small masses, however well or even artistically put together, produce the same impressive and sublime effect on the mind as great ones? We think not. Certainly the rude builders of Stonehenge and the stone circles thought so.

SANITARY CONDITION OF IRELAND.

A DEPUTATION, comprising members of the Irish Medical Association, the College of Physicians, and the College of Surgeons, waited upon the Lord Lieutenant, on Saturday last, to present a memorial, the object of which was to obtain a Royal Commission, through his Excellency's influence, to inquire into the state of the public health of the country, the working of the Medical Charities Act, and further to defer, if possible, the enacting of any system of sanitary legislation for Ireland until such a Commission had reported upon the subject.

From the views put forward by members of the deputation, it was shown that the existing sanitary laws applicable to Ireland were complex and to a great extent inoperative, and they were of opinion that a Commission was necessary and eminently calculated to form a sound basis for future legislation.

His Excellency thought that sufficient knowledge of the state of Ireland was already in the possession of the Government to frame a Bill on a similar basis to Mr. Stansfeld's measure, and he considered it would be impolitic to frame a Bill for Ireland until the discussion on the English measure had first taken place. After Mr. Stansfeld's was introduced, the Government, he said, would be prepared to state what they considered would be necessary for Ireland.

Dr. Stokes, who formed one of the deputation, and who is well known in Dublin as a leading physician, made a statement which seemed to take the Lord Lieutenant by surprise. He stated a known fact,—that for the last half-century or more, about every ten years a devastating epidemic took place in the sister country,—a state of affairs which, Dr. Stokes said, was quite unknown in England or Scotland, and nothing could be more important than that steps

should be taken to investigate the history and reasons, and the measures requisite to check it. In answer to the query of his Excellency as to whether these epidemics were to be attributed to the prevailing sanitary condition of the country, Dr. Stokes replied that the deputation did not adopt any theory as to the production, but of one thing they were certain,—that public health is promoted by sanitary reform.

One of the reasons advanced by the deputation for the appointment of the Commission was that the voice of the medical profession should be heard prior to legislation. It was also disclaimed that the medical profession had any pecuniary or personal interest in the matter. "They all held that preventive medicine was far beyond curative." This is a cheering admission, and, coming from such a man as Dr. Stokes, it has its worth, even in the eleventh hour, in the struggle of sanitary reform. The Lord Lieutenant promised finally to give every attention to the important statements laid before him.

THE DORÉ GALLERY.

AN important addition has been made to the collection of works by M. Doré, now exhibiting in Bond-street, in the shape of a very large painting, "Christ leaving the Preterium." It is apparently 20 ft. by 30 ft., includes a very large number of figures, and will serve further to astonish those who know what other work this fertile painter has done in the five years during which he is said to have been engaged on the picture in question. The composition is striking. The figure of Christ, draped in white, and descending the stairs, forms the central point of the painting, and in all four corners, the high-level of the buildings above permitting this, crowds of figures, here and there driven back by Roman soldiers, press forward to see Him. Looked at critically, much of it must be considered as mere scene-painting; some of the figures, especially on the left-hand side, are but caricatures (look, for example, at the man with the red hair and beard); still, it is a remarkable picture, and will, doubtless, attract, and deserves to attract, many visitors for some time to come. The most perfect work of the artist, the "Paolo and Francesca di Rimini," is still in the gallery.

THE ROYAL ACADEMY OF BELGIUM.

THE hundredth anniversary of the Royal Academy of Sciences, Literature, and Fine Art of Belgium, founded in 1772 by Maria Teresa of Austria, was celebrated at Brussels on Tuesday and Wednesday of last week, with considerable ceremony. The proceedings were inaugurated on Wednesday with a speech from the king, in which, with great felicity of expression, he welcomed the foreign visitors who had been invited to take part in the celebration. Three papers only were read each day, and these were chiefly of an historical nature, tracing the progress that had been made in Belgium since the institution of the Academy, and alluding briefly to the various distinguished men whose names were associated with it. On Tuesday the foreign visitors were entertained at a banquet given by the Academy, and on Wednesday the members of the Academy and their guests dined with the king at the palace at Laeken. The whole of the proceedings were of the most harmonious character, and the foreign visitors had every reason to be gratified with the reception they experienced. Special mention should be made of M. Quetelet, the permanent secretary of the Academy, who, by his energy and urbanity, contributed greatly to the success of the meeting. M. Quetelet is one of the oldest members of the Academy, his election dating back as far as the year 1820. He is the author of several works on scientific subjects, among which may be named a "History of the Mathematical and Physical Sciences among the Belgians," published in 1865; the "Meteorology of Belgium compared with that of the Globe;" and numerous essays, besides editing the Annals of the Royal Observatory of Brussels since 1834. The Royal Society of England was represented by Professors Owen and Miller; the Royal Academy of England, by Mr. J. Prescott Knight, R.A.; the Institute of Architects, by Professor Donaldson, Mr. Edward P'Anson, and Mr. G. Alexander.

It is worthy of note that three of the earliest members of the Academy, Nathaniel Pigot, the Abbé Needham, and the Abbé Mann, were Englishmen settled in Belgium, and all three distin-

gished themselves by their observations in astronomical and physical science. Pigott was a friend of Dr. MacKelyne, and was employed by the Government of the Low Countries to fix the position of some of the principal towns by observation. The Abbé Mann was the first permanent secretary.

MODERN FRENCH ARCHITECTURE. ARCHITECTURAL ASSOCIATION.

An ordinary general meeting was held on Friday evening, the 31st of May. In compliance with a request from the secretary of the Royal Institute of British Architects, a delegate to the approaching conference was elected to represent the Association,—the president, Mr. Rowland Plumbe, consenting to accept the office. A special meeting, for members only, was appointed for the 7th of June, in order to decide on the instructions to be given to the delegate. Thanks were passed to Mr. A. W. Blomfield, for the permission to visit his new church for the deaf and dumb in Oxford-street, now getting towards completion, of which some members availed themselves on Saturday afternoon, the 25th ult. The arrangements of the annual holiday, commonly known as "Mr. Sharpe's excursion," will be found in another column.

A paper was then read by Mr. G. H. West, called "Notes on Modern French Architecture," of which we give an outline. The subject was treated in three somewhat distinct, but of course allied divisions:—I. The usual student course of French architects. II. Memoranda as to general character and details of executed works. III. Conclusions as to the prospects of architecture in France.

I. The study in an *atelier*, the *École de Beaux Arts*, and system of academic teaching; the thorough, almost (for practical ends at least) over-refining, study of descriptive geometry; the opportunities for the acquisition of personal skill in the arts of drawing, in sciography, &c., were all first described. Then the training in design was treated of. It principally aims at the acquisition of facility in composing with the classical orders, putting before the student certain agreed upon models for imitation, aiding him to the study of the external form of everything accepted as of classical quality; requiring also constant and laborious imitation of the forms to which the eye and mind have thus become accustomed, till the power has been acquired by men of good natural ability of conceiving and delineating thoroughly the most wonderful imaginary compositions. The school of the new Louvre and the New Opera is now mainly in favour for original designs, which are, as usual, prepared to suit the supposed prejudices of the judges. The processes and the science of construction receive little attention, and, in the most finished delineation, a light tint of carmine expresses the hidden constructive detail. It is not the habit of those subjected to this training to design while constructing, or to construct while designing. The design is first completed, and then, if further steps be called for, the construction receives almost its first consideration. The highest honour attainable, the *Grand Prix de Rome*, gives the fortunate winner five years' study out of his own country; and he returns to enter on actual practice seldom younger than thirty, often at thirty-five years of age. The result of so laborious a preparation may be illustrated by an instance not altogether exceptional, in which, returning from Rome after his five years, the *Grand Prix* student was entrusted with a commission to build a house to cost about 1,500*l.*, and found himself obliged to ask with earnestness the counsel of a friend in practice as to the construction of ordinary doors and quarter partitions. The *École Centrale d'Architecture* was started to supply the defects of the *Beaux Arts*, but, from various reasons, is not now of much importance. The *École des Ponts et Chaussées* and the *École des Arts et Manufactures* give more distinct scientific training, and have, at least lately, devoted special attention also to architectural design, producing a class of men calling themselves "engineer-architects," aiming at new applications of materials and a thoroughly scientific use of them. The teaching of M. Violot-le-Duc, well known by this time in England by his "Entretiens," "Dictionnaires," &c., has a different point of departure from that ruling the *École de Beaux Arts*, and consequently promises different results. Treating architecture as the border-land between art and science, this teaching recognises the value and

necessity of constant innovation, the advisability of using all materials, only under the guidance of right reason, to which every problem, new and old, must be submitted for solution,—not in the outward form, but in its informing spirit, will a true revival of Gothic be made. Its principles will be found to afford the surest help in dealing with the complex buildings and the very numerous materials which require often the first successful essay to be made to-day. Trained in M. Violot-le-Duc's school, after experience at the *École de Beaux Arts*, Mr. West felt himself justified in expressing the sense of touching solid earth, that he had felt, when subjected to criticism, which dealt first with the requirements of actual life and with the use of materials, and looked further to the evolution of beauty therefrom, instead of looking only, or at least mainly, to the production of certain effects.

II. As to executed works, a repetition of the mass of details accumulated and recited in the paper will not be necessary. An instance will suffice, showing some of the character of much of the Parisian masonry,—one of the examples of the unconstructive character of their architecture. The *pierre tendre*, so largely used, could not be worked on the banker, and then hoisted, as is the case with the freestone used in London. It is, therefore, built into the work in block, and reduced by planes and scrapers to the required form. As, however, little care is taken to make the joints occur where good construction would require, and as the blocks used are of great size, in order to save labour in severing them, and working the beds and joints, the apparent design (what has been called the design of "superficiality") becomes a sort of scenic presentation. It has been the custom to pay the contractor by the cubic quantity of stone used, and by the area of visible face; the contractor is, therefore, liberal in his provision for the prominent architectural forms, uses some quantity of stone to waste, saves scaffolding, and at the same time too often scamps the beds and joints, and has as few of them as possible. After speaking of the Opera House, which he pronounced on the whole an architectural failure,—and a most costly one, seeing that 44,000,000 francs have been expended on it, and the finishings are not yet begun,—notices of the works of other architects followed; selections for commendation, as among the best modern French work, being made of some of the productions of MM. L. Vaudoyer, L. J. Duc, Baltard, and Duban, with reference on occasion to photographs, &c., exhibited at the meeting. Judging by the prevalent feeling, as far as he had been able to gauge it, he considered it most improbable that a Gothic revival at all resembling that of England would establish itself in France. Associated indissolubly with the feudal times, from any sympathy with which the bulk of the people are wholly severed by their every sentiment, it has been cast aside with the rest of those things that might, if living to-day, remind the people too pointedly of their ancestral slavery. The tendency is now towards a purer and simpler style than has of late prevailed; but there is no likelihood that, however much the work of the future may be leavened by the influence of Gothic, there will be any recurrence to its special forms.

III. As to the immediate present and the future of architecture, the vile and meretricious style of the Second Empire, the writer looked on as wholly done with. The excellent artistic feeling, displayed in many of the details of otherwise by no means successful works, shows no sign of exhaustion. Many French architects have aimed at being more decorators, and at the production of ostentation and surprise. When they uniformly regard architecture as a science to start with, not to finish with, there will be effected a revolution in their executed works, and changes in their school of art-teaching. The words of Bacon "On Building" are true of the buildings of to-day: they "are built to live in, and not to look on; therefore let use be preferred before uniformity, except where both may be had." Let architects anywhere forget this, and they may expect to be classed with alchemists and archemers, and other fossil relics of a bygone age.

Mr. R. P. Spiers said that his conclusions differed from those of Mr. West. He considered the system of academical education worthy of all the advocacy he and others had given it. The "École" in Paris supplies the finest preliminary education that can be had. While requiring to be supplemented by practical work, and by additional attention to the economy of construction, that education thoroughly and quickly

trains the student to the practice of design, and tends to make his work perfect in proportion and drawing; thus starting him at a point to which many English ones, with the no-system here pursued, never attain at all. The principles of construction are taught; but teaching by professors not in actual practice certainly tends to take away some of the useful reality and solidity of instruction. Any training can succeed only in what it aims at; and he thought Mr. West had been led unduly to depreciate the French academic teaching, by considering it as the sole education of the French architect; who, on the contrary, can at any time enter an office, and work at end study his art in its actual practice. In England, on the other hand, at least till lately, little effort has been made towards providing, for the ordinary pupil in offices in London, any advantages of the same kind that have been long the privilege of the students in Paris. After some remarks on the immense power and talent evinced in portions of the design and in the details of the Paris Opera House, Mr. Spiers was succeeded by other speakers.

In reply, Mr. West stated that he had set himself the task of pointing out some of the defects and results of a system, which, however excellent for some purposes, failed from want of attention to the first element of real success in architectural design—constructive decoration. The "design first, build afterwards," of the French *École*, could not deal properly with the difficulties of modern building. At the same time, he did not fail to recognise the genius, the enormous talent, and many really admirable modern productions of the French. That side of this question would also deserve a special paper. On this occasion, he had devoted himself to what could be said on the other side,—to consideration of the defects, in spite of which good men were trained, and successes were achieved.

ANOTHER ALPINE TUNNEL.

DIAMOND BORING AT CLIFTON.

The works of the railway between Switzerland and Italy, *via* the St. Gothard Pass, are in progress, and an experimental portion of the Great Tunnel is to be driven, we hear, by the diamond boring-machine of the company, of which Captain Beaumont, R.E., M.P., is chairman. This machine bores either vertically or horizontally, and at any required angle, but with a continuous straight bore, of course, at the inclination adopted at the beginning of the boring. The machine has achieved great success, from the rapidity and certainty of its action, in "prospecting" for iron, stone, and coal in the north-eastern and north-western counties. It is now also employed upon the tunnel of the Bristol Port and Channel Dock Railway. This tunnel, which is more than a mile long, is through the hard mountain limestone, under Durham Downs, Clifton. At the Stanghow Iron Mines, Cleveland, the diamond borer reached a depth of 680 ft. 4 in. between the 7th of October and the 14th of December last, a work for which two years would not have more than sufficed if the stratification had been pierced in the ordinary method by hand. In its work at Clifton, the borer is under totally different circumstances. In prospecting one vertical bore-hole is sufficient, but in the horizontal boring for the tunnel headway, the machine drills six or eight holes at a time, the drills making about 200 revolutions per minute, and advancing about 2 in. in that time. The drills are steel tubes, with an annular ring or crown upon the face, into each of which eight diamonds are set, in such positions as to work out a circular groove, leaving a clean core of the strata pierced in the inside of the tube, that gives precise information as to the nature of the material passed through in every part of the boring.

As in the working of the Mont Ceuis tunnel, so it is at Clifton, compressed air being employed as a motor, but in quite a different manner. M. Sommeiller and his co-labourers at Fourneaux employed the compressed air for percussive action on the drills, but at Clifton the air is employed to obtain continuous pressure, which, with the rapid revolution, effects the work. The machine in which the drills work is so constructed that they command every part of the surface of the heading, which is 10 ft. by 8 ft. The holes are drilled in perpendicular rows, the two rows in the middle approaching each other at their inner ends, so that the first portion of the rock that is blasted is wedge-shaped. After

an opening has been made in the middle, the portions of rock on each side are blasted inwards, and the remainder of the tunnel, to its full size of 30 ft. by 20 ft., is worked out in the ordinary method by hand. The boring-machine is executing the work at about five times the speed attainable by hand labour. The bore-holes are drilled to about 4 ft. in depth, the debris being washed out, and the drills kept cool by streams of water under pressure that play continuously upon the face of the workings. The core left by the machine is about an inch in diameter, and the total diameter of the bore-hole about 2 in. Dynamite is the agent employed for blasting, and does its work very satisfactorily. The machine has been at work for three weeks daily; the diamonds have given no signs of wear, or of getting loose in their settings in that time.

THE NEW BELL FOR COLOGNE CATHEDRAL.

In the *Builder* of last Saturday is a paragraph on this subject, in which it is stated that "the bell will be 17 ft. high, and 13 ft. diameter at the base."

Now, surely this is a mistake on the part of some British or foreign copyist. Be it as it may, I beg to say that if a bell be 17 ft. high, and only 13 ft. diameter, it can never yield anything like a fine tone.

I may take occasion to remark that other erroneous statements respecting the bell under notice have lately appeared in a daily news-paper.

THOMAS WALESBY.

COMPETITIONS.

Ipswich.—Four architects sent in designs for the proposed new church in St. Matthew's parish, and the committee provisionally accepted those of Mr. James Butterworth. The estimate of the architect for carrying out the building he had designed was 3,000*l.*, but on a closer examination it appeared that the cost would be nearer 5,000*l.* than 3,000*l.*, and the committee, having no hopes of raising such a sum, withdrew their acceptance of the design.

SCHOOL BOARDS.

London.—At the last meeting, with reference to the three designs selected for Battersea-road, Kender-street Hatcham, and Mary street Bromley, the committee gave a table showing the ethical contents and the estimated cost in each case—

	No. of Children.	Cable Contents.	Estimated Cost.	Cost per Child.	Cost per Cable Foot.
(i.) Battersea-road	720	240,000	43,850	43	2 6 5/8d.
(ii.) Kender-street, Hatcham	720	243,658	5,521	7	13 1 5/8d.
(iii.) Mary-street, Bromley	720	Not given.	5,300	7	7 2

In order that no time may be lost in preparing designs for further schools, the committee have gone over the list of sites which have been scheduled. In each of the three following cases there is no doubt about the precise area and figure of the site which will be ultimately secured. They accordingly recommend that in each case there be a competition of four architects, and that it be referred back to the Works Committee to select that number of architects, and to submit the plans prepared to the Board: 1. Monnow-road, Old Kent-road, for 1,040 children; 2. Hunter-street, Old Kent-road, for 1,010 children; 3. Gloucester-street, Stepney, for 1,200 children. This was agreed to by the Board.

Barnsley.—A letter was read from the Educational Department approving of the plans for the proposed schools in Park-road, with the exception of the height of the walls, which they considered too lofty. Messrs. Wade & Turner, the architects, agreed to reduce the walls 2 ft., and the plans were ordered to be returned for final approval.

Scarbro'.—The following report of the committee on the designs for the Falsgrave Infant School was unanimously approved and adopted: "Your committee have carefully examined the plans referred to them, and beg to report that, in their opinion, those submitted by Messrs. Stewart & Bury, of Scarborough, and by Mr.

Wm. Watson, of Wakefield, are the best adapted to the requirements of the Board. The committee therefore recommend that from these two designs the final selections should be made by the Board." It was then resolved that the plans submitted by Mr. Wm. Watson be accepted, in preference to an amendment in favour of Messrs. Stewart & Bury.

Westborough.—At the last meeting, a communication was read from the Education Department, stating that the total school accommodation required was for 9,393 children. The number of children for whom no accommodation was provided was 1,026. To meet that deficiency, her Majesty's Inspector suggested that a new school, of a superior character to the schools already existing, should be built at Greef's Green, for 350 children, and another at Holloway Bank (on the Wednesbury-road), for 200 more. The adoption by the Board of the Mayor's Green School, it was considered, would be open to objection, owing to its close proximity to the schools in Walsall-street and Bratt-street. The matter was referred to the General Purposes Committee.

LIBRARY BUILDING, NEW YORK.

The building occupied by the Library, and erected from the designs of Mr. P. B. Wight, architect, is 75 ft. wide on Montague-street, and 92 ft. deep. The public entrance is in the centre, and is approached by steps of Ohio stone, flanked by stone parapets and newels. The porch is arched with Ohio and Haverstraw stone, and the front of it supported on columns of polished Gloucester granite, with bases and carved caps of Ohio stone. Over the porch, the walls of which are brick, is a stone platform and parapet with carved gargoyles, crockets, and eagles at the angles. The front of the building is faced with Philadelphia brick, and trimmed with the two kinds of stone above mentioned. It is surmounted by three gables in the roof, which have stone copings and wrought-iron finials. The front part of the roof is covered with Peach bottom slate.

From the main entrance, passing through the vestibule, which is separated from the main hall by a screen of oak and plate-glass, and enclosed on the outside by wrought-iron gates, the visitor enters a spacious hall, floored with encaustic tiles. In front is the entrance to the general reading-room, and to the left is the ladies' reading-room, and to the right is the office, behind which is the main stairway, making an L with the main hall. This story is 16 ft. in height. The general reading-room occupies the greater part of this floor, and has windows on both sides. Unobstructed light for the rear of the buildings is thus obtained from the yards of the adjoining buildings on both sides, which are the property of the Library Association. The reading-room is furnished with reading-tables of oak and walnut (A), and racks for newspapers of all sizes. The central portion at the back of the room is raised off, and contains the desk for the attendant (C), and the case for files. This case is also intended to contain hooks of reference for the reading-room.

Three open arches connect this room with the ladies' reading-room, which is carpeted, and furnished with tables, chairs, and sofas. It has three windows looking upon the street.

Under the platform of the main stairway is a ladies' retiring-room, and in the panel work beneath the first flight is a door opening upon the stairway to basement. The main stairway from first (or ground) story to second and third stories is of solid oak, and finished without plastering on the under side.

The second-story hall is similar to that of the first story. The entrance to the library is over that to the general reading-room, and the library occupies the same space on the floor as that room, but is two stories in height, and occupies the whole space up to the roof, having a gallery on a level with the third story. The lower floor of this room has a central public space, in the middle of which is an opening to afford additional light to the centre of the general reading-room, surrounded by an iron railing, against which is a permanent reading-table (A), supported on wrought-iron standards. The alcoves are raised off, and the divisions between them are marked by the wooden columns which support the gallery and roof. The whole library is lighted by a large skylight of wrought iron and plate glass in the roof, and additional light is afforded to the deep alcoves at the ends of the room by means of side windows. The alcoves contain two tiers of

cases. The second tier is surrounded with light wrought-iron balconies, which are reached by straight stairs, also of wrought iron, placed in every alternate alcove. The gallery round the library-room, which is at present used only for storage purposes, is intended to be eventually arranged for books, in the same manner as the main floor, and will have the same capacity. It is approached from the main floor by three circular iron stairways (E), and has independent entrances from the third-story halls. The library has shelves for 60,000 volumes on the lower floor, and will accommodate double that number when the gallery is shelved and finished.

The conversation and book-delivery room is on the west of the second-story hall, immediately over the ladies' reading-room. It is connected with the library by a large arch opening into the south-west alcove, in front of which is a counter extending across the room, over which books are delivered to members.

Across the hall, on the east side, is the meeting-room of trustees and directors. This room is carpeted and appropriately furnished. On the third floor over the book-delivery and trustees' rooms, are two class-rooms. The attic is as yet unfinished, but will probably be fitted up as a school of art.

The private entrance to the building on the basement floor, at the east side, connects with a private hall and stairway from that story to the attic, which is for the use of officers and attendants, and inaccessible from any portion of the building open to the public. This stairway is supplemented by a lift, or elevator (D), which passes through all the floors, and is used for the transmission of books, coals, and other heavy matter to the upper floor. Alongside of the basement entrance is the bindery, and on the west side of the basement are the janitor's rooms. The whole of the rear basement, under the reading-room, is used for the heating apparatus and storage of fuel. The coal is brought in, and ashes are removed, by means of a railway connecting a vault under the side-walk with the cellar.

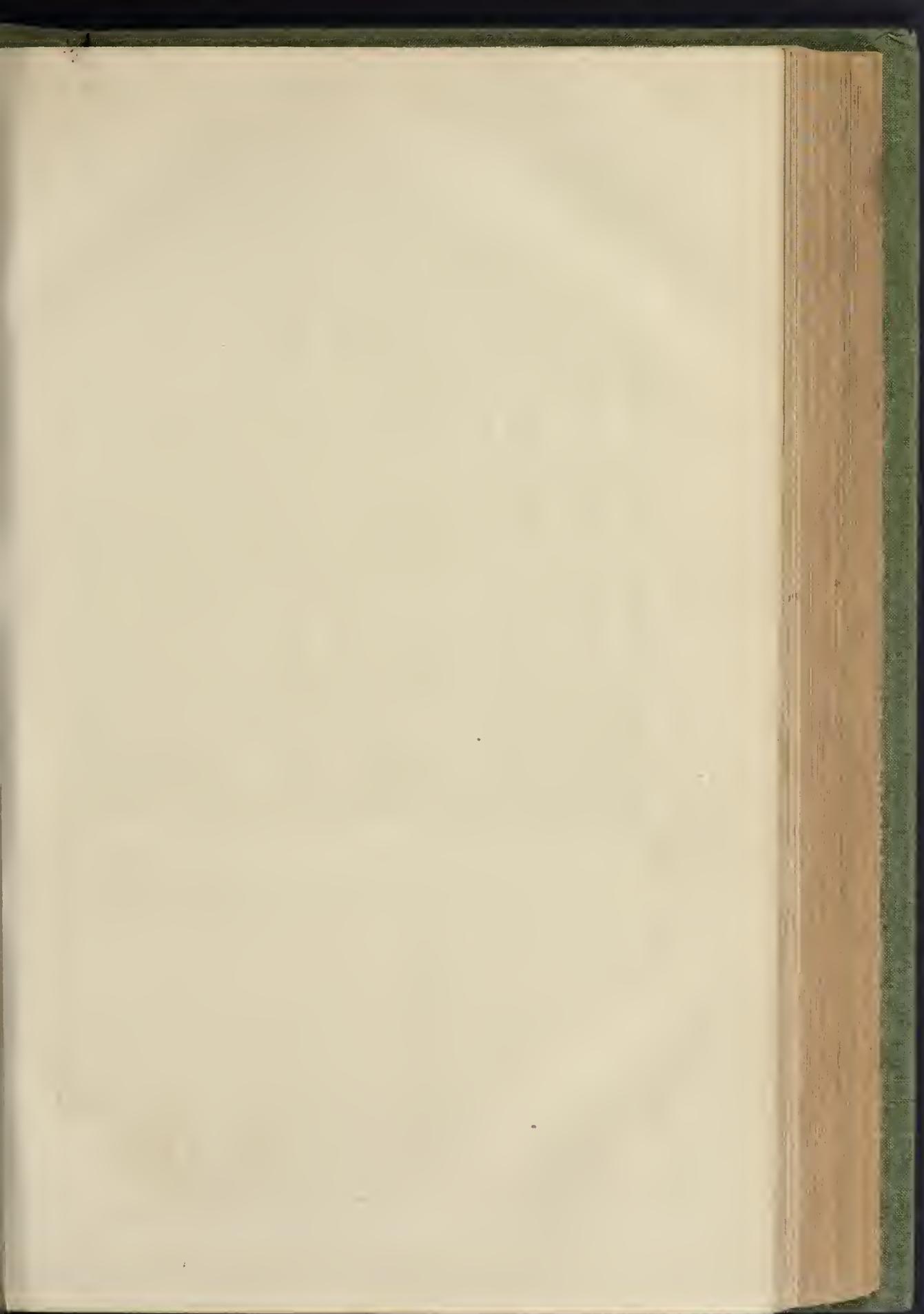
The closets are under the entrance steps. The janitor's rooms are supplied with hot and cold water, and water is supplied to all the principal rooms, which contain basins and water coolers. Provision is made against fire by means of fire-plugs, on the basement, first and second stories, to which the hose is always secured and ready for use.

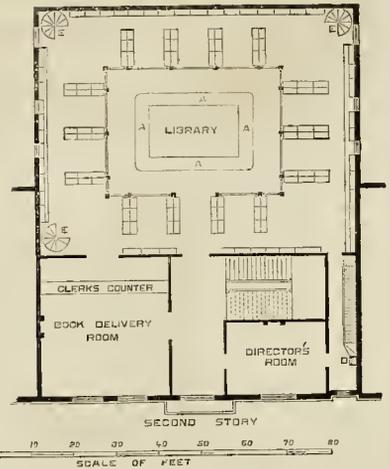
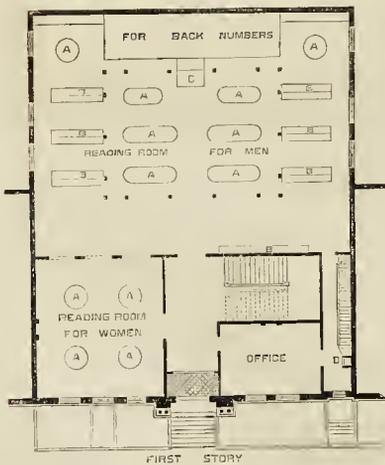
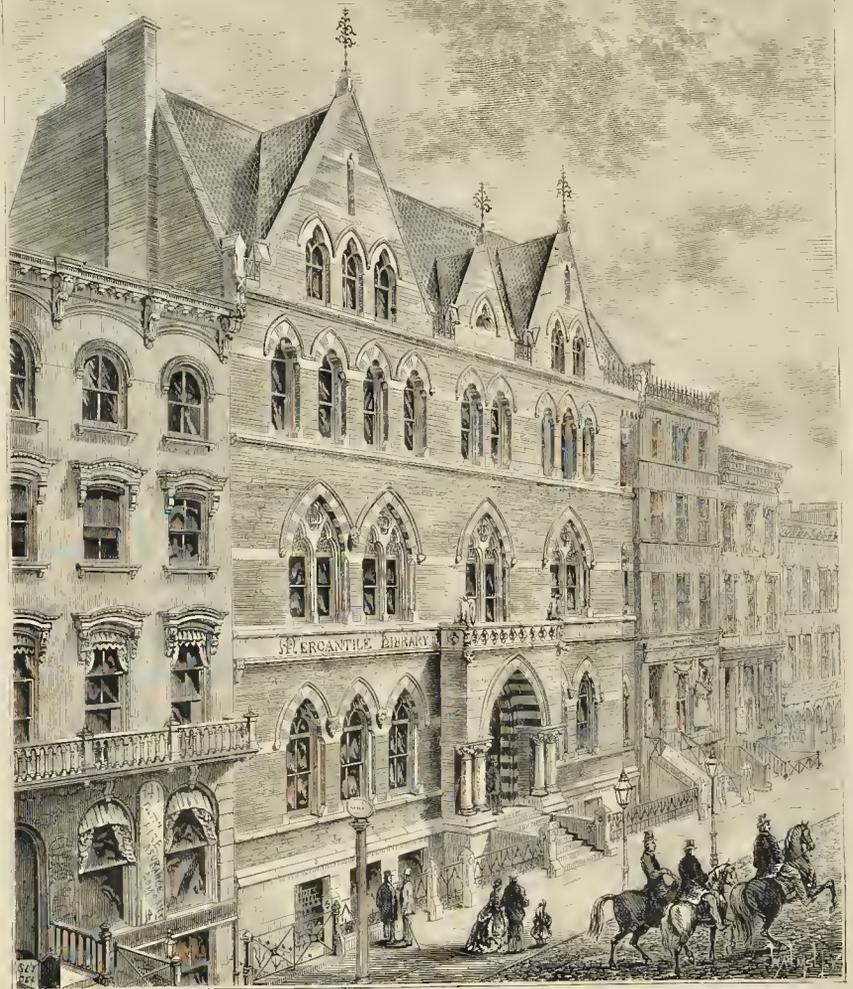
Particular attention has been given to the matter of heating and ventilation. The heat is supplied by one of Baker, Smith, & Co.'s safety pipe boilers, of 40-horse power. All the fresh air required for the rooms of the first story and the main hall, being those in which the greatest number of people congregate, is introduced through two openings on the sides of the building, and passes through radiating coils suspended beneath the floor, over which are iron gratings. The air is discharged through ventilating flues in the walls, which have registers both at the floor and ceiling. The library is heated by eight radiators placed under the small stairways in the alcoves, four of which are supplied with fresh air brought through registers in the sides of the building. All the other rooms are heated by direct radiation, and ventilated by open fireplaces and other flues.

The building is lighted at night by gas, which in the large rooms, is distributed as much as possible, in order to avoid shadows. The gas fixtures and furniture have been mainly designed by the architect to accord with the architecture of the building.

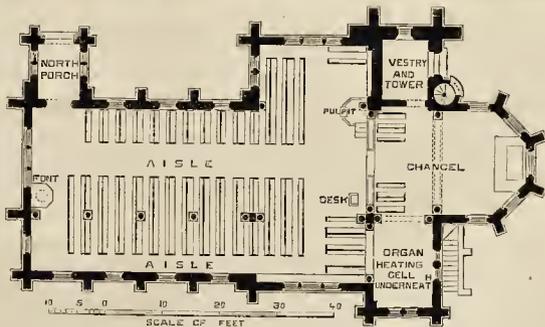
The architecture is thirteenth-century Gothic in style, modified to suit the necessities of modern times. Wrought iron has been used nearly everywhere in preference to cast iron. The walls and partitions are mainly of brick, and in the first and second stories entirely so. The floors are of yellow pine. The woodwork of the hall and stairway and of the doors is oak; that of the rest of the building is of white pine, and painted in parti-colour. All the columns used in the building are of white pine, and the construction is shown throughout. The plastering is what is called "sand finish," and the walls are now being decorated in polychrome from designs by the architect.

The contractors are:—John French, mason; Jeremiah Van Riper, carpenter; Jacob Outwater iron; Armstrong & Blacklin, plumbing and gas fitting; M. L. Curtis & Co., gas fixtures; Wm. S. Hunt, furniture; Miller & Coates, floor tiles; Henry Sharp, stained glass; and Baker, Smith & Co., heating apparatus.





THE LIBRARY BUILDING, NEW YORK, U.S.—Mr. P. B. WIGHT, ARCHITECT.



ENGLISH CHURCH AT THE HAGUE, IN HOLLAND.—MR. H. H. VALE, ARCHITECT.

ENGLISH CHURCH AT THE HAGUE,
IN HOLLAND.

This church, of which we give the ground-plan and a perspective view, is now in course of erection, for the use of the members of the Church of England resident at or visiting the Hague. It is built at the entire cost of Mr. John A. Tinné, Briarley, Aigburth, near Liverpool, and is erected in memory of his family, which is of Dutch extraction, and especially of his grandfather and father, who were natives of the Hague, and resided there.

The want of a permanent place of worship for members of the Church of England at this place has long been felt. For some years past they have occupied a wooden structure, now going to decay, and in an inconvenient situation. The position of the new church is on the south side of a handsome square, called "Van den Bosch," adjoining the Beemden-hout, well known for its many attractions, being on the side of the great wood, and contiguous to the Netherlands Railway and the Belle Vue Hotel. The site is not likely to be encroached upon, as there are pasture-fields open to the country behind it; and it occupies nearly the whole of one side of the Van den Bosch-square. Besides the land appropriated to the church itself, an additional space next to it has been secured, upon which a parsonage, school, or other building in connexion with the church can be erected, should such be hereafter thought desirable. The traces shown in the view are by no means ideal, but exist in reality, and are to be preserved.

The materials of which the church is mainly built are such as the immediate neighbourhood furnishes. A simple treatment has been adopted, and, in consequence of the difficulty of obtaining stone in Holland, tracery has been avoided, and natural stone used for the plinth of the building only. The operation of preparing the foundations is peculiar in this district, which possesses merely a substratum of bogsoil. A depth of about two yards being excavated, the soil is removed and sand filled in, which is brought in barges by canal, a distance of several miles. Upon this material the foundation-walls are built, of great thickness, up to the finished ground-line; by this means the necessity for the use of piles is entirely obviated. All the new residences in the Van den Bosch-square have been built in this manner.

The main walls are built of local bricks, in several shades of colour, from deep red to light buff. The bricks are very small, and only about 2 in. in thickness, and require great care in laying, but make very beautiful work when finished and pointed. The bricklayers are very careful workmen, but slow, which, together with the smallness of the bricks, greatly increases the cost of workmanship, it being more than double the price of English work. A sober tone of colour has been used for the main walls, with arches and bands of deeper colours. The particular system of brickwork is not new to the Hague, as there are evidences of this kind of treatment in some of the ancient public works dating from the sixteenth century, which may have been introduced by the Spaniards, as the treatment possesses something of the spirit of Moorish architecture, and such as has been recently adopted in England from Italian examples.

Many old brick buildings, both in Holland and Belgium, possess features resembling the "brick and marble" style of Italy, with radiating parti-coloured arches. A curious instance of this may be still detected in Antwerp, in the walls of the old Spanish Custom-house, built originally in coloured brickwork, which was doubtless the fashion of the day, and subsequently coated with cement or plaster, through the cracks and broken coating of which the richly-coloured bands of the original work may be seen; and probably the walling of the Spanish building, if exposed more fully, would present many interesting features.

In the church under notice, local materials have been principally used, but the slating in two colours has been sent from Wales. The decorative materials for the interior, such as granite pillars, serpentine shafts in chancel window reveals, encaustic tiles, the reredos, pulpit, and reading-desk, in Bath stone, and all the stone carved capitals and corbels have been sent from England; also the stained-glass windows, the ornamental and other ironwork, the pitch pine benches and roof-principals below the carved boarding. The small quantity of artificial stone used externally in quoins, sills, and

dressings, is of the local manufacture, called "Lindo's patent stone," which is said to stand the climate of Holland better than any natural stone, and is indurated under water for 100 days, after coming from the moulds. It has been largely used for monumental works in the country.

The church consists (as will be seen on reference to plan) of nave, single side-aisle, transepts, and chancel, with organ-chamber, vestry in tower, and porch. The roofs are boarded to a curved shape, and divided into panels by moulded ribs. The whole of the pitch-pine has been worked in England, the rest of the joiners' and carpenters' work has been done at the Hague.

The contractor is Mr. Van Zanten, Van den Bosch Straat, The Hague. The English contractors are Messrs. Holme & Nicol, of Liverpool. Mr. Joseph Rogerson, of Liverpool, is the carver, and has also supplied the pulpit, reading-desk, font, and reredos, and all the granite and marble used in the church. Messrs. W. H. Sullivan & Co., of Liverpool, are doing the stained glass. Mr. W. Orme Carter has furnished the slates; and Messrs. Maw & Co. provided the encaustic tiles.

The whole of the works are from the designs and specification of Mr. H. H. Vale, architect, Liverpool; and Mr. J. Waldorp, engineer-in-chief of the Waterstaat and Government Railways of the Netherlands, has kindly taken the local superintendence of the building, which is under contract to be finished during the ensuing autumn.

THE TRADES MOVEMENT.

London.—The operative house-painters and decorators of London have organised a committee and delegate meeting, for the purpose of co-operating with the carpenters and masons, with a view of securing the nine-hours system. They ask 8s. an hour as a minimum; the maximum to be fixed by arrangement.

Croydon.—At an adjourned meeting of the carpenters and joiners a long discussion took place, and ultimately it was resolved that the masters should be asked to give 7s. per hour on and after the first week in July next, and that a deputation wait upon each employer for an answer. Some of the men present were very sanguine that ere long 8s. per hour would be the price obtained, but thought that 7s. should be first got, and eventually the former sum would be easily secured.

Ipswich.—The arbitrators, Mr. T. D. Burroughes and Mr. J. Orford, jun., on the part of the masters, and Mr. F. J. Buggy and Mr. Watts on behalf of the men, with Mr. J. Worledge as umpire, are to sit at the Town-hall to dispose of the dispute.

Bristol.—The carpenters and joiners have offered to refer their difference with the masters to arbitration, and abide the result. The men ask for a reduction of the hours to 50½ per week, and a rise of wages from 6s. to 7s. per hour, and increased pay for overtime. The masters offer to reduce the hours, and a rise of ½d. per hour, viz., to 6s.½d., but will not alter the price of overtime.

Botham.—The master builders, acting under the pressure put upon them, have conceded the nine-hours limit to their men.

Halifax.—A numerous meeting of carpenters and joiners has been held for the purpose of hearing the decision of the employers on the application of the men for an increase of their wages from 2s. to 2s.8s., and of a reduction of the hours of labour from 52½ to 50. The Secretary read the answer, in which it was stated that the employers would grant the reduction of hours, but declined to give the increase of wages. After some discussion it was unanimously resolved to adhere to the original terms, and as the six months' notice given on the 13th of October last expired on the following day it was resolved to cease work at that time. It was stated that Mr. Joseph Bedford, of Horton-street, had acceded to the terms, and that five or six other employers were favourable to the proposition of the men.—The masons of Halifax have had their request complied with by their employers for an advance of 1s. in wages and an hour less on Saturdays.

Dunfriess.—The masons' strike in Dunfriess, which has lasted for six weeks, has terminated, and those of the men who had not left for other towns have resumed work. The dispute originated in the master masons employing slaters to do pointing work which could not be

done when buildings were erected in winter. The masters have now agreed that all new work shall be done by masons; and when, from exceptional causes, masons refuse to do it, the matter is to be referred to the Operative Lodge. The masters, at the same time, agreed to grant the nine-hours limit, but without any rise of wages. Their former offer was that the shorter hours should commence on the 1st of August, and ½d. an hour of advance.

Leeds.—The master bricklayers have conceded the 7½d. per hour demanded by the men. As soon as the question of overtime has been settled the men will resume work.

STRIKE IN THE BUILDING TRADE.

Str.—The strike which has already commenced in London, so far as the carpenters and joiners are concerned, seems quite unjustifiable, looking at surrounding circumstances. The hours now worked are 56½ in summer, and 50½ in the winter, or on an average of about 54 hours per week. The engineers have agreed to 54 hours per week all the year round, so have the printers and other trades. The carpenters now ask 51 hours in summer, and when the short days of winter are taken into account, there would be an average of about 48 or 49 hours per week.

Can the engineers, who are an intelligent body of men, consistently support a movement in direct opposition to their own rules? I think not, nor do I think the general public will do so. The workmen of Ipswich (as I see by the papers to-day) have agreed to 56 hours per week. If the building artificers had asked for a slight increase of wages, I could have well understood their object, but as the present demand would only increase their pay to the extent of 7d. per week, the present strike seems really got up for the sake of striking. A MASTER BUILDER.

We beg to contradict the statement, as reported in the daily papers, at the meeting of the Society of Carpenters and Joiners, that we had looked out our men before the final decision of the master builders. The facts are, we were compelled to discharge the whole of that trade on one job, through some conspiracies between the men, and their maliciously cutting up setting-out rods, and causing a general disturbance, beyond control. PERRY, BROS.

Str.—Will you kindly allow me to make a few remarks on the nine-hours movement, or the threatened strike in London? I observed in your paper a letter from a "Master Builder," where he distinctly states the carpenters and joiners, if they do strike, it will be for 12½ per cent. in wages, and that alone. I beg most emphatically to deny that, as the reduction of the hours of labour is far more thought of, and discussed than the subject of the wages; and I feel convinced, according to the amount of labour done by machinery, there must something be done to meet the demands of the operatives, carpenters, and joiners, otherwise we shall still have hundreds of our fellow workmen walking the streets in search of employment; while, if the hours of labour be reduced, that will be one step toward attaining the object of finding labour for more. One thing I fully believe, if the employers would consent to the reduction of the nine hours, and an advance of a halfpenny per hour at the present time, with the firm guarantee of the other halfpenny per hour at the end of the six months, which will then be 9d. per hour, it would be accepted. In the meantime it would enable them to complete some of their works already in hand, and they would at the same time be able to send in any fresh tender in accordance with the advance, and I think the public at large would be satisfied to pay the extra money if they themselves were convinced that the employers, one and all, were paying that rate of wages. One thing I don't much care if we could depend upon them all; some, I feel satisfied in saying, would fulfil their promise. If this rule was brought forward and carried out, I think it would put an end to the strike; and, sir, I beg pardon for taking up so much space of your valuable paper, only I do not like the "Master Builder," as he called himself, endeavouring to make the public believe that we want an advance of wages, and not the time, and that working men are always in the wrong. I think not this time. I feel justified in saying that, instead of sixteen men at twenty hours, and four walking the streets, to have the twenty men working nine hours, or even less, is nothing more than just and honest. W. M. H., Carpenter & Joiner.

GENERAL CONFERENCE OF
ARCHITECTS.

The programme of proceedings announces that the opening meeting will take place at eight p.m. on Monday, June 10th, and will be followed by other meetings on the 11th, 12th, and 13th. The proceedings will terminate on the 14th with a public dinner, to which non-professional guests may be invited.

All members of the Institute will have the right of attending the meetings. Other practising architects (British or foreign) who may desire to attend, are requested to apply at once

for cards of admission to Mr. C. L. Eastlake, secretary of the Institute.

The following members of the Institute have been appointed to act as hon. secretaries to superintend the arrangements necessary for each subject or section, viz. :—

Professional Practice.—E. F. Anson, fellow; T. Roger Smith, fellow; J. D. Maitland, associate; *On Modern Architectural Art*.—Professor Kerr, fellow; T. Talbot Bury, fellow; Thos. Wells, associate; *Construction and Materials*.—Professor Lewis, fellow; Edwin Nash, fellow; E. W. Tern, M.A., associate; *Exhibition of Practical Drawings*.—C. C. Nelson, fellow; J. Norton, fellow; H. L. Florence, associate; *Arrangements for Public Buildings*.—Horace Jones, fellow; O. Hansard, fellow; F. Marrable, fellow; *Arrangements for Visits to Public Buildings*.—T. Roger Smith, fellow; W. Papworth, fellow; T. H. Watson, associate.

MATTERS TO BE DISCUSSED AT SECTIONAL MEETINGS.

Professional Practice.—1.30 p.m. Tuesday, June 11th; Thomas H. Wyatt, president, or George Godwin, F.R.S., F.S.A., in the chair. Report of the Conference Committee on Professional Charges; report of the Conference Committee on the Employment of Surveyors; on "Esprit de Corps," by T. Roger Smith, fellow.

Architectural Art.—8 p.m., Wednesday, 12th June; Sir M. Digby Wyatt, fellow, in the chair. "On Modern Church Architecture in Scotland," by John Honeyman, esq.; report of the Conference Committee on Competitions* (with a draft form of conditions and notes of various members thereon).

Construction and Materials.—2 p.m., Thursday, 13th June; Sir William Tite, C.B., M.P., F.R.S., Past-President, or Horace Jones, Vice-President, in the chair. "On the Scientific Method of Treating Lime," by Major-General Scott, R.E., C.B.; "Notes on the Recent Conflagration in Paris," by R. W. Edis, fellow.

Final Meeting.—An adjourned meeting will be held (if necessary) at 11 a.m. on Friday, 14th June.

Delegates from the following Architectural Societies are expected to attend the Conference.—The Royal Institute of Architects of Scotland, the Architectural Institute of Scotland, the Glasgow Institute of Architects, the Glasgow Architectural Society, the Birmingham Architectural Society, the Liverpool Architectural Society, the Manchester Society of Architects, the Northern Architectural Association, the Nottingham Architectural Association, the Sheffield Architectural Society, the London Architectural Association.

FIGHTING FOR THE CHAIR AND MEANING THE TABLE.

THE office of Chief Artificer, or, in mundane words, Town Architect of Juteopolis, was submitted to competition a few days ago, under the auspices of the provost, bailies, and councillors. The candidates, four in number, having duly submitted their diplomas, the corporation proceeded to a decision. Now it so happens that for the last two years there has been a feud in that corporation on the subject of high and low heeled shoes, and this has accordingly divided it into two distinct parties. The advocates of high heels, successful last year in securing the smiles of collected national wisdom on their efforts; their opponents managed this year to provoke that smile into a frown, and obtain imperial authority for low heels.

Glowing with victory and smarting under defeat, the two factions ranged themselves on their respective sides; and as the office of Chief Artificer was a comparatively unimportant one, merely relating to the due administration of valuable town property, and other equally insignificant matters, it was determined by common consent that the choice should be considered as a contest of high and low heeled shoes, and be settled accordingly. One of the candidates having no nominator, was set aside; the senior and most competent withdrew, on hearing of "certain circumstances" (the impending battle of the fashions, probably); the contest was now, therefore, between the protégés of each party. The battle commenced, and high heels were slain; the senior candidate, who had just withdrawn, was thereupon ruthlessly seized by a high-heeled baillie, set erect and confronted with the low-heeled champion. But too late; he was neither blue nor yellow, simply an ably-qualified candidate for the office, and as such had no chance.

Need we say that low-heels won, and the provost and council went their way rejoicing or sorrowing, as the case might be. There were many aching heads on restless pillows that night, and in the troubled dreams of high and low heeled dignitaries alike, a vision of Dick Whittington mournfully touched the staple bells, and evoked the simple but monetary chime,—

"Please to remember the coming November,
And the City of Jute that was sold." B. C.

CAPT. SEDDON'S PAPER ON TESTING MATERIALS.

SIR,—Permit me to call attention through your columns to an error fallen into by Capt. Seddon, R.E., in his paper on the "Testing of Materials," read before the Royal Institute of British Architects, and partly reproduced in your paper of the 31st ult., in which he alludes to a discrepancy between the transverse strength of English oak and its tensile strength, as given in Moleworth's "Pocket Book" and Hurst's "Architectural Surveyor's Handbook." Capt. Seddon appears to have taken the figures for tensile strength from an old edition of Moleworth's book, and applies them to the rule for transverse strength in mine. If he had used recent editions, or had compared the figures given by myself in both cases, he would not have found the difference so wide as he endeavoured to make out.

Again, he calls attention to the imperfection of the formula for the transverse strength of wrought-iron girders given in my Handbook, p. 15, as being misleading. Capt. Seddon ought to have known that the formula he

* The subject of this report was transferred to the Sectional Meeting on Architectural Art, in order to leave time for the consideration of the reports from the other Conference Committees at the meeting devoted to professional practice.

refers to is the well-known formula of Sir Wm. Fairbairn, and that which he proposes to substitute is only a modification of the equally well-known formula used by civil engineers for large girders, but which is not a whit less one can see for himself, by applying both to girders broken for experiment.

Capt. Seddon appears also to have overlooked the fact that pocket-books are intended only for those who have had some previous knowledge of the subject, and for whom common-place explanations are unnecessary.

J. T. HEBST.

A GLAZED SURFACE.

I BELIEVE that common window-glass may be used for facing walls, if cut into geometrical shapes, as quarries, squares, hexagons, triangles, &c., and cemented on the plaster by some silicate cement. Any desired pattern could be produced on the glass in various colours, and very cheaply, if the demand were good. It might be largely used to relieve the monotonous drab of modern cement-fronted houses by being introduced in the friezes over the windows, in the architraves, string-courses, &c. Any common glass will do; and very thin glass might be applied to ceilings, which would be as easily cleaned as our windows. Glass when bedded solid will bear considerable wear, and, unlike paint or paper, can be repaired if damaged. Any broken squares can be picked out and replaced with new ones, and the whole is again perfect.

I enclose my card, and would give your correspondent further information if he desires it.

W. U. JAMES.

HAMILTON PLACE, PICCADILLY.

THE new month to Park-lane is extensively used, as was to be expected. Some low but ornate buildings that have been erected on the east side of it have led to many inquiries. The fact is, they are stables, in substitution of some formerly there, which were taken down to give increased width to the road, and are shared by the Earl Dalkeith, Sir Edward Antrobus, the Marquis Conyngham, and Mr. Barrington. The building—designed by Mr. George Vulliamy, the architect to the Board—has red-brick facing and Portland stone, some of the ornamental bricks being supplied by Mr. Richardson, of Vauxhall. Mr. Bradwell was the builder, and the iron joists and girders required in the construction were supplied by Messrs. Messures, Brothers, & Co., of Southwark-street. There is a turret at either end, 40 ft. high, and the centre of the building breaks forward a short distance before the flanks on either side. According to the *Metropolitan*, "the ground-floor is entirely occupied by stables, some portion of which have been fitted up by Messrs. Cottam & Co., of Winsley-street, Oxford-street, with their patent dove-tail wedge sill to the stall divisions. Also a patent vertical over-feeding hay-rack, with sliding grating and seed-box to the mangers, which will be fitted with their patent halter-guide and registered shackle. The back of the mangers is lined with enamelled files, of a light sage-green tint, from Messrs. Milton, Holbros, & Co. Another section of the stables has been fitted up by Messrs. Musgrave, of Belfast." Considering the fineness of the situation, it is to be regretted that a site for the stables was not found elsewhere. There is still some vacant ground at the Piccadilly end, on the eastern side, which forms a magnificent situation for one or more Town mansions.

ACCIDENTS.

Birmingham.—The roofs of three adjoining houses in Exeter-row, Birmingham, have fallen in, pushing the parapet about 4 ft. high and 60 ft. long, into the street. A man who was passing was struck by the falling bricks, and badly injured. The inmates of the rooms had to make a hasty escape from their beds, as the front of the house is bulged out. The houses were very old, and the roof, a heavy tiled one, is supposed to have been affected by the continued wet.

Sheffield.—At the Clyde Steel and Ironworks in the Wicker, belonging to Samuel Osborn & Co., the company were enlarging their steel foundry by erecting an additional shop, skirting the river Don. The building was about 36 ft. long, and 17 ft. wide. On Saturday morning, while the men were at work, the middle girder suddenly snapped in two, and the centre structure collapsed, and fell into the river. It was found that although four of the men at work were much cut and bruised about the head, no bones, fortunately, were broken. The building was being erected by Mr. James Fishman, and at first con-

siderable anxiety was felt by him and his workmen as to the cause of the accident. When they came to inspect the girder that had given way a flaw was found in it which it is said had been stopped up with lead. When the full weight it was intended to carry came to press upon it, it proved unequal to the strain, and suddenly snapped in the middle, and the centre part of the building came down. The damage is estimated at 200l.

London.—An inquest has been held at Lambeth, to inquire into the circumstances attending the death of a labourer who was suffocated by a quantity of earth falling upon him while he was working at the Lambeth Steel Works. The assistant storekeeper said that he was passing by a large opening from 25 ft. to 30 ft. deep, and 10 ft. or 12 ft. wide, which had been dug for the purpose of putting in the foundation of a wall. He saw the deceased and another man down in the opening; the deceased was knocking a prop as if he intended to knock it out. Deceased asked what time it was. He passed on, and in about ten minutes returned, and saw the earth had fallen in. Steps were taken for recovering the men who were believed to be in the hole. Ebenezer Meredith, plate-layer, said that the sides of the excavation were well shored up with timber, and secured. When found the deceased was in a stooping position, but from the fact of small gravel being closely packed round him, he must have been suffocated. Charles Lockley, foreman bricklayer, said that during the excavation had been open for five months, and some concrete had been placed at the bottom. Nothing else had since been done to it up to last Monday, when he set the deceased and another man to clear away the spoil that had dropped in, to be ready for the masons. It was no part of their duty to interfere with the props or struts. If the props had been knocked away, the earth would be likely to fall in. Some other evidence was given, and the jury returned a verdict of "Accidental Death."

MONUMENTAL.

Statue of Sir Humphry Davy for Penance.—The committee for carrying out the scheme have raised enough money to authorise them to order a marble statue from the Messrs. Willis, of Euston-road, London,—a statue the model of which was generally approved. The statue itself now approaches completion, and the last difficulty is as to the site. At first the statue was to be fixed between the pillars of the piazza of the Market-house. As a last resource it was resolved that it should be placed in front of the Post-office, on a cab-stand. Mr. T. S. Bolton, however, says the *Cornish Telegraph*, led the statue of Sir Humphry Davy should be placed in what a very large majority of persons consider an unsuitable spot, has now formally offered 25 superficial yards of his land south-west of the Public Buildings for the pedestal and figure. There are some conditions attached to this offer which will have to be carefully considered.

Memorial of Sir Thomas White, Coventry.—Mr. Poynton, of Messrs. Lester, Hodgkinson & Poynton, Midland Architectural Metal Works, has submitted a design for the proposed memorial. He suggested that the breadth of the base should be 8 ft., that the height from the platform should be 45 ft., and that there should be a statue of Sir Thomas in a sitting position, and which should be 5 ft. 6 in. in height. The following resolution as to it has been carried:—"The committee consider the same a highly artistic work and admirably adapted for the purpose." The chairman urged the collectors to be energetic in getting subscriptions to the fund. Mr. Poynton's design is now being exhibited.

MARKETS IN THE CITY OF LONDON.

SIR,—The discussion at the meeting of the Common Council of the City of London relative to Farringdon Market is perplexing to those not behind the scenes, particularly as while one member asserted that the Corporation was losing 5,000l. yearly on the Farringdon Market, another proclaimed that the market was so overwhelmed with business, gardeners' carts, and, therefore, amidst that confusion, every prudent citizen must rejoice that the Common Council had decided against the proposition of spending 150,000l. upon Farringdon Market, referring th-

report back to the committee for further consideration.

At this meeting the startling announcement was made that for new markets, and enlarging the old markets, the City of London had committed themselves to the amount of half a million of money: doubtless, it is the duty of a municipality to provide markets for the citizens, but, of course, the expenditure should be kept within prudent limits, avoiding a lavish architectural display on the market buildings as not required.

I will take this opportunity of alluding to the provision-markets within the City of London:—Spitalfields, for vegetables; Whitechapel and Leadenhall, for butcher's meat; Leadenhall, also for poultry and game; Billingsgate, for fish; Mark-lane, for wheat; Farringdon, for vegetables; the Metropolitan (Smithfield), for meat; the Columbia, for vegetables and fish; and out of the City, although the property of the City, the market for Foreign Cattle at Deptford.

Thus it will be seen that the City of London has provided eleven markets, a number not called for by the population of the City, which, I believe, does not exceed 100,000 persons, but calculated for the whole of London, which would embrace an area of at least fifteen or twenty miles round St. Paul's, and certainly the revenues of the City should not be mortgaged for the benefit of the world of London without some chance of its redemption. OLD JEWRY.

INSTITUTION OF SURVEYORS.

The annual general meeting of this society was held at 12, Great George-street, on Monday last. Mr. Edward Norton Clifton was elected president for the ensuing year, in place of the retiring president, Mr. Richard Hall. It appeared from the report that the society is rapidly increasing in numbers, and now includes in its ranks a large majority of the surveyors and leading land agents of the kingdom. Many valuable and interesting papers have been read at the fortnightly meetings of the past session, and have been printed under the "Transactions" of the society. It was announced that arrangements were in progress for the erection of a lecture-hall, library, and offices, and which, it is anticipated, will be ready for occupation by the commencement of the next session, in November. The annual dinner will take place early in July.

THE EXCURSION OF THE ARCHITECTURAL ASSOCIATION.

For the third annual excursion, under the direction of Mr. Edmund Sharpe, it has been decided to visit Northamptonshire. On Monday, the 19th of August, the meet will be at Stamford, about fifteen miles from the nearest point of last year's expedition. After devoting some time to the buildings of that town, and of its immediate neighbourhood, the party will proceed southwards, by Oundle and Wellingborough, to Northampton, visiting many of the very superior parish churches and other buildings to be found there; most of them not entirely strangers to those who know duly their Brandon, Johnson, Wickes, Cavelar, &c. On Saturday, the 24th, the final dinner will take place at Northampton,—the point nearest to London,—an arrangement that will enable the members to reach their homes, in most parts of England, that evening.

It is considered that the party should not comprise more than fifty persons, in order that the hotel accommodation at the towns visited may not be too severely taxed. Early application to the secretaries of the Association, especially on the part of those living out of London, may be desirable. Members of the Association will naturally have to be first considered, if any serious difficulty should arise as to numbers. It is not, however, wished to exclude non-members occupied in the study of English architecture.

The list of buildings to be visited, as it stands at present, comprises the four churches at Stamford (Lincolnshire), and St. Leonard's, close by; Tickencote, Ryhall, the two Castertons, and Ketton, in Rutland county; in Northants, Barnack, Oundle, Cottesbrook, Tansor, Fotheringhay, Warmington, and Polebrook; between Oundle and Wellingborough, the two Aldwinkles, Shrapton, Islip, Donford, Woodford, Ringstead, Raunds, Stanwick; from Wellingborough, Fineson, Irthlingborough, Higham Ferrers, Rushden, will be visited. Then the church at Kingshorpe and the churches the Eleanor Cross, the St. John's

Hospital, at Northampton. From the time of coming upon the river Nene, at Fotheringhay, in the north-east of the county, these churches are rarely a couple of miles distant from its course, which is thus to be practically followed all the way to Northampton.

The catalogue certainly has an inviting sound, and, with such weather as has been secured on other occasions, the old, over-present spirit of comradeship will secure, without fail, a week's good time.

EDWARD PEARCE AND F. DE LORINY.

Your correspondent, on p. 410, probably knows all that is to be learnt of Edward Pearce and F. De Loriny in what he has sent to you. The work by the latter was published in 1688, at Paris, in December of which year James II. retreated to France! WYATT PARFOWITH.

MAREZZO MARBLE.

This is an invention intended to popularise the use of imitative marble for indoor and outdoor decorative purposes, and an account of it was some time since given in the *Builder*. At a private exhibition of it at the works of the company, in Shenton-street, Old Kent-road, various architects, district surveyors, builders, sculptors, and other professional and practical men were present, and many commended the material,—some from personal experience, and others from what they saw. The advantages of the Marezzo marble, as explained by the manager of the works, M. Racotti, are its cheapness, the ease and rapidity of manufacture, and its applicability to all purposes of internal building decoration,—such as wall-lining, flooring, chimney-pieces, pedestals, columns, cornices, as well as statuary, fountains, and other out-of-door ornaments. During the visit two slabs, one of Sienna, the other of white-veined marble, were begun and finished ready for the polisher in somewhat less than three-quarters of an hour, the slabs being each about 5 ft. square. The process of manufacture is a very simple one. A slab of plate-glass is laid down, and upon that skeins of silk saturated with the dyes representing the colours and forms of the veins, in the kind of marble to be imitated are spread: upon this, cement, in a semi-liquidised state, is sprinkled to a thickness of about the eighth of an inch. This is left to be thoroughly impregnated with the dye from the silk, which is then removed. More of the liquid cement is added, until the slab acquires the requisite thickness; then it is left to dry (a process that usually occupies about twelve hours), and the slab is then lifted from the glass, and is ready for the polisher. The cost of this Marezzo marble is, we are told, about one-tenth that of real marble, and one-fifth that of scagliola for plain work; and the difference as regards marble in cornices, capitals, statuary, and other work of ornamentation, must necessarily be much greater, seeing that the material is all worked in a semi-fluid state.

EXPLOSIVE AGENTS.

At the last ordinary meeting of the session of the Institution of Civil Engineers, May 14th, the paper read gave an account of "Explosive Agents applied to Industrial Purposes," by Mr. F. A. Abel, F.R.S. In the course of it, the author pointed out some of the causes of the great difficulty experienced in arriving at anything approaching a precise estimate of the relative power and effect of different explosive agents. Taking dynamite as the type of the practically useful nitro-glycerine preparations, and as certainly one of the strongest, experience had shown it and compressed gun-cotton to be about on an equality in point of power, and to exhibit, in their most advantageous applications, a strength which was estimated at six times that of powder. The plastic nature of dynamite, and its power of resisting penetration by moisture, gave it advantages over compressed gun-cotton, as it could be used in wet blast-holes, and as very irregular holes, or holes terminating in fissures, could be more conveniently and heavily charged with it than with gun-cotton. On the other hand, the readiness with which dynamite froze, and its inertness unless thawed, or fired by special arrangements, and the unpleasant effects experienced occasionally by those using it, were inconveniences not shared by gun-cotton. The advantages presented by these materials in their general application as blasting agents,

were shown to consist chiefly in saving of time and labour, especially in tunnelling or in blasting in hard rock. They were also susceptible of advantageous employment as auxiliaries to gunpowder, in the rapid removal of large masses of rock, or of submerged wrecks; the violent explosive agent being first used to produce extensive rending and shattering effects, and the superior displacing effect of powder being afterwards brought to bear. It was pointed out that gunpowder could not be satisfactorily replaced by these violent explosive agents in some kinds of work, where its comparatively gradual action was a specially valuable feature.

CHURCH-BUILDING NEWS.

Wirksworth.—The first contract for the restoration of the parish church is now complete, and the part finished re-opened. This portion, which comprises the tower, transepts, and eastward, was commenced in July, 1870. Mr. George Gilbert Scott is the architect engaged; and the work has been executed by Mr. G. W. Booth, contractor, London and Gosport. The plan of the church is cruciform, and mostly dates from the thirteenth century, or Early English period of architecture. It has a central tower, supported on pillars, transepts with aisles attached; and a chancel, also with aisles. The nave with its aisles, now about to undergo restoration, is peculiar from being extremely short, and in very bad proportion to the rest of the structure; but it is hoped that as the work proceeds, funds will be forthcoming to carry out the wishes of the architect and the committee by extending the nave westward two or three bays, which would make this portion of the fabric in keeping with the rest. The roofs of the chancel and transepts are highly pitched, and the timbers are of wrought and moulded oak, covered with grey stone slate. The roofs of the aisles are also of oak, covered with lead. The tower has been generally repaired and pointed with Portland cement. The walls, some of which have been rebuilt, are of sandstone, with ashlar facing internally, except the transept walls, which are rubble inside, and have been cleaned and pointed. A new clearstory has been added to the chancel, pierced with six cinquefoil tracery windows. Many new windows have been inserted, all filled with moulded tracery. The five-light window in the north transept was given by Mr. James Wall, of Wirksworth. A new stained-glass window has been placed in the north chancel aisle, and was given by Mr. A. Macbeth, of Steeple Grange. The artists were Messrs. Edmunson, of Manchester. The floors have been laid with tiles, arranged in various designs. For the present chairs will be used for seating the church. The cost of the works to this time is between 5,000l. and 6,000l. During the progress of the works many sculptured fragments of stone, of the Saxon and Norman periods, have been found and preserved, also in some places portions of the Norman foundations. One portion only of that church still exists in the part of the north chancel called the Gell Chapel, the moulded base and walls of which are Norman, and have been preserved. A sum of 1,700l. is still required to complete the second portion of the work now in hand, in addition to the cost of lighting, seating, and warming the whole church.

Kings Norton.—The church, having been restored, has now been reopened for Divine service. The tower has been repaired. The north aisle has been rebuilt on concrete foundations, and the north arcade has also been rebuilt, the piers and arches being taken down, and the stones replaced in their original positions; a lean-to roof has been placed upon this aisle, surmounted by a parapet of the style of the fourteenth century (the date of the north and south arcades). The nave has been re-roofed, on the hammer-beam principle; the roof is open to the ridge, by which means 12 ft. of additional height have been gained. In the south aisle the bases of the piers have been renewed, and the foundations strengthened; the gables (seventeenth century) have been reopened, and the gable windows glazed. In the chancel a new floor of Maw & Co.'s tiles has been laid, and a small Norman "low side" window, discovered on the removal of the brick vestry, has been opened. By private liberality, figures have been placed in the niches of the south front of the tower, the stone corbels of the nave-roof have been carved, a stained-glass window, by Hardman, has been placed in the south aisle, and a sum of money has been given towards providing a retables of stone and marble.

The work remaining to be done is as follows:—The repair of the spire (much needed), the restoration of the western doorway of the tower, and the addition of an organ-chamber on the north side of the chancel. The amount expended is about £2,800, and a further sum of 500l. is required for the completion of the work. The organ has been removed from the tower, and placed at the east end of the north aisle, and an organ-chamber is greatly needed. The removal of the organ has made the western doorway of the tower available for use; but it requires thorough restoration, and this and the spire are included in the work yet to be done. Mr. Hopkins, of Worcester, is the architect.

Oldham.—St. Thomas's Church, Moorside, Oldham, which was to be consecrated on Whit-Monday, has been built at the sole cost of Mr. Thomas Melldow, of Moorside, from the designs and under the superintendence of Mr. H. Cockbain, of Manchester, architect. The church consists of nave and aisles, a chancel, with chapel on the north, and organ-chamber and vestry on the south; tower, south porch, and a sponsors' vestry on the north, near the font. The nave and aisles form a square of 52 ft., and are divided into four bays, having two-light windows in the aisle walls. The clerestory is lighted by three-light windows. The square or line from which the roof rises is 32 ft. above the floor line. The roof is open-timbered, the main timbers having mouldings; the height from the door to the ridge is 45 ft. The chancel is divided into three bays, and lighted by three windows on each side; four of these are rose windows, the other two are long two-light windows, with traceried heads and transoms in the middle. The east window is a large five-light, with traceried head, and contains 52 ft. of glass. The floor is paved with tiles. The steps in the sacristy are of marble, supplied by Messrs. J. & H. Patteson, each step being of a different kind. The top step, forming the dais for the Lord's Table, is of white Sicilian; the space between this and the table being filled with marble mosaic. The table is designed so as to be used either with or without antependium. The walls on each side are covered with a majolica and encaustic tile pattern, designed by the architect, and executed by Messrs. Minton, Hollins, & Co. Recesses (at present built up) are left in the walls for credence and sedilia. The choir is seated with a tier of stalls and two tiers of sub-stalls on each side. The chancel opens with two arches on the aisle, and one arch towards the church by open traceried screens; it is lighted by two two-light, square-headed, traceried windows, and a three-light tracery-headed east window. This chapel, which was designed with a special view to week-day services, early communion, and other occasions when the congregations would be very small, has its own entrance-door; and provision is made for a dais for communion-table, a credence, and sedilia. The seats proposed are movable, so as to allow of their being adapted either for use as a distinct chapel or as part of the main building. For the present this part of the building is fitted with benches for the school children. The tower, which is at the west end of the nave, is 20ft. 6in. square, and rises 92 ft. to the leads, and will be 116 ft. to the top of the final over the staircase turret, which is carried up at the north-east angle, and is covered with a spire. The lower stage of the tower opens to the nave by a lofty arch, and has a western door and a three-light traceried window over. Above this stage comes the ringers' loft, the clock-chamber, and last, the bell-chamber. The tower is finished by a pierced parapet and turret, 4 ft. in diameter at the angles. The pulpit is of oak, and carved by Earp. The font is of Caen stone, and was executed by Mr. Lunt, sculptor, Oldham. The organ was by Messrs. Hill & Son. The hot-water apparatus for warming the building was supplied by Scott & Brother, of Oldham. The large east window is filled with stained glass, by Hardman, and is the gift of Miss Bridge. The subjects represented are, "The Lord's Supper," which occupies the lower part of the three middle lights; and above and at the sides the spaces are filled with seven incidents from the life of Joseph and his brethren; the tracery and other portions being filled with emblematic devices.

Crumwell.—A meeting has been held with reference to the fund for rebuilding St. Mary's Church. The Bishop of Manchester occupied the chair. The Rev. Henry Cottam, the rector, said, that at a meeting held soon after the burning

of the church, a general committee and a building committee were appointed for raising money or for regulating the affairs of the rebuilding of the church. The result of their work was that 6,200l. had been raised; but that amount included 2,300l. from the insurance company. Mr. Crowther was appointed architect, and he had drawn the plans. Several tenders had been received, the lowest of which was 7,850l., sent in by Mr. Robinson, jun., of Hyde. In addition to the amount of the tenders there would be various other sums required, which would raise the total amount to 8,610l., without provision for an organ. To meet that there was in hand 6,200l., and subscriptions amounting to several hundred pounds more were expected to come in. The architect and the building committee had had a consultation under the circumstances, and had suggested other plans, the carrying out of which would cost altogether about 6,800l. The plan, however, was an imperfect plan; whereas the original plan was perfect, and the difference between the two was 1,880l. In other words, deducting 300l. insurance-money for the organ from the amount now raised, 1,200l. were required to carry out the imperfect plan, and 3,000l. to complete the perfect plan. A discussion ensued, and it was resolved "that the building committee be requested to proceed with the rebuilding of the nave, aisles, vestry, and restoration of the tower, estimated to cost 5,900l., and complete them according to the present plans and estimates, and to proceed also with the organ-chamber as soon as they have funds."

Leicester.—Trinity Church has been reopened for divine service. The church has been, to a great extent, rebuilt from designs by Mr. S. S. Teulon, London. The style is a compound of the Continental, closely approaching the Anglo-Norman and Early English in character. The additions are a west-end tower, over 50 ft. high, strongly buttressed, on which will shortly be raised a spire to the height of about 80 ft. over the tower. On either side of this are built two substantial turrets (containing the gallery staircases), each pierced with ten windows of an Early English character. Two ambulatories 4 ft. within run the whole length of the building, each lighted by sixteen windows of the thirteenth century model. The east end has been squared up, and contains an Early English window filled with stained glass, by Mr. Odell, of London. It consists of five lights, and a large centre window with two smaller windows on either side. An organ-chamber has been attached at the south-eastern corner, with opening into the chancel and church. The whole has been built of Luton brick faced with Box Ground stone. The body of the old church has also been cased in Luton, and finished off with a cornice composed of Diseworth white and Luton brick. From the west porch, the principal entrance passes under the tower. The galleries and ambulatories each have a separate entrance, the pavement being hard Yorkshire stone, and lined with white Diseworth brick. The doors are of oak, and the windows filled with quarries of opaque cathedral glass arranged in quaint patterns, with ruby and blue borders. The glazing has been done by Mr. Shardlow. The heating apparatus, planned by the architect, has been carried out by Messrs. Gimson & Co. The whole of the old sittings and fittings have been removed, and replaced by open seats. The bench ends and gallery front are pierced with an Early English design. The centre aisle and chancel are paved with Maw's Brosely tiles, and the ambulatories are in black and red Staffordshire quarries. The Italian roof has been decorated by the firm of Messrs. Heaton, Butler, & Bayne, of London. The body of the church has been lighted by four sunlights, by Messrs. Stroud & Co., of London; and they contain forty-two jets each, and are said to cast a beautiful subdued light. The ambulatories are lighted by sixteen pendants of original design by the architect, supplied by the Leicester Gas Company, under the superintendence of Mr. Hobson. The whole of the restoration has been carried out by Messrs. T. Hewitt & Sons, of London. The stone-work has been supplied by Mr. John Firm. Mr. Basford was clerk of the works. The cost of the alterations is over 5,000l., and the spire, which it has been resolved shall be erected, will cost 700l. more.

Decoration of St. Paul's.—The Dean of St. Paul's has declined to call a meeting of the subscribers to consider the recent appointment of a second architect. The request was signed by twenty-eight of the subscribers.

SCHOOL-BUILDING NEWS.

East London.—The foundation-stone of new school-buildings about to be erected in Burdett-road has been laid, in connexion with the Congregational Church there. It is intended to use the rooms likewise for lectures and public meetings. The cost of the proposed schools, including necessary fittings, is estimated at 1,400l., the builder's contract being 1,080l. There is no architect. Mr. Adm. Sheffield, of Poplar, is the builder.

Boston.—New public schools have been opened here. They consist of a boys' school, a girls' school, and two class-rooms, one of which is adapted for infants. The girls' school is 50 ft., and the boys' 58 ft. long, both being 20 ft. wide, and 16 ft. high, to the springing of the roof, which is left open to the ridge. The several rooms have accommodation for 300 children. Each school has a spacious playground attached to it. The building is constructed of red brick, relieved with white brick dressings, and terracotta springers and key-stones to the arches. The interior is built of white bricks, relieved with courses of red and black bricks and tiles. The lower part of the walls,—as high as the children reach,—is built with glazed bricks. In addition to the colouring to the walls, short sentences have been introduced, the letters being formed in encaustic tiles. The schools are warmed by means of open fireplaces, with Milner harks and stone fenders. Ventilation is provided by means of shafts running parallel with the flues of the chimneys, into which openings are built, covered with perforated zinc; also, by openings on each side of the roof, so as to create a thorough draught across the upper part of the school, where it cannot be felt. Ventilators have also been introduced into the ridge, which combine use and also ornament. The framing of the roof is a combination of wood and iron. It is open to the top, and boarded in. The wood-work is varnished, the iron rods and bolts being painted blue. The closets have been fitted up on the dry-earth system. The contract amount for the building was 1,194l., which is about 4l. per child. The architect was Mr. W. H. Wheeler. The contract has been executed by Mr. Samuel Sherwin.

Middlesbrough.—The Roman Catholics of Middlesbrough are about to erect new schools in Lawson-street, in the marshes. Messrs. Hunter & Carr are the architects, and the buildings will accommodate 300 children. The plans have been approved by the (R. C.) Bishop of Beverley, and, on some minor alterations being made, tenders will be advertised for. The principal promoter of the school is said to be Father Burns, the late Roman Catholic rector at Middlesbrough.

Books Received.

Dilapidations: a Text Book for Architects and Surveyors, in Tabulated Form. By BASISTER FLETCHER, Architect. London: E. & F. N. Spon. 1872.

In this little book Mr. Banister Fletcher gives the result of a good deal of careful reading on the subject of dilapidations. It must be supposed that his seventy-eight pages will render their possessor independent of the more elaborate works available, but the student who makes himself master of Mr. Fletcher's tabulated information will find it a very useful introduction, and be able with ease to look further into it with more elaborate exponents. The writer very properly remembers that tenants have rights as well as obligations. It is impossible to deny that some surveyors have a mistaken notion of their duties to lessors employing them, and often seek to obtain for them, to the loss and injury of the tenant, not an old building fairly attended to and kept up, but actually a new building.

VARIORUM.

UNDER the title "Landmarks in English Constitutional History," Mr. J. A. Picton, F.S.A., has printed a paper read by him recently before the Liverpool Literary and Philosophical Society. It is a particularly interesting communication. In some thirty-eight pages Mr. Picton shows graphically the early steps which led this England of ours to its present constitution,—how it became—

"A land of settled government,
A land of just and old renown,
Where freedom broadens slowly down
From precedent to precedent."

And this he does, not by repeating what other

men have deduced and written, but by the digest of public documents at successive epochs, affording contemporary evidence. It is quite delightful to see how well and profitably our old friend, having given up the struggle of professional life, employs his acquisitions and well-earned golden leisure.—According to the *Art Journal* the patent of the Metallic Compression, Casting Company is an American property, which under a company is now about to be worked in this country. "Its operations embrace a large class of utilities, representing a large and very important section in the hardware business, and in respect of the cost and beauty of the products offering extraordinary advantages over the results of the ordinary methods of manufacture now in use. The process of production appears to be adapted to a variety of uses, and only waits for development to show the extent of its application. We know that castings in bronze and other metals are never presentable in commerce until they have been dressed and trimmed with the chisel; but one remarkable advantage in castings by this process is that the most delicate traceries require no after treatment; and of this the best evidence is, that woodcuts and the most minute stereotypes leave the mould in a state so perfect that in working them immediately not the slightest imperfection is perceptible; and nuts and screws, which are among the most delicate of metal products, can be turned out of hand with rapidity and perfection of finish far exceeding the results of all ordinary means."

Miscellanea.

New Font in St. Luke's Church, Derby. A font has been placed in St. Luke's Church. This font stands near the west entrance into the church. It is made of various kinds of marble, worked together. The bowl, which is of veined Hanbury alabaster, is octagonal in plan, and is supported upon a base composed upon a central shaft of Serpentine marble, surrounded by eight smaller detached shafts of Serpentine and Irish green marbles alternately. These shafts have carved foliage capitals, and moulded bases of alabaster. Around the bowl of the font runs a sunk arcade, the arches of which are cusped and supported at each angle by small Derbyshire spar columns, with moulded alabaster caps and bases. The spandrels of the arches are filled with Serpentine marble and Derbyshire spar-bosses. The sunk panel on each face is filled with a carving in white Chellaston alabaster, the subjects being taken from Old and New Testament history. The font is surrounded by marble steps, the lower one of Derbyshire black-eyes, and the upper one Belgian red. The work has been done by Mr. Hall, of the Derby Marble Works, from the designs of Messrs. Stevens & Robinson, the architects for the church. The carving has been executed by Mr. Chambers, of Derby. The bowl of the font is lined with electro-gilding.

New Use for Water.—A contrivance that has been erected at a colonial foundry is worthy of notice. At present it is only used for blowing the ordinary blacksmith's fire, but eventually it will, no doubt, be used for the smelting-furnace. It consists of an empty barrel, or quarter cask, stood on end behind the fire, to the centre of which a blast-pipe, from 2 in. to 3 in. in diameter, is fixed. On the top of the cask is another pipe, the same size as the blast-pipe, some 6 ft. in height, with a funnel-shaped top. Just above this there is a horizontal water-pipe of the ordinary service size, with a nozzle, having an aperture of $\frac{1}{2}$ in. in diameter, fixed at right angles—that is, pointing down the pipe leading to the barrel, down which there rushes, with considerable force, a tin jet of water, which causes a rush through the blast-pipe that is far superior both in power and steadiness to any that can be obtained from the common blacksmith's bellows. The waste water, which is very limited in quantity, escapes through a pipe attached for the purpose to the bottom of the barrel.—*Adelaide Observer.*

The Rateability of the New Foreign Cattle-Market.—On the opening of the new foreign Cattle-Market at Deptford, the property is sought to be assessed to the parochial rates to the gross value of 11,400*l.*, and a rateable value of 9,500*l.* Against this assessment the Corporation of the City of London appealed, the suit being an agreement to reduce the original assessment to a gross value of 5,825*l.*, and a rateable value of 4,807*l.*

The Oxygenation of our Gas.—The supply of oxygen gas to the public—in the same way as ordinary gas, to be used for improving street illumination, or to become an instrument in our metallurgical processes,—is again talked of. M. Tessie du Motay's process for producing oxygen cheaply, consists of charging retorts with a mixture of manganate of soda and oxide of copper, from which large quantities of gas are evolved at very small cost, and it is offered to the public at one franc the cubic metre. Applications are made by the company to the Municipal Council to lay down mains, and to make the necessary arrangements for supplying the public with this gas. One would think, however, that the more simple and obvious way to improve our gas, is to compel the gas companies to give better gas. The vile rubbish usually given is really disgraceful. A second supply, providing oxygen gas wherewith to doctor it, will only enable the adulterators to give worse gas than ever; and they will certainly do this, should any such ponderous way of amending what can so easily and simply be improved be adopted. Amalgamations ought not to have been allowed. What the companies could do for the public behoof when amalgamated has turned out, as the *Builder* urged, anything but what they would do.

Ventilation of Dwellings of the Poor.—Mr. Liddle, the Whitechapel medical officer of health, says,—“In my report for the quarter ending Sept. 30, 1871, I drew attention to the defective ventilation of the dwellings of the poor, and I pointed out that there was an intimate relation between such defective ventilation and the mortality from tubercular and other diseases of a similar class; and I further showed, by the returns of the Registrar-General, that this class of disease, which is generally admitted to be caused by the breathing of impure air, has a greater mortality than the whole class of miasmatic diseases; the latter being 23.4 per cent. of the total mortality, while the former amounts to 27.8 per cent. Nothing to my mind is more clear than that the attention of the Board and the sanitary officers must be directed to the defective state of the ventilation of the dwellings of the poor; for consumption, and the whole tubercular class, viz. scrofula, mesenteric disease, hydrocephalus, convulsions, premature birth, teething, atrophy and debility, and tubercular meningitis, are chiefly caused by the defective ventilation of dwelling-houses, and particularly of sleeping-rooms, in which at least one-third of one's existence is passed.”

New Offices of the City of London Union. These offices in Bartholomew-close, the completion of which we have mentioned, have been erected from designs prepared by Mr. W. Hinson, architect, of Doctors' Commons, which were selected from those of six architects, who had been invited to submit plans in competition; and the contract was undertaken in July last by Messrs. Hill & Son, for the sum of 5,894*l.* According to the *City Press*, besides the general offices for the clerk and registrar to the Union, the building includes a Board-room, 45 ft. long by 31 ft., and 21 ft. in height; a room for the meetings of the Assessment Committee, 34 ft. by 20 ft., with waiting-rooms for appellants; also spacious and lofty waiting-rooms, with airy yards for the poor persons in attendance upon the Relief Committees; a residence for the messenger and housekeeper; medical officers' rooms, strong rooms for books and documents; and there is cellarge throughout. The room has been furnished by Messrs. Cooper & Holt. The benches are covered with dark green morocco; they are of oak, and the tables, &c., are, of course, made to match.

Derby Licensed Victuallers' Asylum.—The Mayor of Derby has laid the foundation-stone of the Derby Licensed Victuallers' Asylum, which is about to be erected on the Nottingham-road. The cost of the erection and endowment of the proposed building will probably amount to about 2,500*l.*, and it is proposed to allow each inmate 10s. 6d. per week. Messrs. Giles & Brookhouse are the architects, and Mr. Dusanfoy the builder.

The Canal Accident at Birmingham.—It is almost impossible to give an estimate of the whole damage done by the bursting of the Worcester Canal, announced last week, but it amounts to several thousands. It is roughly estimated that the damage done to one nursery amounts to 300*l.* The canal was made in 1797, and is 29 miles in length. Its breadth is 42 ft., and its depth 6 ft.

Laying the Chief Stone of Royal Engineers' Institute, Chatham.—The chief stone of the Royal Engineers' Institute, at Chatham, has been laid by the Duke of Cambridge. The new building, which, before it is completed, will cost upwards of 20,000*l.*, will present a front principally of brick, with stone and terra-cotta enrichments. In this new Institute will be gathered all the various schools of the corps; and the different studies of the officers and non-commissioned officers will be carried on under one roof. Among the things provided in the Institute will be a lecture-theatre, capable of seating some 800 persons, various rooms for museums, halls of study or class-rooms, committee-rooms, officers' library, rooms for photographic works, printing schools, chemical laboratory, &c. Captain Marsh, R.E., is carrying out the work, assisted by Sergeant Mayne, military foreman of works, under the sole direction of Colonel Lovell, the Commanding Royal Engineer of the district. Mr. George Solitt, of Strood, is the contractor.

The Artists' Benevolent Fund.—The anniversary dinner of this corporation is to take place this Saturday evening, the 8th, Mr. R. N. Fowler, M.P., presiding. This fund suffers, in the opinion of the public, from the impression that aid is given only to its own members. It ought, however, to be known that it consists of two distinct branches, the "Artists' Annuity Fund" and the "Artists' Benevolent Fund." While the Artists' Annuity Fund is wholly supported by the contributions of its members for their own relief in sickness or old age, and neither asks for, nor receives, any support from the public; the Artists' Benevolent Fund is a strictly charitable society, and has for its object the relief of such of the widows and orphans of members of the Artists' Annuity Fund as are left in need. This is supported by the donations and subscriptions of the patrons of the fine arts and artists, and the annual contributions of the members of the Annuity Fund. Mr. L. Young, the secretary, at 4, Trafalgar-square, W.C., will give any information that may be required.

The West Front of Chester Cathedral.—Another meeting has been held in the Town-hall, under the presidency of the Mayor, for the purpose of further considering the approach to the west front of the cathedral. The meeting was attended by the bishop, the dean, Canon Kingsley, Sir T. G. Frost, and others. The town-clerk had ascertained that there was little chance of carrying out the more complete scheme, which, it was said, would cost 4,000*l.*, and that the smaller one would cost 2,500*l.* As there were 1,700*l.* promised, however, the bishop thought the smaller scheme should be put aside, and Mr. Brown thought they should go on pluckily for the larger one. Eventually, the bishop, the mayor, Mr. Potts, and the town-clerk, were appointed a committee to obtain information.

An Iron Screen.—A new cast-iron sanctuary screen has been erected in the Roman Catholic Church, Newport, Monmouth. It is 51 ft. wide by 22 ft. 6 in. high in the centre, and divided into nineteen bays or compartments by ornamental shafts and arches, supporting foliated cresting and ridge, where passion-flowers are introduced. Over the centre compartment or bay, which is 4 ft. 10 in. wide, are three figures, each more than 3 ft. high, representing the Crucifixion, the Blessed Virgin, and a St. John. The screen has been cast by Mr. J. Nicholas, iron-founder, Newport, from full-sized drawings and under the supervision of Mr. E. A. Lansdowne, architect.

The Railway Bridges in the Metropolis. Works involving an improvement of an important character are said to be now in progress at the railway bridges and arches belonging to the several railway companies south of the Thames. The several bridges crossing over the various thoroughfares in Lambeth, Camberwell, Brixton, and other portions of South London, are now being covered above the footpaths with corrugated iron, to carry away the water. The South-Eastern Company's bridge crossing over the Thames Embankment, at Oving-cross, is also being similarly encased. An indictment against some of the companies is pending.

St. Michael's, Chester-square.—The Marquis of Westminster has laid the foundation stone of the new vicarage-house for St. Michael's, Chester-square. The house is being built in the Buckingham Palace-road, from designs of Mr. R. J. Withers, architect. The marquis gives the site and other assistance.

The Proposed New Schools, Oxford.—In a recent Convocation the decree was discussed which proposed to adopt the report of the delegacy recommending that new schools should be built on the Angel site, and the decree was carried by twenty-seven placets to four non-placets. It was stated by Professor Price during the debate that the probable cost would not exceed 40,000*l.*, and that the funds at the disposal of the University were able to bear that sum. A further decree should be appointed to procure a design and estimates to be submitted for the approval or disapproval of Convocation.

A Whole Family attacked by Typhoid Fever.—The family of Lady Caroline Haskell, sister of the late Earl of Kellie, and widow of the Rev. Joseph Haskell, have been attacked, at East Retford, Nottinghamshire, by typhoid fever of a very bad kind. Five of her ladyship's children were at once laid down, and one girl twelve years of age was quickly carried off. The others are now in a fair way of recovery. It is supposed that this fever arose from the town drains having been flooded and stopped, and then opened by the authorities without due precautions having been used.

The Electric Telegraph.—In connexion with an application to the Privy Council by Sir Charles Wheatstone for a prolongation of his patents on the electric telegraphs, it was stated that about 12,000*l.* had been paid to him out of the 177,000*l.* paid by the Government, and the sum of 7,000*l.* was in abeyance. An offer was made of 9,000*l.*, and, after a discussion, it was agreed that Sir Charles, in addition to the sum already paid, should receive, by payments, 9,200*l.* odd up to the year 1878, which should be deemed sufficient for his great invention.

Cumberland and Westmoreland Archaeological Society.—The first meeting for the year of this Society has been held at Kendal. The objects of the meeting were the visiting and inspecting of Kendal parish church, and hearing a paper upon it read by Mr. J. S. Crowther, architect; visiting Heversham Church and Hall, and Beetham Church and Hall, and hearing a paper on Beetham Church read by Mr. J. Bintley. The Rev. James Simpson, Kirky Stephen, was elected chairman. The Town-hall at Keudal was the rendezvous.

The Lyons Exhibition of 1872.—Complaints are made of the incomplete state of the International Exhibition at Lyons. The Paris artists altogether declined to send any of their works, being of opinion that the promoters did not offer sufficient guarantees that due care would be taken of pictures and statues. Several large German houses who asked for space were refused; but the two provinces lost to France are represented by a large number of exhibitors. Very few contributions appear to have been sent from Great Britain.

Druidical Decadence.—At the closing meeting of the "Annual Movable Delegation" of the Order of Druids, "Past Grand Master" Wood stated "that two-thirds of their lodges were insolvent, and he was prepared to prove it," and another delegate remarked that "every other Order was in the same position." This is a much more serious matter than many will think it. A proper inquiry should be instituted.

The Light of the Legislature.—The experiment of displaying a light on the clock tower of the New Palace at Westminster has been tried experimentally, and so far as could be judged, successfully. From the Athenaeum Club it appeared like a hybrid between a comet and a moon. It will soon become a familiar object in the metropolis.

Bethnal-green Branch Museum.—We mention with great gratification that his Royal Highness the Prince of Wales has communicated to the Lord President and the Vice-President of the Committee of Council on Education his intention of opening this National Museum on Monday, the 24th of June. The Prince will be accompanied by her Royal Highness the Princess of Wales.

Line of Front and the Metropolitan Board of Works.—Those who are interested in the determination of lines of front by the Board of Works, will find it useful to refer to a case recently decided in the Court of Chancery, Lord Auckland v. The Westminster District Board of Works. A full report will be found in the Times of May 30th.

"Condition of Sale."—The case of Torrance v. Bolton, just now decided in the Vice-Chancellor's Court, will probably be advertised for conviction that it is not safe to advertise property to be sold subject to conditions not in the printed particulars, but to be read in the auction room. In the case named the contract was cancelled, and the return of the deposit enforced, the buyer swearing that he had not heard certain statements read at the sale, and which affected the value of the property.

Charlton Kings Surveyorship.—Mr. Sadler having, in pursuance of the understanding upon which he was elected to the highway inspectorship of Cheltenham, resigned his appointment as surveyor of Charlton Kings, the Local Board of the latter place proceeded, at their meeting last week, to the election of his successor. Mr. J. Villar, jun., was the successful candidate.

TENDERS

For the erection of two malshouses, at Market Rasen, in the county of Lincoln, for Mr. Joseph Marriott. Mr. Charles Bailey, architect:—
 Pretwell & Mackenzie 4,275 0 0
 Huddleston 3,450 0 0
 Harrison 3,420 0 0
 Wallis (accepted) 3,250 0 0

For gasworks, West London District Schools, Ashford, Middlesex. Mr. H. H. Collins, architect; Mr. G. A. Berry, engineer. Quantities supplied by Messrs. Batstone & Hunt:—
 Veary & Sons 1,890 0 0
 Catter & Co. 8,815 0 0
 Porter & Co. 4,385 0 0
 May & Sons 3,350 0 0

For sundry works in the building of a pair of semi-detached houses, at Finchley, for Mr. James Sims. Mr. E. Shales, architect:—
 Patman & Fotheringham 4,579 0 0
 Kerry 899 0 0
 Anley 832 0 0
 Southcott & Widgery 730 0 0
 Slagg & Long 780 0 0
 Niblett & Son (accepted) 753 0 0

For the erection of girls' school, class-rooms, offices, teacher's residence, &c., at Sudbury, for the trustees of Girling's Charity. Mr. Salter, architect:—
 Elliston & Son 2,857 0 0
 Wanford 618 0 0

For school-room, class-room, &c.
 Grimwood & Sons (accepted) 320 0 0

For Teacher's Residence.
 Grimwood & Sons 257 0 0

For the erection of sixteen cottages, at Glensford, for Messrs. Kelle & Sons. Mr. Salter, architect:—
 Stevenson 42,570 0 0
 Grimwood & Sons 1,900 0 0
 Twinn & Son 1,580 0 0
 Adams & Debenham 1,362 0 0

For extension to Messrs. Phipps's Brewery, Northampton. Mr. R. Davison, architect. Quantities by Messrs. Curtis & Son:—
 Cosford 23,544 0 0
 Heshaw 3,260 0 0
 Smith 3,185 0 0
 Dunley (accepted) 2,940 0 0

For the granary, at Barking, for Mr. D. T. Ridley. Mr. Frank Whitmore, architect. Quantities supplied:—
 Holmes 21,696 0 0
 Crockett 1,449 0 0
 Brown 1,282 0 0
 Lacy & Torkington 1,269 0 0
 Kirk 1,180 0 0
 Mansbridge 1,154 0 0

For warehouse, at Poplar, for Mr. G. Burney. Mr. J. W. Morris, architect:—
 Harris & Waldrop 2,523 0 0
 Heiser 610 0 0
 Kilby 487 0 0
 Emor 488 0 0
 Linn 480 0 0
 Sall 476 12 0
 Sheffield 447 0 0
 Waits & Holland 445 0 0
 Tanner 439 10 0
 Atherton & Laits 435 0 0
 Abraham 419 0 0

For the erection of a gentleman's residence and stable buildings, at Hampstead. Messrs. Spalding & Knight, architects:—
 Peto, Brothers 22,939 0 0
 Patman & Fotheringham 4,769 0 0
 Jackson & Shaw 4,729 0 0
 Weeks, Bangs, & Co. 4,719 0 0
 Scrivenor & White 4,597 0 0
 Carter & Son 4,563 0 0
 Mann 4,559 0 0
 Stephenson 4,383 0 0

For coach-house and stable, Holmwood, Dorking. Mr. F. J. Dibble, architect:—
 Putney 4,124 0 0
 Lynn & Dudley 349 0 0
 Johnson 333 14 0
 Pledge 313 9 7

For infants' school, Falkland-road, Dorking. Mr. F. J. Dibble, architect:—
 Lynn & Dudley 2,690 0 0
 Clear 690 0 0
 Hamblin, Brothers 680 0 0
 Putney 653 0 0

For school and residence, at Ellen's-green, Ewhurst, Surrey. Mr. F. J. Dibble, architect:—
 Port (accepted) 2,563 8 0

For three new shops and houses, at Hampstead, for Mr. J. Colverhouse. Mr. W. Thompson, architect:—
 Brass 4,423 0 0
 Conder 4,359 0 0
 Nixon & Son 4,288 0 0
 Gammon & Sons 4,278 0 0
 Manley & Rogers 4,087 0 0
 Kelly, Brothers 3,983 0 0
 Newman & Mann 3,938 0 0
 Scrivenor & White 3,928 0 0
 Nightingale 3,873 0 0

For new laundry, at the St. George's Union Work-house, Kensington. Mr. H. Saxon Snell, architect:—
 Foster 21,856 0 0
 W. Howard 1,709 0 0
 Bridgman & Nuthall 1,557 0 0
 Manley & Rogers 1,527 0 0
 Gibson, Brothers 1,465 0 0
 Lathey, Brothers 1,459 0 0
 Simpson & Co. 1,455 0 0
 Wall 1,372 0 0
 Howard, Brothers 1,289 0 0

For Engineering Works and Fittings.
 Benham & Sons 1,245 0 0
 May 1,134 13 0
 Potter & Sons 874 0 0

For external painting, &c., at the Bethnal-green Work-house, for the Guardians of Bethnal-green. Mr. Williams Mundy, architect:—
 Cailet & Co. 6,669 0 0
 Thomerson 620 0 0
 Moore 595 0 0
 Thorpe 594 18 6
 Gribble 594 18 6
 Hocking, Brothers 457 0 0
 Blackmore & Morley 482 0 0
 Gough 459 0 0
 King & Son 449 0 0
 Young & Son 410 0 0
 Lovell & Co. (accepted) 398 0 0
 Richards 330 0 0

For villa residence, at Chislehurst, for Mr. J. L. Morgan. Messrs. Habershon & Pite, architects:—
 Carratt 21,897 0 0
 Moore 1,867 0 0
 Gumball 1,640 0 0
 Grover 1,625 0 0
 Cary & Co. 1,497 0 0
 Forrest 1,494 0 0
 Boden 1,463 0 0
 Prosser & Sons 1,430 0 0
 Blackmore & Co. 1,398 10 0
 Whiting 1,392 0 0
 Willis 1,344 0 0

For villas, Gold Tops, Newport. Messrs. G. Habershon, Pite, & Fawcaker, architects:—
 No. 1. No. 2.
 Weeds 21,330 21,356
 Miles 1,120 1,225
 Bewler 1,118 1,239
 Deakin & Sons 1,118 1,250
 Bearfield 1,115 1,200
 Linton 1,100 1,200
 Whitaker 1,107 1,100
 Richards 1,095 1,184
 Hasell 988 1,054

For villa residence, at Sydenham, for General Bayly. Mr. John Norton, architect:—
 Moore & Granger 24,940 0 0
 Bless 4,129 0 0
 Ward 4,390 0 0
 Aitchison & Walker 4,139 0 0
 Strepson 4,102 0 0
 Mansbridge 3,995 0 0
 Lovell 3,993 0 0
 Newton & Co. 3,870 0 0
 Crook & Wall 3,759 0 0
 Gooding 3,750 0 0
 Wright, Brothers, & Goodchild 3,695 0 0
 Gough 3,640 0 0
 Waterson 3,610 0 0
 Hedgeson 3,605 0 0
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The Builder.

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General Conference of Architects.

ON Monday evening last the closing meeting of the session of the Royal Institute of British Architects was made the opening meeting of the Conference: *Le Roi est mort! Vive le Roi!* or, as the President, Mr. T. H. Wyatt, put it, on taking the chair, "The Institute is closed: long live the Conference!" The meeting was numerously attended, and included delegates from the various architectural societies mentioned in our last issue. A member of the Austrian Delegation attended the President the Royal Gold Medal for 1871-72, awarded to Herr Ober-Baurath Professor Friedrich Schmidt, of Vienna. The Sonne Medalion, the Institute Silver Medals, and other prizes awarded were also presented by the President to the various gentlemen whose names we have already printed.

The President then proceeded to open the General Conference, by delivering the following Address.

Let me begin the few words I have to offer by reminding you that the Conference is repeated this year in order to bring up the Reports of the several committees appointed at our meeting of last year; but for the future it is proposed that these Conferences shall only take place biennially. The main difference between the programme of last year and the present is this, that in 1871 it extended over a wider field, and embraced more subjects. Five papers were announced for each meeting, but this was found to leave too little time for discussion, and our bill of fare this year will be less pretentious. The attention of the Conference last year was divided between architecture as an art and as a profession. The first elicited several interesting papers; but the latter resulted in some important resolutions, the offspring of which are the reports we have this year to consider, and which will necessarily give a drier and more business-like character to our meeting.

When I had the honour last year of welcoming you to London, in the name of the Royal Institute of British Architects, those members of the profession practising in the provinces who were not actually associated with this Institute, but whom we were anxious to bring into council with us on matters deeply interesting to our profession (and, let me add, hardly less so to the public), I felt it my duty to lay before you, at the first meeting, some of those points which seemed most important and pressing, and on which unanimity of practice was most desirable. The principal ones were, I think, subsequently discussed and considered in a careful and dispassionate spirit; and I venture to believe you will find that the three subjects which were then delegated to the consideration of separate committees have received their full care and consideration at the hands of the gentlemen forming those committees, though their labours have been so succinctly alluded to in one of the professional papers. Whether the various suggestions contained in those reports be generally accepted or not, of this I am quite certain, that the whole body of our profession

stands deeply indebted to the gentlemen forming these committees (and especially to those who acted as the secretaries) for the great amount of time and labour bestowed on these subjects.

Gentlemen, these reports will be officially submitted to you to-morrow and Wednesday for consideration and discussion, so as, in the words of your own resolution of last year, "to ensure (as far as practicable) the greatest unanimity of action and opinion amongst the whole body of professional men in the United Kingdom." On one of these subjects (viz., on the employment of surveyors) considerable difference of opinion will be found to exist, and to such an extent that the Council did not feel able formally to adopt this report. It, therefore, will come before you as the suggestions of the committee. Whether, on further discussion, this matter may be put on such a basis as to ensure something like uniformity of practice, or whether it had better be left to the individual action of members, remains to be seen. Happily, it is one involving no question of professional honour or etiquette; so that each architect may remain at liberty to adopt that course which under the special circumstances of his own case, he may think most conducive to the interests of his client.

The committee have, I believe, adopted the only practical course that was open to them. They have sought the opinions of large numbers of their professional brethren, and these opinions (bound together and now lying on the table) form a most bewildering mass of evidence, hardly less so than that recently laid before the public in the case of a celebrated Claimant. The secretaries (failing to find those tattoo marks which might throw clear light on the subject) have had to analyse and classify these conflicting views as far as possible, and upon the preponderance of those opinions, to a great extent have been based the reports. Many of the replies to these inquiries have been most considerate and suggestive, expressing readiness to act upon the views expressed by the majority at this Conference; one or two, on the other hand, dealing with the subjects on which their views were asked in a very selfish and opinionated manner, declining to be bound by the views of any majority, and threatening resignation if it was proposed that their views and practice were not to be sanctioned! I should wish these gentlemen to consider how they can reconcile such independence of action with the attainment of that *esprit de corps* which it is acknowledged on all hands is so much wanting in our profession.

Gentlemen, I have but to urge that we shall enter on these discussions with as much abnegation of self and individual prejudices as human nature is capable of; that we shall respect the opinions of others, though we may differ from them, and that we should not fail to remember how many difficulties architects practising in the provinces have to contend with, and in some instances how impracticable they may find it to assimilate their practice in all particulars to ours in the metropolis.

Nor is this all. We must remember that we have to deal with a public, who will be too ready to resent and resist any rules of practice or professional etiquette which are not based on honourable and equitable conditions. We live in days of energetic and constant competition; an incessant professional struggle, when there are almost as many architects as clients, and when in this (so-called) land of liberty every man is free to employ whom he fancies, be he builder, bricklayer, or architect; and being thus free is not likely to allow himself to be bound by professional rules which he considers one-sided, and which he will repudiate as a sort of "trade-union rule" to be resisted at all costs. A recent case, tried at Durlin, bears strongly on this view, and shows how ready the public (and the clergy not the least so) are to dispute professional customs and charges; but to my mind, the conflicting evidence given by architects at that trial was not the least painful part of the proceeding.

Since we attempted last year our first Conference, the American architects have held their fifth Congress; and with a "go-ahead" rapidity and energy which belong to that nation, but which, in spite of the gratuitous advice so freely given, I venture to think we shall do well not to attempt to imitate. Their Congress began at three o'clock in the afternoon of the 14th of November, and by the following evening they had read and discussed no less than twelve reports from the six chapters and committees of their Institute. They had an annual opening address from the president; three closing addresses from the presidents of Harvard

College, the Institute of Technology, and the late master of the Leeds School of Art; two other practical papers; sundry discussions, and general Institute business.

The conditions under which we should start in such a race of swiftness are thus described in a professional journal—"Bound down by the swaddling bands of red tape, impeded by precedent, choked by apologies and compliments, blinded by the dust of prejudice, and deafened by the monotonous buzz of self-gratulation, the architects of England have grown to be wearisome to the public." Thus weighted, gentlemen, how could we compete in such a contest: better far to assume at once the rôle of the tortoise, than attempt that of the hare.

I venture to believe that the American architects have found the question of competition quite as difficult to deal with as we may, and in the words of one writing on this subject, "it will be found that in the New World as in the Old, competition is attended by selfishness, jobbery, and iniquity." The most useful result of the American meeting will, I think, be found in the discussion on fire-proof construction, and in their recommendation "of thick solid walls, solid constructions in floors and partitions, brick or artificial stone rather than granites, lime stones or sand stones, and oak posts, rather than iron or stone columns."

Gentlemen, we do not meet under the brightest conditions: our profession seems as it were to be under a cloud, to be affected by some unknown influences as the weather has lately been by atmospheric ones: violently assailed both in the leading periodical of the country and in the most influential of the daily journals: we have in addition members of our own profession publicly joining in this unjust crusade, and indulging in personalities of a most painful and uncalled for nature; and, though last, not least, we seem about to have revived a sort of "battle of the styles," a feud which I at least had hoped was buried with that of the gauges. Whilst I think it would not be very difficult to show how unjust are many of the charges made in the former, how unsound its reasonings, or how impracticable its suggestions; or to find a motive for the animus displayed in the latter; it will be well for us to consider calmly why at this particular moment such a storm should burst over our heads, and why the works of British architects, which certainly are not thus discreditably esteemed on the Continent, should be so abused in England! Is it to be attributed to the defective professional education of the English architect; to the want of examinations and a diploma to practise as in the legal and medical professions? or to a higher standard of public taste, requiring works of a higher class and purer taste? I doubt if to either of these causes is due the existing state of things; but if education is defective, that I think will soon be changed, for I believe there are abundant means now within the reach of the diligent student in architecture, not only with reference to the study of the true principles of all design, but to the artistic and constructive parts of his profession.

I have great doubts whether the diploma could now be realised for our profession, and certainly I do not believe as yet in the great advance of public taste, or we should not see such monstrosities as now find favour and approval; but supposing the professional studies of young architects have much to be desired, what shall we say of the defective taste and information of the self-constituted architectural critics, who sometimes take the world by storm through the vehemence of their assertion, and the self-complacency of their dogmatism? This species of criticism by wholesale has lately been indulged in an annoying manner by the author of the article to which I have already alluded. I hardly know whether to compare the writer's assumption to the discovery of a mare's nest, or to the announcement of those quack doctors whose sole notion of argument is the indiscriminate abuse of the whole medical profession. The writer assumes that modern architecture is bad because it is the work of professional architects who make designs but do not execute them with their own hands, or under their constant personal superintendence as master masons or builders, and he fancies that the works of the Greek and Medieval designers were successful because there was with them no such distinction between the authors of the design and the persons who carried them out. Under our system he thinks there can be none of that real loving devotion to architectural fitness and beauty which he discerns (and correctly) in the works

of the Greeks and of the Middle Ages; but really this distinction between past and present customs is a quibble upon words, or, as has been well said of this article in a celebrated weekly paper;—"an analysis of the strange confusion of accredited criticisms and of original sophisms, pertly dished up as novelties." There is nothing but an increase in the division of labour such as has taken place in other branches of art and industry, rendered necessary to a great degree by the altered conditions of society, and by the undue haste with which everything must now-a-days be realised,—no time given for study or correction. If the details of our modern work are poor and weak (which is assuredly not always the case), it is not because the designer was not also a handicraftsman, but because he is a poor artist; and if the actual mason works like a carving machine, it is not because he works under a builder who is not the author of the drawings given to him, but because he wants the genuine artistic spirit; because he is fettered by trade-union rules, seeking to do the least possible amount of work for his day's pay, and that in the most careless and heartless way.

It would be as unreasonable to pretend that English painting is inferior to that of Raffaele and Titian, because English painters buy their colours ready made up from the dealers, whilst the great Italian painters had them ground up in their own studios, and under their own eyes. If we fail it is not, I repeat, because we are architects only and not builders, masons, or carpenters, but because our training has not been complete in the study of those fundamental ideas of proportion, harmony and truth of construction which underlie all the great buildings of the past, whether of Greece or Rome, of the Middle Ages, or of the Renaissance itself; and because we are not aided by the public as our employers in the exercise of such patience on their part as would ensure greater thought and study in the works they seek at our hands. There are few present, I feel sure, who have not felt this want; it is not in private practice alone, in works freely and individually given to our care, that there is this want of consideration. In Government and public competitions, it seems essential to secure the designs asked for with the least possible expenditure of time; and, as a natural consequence, with the least amount of thought and study, and without regard to the demands which our other professional engagements have upon our time. I am not clear that there is much consolation to be derived from sharing disgrace with others, but if there is, then must our suffering be much diluted for engineers, sculptors, dilettante, and connoisseurs, all come in for the general abuse so lavishly spread about by this writer. These gentlemen are, however, well able to take care of themselves, and I can only hope that the observations made for their benefit may have a more practically beneficial effect than those made upon our profession are likely to have.

I for one have good faith in the future of our profession; even now I believe that in the calm opinion of the educated and travelled public its status is held in fair and favourable esteem; the works of its leading members allowed to hold their own in European estimation, and the honour and character of the general body to be unquestioned. I think it rests with us to live down this small of prejudice; I believe that the violent and personal language now so freely indulged in by the literary and professional critic does not carry conviction with it, and though exciting or amusing at the moment, is not to the taste of those whose opinion or influence is of real value; but of this there can be no doubt that the violent personal attacks and criticisms now so often made by architects on the works of their professional brethren, are generally condemned: where is such abuse thus publicly attempted in any other profession and how would it be tolerated?

At the close of the address a cordial vote of thanks to the President, on the motion of Professor Kerr, seconded by Mr. Street, was carried unanimously.

Professional Charges.

The first sitting of the Conference for practical business, which took place at 1:30 on Tuesday, was, according to the programme, to have been occupied by the discussion of two very important subjects, professional charges and the employment of surveyors. As might have been expected, however, the former topic furnished full occupation for the whole of the available time, and

the latter was necessarily adjourned. The main object of the meeting, so far as the former subject was concerned, being to discuss the revised form of the schedule of professional charges and practice, first issued by the Instituto in 1862, the Chairman (the president of the Instituto) commenced the proceedings by reading over the resolution at the last Conference, dated May 26, 1871, referring the various questions connected with professional charges to the professional practice committee of the Instituto, with certain additional names, whose report, when sanctioned by the council and confirmed by a special general meeting of the Instituto, should be discussed at the next general Conference.

The Chairman subsequently read a letter from Mr. C. F. Hayward strongly deprecating any interference with the Instituto schedule as previously drawn up, on the ground that to change the rules and practices then agreed to, after they had been only ten years in operation, would argue a want of confidence in themselves and would be prejudicial to the Instituto and the profession at large. The previous intention had been, he said, only to revise the old schedule by appending notes to it, not by printing an entirely new one. Another letter was read from Mr. Jolly, of Derby, who went at some length into the disadvantages resulting from the present status of the profession, in being open to all who chose to take it up, and urged that it should be put on the same level as the medical and legal professions, and no one be permitted to call himself architect or practise as such who had not passed a formal examination. Some amusement was caused by the writer's wholesale propositions for the well-being of the profession, one of which was "to abolish all provincial societies," which by their local variations of practice prevented all possibility of united action. It would have been a better way to put it, to have urged that all such societies should be requested to connect themselves with the Instituto and adopt one general rule of practice; but the obstacle named by Mr. Jolly is certainly a serious one. These letters having been read, Mr. Godwin, referring to Mr. Hayward's communication, hoped that the meeting would fully consider the point raised therein before committing themselves to the idea of an entirely new schedule; the other schedule had worked very well for ten years, and it was a very hazardous step to rescind their resolutions and replace them by others at so comparatively early a date. Professor Lewis defended the consideration of the new schedule; and after some conversation it was resolved to proceed with it, viewing it, as in fact, simply a revision of the existing schedule.

A long and careful discussion of the various clauses was then gone into, in which, besides those already named, the following and other gentlemen took part:—Mr. Edmeston, Mr. S. Matthews, Mr. Hine, Mr. Street, Mr. H. H. Statham, Professor Kerr, Mr. Oliver, Mr. C. Fowler, Mr. Panson, Mr. Roger Smith, Mr. Waterhouse, Mr. Aitchison, Mr. Fogarty, and Mr. W. Burges.

We have before us a report of the discussion, but as this meeting was regarded as private, and properly so, as it seems to me, we will simply add that, before separating, attention was drawn to the fact that, in the new schedule, all reference to charges for the over-seeing and laying out of estates was omitted, although in that of 1862 there had been special clauses referring to this branch of work. Professor Lewis explained that as the usual terms for this work were contained in recognised auctioneers' scales of charges, it was considered unnecessary to embody them in a strictly professional scale like the one under consideration, as this was not necessarily architect's work. On the motion of Mr. Edmeston, however, it was decided that the question of the retention or omission of these clauses in the 1862 scale should be considered at the adjourned meeting, which was fixed for twelve o'clock on this Friday. Hereafter we will print the revised schedule for general guidance.

Visit to the British Museum.

At half-past two on Tuesday morning, in spite of very bad weather, there was a fair concourse of visitors at the Museum, to hear what Mr. Newton had to say in regard to the interesting fragments from the Temple of Ephesus, of which the investigations of Mr. Wood have put us in possession, and which have been already referred to, with illustrations, in our columns. The fragments at present in the Museum consist chiefly of an Ionic base, part of a volute capital, a large block with sculptured figures, and numerous small pieces of base moulds, bead and reel ornaments, &c. The general nature of the site, and the amount of excavation already undertaken, were indicated by a coloured tracing exhibited by Mr. Newton. On this the supposed outline of the temple plan has been indicated, so far as can be judged by two of the bases already found. Another base has not yet been communicated, so as to be placed on the plan, it was not possible to say how far it would confirm or negative the assumed position and extent of the plan. The portion of fluted base-mould shown gives a very large scale to the building. The fluting is in very good preservation on what has been the under side of the member. The upper side is much worn, and the profile nearly destroyed. The most interesting of the relics at present in the Museum is, however, the sculptured fragment referred to, which is conjectured to be a portion of one of the "columns ornamented with sculpture" mentioned by contemporary historians as existing in the temple. The block is about the same diameter as the base-mould here mentioned, or would be if its diameter were complete, and is circular in general form, with parts of life-size, and draped figures on it, in low relief. Whether, if this be really part of a column, it is the base or the upper portion; whether the sculpture was continued all up the column, or whether grouped at the head or foot of it, there are as yet scarcely data even for conjecturing. If the former, it was such a treatment as certainly could only be found in Asiatic Greek architecture; if the latter, Mr. G. G. Scott may find an unexpected precedent for the small groups of figures at the base of the window-shafts in the St. Pancras Hotel, which have been a good deal criticised. Several smaller base members of columns (perhaps belonging to the internal colonnade) have well-marked, sharply-cut inscriptions on them, evidently forming part of a general scheme. There are distinct marks of colour on many of the fragments, chiefly a reddish tone; but on one hit of ornaments sculpture blue is clearly discernible. It would appear, so far as can be discerned, that the colour had been applied with considerable minuteness of detail in bringing out the smaller features and fillets of the carving. All who have seen these specimens will look with interest for the result of further investigation. Mr. Watkiss Lloyd was present, and gave some additional information; but, owing to the confined space, it was impossible for all present to benefit by his remarks.

In replying to a vote of thanks to Mr. Newton proposed by Mr. Waterhouse, Mr. Newton observed that it was of importance to obtain an opinion to make public the opinion of qualified judges as to the value of these fragments, and the desirability of continuing the investigations, as it would only be in the event of the Government being fully persuaded on this head that any material assistance could be obtained towards continuing the investigations on a larger scale. Upon this it was moved by Mr. Cates that Mr. Waterhouse as a member of the council of the Instituto of British Architects, should be requested to bring the subject before them, with the view of their ultimately memorialising Government in regard to it; a proposition which met with the approval of all present. Some of the party subsequently went over the Assyrian and Egyptian collection in the Museum.

Modern Ecclesiastical Architecture in Scotland.

The sectional meeting on Architectural Art held at eight o'clock on Wednesday evening (St. M. Digby Wyatt in the chair), did not in reality include very much that bore directly upon art. Most of the evening was taken up with the discussion of the competition question. Previously however, to this discussion, a short and well-written paper was read by Mr. Honeyman, of Glasgow, on the subject of modern ecclesiastical architecture in Scotland, and in Glasgow more particularly; the subject having been suggested to the author by a member of the Instituto when on a visit to Glasgow. Mr. Honeyman gave a concise sketch of the ecclesiastical "situation" in Scotland, as influencing the development of the architecture of her churches, observing that the rigorous nature of the Reformation under Knox had led at the time to the demolition of Mediaeval churches to a great extent, and left open a wide field for rebuilding, and that it was probably to the connection of Mediaeval architecture, in the minds of the Scottish people, with the abhorred Papal worship

and rule, that a good deal of the preference for classic architecture in their churches might be traced. There were two large bodies, independent of the Episcopal Church, in Scotland—the Free Presbyterian and the United Presbyterian; the former having been an offshoot or secession from the latter as late as 1843; and the fact of this secession had given a great impulse to the building of places of worship. Until a comparatively recent period, church architecture in Scotland since the Reformation had scarcely had an existence in an artistic sense, partly owing to the ideas inculcated at the Reformation, but also to the fact that the building and repairing of the churches rested with the heritors, or landed proprietors of the district, and not with the people at large; and they executed their task generally as cheaply as possible. One or two sketches of the typical Scottish Presbyterian Church of last century afforded some amusement by the very unmistakable illustration they afforded on this point; and even a good deal later than this things were in such a state that there was record of a competition for the old College Church at Glasgow by two joiners, one of whom was said to have been assisted by "an itinerant London architect." The first specimen of anything that could be called architectural Gothic was a church erected by Rickman in 1825. In the present day the state of feeling was very different; the Free Presbyterian Church had no scruple about introducing any amount of ornament into their churches, and were desirous to render them architecturally beautiful; but in looking at the designs of these edifices, English architects must remember that the requirements and the principle on which the service was carried on were perfectly distinct from those which prevailed in the Episcopal churches of England. There was no special sanctity attached to any part of the edifice, or, indeed, to the edifice as a whole, except during the time of actual service; and, as the prayers were extempore as well as the sermon, the church was, in fact, an auditorium, in which the pulpit was the central and principal object. Generally an assembly-room for meetings was attached to the church, as well as retiring-rooms, waiting-rooms, &c. Mr. Honeyman then called attention to photographs and drawings of some modern Scottish churches, conspicuous among which were some of those by Mr. Thompson, of Glasgow, particularly St. George's Free Church and Queen's Park United Presbyterian Church. The former is remarkable for much originality of treatment in the modification of Greek architecture which the architect has made his own; the interior, it was stated, was entirely lined with yellow pine, no plaster being employed, and decorated in colour on the natural tint of the wood as a ground. The Queen's Park Church, less original and striking in detail, is an admirable composition as a whole, and a completely legitimate application of Greek architecture to modern building; the pediment in particular being really the finish of the slope of the roof behind it, and not, as in many cases of modern so-called Greek architecture, a mere mask to a roof of different outline and construction.

A domed church on a Greek cross plan, by Mr. Bushell, was among the buildings illustrated, and appeared a very good composition; but the acoustic effect internally had not proved very satisfactory. Some of the Gothic designs exhibited, including one or two by the author of the paper, possessed no ordinary merit and originality;—the omission of the chancel (which is not required by the Presbyterian ritual) giving also a certain novelty of effect.*

Mr. Street, in moving a vote of thanks to Mr. Honeyman for his paper, thought that as the Presbyterian churches were in reality halls of meeting, not churches in the commonly accepted sense of the word, the Scottish architects would take the best course in discarding the idea of a Mediaeval church altogether, and accepting openly the fact (which appears to have been done in some instances) that they were halls, and treating them as such. He also observed that there were still many interesting remains of Mediaeval architecture in Scotland, which were quite as interesting and valuable as those in England, but had not received the attention and study they merited from English architects. Professor Kerr seconded the vote of thanks, which was cordially endorsed by all present.

The meeting then proceeded to the discussion of conditions for regulating architectural competitions. The proceedings did not close till a late hour, and we must defer comment on this subject till our next.

"ARCHITECTURE" AND ITS MODERN CRITICS.*

We are forced to omit the lengthened and remarkable display of historical lore commencing at p. 314 of *The Scavengerian*, devoted to expansion of the subject. It will, perhaps, be sufficient to give the concluding summary of this division of the theme.

Thus we have only to regard the early stirrings of the art faculty,—shown in our barbarous ancestors, on engraved bones, to be seen in the Christy Collection and elsewhere,—and manifested by the youth of our own days (not yet "educated" in "art-schools") on barn-doors and, in less rural localities, on the portals of houses or the surfaces of pavements; and we are irresistibly forced to the conclusion that such acts were, and are, the outcome of delight in the wholesome exercise of natural powers. The carving of a savage's club or boomerang, the war-paint and trappings of the Red Indian, the tattoo,—all indicate the early uncorrupted tendencies of our race, and the same sense of keen enjoyment. Traced through the ages and all the stages of civilisation, the signs are equally interesting, and full-fraught with meaning to the apprehensive eye and mind. It is not till we arrive at a certain period, in the month of April, A.D. 1572, 14 Reg. Eliz. (three centuries ago), that we detect a sudden and apparently complete destruction of one of the most valuable gifts that humanity had inherited with existence. Then was irremediably choked at its source the healthy spring of pleasure that, with minds innocent and pleasant, creviche, had, as by lubrication, seemed to exorcise many of the difficulties of, and eventually to render delightful, even the most prosaic toils. Nature is bountiful to us no more in this regard. Nemesis has visited us to avenge our acts; and in every instance, as soon as the blighting influence of knowledge begins to destroy the earliest teachings of nature, in artificially training the huddling growths, there vanishes for ever the possibility of true satisfaction and happy content. These were, in happier days, the accompaniment of all honest labour, proportioned always to the nature of each man; but (to start a new simile) the bright blue sky has long been covered with a leaden lining. The world has become a dreary prison-house, in which all are performing, under the constraint of fear of retributive hunger, their miserable prison tasks. The use, in order to pain our fellows, of the sharpest goods that our skill and means can devise, is the only satisfaction reserved for the most honest hearts and cheerful minds,—in this woe-begone time of fearfully imperfect digestion, and of alternating madness and idocy. The moral appetite and palate have both become incapable of conveying sensation. In every occupation, in every art,—in that of building especially,—sheer weariness, despondency, and despair are the lot of all those who direct and those who work.

It may be here remarked that, in our profatory general view of the present condition of the world, we did not characterise the "engineering profession." This is accounted for by its close relation with that of architecture, amounting at times to absolute identity. Every mind, not quite disabled by the paralysing strokes of worthless modern wisdom, will perceive that we have intended and put no limit to our remarks. What has been said of architects might be applied word for word to engineers. The Menai and London bridges, created before the beginning of the baleful existence of "celebrated engineers," are "two of the most simple, dignified, and noble buildings in the world." In modern times, however, here, as elsewhere, things have changed; and this "profession," with its experiments, its blunders, and its imperfect intelligence,—is another Old Man of the Sea, seated amid an ever-increasing group of similar monsters on the broad shoulders of the most patient of modern Suddads. How purely unnecessary is this part of our poor country's load will appear from the simple statement that, with sufficient intelligence in workmen (or

others), we should by this time have had, besides other desirable things, a perfectly-developed system of judiciously-constructed lines of railway. Though of course open to some debate, it will probably be admitted by a sufficient majority, temporarily disentangling their minds from prejudice, that all which can be needed is the will and the power to act wisely.

But we must return, and complete the reasoning on which we have based our demand for the abolition of the architectural "profession." The happy personal results to be expected by employers have been shown; let us devote a few words to the certain effects on the buildings—in respect especially of a prevalent longing for vulgar display in certain sections of society. This is always hailed with acclaims, and heartily pandered to in architecture and other things by the whole body of "eminent" persons, who exhibit a sheer depravity—the more intense and hopeless in proportion to their "celebrity,"—compounded of imbecility and craven compliance, mingled with simious imitation and base-minded sympathy. The occasional yielding of the merely weak-kneed to dictation may be passed over, as less pernicious and less frequent than the willing accord of corrupted heart and mind. How clear that any workman would war successfully against influences to which members of "the profession" have naturally succumbed. An expression of refined luxury, combined with a certain sustained *hauteur*, redeemed from utter imposture and failure some of the works of the wildest French Renaissance, and similarly qualified praise might even be accorded to an occasional sumptuous (or even panderful) English building, deriving its gay splendour from an architect,—in the memory of every one a few years, at least, deceased. But though thus sparing judicious eulogy, we cannot give way to the loud demand for exact, rigid justice for contemporaries. It is better to temper justice with mercy, and only to deplore the universal constant sinking deeper and deeper in painful incapacity and uniformly grievous degradation. . . . Such works as "the Travellers' Club and the San Fire Office—the most beautiful work in Europe of its style and dimensions"—may, for the sake of contrast, be cited as specimens of what has been effected under happy auspices, where no single will controlled absolutely, and consequently marred, the whole and each part. The unity and variety,—the expression of well-hred grace, and its pure intelligent smile,—that we see there, resulted from the control of both general design and detail by the individual workman, and the entire absence of the smooth-handed men belonging to "a mock—we had almost said a spurious—profession."*

We do not feel called upon to deny ourselves the pure satisfaction of commenting on some recent, unfortunately somewhat singular, appearances in Jupiter and some of its satellites. Therefrom with Sidrophelic art we divine with confidence the existence of ill-conditioned masses of matter. Judging from the most coherent samples yet obtained,—much of the remainder, described in language of suitable piquancy, might obtain the attention it deserves. A surprising hereditary strain of feeling and utterance may be noted. In the "Contrasts" of to-day are signs of the deep draughts of inspiration from older sources. It is pleasing to recognise a kindred spirit,—for whom also let us hope the *debris* of Ishmael's conflict may serve as scaling ladders to reach and to occupy a place in the Temple of Fame. We must not be understood to make accusations of plagiarism or imitation. We all are imitators of a far older original. We, at least, are not unaware that historic renown—the repute that comes of an ancient origin or sanction—predisposes every one to a special consideration. We appeal then to the great father of Grecian song and his glorious roll-call of names. He has evoked, from out the historic mists, heroes who are, more thoroughly than any autobiographical personages, types of human character. Types discriminated with consummate art, but still possessing all the manlike passions,—not desiccated mummies deprived of the motions of the spirit and of the warm life-blood of humanity,—distinctions made more obvious by the withdrawal of what is common to all mankind. Among that goodly

* The most extraordinary of all the designs shown was one of a Classic church, the sides of which were formed by a colonnade, with plate glass between the columns, so as to leave the latter equally visible from inside and out,—a new, but scarcely a happy idea.

* But an imputation of want of genuineness of "professional" character might be misinterpreted as a covert recognition of similitude, with reference to architecture, which cannot happen while the word "mock" is kept to.

* See p. 440, ante.

pretension, the desire of mere display,—or a scanty, heartless, perfunctory,—instead of “a constant, careful, in a sense almost affectionate, performance of allotted tasks.” The honourableness and pleasureableness of all thorough handicraft and other work being taught and accepted, not as mere verbiage with mental reservations, but as a hearty universal belief and rule of action; as a consequence there must be for every man “a life of real work,—true, grateful, ennobling, and refined.” All anomalies, social difficulties, and dangers, and personal imperfections done away.—art is not an occasional utterance, with struggling articulation, but spontaneous and univocal; not the babbling of children, but natural eloquence streaming from the mind, and, in the technic arts, from the hand of man. . . . Having thus made pretty ample provision in most directions, and regarding such handiwork with some satisfaction, we are led to take one glance at that outer world from which we retired, and at the building-art that had ere while occupied us. . . . There we see at once that the refusal of commissions, by the most distinguished architects, could not seriously be expected; nor that they should attempt in any other way to limit their undertakings to what their own powers can properly originate, inspire, and direct. We even so that, if they puzzled the ordinary public by omitting to outrun, and at times to jostle, their fellows, their conduct could only proceed from a chivalry for the weaker, which would be wholly out of proper course, and in effect thoroughly pernicious. For who should thus dare to deprive the world of an object of reverence? Can any such sentiment be truly felt for a giant who has no lusty overplus of life within, prompting him to deal out a little death around him? . . . We are, therefore, of opinion that the simplest and shortest course will be to entirely remodel existing human nature, and to reconstruct society from the foundation, both on its spiritual and material sides. On looking back we cannot but be satisfied to find that not less than forty pages have been required for an adequate expression of this fundamental truth.

But we must stop. Curious persons may, we are told, find much matter of equal importance on reference to the original source. As our space is exhausted, we are forced to refer the anxious reader thereto. Our correspondent makes the following eulogic note:—“If not particularly new, it would be a pity that at least one or two of the underlying ideas of some of this should ever become antiquated and forgotten.”

NOTES ON PICTURES

IN THE INTERNATIONAL EXHIBITION.

We pointed out last year that an attempt to make the fine-art department of this exhibition an annual display must prove a failure, so far as any illustration of the art-progress of various nations is concerned, as it was impossible that a sufficient number of works of a high order could be supplied annually to fill these long galleries; and the attempt must degenerate into merely covering the walls with so many square yards of painting, begged or borrowed from any quarter which could supply the material. The present year's exhibition entirely confirms our prediction,—at all events, as regards the English school. There was too much even last year of mere wall-covering; and in the present collection not only are the majority of works of an old date and style, not representing the present state of the art, but too large a number of these are of very mediocre merit. The fact seems to be that the public will not attend, in sufficient numbers to pay for the undertaking, unless there are pictures to look at, and therefore pictures there must be, of some sort. It would be wrong to say that even in the collection now in the English gallery there are not works of real merit and interest, which are none the worse for being, some of them, old favourites; but the general impression is that anything which is not much valued by the painter or the purchaser, and which is in the way in the studio or the drawing-room, finds a resting-place in “Gallery No. VI.” of the Kensington building. This is not very satisfactory, in any point of view.

The most important new work in this gallery is the study, by Mr. Leighton, of a design to be executed on a larger scale in the Kensington Museum, representing “The Arts applied to War” (137). The painter has chosen to repre-

sent Mediaeval arts and arms. The composition shows a crowd of figures engaged in offering, inspecting, or trying on weapons of offence or defence, the right half of the picture being devoted to the former, while the left is occupied by figures trying on armour, spurs, and other accoutrements, and in the foreground by a group of women seated and engaged in the manufacture of “gentle armour,” not exactly of the kind which Leigh Hunt's knight wore, but presumably banners and scarfs. The background is formed by a composition of Gothic,—very Gothic,—architecture, of a nondescript, heavy, castellated description, capable of improvement. Through the slight gap which divides the two crowds of figures, we see through an open archway an indication of some of the pomp and circumstance of war in progress. As a composition, this is quite worthy of the artist's name: the manner in which all the numerous figures are discriminated in attitude and action, without confusion, and in apparently the most natural manner possible, must be the result of no little thought. Some of the single figures are admirable: we notice especially the youth on the left, supporting himself with one hand against a column, as he raises his foot to have the spur fitted. Why the Mediaeval period and costume should be selected for a building so completely modern in every sense as the Kensington Museum it would be hard to say; nor why the manufacture of Armour and Knapp guns should not afford as good a field for the painter's art as that of breast-plates and swords. Possibly, we are to infer that war is a thing fit only for a semi-barbarous age, and no worthy object of modern art and industry. If so, we thank the painter for the hint, and concur with our whole soul. Reverting to the other pictures (the majority lent by owners), we notice Mr. Spencer Stanhope's “Juliet and the Nurse” (28), painted some little time since, as one of the best and least mannered and conventional works of this disciple of Rosetti; very powerful in its contrasts of light and shadows, but a singular instance of the inability of this mystical school of painting to realise such ordinary flesh-and-blood people as the characters of Shakspeare: the figures here look like a thoughtful old abbess and a young nun; that of the nurse is the direct opposite of the vulgar, garrulous, scarcely decorous old woman we are familiar with in the play. Armstrong's “Summer Evening” (35; lent by Mr. Leighton), is an admirable little study of a single figure against a background of dark trees, an excellent typical instance of the flat, thin, conventional execution of a school which numbers some of our most original artists. Mr. Watts's “Daphne” (66) has been so much retouched as to come out with a new effect; in particular the articulation of the knees is more fully indicated, and the figure has less of that look of stiffness and conventionality which impressed us when it was shown at the Academy, and was somewhat overpraised by the artist's friends. Sant's “Mlle. de Bunsen” (79) still vindicates itself as a charming specimen of a natural and graceful portrait. Raven's “Midsummer Moonlight” (86), and the late L. R. Mignot's “Hoar Frost, Richmond” (92), are fine specimens of what may be called a somewhat scenic illustration of nature. A finer class of work is the little one by Mr. H. Moore (we think new), “Winter Evening” (139), a view over a cold grey sea, with a snowstorm coming up on the horizon: this is a notable little work, full of originality. Mr. Marks's “Plea for Education and Employment: Portraits of the same Boys before and after Training in the *Chilchester*” (208), is an instance of the use of painting to subscribe a “moral end”; but it hardly furnishes denial to the theory that moral teaching cannot be the primary end of art; the picture has been most carefully painted, yet in power and interest it falls far short of many by the same painter wherein no “moral” was inculcated. Sir E. Landseer's two studies of lions (339, 346), which were among the prominent objects in the Royal Academy of 1869 (and which a literary contemporary classed among the new works in this gallery), look as powerful as ever. Near these is another very fine landscape, by H. Moore, “Thunder-clouds Gathering—Harvest Time, Kenilworth” (345). Two small landscapes, by T. C. Farrer, “Moonrise after Rain” (391), and “The Last Moment of a Day” (399), should be noticed as instances of the true poetry of landscape, evoked from very simple materials, and thoughtfully treated; the latter, with a dark stretch of bank and trees across the middle of the composition, a faintly-lighted sky above, its tone more faintly repeated

in the water below, is a very pleasing specimen of composition on a very simple and natural motive. Poynter's “Orpheus and Eurydice” (129), and Watts's “Endymion” (416), we take to be comparatively early specimens of the respective artists; since then the hardness of the former artist has developed into brilliancy; the latter is a beautiful specimen of a classical subject romantically treated. Millais's “Ophelia,” and Sir E. Landseer's “The Sanctuary,” are among old acquaintances which one is glad to look at again. Naish's fine coast scene, “A North Devon Cove” (502), attracted some attention in last year's Academy. A little picture, by R. Leslie, “Caught on the Beach” (474), an evening scene, is masterly in colour and tone.

The Water-colour Gallery (No. VII.), comprising drawings, “chiefly British,” comprises also a great deal of which nothing need be said. Some sketches by Maclise are interesting for various reasons: “The *Debut* of Paganini” shows the violinist in front, and the members of the band behind, in various attitudes of astonishment or despair (a celebrated pianist of the day is said to have expressed the general feeling by the remark, “Thank God, I'm not a violinist!”). If these were made on the spot, they form a curious and interesting reminiscence of one of the most notable apparitions that ever startled the artistic world. Two or three of Mr. Absolon's best drawings are here—in particular, “The Last Load of Hay” (668), which it is pleasant to meet again. A portrait of the Marchioness of Lorne, by W. G. Wills (656), is a remarkably fine, broadly-executed drawing, and very good specimen of portraiture treatment in water-colour. There are several of Mr. Phénix Spiers's architectural sketches, and one or two of the small landscapes of Mr. Ditchfield should be looked at; “Near Cowes” (690), in particular. Who is A. L.? There are two very good drawings under this name, “Christmas Roses” and “Day Dreams” (698, 735); the artist need not be ashamed of his (or her) name. That masterly executant, J. M. Topling, sends some of his most brilliant achievements, in particular a Chinese (half-length) woman, under the title “Ching-a-ring-a-ring-Ching” (709), a splendid piece of colour. Mrs. Sparrall Stillman is represented by one of her single figures, “St. Barbara” (695); it is a pity this clever lady has given her adherence to a school whose defects rather than merits she has been able to illustrate: the colour in this is as usual very heated, and the hand is certainly not well drawn. Is J. D. Watson's “Book Lore” (716) here exhibited for the first time? We at least do not remember it; in real artistic power it is probably the finest thing in this gallery; it represents an old man studying in a library, in a bright red cloak, and a curious headress of the same colour, the background formed by a dark oak cabinet: it is a most powerful and effective work.

The reserve force which France always seems to have at command in painting is really remarkable. Last year, in the very midst of her unexampled misfortunes, she furnished by far the richest contingent to the picture galleries at Kensington; and in the present year, though there is nothing certainly like the remarkable array of works by Daubigny, Corot, and Dupré, which last year furnished means for quite a comprehensive study of the French landscape school, yet there is far more to look at here, far larger a proportion of good pictures, in Galleries XIX. and XX., than in any others; and no small number of these are dated “1871.” Some among these have direct reference to the events of the two previous years; for instance, the pathetic work of Protais, entitled simply “1870” (1,212), showing a group of three soldiers lying, wounded and helpless, in the midst of a plain, the scene of a recent battle, and encompassed by the fire and smoke from burning villages. Immediately above this hangs Perault's charming “Odalisque,” a semi-nude figure of singular delicacy of contour, half kneeling on a couch, her lower limbs enveloped in rich satins, her bright golden hair braided up, her face only seen in the mirror which reflects it: a beautiful embodiment of the more refined form of voluptuousness. Are we too fanciful in seeming to find somewhat of a moral lesson in the accidental juxtaposition of these two paintings? Is it not in the taste for sensuous beauty and sensuous enjoyment characteristic of the Second Empire, and typified in Perault's work, that we may look in great measure for the influences which have aided in bringing France to the melancholy situation shadowed forth in the more

recent work of Pratis? Another of the war pictures is the "Rue de Rivoli, May 21, 1871," of Leon Y. Escourea (1,146), a painting of remarkable maintenance of finish, and combining realism with effect, from the long deserted street and the mass of fire and smoke at the end of the vista, in a notable manner. In the foreground lies a dead Mobile in the centre of the street, and at the side under cover of a colonnade crouch a sketcher (the artist?) and a correspondent of an English paper, busily at work. For simple pathos, too, we may note Joulin's "Episode of the Bombardment" (1,263): a young girl of the middle class has been struck dead by a shell-splinter, and lies alone in the snow just as she has fallen, her head drooped on one side, her dress scarcely discombed by the fall; the snow is stained with her blood. This is a sad picture to look at, and yet it is well it has been painted, and well that its meaning should be realised. A melancholy interest attaches, too, to the "Portrait of Monsgr. Darbov, late Archbishop of Paris" (1,158), by Lehmann; a thin, gentle, refined face, answering to all we heard of the character of the victim of the Commune; the colour effect of the dress, a purple cape and flowered crimson sleeves, is very rich, if a little too warm. Leaving, however, the works which have this immediate historical interest, there can be no question that the central picture of the French gallery is the great work of Cabanel, "Francesca di Rimini" (1,230). This is a large life-size painting of the hapless lovers; Francesca is thrown back on a kind of settee, her face turned backward towards her lover, who kneels on the floor beside her, in an attitude somewhat awkward, but which has afforded the painter opportunity for a triumph of drawing and foreshortening; the spy looks in from behind a curtain to the right. Of the drawing of both the figures, and the finish and execution of the rich dress of the lady, one could hardly speak too highly; but these accessories are as nothing in comparison with the intensity and abandon of passion displayed in the faces and attitudes of the principal figures: there is something almost fearful in this unveiling of such a moment to the vulgar gaze; the British Philistine, however, true to his instincts, looks stolidly at it, reads the name of subject and artist from his catalogue, and passes on with his usual contented indifference. This picture was painted in 1870, and therefore shows the maturity of the artist's powers; such a realisation of Dante's celebrated line,—

"Quel giorno più non vi leggemmo avante,"—

we will venture to say has not before been put upon canvas. It is instructive, by way of noting the distinction between passionate and passionless art, genius and commonplace, to contrast this work with one illustrating exactly the same subject (1,263) by an artist not capable of entering into the situation or the feeling portrayed by the poet.

NEW SCHOOLS FOR THE GROCERS' COMPANY.

The Grocers' Company are about to convert a considerable portion of their large accumulated fund from non-educational to educational purpose, and under the Endowed Schools Act of 1869, have agreed with the Endowed Schools' Commissioners and the Charity Commissioners to hand over to a new governing body the whole of certain rent-charges, and sums of money, the latter amounting to 30,000*l.*, and to be called the "School Fund," for the establishment of middle-class schools in London or its vicinity. The new schools about to be erected under the agreement between the Endowed School Commissioners and the Grocers' Company, are to be built on some suitable site or sites, to be chosen by the new court of governors, within three miles of the city of London, and are to be in a single building, or otherwise as the court may determine. The schools are to be large enough to accommodate 500 day scholars, with a residence for the head master. The schools are in the first instance to be opened for boys, but the court is to have power at any time to convert them wholly or partly to the use of girls if deemed expedient. No fees are to be paid except such as are prescribed by the scheme or the court, but the head master, in addition to a fixed stipend of 200*l.* a year, is to receive a minimum sum of 1*l.* for each boy. The boys' entrance-fee is not to be more than 1*l.*, and the tuition fee not to exceed 5*l.*, no extras of any kind being allowed. The aim of the schools is

to give a practical education suitable for the children of that class who desire to educate their children up to the age of fourteen years. The new governing body under the scheme is to be the master, wardens, and court of assistants of the Grocers' Company for the time being.

NEW PUBLIC BATHS AND LECTURE HALL AT BRIXTON.

LARGE swimming and other baths, together with other buildings of a public character, are about to be erected at Brixton. A company, called the Brixton and Clapham Baths Company, Limited, has been formed for the purpose, and they have already secured a site for the intended new buildings on the land in Shepheard's-lane, in Brixton, known as the Peabody estate, situated between the Brixton and Clapham Roads. The buildings to be erected will be on a scale of considerable magnitude, and will comprise spacious swimming-baths, in addition to hot, tepid, and Turkish baths, possessing many modern, novel, and improved features. The objects of the company comprehend several features besides the baths, and the new building will also contain a lecture-hall, reading-rooms, billiard-room, and gymnasium.

A public meeting was held on the subject last week in St. John's Schoolroom, Canterbury-road, Brixton, at which there was a large and influential attendance, when Mr. Fowler, the architect for the intended new buildings, having explained their character and extent, a resolution was carried to the effect that the objects which the company had in view were worthy of the warm support of the public. The company has the cordial support of the borough members, Sir J. C. Lawrence and Mr. W. M'Arthur, and several of the most influential inhabitants, and already a large number of shares have been taken.

PRIZES, SOCIETY OF ARTS.

THE Albert medal has been awarded by the council this year to Mr. Henry Bessemer, "for the eminent services rendered by him to Arts, Manufactures, and Commerce, in developing the manufacture of steel."

His Royal Highness the Prince Consort's prize of twenty-five guineas has been awarded to William Pollitt, aged 20, Salford Working Men's College, clerk, who has obtained the following first-class certificates:—1869. Gorman—First-class certificate, with second prize; English History—First-class certificate, with first prize; 1870. Book-keeping—First-class certificate; Logic—First-class certificate, with second prize; 1871. Latin—First-class certificate, with first prize; English language—First-class certificate, with second prize. 1872. Domestic economy—First-class certificate, with first prize; Metric system—First-class certificate, with second prize; Mensuration—First-class certificate.

On a previous occasion the recipient of this prize implored us not to mention his name, as he believed it would be most injurious to him with his employers if they heard of it—more shame for them. We hope there is no fear in this respect in the case of Mr. Pollitt.

WEYMOUTH.

THE new Weymouth and Dorset County Royal Eye Infirmary, now formally opened, has been designed, as far as the funds at command would permit, in accordance with the modern ideas of arrangement and accommodation. It is of Gothic character, freely treated, and built with Portland stone. Due attention has been paid, as at the Royal Hospital, to the comforts of the patients, by providing lofty, commodious, well-lighted, and well-ventilated wards, and heating all the rooms by means of open fireplaces. On the ground-floor are the waiting-room, consulting-room, dispensary, bath-room, matron's room, kitchen, and offices. The first and second floors are wards, with accommodation for twenty-two patients. Mr. G. R. Crickmay is the architect for this building, and Mr. Samuel Stevens, of Southampton, was the builder.

In the Royal Hospital and Dispensary for in-patients separate wards have been provided, both in case of men and women, for accidents. The wards are lofty, and well lighted, and attention has been paid to the ventilation. Entering at the principal and central door, we find on the right of a wide and well-

lighted corridor the females' accident-ward for two beds, and the male accident-ward for four beds, and at the end of the corridor a kitchen and offices. On the first-floor, approached by stairs and corridor of fireproof construction, is a females' medical-ward for five beds, males' medical-ward for four beds, bath-room, library, matron's room, and committee-room; and on the second-floor are two bedrooms and a linen-room. For outdoor patients there is a waiting-room, consulting-room, and a dispensary, so arranged that they do not interfere with the in-patients. The building is faced with red bricks, pointed with black, and the front next School-street is of red and black bricks and Doulton stone. The grounds are laid out in flower-borders, grass-plots, and wide gravel-walks. The architect is also Mr. G. R. Crickmay, of Weymouth, and the builders were Messrs. England & Innes, of the same town.

SOUTHWARK BRIDGE.

IN 1869, after the purchase of the Southwark Bridge by the Corporation had been finally settled, the question of "improving the communication between the north and south sides of the Thames" was officially submitted to the Bridge House Estates Committee by the Common Council. Mr. Carr's plans for the widening of London Bridge and the improvement of Southwark Bridge by widening and lowering the existing arches were submitted to the committee; but, owing to the heavy expenditure then being incurred in rebuilding Blackfriars Bridge, nothing further was at that time undertaken. Now, however, the question is again brought forward, and is under consideration by the Bridge House Estates Committee.

Though it is a fact that the route from the Bank to the Elephant and Castle is shorter by Southwark than by London Bridge, still the steep approaches of Southwark Bridge deter heavy traffic, and the relief is not afforded to London Bridge that would otherwise be given.

The proposals before the committee at the present time are understood to be those of Mr. Leach, the engineer to the Thames Conservancy, and of Mr. Carr; Mr. Leach proposing to lower the summit of the bridge by the trifling amount that could be attained by reducing the thickness of road-material; Mr. Carr proposing to take down the existing cast-iron arches, and to replace them by wrought-iron arches, giving a headway underneath of 25 ft. above Trinity High-water,—the same as at New Blackfriars Bridge,—and lowering the summit to the extent of 8 ft., improving the gradients from 1 in 19 at the worst part to 1 in 40. Money laid out in the smaller work would be so much thrown away, if eventually it be found requisite to make the bridge such as would be required for a large share of the City traffic, and so to relieve the overcrowding of London Bridge.

COMPETITIONS.

Sevenoaks Cottage Hospital.—Four architects, more or less connected with Sevenoaks, offered, we are told, to give a design for the above; namely, Mr. J. M. Hooker, Messrs. Teulon & Cronk, Mr. Graham Jackson, and Mr. C. Petley. The committee suggested that each should send a design from which they would select the one they considered best suited to the purpose, and issued instructions accordingly. On the 1st of May two designs were sent in, one by Mr. J. M. Hooker, and the other by Messrs. Teulon & Cronk. Mr. Graham Jackson and Mr. C. Petley did not compete. On the 27th, at a general meeting of the subscribers, the design of Mr. J. M. Hooker was selected. The plans were open to the inspection of the public a fortnight before the decision.

Darlington Fever Hospital.—At a meeting of the Town Council held last week, the Town Clerk read the report of the Hospital Committee, which stated that the plans for the proposed new fever hospital had been forwarded to the Local Government Board, who had, however, declined to pass them, unless certain alterations recommended by their medical officer were made. Several alterations were made in the plans, increasing the accommodation, and rendering it necessary that a separate building should be erected, the cost of the hospital, at first estimated at 5,000*l.*, being thus increased to about 9,000*l.*, in return for which they were able to accommodate forty-four, instead of thirty-two

patients, as before. The Mayor remarked that the alterations suggested by the Local Government Board medical officer would add considerably to the amount of accommodation required and also to the cost. He moved the adoption of the report. Mr. Alderman Luck objected to the adoption of the report, and proposed that the plans should stand over for a month. With reference to the outlay, the first estimated cost was 5,000*l.*; they had then what he might term a hop to 9,000*l.*, and perhaps they would afterwards take a step to 12,000*l.*, and what the jump would be he could not tell. The motion was ultimately carried.

THE DEATH OF CATTERSON SMITH, M.R.I.A.

This artist was favourably known for many years in Ireland as an excellent portrait-painter. He was a Past-President of the Royal Hibernian Academy, and was lately engaged in arranging the collection of paintings now on view in the Dublin Exhibition. On Thursday in last week, while so occupied, he was taken suddenly ill, returned home, but never rallied. His remains were interred in Mount Jerome Cemetery, his chief mourners being his six sons. Several distinguished persons, noblemen, judges, artists, architects, and other professional gentlemen, attended his funeral; in fact, the concourse consisted of the majority of those in Dublin who are connected with artistic pursuits.

The walls of the Royal Hibernian Academy, in its annual exhibitions, were seldom without one or more of his successful efforts. Long connected with Dublin, and generally respected, his place will be missed among the few resident artists of note in the Irish capital.

TOMB OF LORD STANLEY OF ALDERLEY.

In designing this tomb, parts of which are to be seen just now at Messrs. Salvati's, in St. James's-street, Mr. J. G. Waller has taken a hint from that of Henry III. at Westminster; but where in the latter is a slab of porphyry he has introduced a brass, which contains figures of the widow and all her children, twelve in number, introduced with much skill. Nine of them are living, and portraits; viz., the present peer, Col. Stanley, Lyulph Stanley, Rev. Algernon Stanley, Mrs. Lane Fox, Lady Arlie, Miss Stanley, Lady Amberley, and Mr. Howard, in the order in which they stand. All these are distinguished by small enamelled coats of arms.

"Pouncing" is introduced for ornamentation, and the "hawthorn badge" on the sleeve of Lady Arlie. The whole is certainly unique. Means will have to be taken to prevent tampering. The geometrical mosaics which adorn the tomb are put in with studied irregularity and rudeness, to avoid a mechanical aspect; and as the brass is obviously and properly modern, a little incongruity results. The recumbent figure which the tomb will support is by Mr. George Nelson.

THE METROPOLITAN STRIKE.

At a meeting of the Master Builders, held on Friday, 7th inst., at the Freemasons' Tavern, Mr. Plucknett in the chair, the following resolutions were adopted:—

1. That this meeting is of opinion that it is advisable for the employers to do all they reasonably can to obviate the necessity of a lock-out, and expresses its willingness to submit the decision as to hours of labour and rate of wages to the Marquis of Salisbury and the Earl of Derby, whose decision shall be binding on both parties; but this resolution is upon the express condition that the workmen now on strike at Mr. Brass's and Messrs. Jackson & Shaw's works shall, until the arbitrators make their award, return to their employment at the present rate of wages not later than Wednesday next, the 12th of June.
2. That the builders now assembled agree to give notice to the men in their employ, that unless the proposition contained in the first resolution be accepted, the works and shops belonging to those builders in the metropolitan district will be closed on the 17th of June.
3. That the builders present do constitute themselves into a society, to be called the Central Association of Master Builders, the annual subscription of each member to be one guinea. Each member shall pay towards the extraordinary expenditure now required a reasonable contribution for each person employed in his establishment on the 17th of June. That the following gentlemen be appointed the committee of the Central Association of Master Builders, with full power to act in any way that they may consider conducive to the interests of the members of the association, and that the following gentlemen be the committee, with power to add to their number:—Messrs. S. Bird, Richardson, Smith, Trollope, F. Dove, Brass, Dines, and Jackson.

A circular, drawing the special attention of

master-builders to the third of these resolutions, and giving a full list of the committee of the Central Association of Master Builders, has been prepared, and is about to be widely distributed, requesting co-operation and subscriptions.

The following is the full list of committee referred to, five being a quorum:—

Messrs. G. Plucknett (W. Cuhitt & Co.); B. Hannen (Holland & Hannen); C. Lucas (Lucas, Brothers); H. G. Smith (G. Smith & Co.); W. Brass, Stanley G. Bird, R. Richard-son, G. F. Trollope (G. Trollope & Sons); G. Dines (Dines & Banderet); F. Dove (Dove, Brothers); G. Jackson (Jackson & Shaw); B. Colls (B. Colls & Sons); T. R. Hill (Hill & Sons); Scrivenor (Scrivenor & White); Head (Keyes & Head); Manley (Manley & Rogers); C. Aldin.

On Saturday night a crowded meeting of the delegates appointed amongst the workmen employed in the various branches of the building trade took place at the Brown Bear, High-street, Bloomsbury, for the purpose of receiving reports as to the feelings of the men in the different shops, and to consider the resolutions adopted by the masters at their meeting on Friday. The chairman read the resolutions adopted at the masters' meeting. The reading of the resolutions was received with marks of strong disapprobation. A large number of proposals were submitted to the meeting, but the following was adopted:—

That this meeting of delegates hereby expresses its approval of the principle of arbitration in the settlement of this question; at the same time we absolutely refuse to accept the conditions on which it is submitted by the master builders' meeting.

A resolution of the committee of the Central Association of Master Builders, inviting the Carpenters and Joiners' Nine-hour Delegation to nominate some of their number to confer with them upon the terms of an arbitration, was arrived at after long deliberation. Mr. Piper, their secretary, personally carried it to the Brown Bear Tavern later in the evening, when he ascertained that the men's committee were not invested with the requisite powers to act alone, and the delegation meeting stood adjourned until Thursday night, the 13th. Mr. Matkin, the secretary of the delegation, and the delegates from Jackson & Shaw's, were deputed to attend the masters' committee, at the Freemasons' Tavern, and explain the position in which they stood. It was thereupon arranged that an aggregate meeting of the delegates should be specially summoned for Wednesday evening, to elect four of their number to meet four of the masters' committee on Thursday afternoon, to settle the preliminaries or articles of reference, the two secretaries to act as *ex officio* members of the conference. It has since been decided by the workmen's committee that the delegate meeting of the carpenters and joiners will not take place on Wednesday evening, but on Thursday evening, at eight o'clock.

Meantime the Master Builders had a meeting, on Thursday afternoon; and the following copy of a letter to Mr. Matkin from Mr. Stanley G. Bird, as Hon. Sec., *pro tem.*, will show with what result:—

"I am instructed by the Committee of Master Builders to acknowledge the receipt of your letter of the 12th instant, informing them that the meeting arranged with your deputation to be held to-day must be adjourned to Friday, and to express their regret at this postponement of the meeting, having regard to the short time remaining for the pending negotiation. The deputation of Master Builders will be prepared to receive your deputation at the Freemasons' Tavern to-morrow, Friday, at two o'clock in the afternoon."

Messrs. Hill & Sons, of Charlton Works, Islington, wish us to state that the report that they had agreed to give the men in their employ the concession demanded is wholly untrue.

THE BERLIN COMPETITION.

A CORRESPONDENT from Berlin writes as follows:—

The plans for the New Parliament House of Berlin have at last received judgment, though none of them are likely to be executed. As I foretold so it has happened, and our homely German proverb has been fully applied, viz.:—

"The fattened pig was predestined to be killed for fatherlandish home consumption only."

In deed, the Berlin press openly declared their partisanship for those architects only who are *de facto* citizens of the New Empire.

The first prize was awarded to Professor Bohstedt, now living in Gotha (of the Berlin

Eclectic School); 2. Messrs. Kayser & Grosheim (of the Berlin Eclectic School), of Berlin; 3. Messrs. Mylius & Bluntzsch, of Frankfurt (Berlin School); 4. Messrs. Ende & Boettmann, also of Berlin; 5. Last, and not least, to Messrs. G. G. Scott & Son, of London, as a sop to English *amour propre* and national sensibility, Mr. Scott being personally well known to her Imperial Highness the Crown Princess of Germany, as the architect of the Albert Memorial, &c.

SURVEYORS UNDER THE ECCLESIASTICAL DILAPIDATIONS ACT.

On the 11th inst. a meeting was held in the Library of the Royal Institute of British Architects of the surveyors elected for various dioceses under the Ecclesiastical Dilapidations Act, 1871. Thirty-two were present. It was resolved to form an Association of the surveyors, which was accordingly constituted at once, with the object of securing uniformity in the duty. The following officers were appointed:—Mr. J. Clarke (Canterbury), president; Mr. Gordon M. Hills (London and Rochester), vice-president; Mr. Lacy Ridglo (Chichester), secretary for London and treasurer; Mr. C. Bruton (Oxford), secretary for the west of the southern province; Mr. Johnson (Durham), secretary for the northern province. A standing committee was appointed, consisting of the above officers, with the following gentlemen:—Mr. Barker (Winchester), Mr. Blackburn (Norwich), Mr. Chancellor (Rochester), Mr. Crikmay (Salisbury), Mr. Goddard (Lincoln), Mr. Pope (Bristol), Mr. southern province; Mr. Armfield (York), Mr. Bell (Manchester), Mr. Newstead (York), Mr. Nicholson (Ripon), for the northern province.

SCHOOL BOARDS.

Reading.—The committee report, as to the New Town and Early School, that it is premature to enter upon the consideration of the appointment of an architect, but as the purchase of the site has been sanctioned by the Education Department, the preliminary consideration of the question of what character the school buildings shall be may now be entered upon. As to the Silver-street School Scheme, they state that the plans, specifications, and estimate of cost, have been prepared and submitted by Mr. Morris. As the estimate exceeds the sum stated in Mr. Morris's memorandum, which was laid before the Board on the 3rd January last, the committee deem it right to present the plans, specification, and estimate for approval and adoption by the Board, previously to forwarding them to the Education department.

Wolverhampton.—At the last meeting of this Board, the purchase of 2,666 yards of land for the Red Cross-street schools was legally completed, the plans of Mr. Billake for the schools accepted, and tenders for the erection ordered to be advertised for. The tender of Mr. Horsman to build the schools in the Dudley-road for 2,540*l.* 16*s.* 11*d.* was accepted.

Walsall.—The following tenders for the erection of the intended Board Schools at the Wisemore, were presented at last meeting, viz.—Mr. D. Moore, Walsall, building, 1,979*l.*; boundary walls, 326*l.*; fittings, 148*l.*—total, 2,453*l.*; Mr. J. Rowley, Walsall, building, 2,172*l.*; walls, 319*l.*; fittings, 114*l.*—total, 2,605*l.*; Messrs. Stockton & Sons, Oldbury, building, 2,166*l.* 18*s.*; walls, 418*l.* 14*s.*; fittings, 154*l.*—total, 2,739*l.* 12*s.* It was resolved to accept the tender of Mr. Moore, and it was ordered that he be bound to complete the work within six months. The architect's original estimate of the cost of the work was 2,473*l.*, and, subsequently, additions had been made to the value of at least 100*l.* Mr. Billake attended with designs of schools to be erected by the Board in Tautarra-street, and at Bloxwich, and both sets were approved.

Hullian.—The Board has resolved to take over Sion Chapel day-school as a board-school for fourteen years, at an annual rental of 75*l.* The cost of altering the school to adapt it for the purpose will be 650*l.* Notwithstanding the intention of Messrs. Holdsworth to erect a school at Siddal, the Board have resolved to purchase land in that district for a school.

Huddersfield.—The design of Messrs. Walford & Pollard, of Bradford, has been agreed upon for the erection of a school at Stile Common; and that of Mr. F. Fowler, of Leeds, for one at Oaks, Lindley.

Leicester.—The report of the committee ap-

pointed with reference to the size and situation of schools, recommends that the following schools be erected by the Board, namely,—

1. On the site in Slater-street, a school for 438 girls, 219 boys, and 219 infants.
2. On the site on the Belgrave-road, a school to accommodate, in four departments, a similar number in each department as are provided for in the plan adopted by the Board for the school on King Richard's-road; and that the plans be so constructed as to admit of enlargement if necessary.

3. On a site near Maynard-street, a school to accommodate, in four departments, a similar number in each department as are provided for in the plan adopted by the Board for the school on King Richard's-road; and that the plans be so constructed as to admit of enlargement if necessary."

The report has been received and adopted by the Board.

THE ARTISTS' BENEVOLENT FUND.

At the anniversary festival of this institution, held at the Freemasons' Tavern on the 8th inst., Mr. R. N. Fowler, M.P., who presided, urged its claims. In his opinion, he said, and he had hopes that in the opinion of the public at large also, there was no class of persons more justified in looking to the public for assistance in the day of misfortune than the artists of the kingdom. A good deal had of late been said of public education. In this respect much was due to the artists of the country. A good deal had also been said of moral progress. He was not quite sure but that as much service had been done in this particular by the works of Titian, Raffaele, and others he could name, as by those who in the daily press endeavoured in the present day to improve the public mind. The literary labour in connexion with the daily newspapers was necessarily performed on the spur of the moment, and it could not be expected to be as perfect and effective in every particular as the work of those who had sufficient time allowed them to deal properly with the subject in hand. He considered that both the past and the present had benefited by the studies of our artists, and the results which had accrued from those studies. During the past year 49 widows and 9 orphans received annuities amounting in the whole to 947l. 10s. For many years the amount of each widow's annuity was fixed at 15l., with a further annual sum of 5l. for each orphan under the age of 16; but the committee, having been very earnestly entreated to increase the annuity for each widow to the sum of 20l., resolved to do so. Capt. Digilton retained thanks for the volunteers, and proposed the health of the chairman. Mr. Godwin, in proposing prosperity to the Royal Academy, and the other societies connected with the fine arts, referred to the great opportunity afforded by St. Paul's for the encouragement of mural painting, and called for the employment of the highest art that England could supply. When apartments of the Vatican were to be decorated, Raffaele was called in; for the Sistine Chapel, Michelangelo; and Leonardo da Vinci had made a new otherwise squalid room in Milan a shrine for pilgrims of all nations. Mr. W. Cave Thomas, who responded, said that although he was not a member of any of the societies, he felt quite able to say that all strove to do as much good as possible. He commented with some severity on the mode adopted in conducting artistic works in this country. If people were ill they called in a doctor; if they needed law they sought a lawyer; but if artistic results were desired, a number of gentlemen who, to say the best, had not made art a special study, were called a committee, and left to work their will. Various other toasts were drunk, Miss Emily Faithfull replying for "The Ladies," who on this occasion formed part of the guests at table. Mr. L. Young, the secretary, and Mr. C. J. Dimond, treasurer, announced donations amounting to something over 600l.

THE DORCHESTER MEETING OF THE BATH AND WEST OF ENGLAND SOCIETY.

This meeting has just been held. The Department of Arts and Manufacture was an attractive and successful feature. The applications for space were more than could be accommodated. The ceramic collection of Mr. Carey, from Bath, was a prominent part of the exhibition, as was that of cut and engraved glass candelabra, painted vases, and other manufactures in glass. There was some rich decorative furniture. The pianofortes and harmoniums were worth looking at; and the aluminium gold jewelry looked

"as good as gold." There were sewing machines in sufficient variety, and a quantity of cutlery goods.

THE ADORNMENT OF CHURCH WALLS AND WINDOWS.*

As a sequel to a paper which I read a year ago on Stained Glass, I would now draw attention to the adornment of the walls and windows of our churches. In propounding this thesis, all I hope to do is to moot the question, in order to incite thought and inquiry upon it, that artistic taste and godly edifying results may grow out of it.

Ecclesiastical architecture is the parent of ecclesiastical art: fifty years ago the former was as little understood as the latter is now. There was a time when art was national in England,—that is, in Pre-Reformation times. There was then in each great work of architecture and art in the land, a oneness of design in the general outline, and a perfect harmony in all details. All worked together with singleness of heart,—the trades with their handicraft, the arts with their poetry; each and all had one harmonious aim, to raise those beautiful retreats of learning, and shrines of devotion, which still even in their ruins form the models of our own taste. But unhappily and most mistakenly, art came to be put in the same category with the superstitious of Medieval times; so England came to despise it and discourage it; so it sickened and died.

But at last England has in this respect seen the error of her ways—poetic art has been rekindled into new life, and the revival has been so rapid, that the demands which have come to be made upon it have exceeded what it has been possible in good taste and true principles to supply. Is it not painful to see how imperfectly art, as applied to the development and so to the adornment of church architecture, is understood? It is not only too much a thing of trade instead of "art," but it is wanting in religious element; there is a hopeless confusion of the subjective matter,—a want of all harmony of plan, and the entire abnegation of that highest office of art, viz.—to incite religious thought and feeling, to soothe and comfort world-oppressed hearts, and to lift up the soul from earth to heaven. The very province itself of art in our churches is to raise the soul to an atmosphere beyond material things, and hence it needs a special devotion in its treatment, a heaven-ward breathing in all its aims and aspirations. In olden times the artist's pencil felt the heaven-inspired emotion of the artist's heart; it was the objective expression of subjective feeling, the outward reprint of the inner man, a transcript upon outward materials of "the hidden man of the heart." The mural and window decorations of our churches (like our very music and poetry in divine worship), have a high object to subserve, viz.—to tell on the thought and feeling, life and character of our brother man. Now, I claim all this power for art; for be it remembered, art is susceptible not only of artistic expression, but it is equally so of the motive-power of religion. The chisel and the pencil are as subtle as the pen, therefore their power over life and character must be great. And it is because they have this power over life and character that their application to our churches is justified. Art must, if rightly used, subserve the purposes of religion, and that not merely because of its power over man's heart, but even of its acceptability to God. Beauty and harmony have their prototype in the mind and essence of God himself. "He that planted the ear shall He not hear? Ho that formed the eye, shall He not see?"

Why, indeed, was the peep into the heavens given to St. John and the glory of it put into human words, and compared with material things which man could understand, if it were not to aid us in assimilating the earthly tabernacle of the Most High to the heavenly, and the worship of the church militant on earth to the church triumphant in heaven? It must lift up our hearts when we read of "the Holy Jerusalem," "whose light is like unto a stone most precious, even like a jasper stone, clear as crystal," "the walls of which are garnished with all manner of precious stones," "even the sapphire, and emerald, the sardius, the topaz, and amethyst;"

"whose gates are pearls and the street pure gold, as it were transparent glass," lighted up "by the glory of God," and "the Lamb is the light thereof." But instead of our material and earthly sanctuaries being in some degree a type of the heavenly, so that their hallowed associations may aid us in unfettering our earth-bound hearts, and lead our souls to mount up on high to commingle with the spirits of the blessed who bow before the throne, what have we only too often? Cold bare walls, rendered perhaps still more bare and more cold by having had the very plaster removed from the walls,—the very architectural flesh, that is, flayed from off the bones till the skeleton is laid bare in all its rugged and distracting anatomy. Even the windows, white with unsubdued transparency, look out into the strife and tempest of the outer world; or, if enriched with translucent colour, there is such an entire absence of all aim and object in the subjects treated, that the mind, bewildered by confusion, sees nothing, learns nothing, and we pass on unmoved and unimpressed. Even the very altar itself, perhaps, is not more significant with instruction than whatever else we have seen in approaching it. Is this as it should be? For in these days of popular education, do not men's souls need an alphabet of expression above and beyond the alphabet of common life?

First, look specially at our interior walls. The materials to which I am drawing attention are stone,—rough, uneven stone rubble; not ashlar, which presents all the principle of repose for which I am contending; but ashlar is costly; nor brick, although bare brick is almost as objectionable as bare stone rubble.

Can there be anything in the interior of a building of architectural pretensions more painful than the exposure of coarse masonry, in all its native and distracting ruggedness? Its angularity, its staring joints, its broken lines, its jagged forms, its harsh texture oppress the mind with a sense of unrest. All peace and repose are gone. All those grand definitions of architectural power, of moulded and carved ornament, and exquisite features of artistic design (which require the contrast of a smooth surface to give a sense of rest, while giving development to their poetic richness), all are unwarred and sacrificed by the staring, angular, defiant, distracting anatomy of the builder's materials. Great churches, the work of ancient piety, and designed in the spirit of peacefulness and religious beauty,—once so beautiful, once so full of repose and deep religious feeling,—once telling out so sweetly upon man's heart, lessons of reverence and godly awe, and Christian love,—the great and good work of these great and glorious churches has been reduced by ruthless modern hands to the cold condition, yes, of prison-walls. And why is this? It has all arisen out of the mistaken dread of sham. Extremes meet. The dread of Scylla has plunged the bark into the vortex of Charybdis. Let us avoid shams by all means, and with conscientious care, for they tell falsehoods, and not truth; but let us be careful to discriminate rightly between what in principle is false and what is real. But surely plaster, used simply to give a smooth, quiet surface to an interior wall, is no sham? If with plaster you imitate moulded forms or carved ornament, or if you score it with lines to imitate ashlar, or if you use it for exterior purposes, where solid strength and time-enduring materials are required, then let plaster be set at naught as what it is, a sham. To object to plaster, honestly and truthfully used, is to object to all device in colour and gold,—yea, and to sculpture itself. Plaster has a direct and positive office to subserve,—viz., to give a sense of comfort and repose, on the one hand, and on the other, to supply what is really the very best of all bases, for the future application of the artist's pencil. Whatever may be the forms which the artist's pencil may trace (on the semi-smooth surface), whatever colours he may employ to give effect to his design, all should lead up to some religious purpose, as the embodiment of the Christian's hope and belief. Every device should judicate some religious principle, or symbolise some Christian fact, or echo some abiding prayer, or tell the mind through the eye some precious revealed truth. Works undertaken in such a spirit must ever arouse a kindred sympathy; therefore, let the thing done be beautiful, but aim to render it something more,—it is the "House of God" which is being beautified; let us try to render it "the gate of heaven."

With reference to our church windows, so much of that which has been done within the

* By the Rev. H. Usher, M.A., Rector of St. Clement's, Saltfleetby. Read at meeting of the Lincoln Diocesan Architectural Society.

last thirty years has been so imperfect, its drawing so bad, its colouring still worse, and the poor thin watery texture of the materials worst of all, that I fear many of these windows must share the same fate at the hands of a succeeding generation as the high pews and winding pulpit staircases of a previous generation are now undergoing, viz., give place to better taste and more perfect harmony with all else around. The very first glimpse we get of our church windows from a subjective point of view (the point from which we are now looking at them) plunges one into a world of confusion, an indescribable chaos. Not, indeed, that the evil is without apology; for so sudden has been the revival of poetic art and the progress so rapid, that its application *in extenso* to our church windows was wholly unforeseen. Hence, isolated specimens were at first produced as though they were for ever to stand alone, without reference either to their suitability or any sequence of subjects which might hereafter be thought desirable. Hence they were thankfully accepted without ever dreaming of the spottiness of effect of styles so varied, and far more, of the loss of the opportunity they afford of throwing out in bold relief the grand principles of Christianity. For who, indeed, shall doubt that such grand object might and would be the legitimate result of a well-harmonised series of subjects, fresh and vigorous with deep religious life, when the feeling they produce and the thoughts they suggest flow on consecutively? Subjects from the Old and New Testament are commingled, reversed, repeated; and portraits of individuals and allegories are put in bold contiguity and no little confusion with most solemn scenes. Ill indeed would it become me to suggest the plan which should embody the subject matter to be delineated; but plan there should be,—yea, and a purpose and an aim likewise. It might comprehend subjects liturgical as well as Scriptural; but it should certainly consist of a regular series of graduated subjects which should delineate the whole body of the Christian's faith and hope. It should take us by the hand, as it were, from the beginning to the end of our *Zion*. It should portray the mysterious transactions, the types, the predictions of the Old Testament, with the corresponding realities and accomplishments of the New Testament. In short, it should be a complete, however brief, transcript of the whole Bible, embodied in living colours, speaking to the eye in brilliant and impressive characters, combining and displaying in one continuous and glowing prospect the dispensation of the Old Testament explained and enforced by the dispensation of the New.

It has ever been in this way that the church catholic has set forth catholic truth; why, then, should not our sacred windows and walls embody the same principle? Every window in our churches, whether adorned with geometrical design or subject-matter, and every mural decoration which admits of being rendered symbolical, and every structural part of the fabric itself (as the roof, triangular and equilateral), and every part of the furniture,—as the Christian altar, the lectern which bears the Gospel; the corona which pours down its light, and every ornament which is to contribute its share of the Christian surroundings, one and all should tell us of and point us to Him "who is God over all, blessed for evermore," "the author and finisher of our faith."

THE INTRODUCTION OF THE ANGLo-ITALIAN STYLE UNDER INIGO JONES AND SIR CHRISTOPHER WREN.*

UPON the death of Inigo Jones, Wren became the leading English architect,—not, however, immediately. Inigo Jones died in 1652, at which time Wren would be about twenty years of age. Whatever doubt may exist respecting the education and early years of Inigo Jones, it is quite certain that Wren was tenderly nurtured and carefully educated. His father was an English clergyman, of Danish origin, and rector of East Knoyle, Wiltshire, where Christopher Wren was born. From all accounts, he was a most intelligent, if not precocious, child. In his fifteenth year, Sir Charles Scarborough, an eminent lecturer on anatomy, engaged Wren as his demonstrating assistant. When twenty-two years of age, Evelyn writes of him in his Diary, July 11th, 1654, "I visited that miracle of a youth Mr. Christopher Wren," and elsewhere he

calls him "that rare and early prodigy of universal science." When he was twenty-six years of age he solved Pascal's Challenge Problem to the Scientific Men of England, and, it is said, proposed one, in return, that was never answered. He afterwards assisted Willis in his dissections for a treatise on the brain, for which he made the drawings. In his anniversary address to the Royal Society, in 1664, the comprehensive and profound character of his attainments was clearly manifested, and his future greatness foreshadowed. But with all his talents, and prestige, and ability, he was conspicuously modest and retiring. Steele, in his sketch of Wren, under the name of "Nestor," in the *Tatler*, says, "his personal modesty overthrew all his public actions." "The modest man built the city, and the modest man's skill was unknown."

We have now brought Wren's biographical sketch down to the year 1664. Being then a man of high scientific repute, he was placed upon a royal commission with Evelyn to consider the "upholding and repairing" of St. Paul's, that had fallen into a dilapidated condition during the civil wars. Charles II., on his restoration, was anxious that the metropolitan cathedral should be restored to its original grandeur, and Wren proceeded, in his capacity of royal commissioner, to draw up a careful and exhaustive report, or memoir, on the subject, illustrated with a number of explanatory drawings and designs, which were laid before the king. This memoir is much too long to give here, but it will amply repay perusal, and is especially interesting to us at this period, when the question of churches for the people is so frequently discussed, both by architects and by the press. Wren evidently places the Protestant worship in the paramount position, architectural adornments being drawn in to assist its dignity, but never to fetter its freedom. A large auditorium, with as few impediments as possible, seems to have been Wren's beau-ideal of a Christian Protestant place of worship. We may rejoice, however, that he had not the opportunity of erecting a great classic rotunda, as he suggested, in the centre of the same old Gothic cathedral to which, as we have seen, Jones had already been allowed to append his noble but incongruous classical portico and frontispiece. Nevertheless, out of this original idea of a rotunda eventually arose that glorious dome which now dominates so proudly over our great metropolis, and which is seen by the Londoner from so many points of vantage lifting its head on high. As a royal landmark, from Batterscaire-reen, from Hampstead-hill, or from the slopes of Greenwich, that soaring periphery of splendour arrests the vision and enchants the mind. By universal consent St. Paul's Cathedral has assumed the second place in the architecture of Europe; St. Peter's, at Rome, holding the foremost, as no doubt, from its gigantic proportions and splendid decorations, it is entitled to do; but had Wren been allowed to carry out his first plan for rebuilding St. Paul's, I doubt much whether it would have had a rival in the world. We are, however, anticipating. The king, wishing to restore old St. Paul's, as we have said, and around which clustered so many historical associations, Wren set to work to devise the best method of meeting the king's views. To this end, in 1665, he visited France, in order to become better acquainted with the art of architecture and the various approved manners of building. He resided some months in Paris, where he cultivated the acquaintance of the best artists of the day and the most celebrated men of letters; doubtless by these means he sought in some measure to make up for the absence of early artistic training.

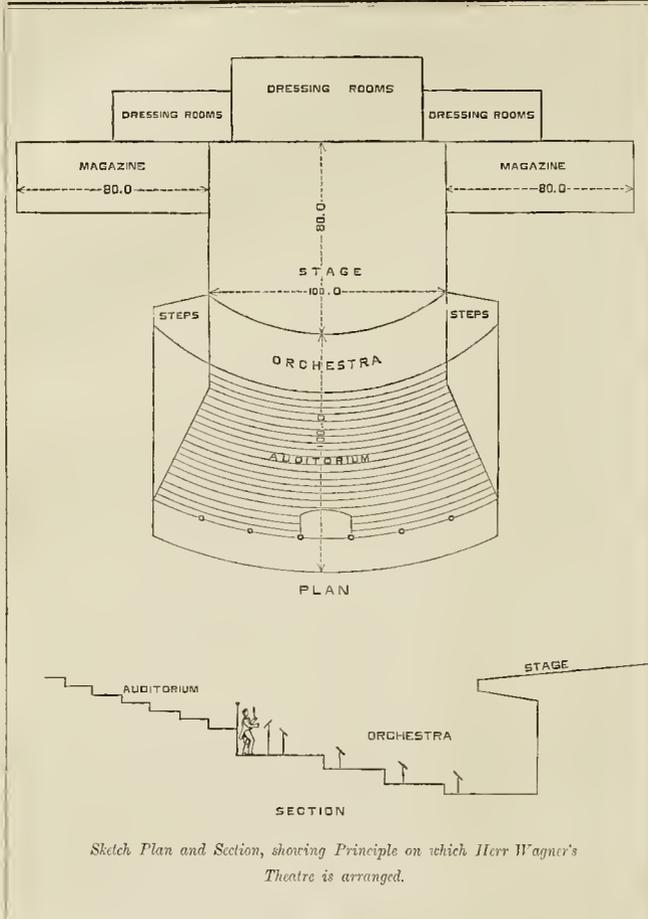
It may be interesting here to sketch some of the Parisian buildings in progress at the time of Wren's visit under the architects most in vogue, whose lives and works are so fully described by Quatremère de Quincy. Among others Jules Mansart, who distinguished himself as the designer of the dome of the Church of the Invalides. He would at the time of Wren's visit be a very young man; he sprang from a race distinguished in the arts, and Versailles and the dome of the Invalides proved that he was not unworthy of his illustrious ancestry. François Blondel, the architect of the Arc de Triomphe, de la Porte, St. Denis, Paris, would be forty-seven years of age at the time of Wren's visit; he had not studied architecture or any of the fine arts in his youth; having been brought up a soldier in the army of Louis le Grand, he profited

by what he saw of architecture and engineering in his various campaigns, and became fired with the ambition to excel in the practice of those arts. In the very year that Wren visited Paris, Blondel's talents became known to the king, who soon after appointed him to design all the public buildings in Paris. Another architect, then much in vogue, was Le Mercier, who died five years afterwards, and whose name mainly rests for its reputation upon the Church de la Sarbonne, which he produced under the patronage of Cardinal de Richelieu. The foundation-stone of this church was laid in 1629, so we may fairly suppose that Wren saw its graceful dome and cupola completed at the period of his visit in 1665. Claude Perrault was also in his glory then; the celebrated translator of Vitruvius, and architect of the colonnade of the Louvre, upon which no fewer than one thousand hands were employed, according to Wren, at the time of his visit, and where he spent a portion of each day, examining the materials and methods of construction.

If we compare this design of Perrault's with the façade of St. Paul's, as executed, a striking resemblance will be observed. The architect Le Veau and the painter Le Brun formed, under the minister Colbert, a council on public buildings about the time of Wren's visit. It was also in the same year that the celebrated Italian architect, Bernini, who designed the colonnade of Louis XIV., was induced, by the entreaties of Louis XIV., to visit Paris and give his advice respecting the rebuilding of the Louvre. The king sent Bernini his portrait, enriched with diamonds, together with a pressing letter of invitation; and he also wrote to Pope Innocent X. to permit Bernini to leave Rome for a season, his great works and his fame having made him the inalienable property of Rome. The life of Bernini would alone fill a volume. We have only referred to him and the other great men whom Wren would most probably meet during his visit to Paris, to show under what strangely advantageous circumstances that visit was made. As well as the buildings we have named, upon the types of which St. Paul's may have been modelled, Wren would see recently completed by De Brosse the Palais de Luxembourg, with its central dome and coupled pilasters; these and other public buildings then in course of erection, or recently completed, would doubtless have no small influence in moulding Wren's innate taste, which, as we have seen, had not received any systematic training in the arts; but whatever he saw in Paris, we have the satisfaction to know he was enabled soon afterwards to rival and eclipse in his great master-piece of St. Paul's. We are not aware that Wren prolonged his journey to Rome, but while he was in Paris he made an extensive collection of views of celebrated buildings, and we may suppose that the frontispiece of St. Peter's, at Rome, by Charles Maderno, who died in 1629, would not be unknown to him. We have mentioned this because, in Wren's first design for St. Paul's, there seems to be a general similarity of treatment to this design by Maderno, especially in the single tier of pilasters and the tall parapet above the main cornice, and the row of statues to break the level sky-line, with the roof kept out of sight. Of course it must remain a question of taste whether this treatment in Wren's first design, or that of the one finally adopted for St. Paul's, was the most suitable; certainly, as regards the dome of the final design, it is as much superior to the original one as the executed ground-plan is inferior to Sir Christopher Wren's original scheme for the same.

We have now traced Wren's interesting and eventful career down to the year 1666, the *anno mirabilis*, when the awful fire of London suddenly put an end to all ideas touching the restoration of Old St. Paul's, and gave Wren a *tabula rasa* for the exercise of his now matured genius; but, alas! that genius was doomed to be still fettered by the influences of those in power, and at the instigation of the Duke of York, he was compelled to abandon his long-cherished plan of a great open Protestant cathedral, and to devote his mind to the production of one which must be considered at best but a beautiful anachronism, viz.—a domed church connected with a purely Mediæval system of planning, more suitable, it has been asserted, for the gorgeous ritual of the Church of Rome than for the Protestant service. It was not until 1673 that Wren was commissioned to produce his designs for an edifice worthy the greatness of the nation, and calculated to rival every

* See p. 424, ante.



Sketch Plan and Section, showing Principle on which Herr Wagner's Theatre is arranged.

edifice of the kind in Europe, but with the unfortunate proviso that his plan should conform to the Mediaeval arrangement which he himself had been so anxious to set aside, for reasons before named. In 1674 the workmen began to clear away the ruins of the ancient Gothic cathedral, ready for the new foundations. The history of the pulling or battering down of parts of the solid old pile is one full of interest. The ancient Gothic work, although time-worn and decayed, was found to be tough and obstinate to the last, and we have no doubt, had it continued until our day, no modern Goths would have completely restored the old cathedral of St. Paul's, as much greater ruins have recently been made fit for worship, and many more may yet be, if the spirit of the present Gothic revival continues to spread. We are not about to quarrel with our architect for what he did, and only regret that he had not more of his own way in the matter, when it had been decided that the cathedral should be rebuilt; for if such had been the case, the thanksgiving service last week might have been witnessed by larger crowds with much greater pleasure and comfort. It is certainly worth while to refer to his first ground-plan, and see how very careful he has been to remove all needless impediments either to sound or sight, even to the extent of piercing the great piers of the dome, with that end undoubtedly in view. The first stone of St. Paul's was laid on the 21st of June, 1675, just twenty years after Wren's visit to Paris, and five years after the completion of the Louvre by Perrault, and in the façade of which we think we can trace some resemblance to the exterior of St. Paul's as executed, but not as first designed, by Wren, and over the abandonment of

his cherished conception Wren is said to have shed tears of bitter disappointment. The choir was finished in October, 1684, and on the 5th December, 1697, divine service was performed for the first time since the fire of 1666. In the year 1710, when our architect was seventy-eight years of age, the highest stone of the lantern on the cupola was laid by his son Christopher, attended by the venerable designer, Mr. Strong, the master mason of the building, and the lodge of Freemasons, of which Sir Christopher was for many years the leading spirit. Forty-four years since the burning of London, thirty-five since the laying of the first stone had elapsed, three reigns had terminated, and a dynasty had been changed and become extinct while this stately pile had been growing up into the blue heavens under his magic wand, to become the great centre and eye of the metropolis, the shrine of the nation's hopes and tears, the place of banners and rejoicing, and the muffled home of the mighty dead.—St. Paul's, whose great bell sounds for royal funerals, and whose massive portals are thrown wide for courtly crowds, and whose dome and aisles still echo with the pious of praise and the songs of thanksgiving. Wren must have felt very thankful when the topmost stone was laid, after all his troubles, all the malice of jealous enemies, and the petty interference of seeming friends, the account of which fills pages in his biographies, but which he bore with patience and in silence to the end. When funds were low, we find him giving 50*l.* out of an annual stipend of 200*l.*, to help him to carry on the works of St. Paul's. The commissioners constantly annoyed him with impracticable suggestions for improvements to the design, which in the first instance they had

assisted the Duke of York to spoil. When we compare St. Paul's with its great prototype, St. Peter's, we must remember that Wren, single handed, built the first in face of opposition, shortness of funds, and the malice of enemies, in thirty-five years; whereas the second was the work of some twenty architects, supported by the coffers of the whole of Christendom, and under the patronage and encouragement of nineteen sovereign pontiffs.

Had St. Paul's been the only work of Sir Christopher Wren, while surveyor-general, to which post he was appointed at the time of the fire, his skill and assiduity would have astonished us; but when we remember all the other works and duties he was called upon to perform, we are really constrained to say that he was indeed a giant among architects. To enumerate his works would fill a page,—the Monument, Temple Bar, and Chelsea Hospital, with many of the halls of the great companies, were designed and built under his direction, as well as some fifty churches and more, all over London, and these while he was actively engaged on St. Paul's. Of Sir Christopher it has been said that he had so equable a temper that, during a long life, reaching to ninety-one years, he never lost a friend. He was of a social disposition, and, although consumptive in early life, by moderation he managed to reach the above patriarchal term of existence. At the age of eighty-five he was, for some unexplained cause, probably owing to the machinations of foreign adventurers, deprived of the post of surveyor-general, when he retired to the country, and occupied the six remaining years of his life in reading and religious contemplation. He was buried beneath the glorious dome which his genius had raised,—fit sepulchre for kings, and noble resting-place for this king of the gifted sons of art.

H. H. VALE.

WAGNER'S GERMAN NATIONAL THEATRE AT BAYREUTH.

A VISITOR to the late festival at Bayreuth, inaugurating the laying of the first stone of Wagner's National Theatre, enables us to give a slight sketch plan of the projected building, as well as a section of the stage, orchestra, and auditorium.

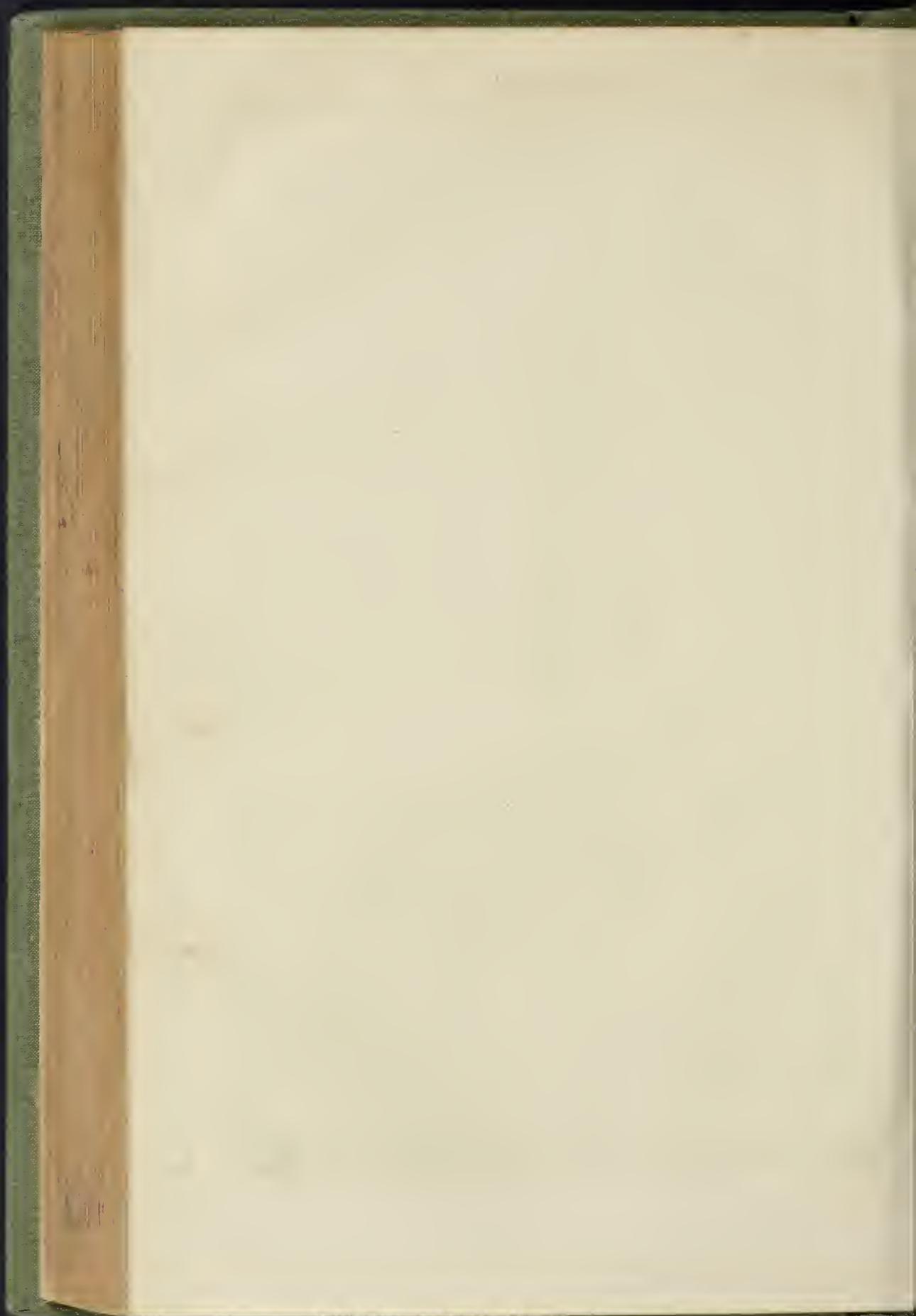
By reference to the latter, it will be seen that Wagner's long-cherished idea of an invisible orchestra will now, for the first time, be carried out in its entirety. Wagner maintains that a sight of the motions of the conductor and the forces he controls, is as disturbing in its effect upon an audience, as would be that of the scene-shifters and the mechanical appliances put in motion by them, if these were also visible. How often one has to complain that the voices of the singers on the stage are drowned by the instrumentalists, situated as they are at present in our theatres, is a fact but too familiar to opera-goers. Wagner's plan of sinking the orchestra some seven feet below the level of the stage, and arranging his auditorium after the fashion of an amphitheatre, without boxes, will have the double advantage of putting the band out of sight and of moderating its tone. By this plan the conductor will be the only person in the theatre who will have a view of both the stage and the band. It certainly seems to be one which deserves the consideration of future projectors of operatic theatres.

CHURCH OF ST. MARY OF THE ANGELS.

This church, now being built in Church-street, Dublin, from designs by Mr. J. J. McCarthy, R.E.A., architect, belongs to the religious order of the Capuchins. It is a "single span" church, several examples of which exist on the Continent, such as the Dominicans', in Ghent, and the Cordeliers', in Toulouse. They belong, for the most part, to the religious orders of Dominicans and Franciscans, who found them convenient for preaching and popular services. St. Mary's, Dublin, consists of a nave with lateral chapels, and apsidal chancel, with large sacristies. Its width in clear of the main walls is 45 ft., and including the chapels, 65 ft. Its total length is 160 ft., and interior height 73 ft. The walls are built of black calp, with white limestone dressings. The ceiling is paneled in wood. The contractors are Messrs. Hammond, of Drogheda, for the stonework; Messrs. Maude, of Dublin, for the roof and ceiling. Mr. C. Dromgoolle has acted as clerk of works from the commencement of the building.



CHURCH (R. C.) OF ST. MARY OF THE ANGELS DUBLIN. —MR. J. J. MCCARTHY, ARCHITECT.



THE PUBLIC MEDICAL SERVICE.

A PAPER on local medical appointments, and on the need of the separation of private practice from the public medical service, by Mr. Edwin Chadwick, C.B., has been read before the Social Science Association, at the Society of Arts, Adelphi.

In the outset Mr. Chadwick pointed out that the Public Health Bill, now struggling for attention before Parliament, should involve means for the best organisation that could be obtained of a preventive service for the removal of the clearly ascertained gross preventable causes of upwards of 120,000 premature deaths annually, together with a vast amount of disabling sickness, in England and Wales. The Bill should also provide means for the removal of forewarned defaults of administrative principle in respect to the union medical service, which is, primarily, solely curative, and indeed mostly unelaborative, by which administrative defaults, as he deemed them, large contributions are made to an annual excess of from three to four millions of paupering and demoralizing expenditure in poor rates. He was of opinion that the admixture of private medical practice with the public medical service and duty is detrimental to the general practitioners, by aggravating competition, and the local congestions of redundant service in populous districts, and by unnecessarily dividing and lowering the average amount of private professional incomes—that it acts injuriously upon the social professional status—that it is at the same time detrimental to the public local service, by dividing the main attention of the medical officer from his public service to his private practice, the chief means of his livelihood—by occasioning the service of medical relief to the destitute to be commonly performed, superficially and perfunctorily, and often neglectfully and cruelly; and that there can be no sound amendment of the medical practice of relief to the destitute that is not based upon its entire separation from private practice, and by confining it to properly-paid, specially-qualified medical officers of independent yet responsible position, giving their undivided attention to their public duties.

A discussion followed the reading of the paper.

PROVINCIAL TRADES MOVEMENT.

Bolton.—The brickmakers of Bolton have struck work for an advance of wages. They applied for an increase of 1s. 6d. per 1,000 bricks manufactured, the amount to be equally divided among the makers, the wheelers, and the clay-temperers. This the masters refused.

Huddleton.—The joiners of Middleton and district went out on strike through the refusal of the masters to comply with a notice sent to them six months ago, for a reduction in their working hours from 64 to 51½ per week, and an advance of wages from 29s. to 30s. per week. They also demanded an advance of 1d. per hour for overtime, which had hitherto been 7d. The refusal of the masters was unanimous; but the strike has come to a speedy end, a compromise having been agreed to by masters and men. The latter are to receive 7d. per hour, which is equivalent to an advance of 2s. 6d. per week. The building trade is unusually active in the neighbourhood just now.

Ipswich.—The arbitrators have made their report, and declare that the men shall work fifty-six hours and a half per week, leaving off on Saturdays at one; the mechanics to be paid 1d. per hour more, and the labourers three-farthings per hour more. This is to be independent of overtime.

Hullian.—At a full meeting of the master joiners and carpenters, it has been unanimously resolved that, seeing they had conceded the reduction of 2½ hours per week to the workmen, they would not, in addition, grant an advance of 1s. in the wages. They further resolved to open their shops on Monday morning, when all men willing to resume work on those terms would be at liberty to do so. Masters who have conceded the demands of the men are said to be not members of the masters' association.

Bristol.—A meeting of employers of carpenters and joiners has been held to consider the request from the men for an advance of wages along with the short hours of labour. Mr. J. Foster presided, and there were about twenty other gentlemen present. The chairman explained that the men had demanded 7d. per hour, along with the nine hours' work per day

(the latter having been conceded). The masters offered 6½d., the present wages being 6d., but the men declined this offer, and proposed to refer the matter to arbitration. A long discussion ensued, and various resolutions were proposed. One was, that the masters adhere to their offer; another was for giving the 7d. per hour; and another for arbitration. The last was eventually carried by the chairman's casting vote. It was agreed to submit the following names, from whom to select an arbitrator.—Mr. Brice, Alderman Abbot, Alderman Ford, Mr. C. J. Thomas, and Mr. F. Terrell. The following were appointed to represent the masters at the interview with the men—Messrs. J. Foster, Davis, son, Banner, Davis, jun., Coates, W. Baker, Grant, and Cross.

York.—The strike of the joiners has been brought to a successful termination. Six master joiners met six committee-men, to try to come to some arrangements respecting the long-pending strike. The men on the 1st of March last asked for an advance of wages and shorter hours,—53 hours per week and 6½d. per hour,—the masters offering the men the 53 hours and 6½d. per hour. The men have agreed with the masters to commence work at an advance,—6½d. per hour and 53 hours per week.

Leeds.—There has been a conference between the master huddlers and the operative hricklayers and labourers, with the object of endeavouring to arrange the differences between them. On the part of the employers, a resolution was moved that the hricklayers' wages from the 4th of June instant should be 7½d. per hour; that the rules as agreed upon at the last conference be adopted; and that six months' notice should be given by either party in case of any required change. At the last conference the employers agreed to allow overtime at the rate of time and half for the first two hours and for night-work and Good Fridays, and double time for Sundays and Christmas Days; and the apprentices should be legally bound for not less than five years. Now, however, the operative hricklayers objected to the two last-named rules being carried, and they also defeated the employers on the resolution promising the workmen 7½d. per hour. The strike, therefore, still exists, as it also does with respect to the hricklayers' labourers, who were offered 6½d. per hour at the same conference. The masters conceded the rate of wages and walking time, and the only remaining matter in dispute was as to overtime, to be paid as time and half. The masters wish it to begin at seven p.m., but the men at half-past five o'clock, that is, at the close of their regular day's work.

Barrow.—A large number of navies employed at the Buccleuch Dock, Barrow, struck work in consequence of their demand for more wages being refused. The men have been paid at the rate of 7d. per wagon, which has enabled them to earn from 28s. to 30s. weekly. The men demand 8d. per wagon, which was refused, and they refused to work. The stonemasons employed at the Ship-building Company's Works on Old Barrow, have struck work for an advance of wages. The demand of the men, which was an advance from 30s. to 33s., was granted, and work was resumed.

Newcastle-upon-Tyne.—The lock-out of the pressed flint-glass makers of the Tyne and Wear, which has now lasted for nearly three months, is substantially at an end, matters having been amicably arranged in two of the principal shops, those of Messrs. Sowerby & Co., of Gateshead, and Messrs. Gremer & Son, of Sunderland. In these places the men were to resume work as soon as the furnaces could be got ready, and part of the hands commenced on Tuesday. The smaller shops did not join in the lock-out. We understand that the men at the Tyne Flint Glass Works, South Shields, and at Carr's-hill probably will follow suit, and effect a settlement such as has been arrived at in the Gateshead and Sunderland Works.

Hawick.—The journeymen painters presented a request to the employers that the working hours be reduced from 60 to 57 hours per week, that wages be advanced 1d. per hour during ordinary working hours, and that time and half-time be allowed after 6 p.m., that men working in the country shall receive additional allowances; that apprentices serve in future six years instead of five, and all apprentices engaged during the last twelve months be dismissed. The employers have shown no intention of conceding any of these demands, and the men are continuing at their work as usual.

Glasgow.—A conference between a deputation from the employers and workmen in the mason

trade was held in the Trades Hall, Glasgow, Mr. Dempster presiding. The employes' demand was, that their wages be raised from 6½d. to 7d. per hour, paid weekly instead of fortnightly. The employers agreed to recommend to their association that the wages should be advanced to 7d. per hour. The masters expressed an opinion that the system of weekly payments would not prove beneficial even to the workmen. The employes, on the other hand, contended that it would place them in a better position in making purchases, and that it was the almost unanimous wish of the trade. The employers unanimously objected to conceding this demand. The masons resolved to strike unless their demand for weekly payments were conceded. The employers have given the advance. The building trade is very busy just now.

Ayr.—The operative masons gave notice that from 3rd of June they would ask a reduction of their hours from 56 to 51 per week, and also an advance on their wages from 6d. to 6½d. per hour. The men struck work, and the employers have since acceded to their demands, and work has been resumed.

Dundee.—Representatives of employers waited upon the slaters on strike, and offered them an increase of ¼d. per hour instead of ½d., as demanded. The offer was refused, and the strike continues.

Sir.—The wall masons have struck work at Plaistow New Cemetery, in consequence of labourers being introduced to do a portion of their work. In fact, all the wallers were retained for the building of the outside shell. The filling in was done by basketists by the labourers; the hassock with which it is built inside was also squared up by labourers. Mr. Kilby, of Limehouse, is the builder.

Signed on behalf of the men on strike,
J. GALLEY,
JOHN BARRATT,
HENRY WHITEHEAD,
G. PERRINS.

THE PEABODY ESTATE AT BRIXTON.

The estate, consisting of 16 acres of land situated in Shepherd's Lane, Brixton, between the Clapham and Brixton main roads, and which was purchased by the late Mr. George Peabody, for the purpose of erecting upon it houses for the poorer classes, was some time ago conveyed by the trustees to an enterprising gentleman, who has already erected upwards of 200 houses of a superior character, and several others are now in course of erection. The Metropolitan extension of the London, Chatham, and Dover line, skirts immediately alongside the line, and as it is thus easy of access both from the City and the West-end, the applications for plots are numerous. Several buildings of a public character are intended to be erected on the estate, amongst which is a Masonic hall, and it is expected that in a short time the estate will produce a large annual rental which, according to the terms under which the land has been conveyed, will enable the trustees to erect, from time to time, blocks of dwellings for the poor in different parts of the metropolis.

SEWAGE IRRIGATION REPUDIATED AT THE LOCAL GOVERNMENT BOARD.

ONE of the first acts of the new Local Government Board, acting under the advice of its inspecting engineers, has been to denounce sewage irrigation.

An irrigation scheme, propounded by the West Ham Local Board, has been refused,—first, upon the report of Mr. Rawlinson, chief inspector of the Local Government Board, January 30th, 1872; and, secondly, upon the report of his colleague, Mr. Harrison, May 18th, 1872.

The decision is so contrary to all that we have been hitherto taught by the Local Government Act Office,—now the Local Government Board,—as well as so contrary to all the reports issued by Parliamentary Committees and Royal Commissions during the last ten years, that a statement of the case may be of advantage to very many who are actively engaged in sanitary work.

The West Ham District contains a population of 70,000, adjoining the metropolis, from which it is separated by the river Lee, and bounded by the Thames on the south. The district was severed about twelve years ago by Mr. Rawlinson at a cost of about 100,000l., the discharge being into the river Lee, by gravitation at low water, and by pumping during the remainder of the day. In 1868, the Lee Conservancy obtained a new Act prohibiting the discharge of sewage. Clauses were, however, obtained, after a hard

fight in the House of Commons, enabling West Ham to continue to discharge the effluent water of sewage providing it were first purified, clarified, and disinfected, "by the best known practicable process." The West Ham Board, believing that the treatment of the sewage of a population of 70,000 in tanks, in a crowded neighbourhood, would be both a costly and an offensive proceeding, used every endeavour to arrange with the Metropolitan Board for the reception of the West Ham sewage, but without success. A sewage committee went throughout the country inspecting the various processes in operation in other towns, and came back unanimously of opinion that tank systems were everywhere a failure and irrigation was a success. The Board sought for land, and fortunately 850 acres came into the market, in Barking and Dagenham, away from a population, but within a reasonable distance, with the great advantages of a frontage on the Thames, and intersected by public roads and a railway. The Board, by agreement, secured 750 acres, provisionally, at the very moderate cost of 96l. per acre. The cost of the works, considering the extent and population of the district, was also very moderate, viz.—42,000l. In round numbers the farm and works would cost 120,000l.; repayment spread over fifty years. The money was offered at 4½ per cent.; and, further, responsible parties offered to lease the land, at 8l. per acre for seven years, the longest period allowed by the Local Government Acts. Thus the whole matter was arranged without any of that litigation or arbitration by which so many Boards have suffered. All that remained was to obtain the sanction of the Local Government Board. That sanction has been withheld upon the following grounds:—

1. That tanks may be used in a populous district "without creating a nuisance, or mismanaged so as to be intolerable."

2. That neither the result of the Rivers Pollution Commissioners' Report, nor the evidence produced at the inquiry from Croydon, Carlisle, Cheltenham, or Warwick, "affords a reasonable or fair prospect to the West Ham Board to enter upon an extensive scheme of sewage irrigation."

3. That "absolute necessity" would alone justify the Local Board in committing the ratepayers to the proposed scheme of sewage irrigation.

The Report contains a distinct denial of the commercial success of irrigation, which should only be adopted under the pressure of "absolute necessity"; and tank systems are recommended as far as possible. The general arguments will apply to every district besides West Ham. What is "absolute necessity"? The standards of purity recommended by the Rivers Pollution Commission, adopted by the Thames Conservancy, and included in Mr. Stansfeld's Government Bill, are all far above the results of "the best known practicable process" with tanks.

West Ham has lost its farm, for which it was offered a rental of 8l. per acre; it is driven to a tank system, at a great annual cost, in the midst of a population; and, in all probability, will be compelled to remove its works elsewhere, at a very great cost; the whole of which operations will result in dead loss and taxation.

If the decision be right, we ought to be grateful that a new light has been thrown upon the subject, and it is well that local boards and sanitary engineers should take note thereof, and thus avoid the waste of time, money, and anxiety which the West Ham Local Board and their engineer have undergone during the past four years, in endeavouring to follow the previous teaching of the Government.

LEWIS ANOELL, M.L.C.E.,
Engineer to the West Ham Local Board.

POCKET-BOOKS.

SIR,—I observe Mr. Hurst says, in reference to error in his Handbook, that "Pocket-books are intended only for those who have had (sic) some previous knowledge of the subject." But, suppose a man, like Captain Seddon, not only "ought to have known," but actually does know, when glancing at a pocket-book as much or more than its compiler, or suppose the case of a less learned reader, would it not be desirable to save trouble—the sole excuse for the condensation—that the editor should mention his authorities for such important things as formulas for calculating strength, &c.; for many hesitate whether a statement is established, whether it is the writer's own, or whether it is something

between the two, notwithstanding the pretence that these or other "common-place explanations are unnecessary."

Thus, sir, it seems to me that such vague pocket-books are in some sense perverse-books; because, clearly, it is *prima facie* questionable whether they lead or mislead. "Distilled books," Lord Bacon observes, "are, like common distilled waters, flashy things." They may become admirable if, besides presenting really reliable results, they indicate where varied and positive information can be obtained.

E. L. TABBUCK.

"DESIRABLE RESIDENCES" TO BE LET.

(From Messrs. Sexton, Headstone, and Hepitaph's Circular.)

No. 1.

A MANSION suited for a merchant retired, With an acre of ground, or more if a smallcroft; The soil very rich, shrubs take a deep root; For the land was formerly used as a "shoot."

No. 2.

A nice handsome villa, lately enlarged, And the incoming tenant will not be charged With cost of removal, for horse and cart lent; The taxes and all can be paid in the rent.

No. 3.

A semi-detached, three-story, quite new, Built for the owner, is open to view; Being a projected man of some wealth, He's advised to leave home for the sake of his health.

No. 4.

A dwelling, with coach-house, stables, and loft; A lodge in the front, at the back a smallcroft; A walk to the church through the churchyard in rear, A known noble lord very lately died here.

N.B.

The agents have houses like these full a score, And they now are engaged in building some more. Apply, please, at once, applications are rare, All tenants are sure to be settled for life.

DECORATION OF ST. PAUL'S.

At a meeting of the Executive Committee of St. Paul's Completion Fund, held on Monday, June 10, the following resolution was moved by Mr. Oldfield, seconded by Mr. Beresford Hope, M.P., and carried unanimously:—

"That it be an instruction to Mr. Burgess, in preparing his plans for the completion of St. Paul's, that he consider himself limited to a style of decorative design for which authority is to be found either in any such models or drawings of Sir Christopher Wren as may be in existence, or, failing these, in the best works of the Italian architects and artists of the first half of the sixteenth century."

WORCESTER GUILDHALL COMPETITION.

At a meeting of the Worcester Town Council on the 4th inst., the Buildings Committee reported they had

"Found that six sets of plans for the proposed Guildhall buildings had been received at the Guildhall, before five o'clock p.m., on the 15th ult. (the hour to which the time for receiving same had been extended), and that two packages of plans had arrived at the Guildhall after five o'clock on the same day, and one package on the following morning."

And, at a meeting on the 24th ult., it was resolved, *nem. con.*—

"That it be recommended to the Council to allow the three sets of plans to be opened, and placed in competition with the others, subject to its being hereafter proved to the satisfaction of this committee (if any of these plans should be selected) that the plans so selected were despatched from the office of the architect in sufficient time, but for delay in transit, to have reached the Guildhall by the hour fixed."

The adoption of this having been moved, The Sheriff said he had expressed a very decided opinion as to the course that ought to be adopted by the committee. They had advertised that they would receive plans till five o'clock on the evening of the 15th of May; and he did not think that they who made the rule should be the first to break it. He thought that they had not the power to open the three plans that came later, and that the question should be left to be decided by the Council.

After discussion, an amendment was moved and seconded, to the effect that the three designs delivered after time should be admitted to competition. The mover, Ald. E. Webb, said, if there was no practical unfairness, he did not see that there could be any cause of complaint. He was in Mr. Grainger's shop the day after the 15th, and Mr. Harlow, who was there, stated that he had been in the coaching-office at the Star that morning and saw a parcel there that apparently contained plans. He asked the person in charge whether the time was not past for delivering it, and it was sent off at once for delivery. The plans were really only a few hours late.

The Mayor, in rightly arguing against the possible injustice of the amendment, said the Town Clerk had invited, and obtained, the opinion on the point of the Editor of the *Builder*, which was as follows:—

"In reply to the inquiry you have addressed to me, I have no objection in saying that the competition should be rigorously confined to those designs which were delivered by five o'clock on Wednesday, May 15th. A departure from this course would be a breach of contract and would lead to controversy, if not difficulties."

"If one of the designs delivered too late should prove much better adapted for your purposes than the premiated design, another question might arise which would have to be dealt with separately, with due regard to the interests of the author of the premiated design.—GROVER GODWIN."

On a division, the amendment, to the effect that the whole nine designs be placed on the same footing, was carried by 1,—15 voting for it, 17 against it.

STATE OF THE COVERED MARKET AND TOWN-HALL, LONGTON.

At a recent meeting of the Longton Town Council, the Market Committee reported that:—

"After very carefully examining all the documents and papers relating to the building of the covered market and town-hall, and considering the report of Mr. Lewis on the state of the covered market buildings, and hearing Mr. Burrell's explanation in reference to the same, it is of opinion that the specification is generally, although not fully, carried out, and therefore only partial blame rests upon the architect in reference to this building; but with regard to Mr. Lewis's report on the town-hall and ancillary buildings, the committee adopted his report in its entirety, and is of opinion that the architect has shamefully neglected his duty, and deserves severe censure. The committee is recommended to be instructed to prepare specifications for the necessary repairs and alterations throughout the whole building, and that such repairs and alterations be immediately proceeded with."

Alderman Green said that the report of Mr. Lewis was one which was of a character calculated to create alarm. He referred to the specifications and the complaints which had been made, and said, with respect to the Market-house, it was shown that blame did not attach to the architect, who was restricted by the Improvement Commissioners (who were the local authorities when the work was done) as to the amount expended. But with reference to the Town-hall, he said the committee considered that there was great evidence of dereliction of duty on the part of Mr. Burrell. Some blame was, no doubt, due to others, but for some of the wrong-doing Mr. Burrell alone was responsible. The consequence was that the Town-hall was now in a very unsafe condition; and it was desirable to have the building repaired at once.

Mr. Farmer said the cost of the necessary repairs and alterations would be about 1,500l. He observed that soon after the building was erected a committee of ratepayers called attention to the state of the building, and it was then patent to everybody that there had been a violation of the specifications. If the architect was to blame, what must be said about the old Commissioners, who disregarded the complaints of the ratepayers' committee? He questioned whether it would not pay to take down the Town-hall and rebuild it, but the expense would be too great for the borough to incur at present.

The report of the Market Committee was adopted, excepting the latter part,—"that such repairs and alterations be immediately proceeded with."

PIECE-WORK.

SIR,—Please indulge me by inserting in your next issue a few thoughts from an artisan with reference to the present agitation in the building trade. It is clear that great dissatisfaction prevails among us, and I fear the attainment of the demand now made will not entirely remove it. I am diametrically opposed to one or two of the favourite rules of the "Unions." Instead of saying, "There shall be no piece-work," I say there shall be as little day-work as possible; and let us have a fair and just schedule of prices, to be agreed upon between masters and men. But it is objected, "Piece-work has already ruined the trade." "Men have taken piece-work at a low figure, and have worked like slaves to earn only as much as their wages at day-work and so, which is similar to what has been done at day-work, the master has turned upon the men for not doing it as fast as they did when at piece-work." Whatarranted knaves men must be to do it! If the trade is thus ruined, whose fault is it? I certainly do not advocate such piece-work as this; but let every man, as far as possible, work by the piece on a fair and just scale of prices, that would give the masters their reasonable and fair profits, and I believe that a trades-union having this as one of its principles, would do good. 1. It would give to us all more of that independent and proper feeling that is so wanting for ourselves. 2. Every man would then be placed upon his own merits; and who that is desirous of the noble name of a man can object to this? But if my wife be asked, are you a man already rewarded according to what they individually merit, certainly not. If, sir, you look into the shops, and on the buildings now in progress, you will find that, with the exception of improvers and apprentices, all the men are paid at the same rate, notwithstanding some are thoroughly efficient, and others are complete *slugs*. And too often, when hands have to be lessened (owing to the nearness to the works to com-

pletion), these *snuffs* are kept on, while really good men are discharged. Why is this done? Well, sir, do not tell the masters, for the foremen say they do not know. It is because a certain sum in hard cash, or a quantity of beer and spirits, usually called "tipping," or "lubbing," passes from those indifferent hands to the foreman, who, notwithstanding his position, is too often mean enough to take, and even demand it, though on the quiet. The consequence of this nefarious practice is too plain to require comment. I firmly believe that a general system of piece-work was the most, and more independent of the demand on the part of the foreman, though it would not, perhaps, entirely eradicate it. There is many a man who, by his first-rate ability and untiring industry, could and would earn more than six pence per hour, even if the price paid for a job of piece-work was just what it would cost if done at day-work. And why should he not have the opportunity of doing so? Would it not be better for master and man? It would be a powerful inducement to every man to improve, and add to his ability.

JOHN BUCKINGHAM.

CHARGE OF PERJURY AGAINST A MASTER BUILDER.

At the Birkenhead police-court, before Mr. B. Derbyshire, George Henderson, a joiner and builder at New Brighton, was the accused, & a summons charging him with having committed perjury in evidence given in an arbitration case before Mr. Preston, the stipendiary magistrate of Birkenhead. From the evidence, it seemed that Mr. Henderson was engaged by Mr. Edgar Swinton Holland to execute certain alterations and repairs to a cottage at New Brighton. The amount charged was £200, less 7d. The payment was disputed, on the ground that it was exorbitant, and an action for the amount was brought on at the Chester assizes in April last. Before the case was brought on at the assizes the record was withdrawn by Mr. Henderson, subject to a reference to Mr. Preston, the stipendiary magistrate of Birkenhead, who ultimately awarded Mr. Henderson 191s. 8d.

During the hearing of the case before Mr. Preston, it was ascertained that Mr. Henderson committed perjury by swearing that he had used 8,000 new bricks in the work at Mr. Holland's cottage; whereas it was stated on the other side that in the interior of the cottage only old bricks had been used, and that the number of new bricks was not more than 600.

The charge of perjury against Mr. Henderson was supported by the evidence of Mr. H. W. Biggs, solicitor; Mr. George Northcott, surveyor, Liverpool; Mr. W. Langley, builder, Liverpool; and other witnesses.

Mr. Henderson reserved his defence until the trial at the next Chester assizes, but admitted him to bail.

ON TESTING MATERIALS.

Sir,—In your issue of last week there is a letter from Mr. Hurst, C.E., which calls for a few words in reply from me.

In reference to the formula to which I took objection in my paper, I am perfectly aware how, and by whom, it was arrived at; but that has nothing to do with its being a good formula to give in a hand-book, without a word of explanation. It is a formula which no one who knew what he was about would be troubled with, for the simple reason that it only applies to iron of a certain strength, and is also objectionable on account of one of the terms being in feet and the rest in inches, which leads frequently to mistakes being made in working out calculations.

If, as Mr. Hurst says, the formula is only intended for those who have previous knowledge of the subject, I must be allowed to remark that those are the very people who, as far as my experience goes, never think of using it.

Another point which requires explanation in connexion with the formula is the use of the word "Hand-book," is whether the rivet-holes are intended to be deducted from the area indicated on the accompanying diagram.

I must be allowed to differ in toto from Mr. Hurst when he says that the formula recommended in my paper is not one which is less convenient or misleading than the other. The formula symbolically represents an actual value, such as inches or tons; whilst in the other, purely conventional, or rather manipulated, constant is made use of; so that the formula conveys no definite meaning to any one who has not taken the trouble to unravel it.

The mistake I made in quoting from an old, instead of the latest edition of Molesworth's "Pocket-Book," I am much obliged to Mr. Hurst for pointing out, though it does not affect my argument that our present knowledge of building materials is not what it ought to be.

H. C. SANDROS, Capt. R.E.

CHARLES J. LEVER.

The Irish novelist, who died a few days ago as Vice-Consul at Trieste, and whose name has been before the reading public for nearly forty years, was the son of a Dublin builder. He was born in the year 1809, and the writer of the present brief notice remembers the spot, nearly opposite to the terminus of the Dublin and Drogheda Railway, where his father's yard stood, but the concern has many years since been swept away by modern building improvements. The elder Lever was employed on public works by the Customs authorities of Dublin, and built much otherwise. Charles Lever was a student of Trinity College, Dublin, and on the 27th of February, 1827, took his degree of A.B., and in 1831 that of M.B. Afterwards the University conferred on him the honorary degree of LL.D. Lever did not go to Cambridge to qualify for the medical profession, as he was in early life artied to the celebrated Surgeon Cusack, of Madame Stevens's Hospital. He was reported to have exerted himself con-

siderably, and to have rendered actual and efficient service to the citizens of Dublin during the first great cholera epidemic in 1832. Some time subsequently he was attached to the British Legation at Brussels in the capacity of a physician. Some of Lever's best stories appeared first in the pages of the *Dublin University Magazine*, a monthly journal established in Dublin about 1833, and still in existence, though it has undergone many vicissitudes and changes of publishers. Lever acted as an editor to this magazine for a considerable period, and contributed to its pages while abroad. While at Brussels his first success, the "Confessions of Harry Lorrequer," was written. Then followed, "Charles O'Malley," "Jack Hinton the Cardsharp," "Our Mess," "St. Patrick's Eve," "Tom Burke of Ours," and numerous others. His most recent contributions were to the pages of *Blackwood*, in the character of "Cornelius O'Dowd," piquant and spicy. "Lord Kilgobbin," his last novel, has not been many weeks issued, and though there was not any novel written by name even among the Irish people to our recollection or reading, there is a noted old castle of the name in the county of Dublin, a hoary ruin to which many legends are linked, and notably that of the great Goban Seer, the mythical and traditional architect of the Round Towers of Ireland. There is a somewhat mournful and pathetic dedication attached to his last work, which runs thus:—

"To the memory of one whose companionship made the happiness of a long life, and whose loss has made me hopeless, I dedicate these volumes, written in breaking health and broken spirits. The last that was once my pride I have lived to find associated with my sorrow. It is not, then, without a cause I say I hope this effort may be my last."

His wish was literally fulfilled. Lever died suddenly of a disease of the heart, and he leaves many others besides his daughters to mourn his death. Personal friends he had many, literary and literary; and his admiring readers might be counted by thousands. Unlike many of his literary brethren and countrymen, from the days of Goldsmith to his own, he was not obliged to write for his support, for his appointment placed him in a position of not having to write for bread. To the kindness of the late Lord Derby he was indebted for the Vice-Consulship of Spezzia, in 1858, from which he was transferred, in 1867, to Trieste, where he breathed his last.

TRICKS OF PICTURE-DEALERS.

Sir,—When my father remarked—"You have feeling, and an artist is nothing without it," I submitted, and studied very closely, having the assurance he was by his attainments thoroughly capable of grounding me in art. In 1836 it was told by my servant that "a person called, wishing to see me." "Show him in," was my reply. On entering, and the servant leaving the room, he said,—"I am deputed to call upon you and offer you 500*l.* a year, if you will place your father's signature to such paintings as are brought to you." I put my hand to the bell, and told the servant, on entering, to show the man out of the house adding,—"If there were no seconds like you the world would not be so bad as it is, and if you do not go out of the room I shall kick you out."

A short time since a person waited upon me, with a request from Mr. Wornum, of the National Gallery, that I should see a painting in his possession, supposed to be one my father had painted, of "The Pilgrimage to Canterbury." On seeing it, the first glance proved to me that it had been painted thirty, not forty, years; the second, that it was only a copy; and the third, that it was got up for the parties who had offered me 500*l.* a year. The artist sent by Mr. Wornum must explain how it came into his possession.

ANT.

CHURCH-BUILDING NEWS.

Hunsdon.—The parish church of Hunsdon has been re-opened, after being closed about nine months, for repair and restoration. Externally the roofs of the church and the spire have been put into a proper state. Internally a new oak roof has been placed in the chancel; and the ceiling of the nave has been decorated. In both nave and chancel new open seats of oak throughout, have replaced the old-fashioned pews, and a new pavement of stone and ornamental tiles has been put down. But the chief feature of the work is the throwing out an organ-chamber on the north side of the chancel, at its junction with the nave; and the removal there of the organ from under the western arch. The throwing open of the western arch is an improvement. The carved pews in the chapel have not been removed. The restoration has been carried out under the superintendence of Mr. P. Webb, architect, London, by Mr. Redington, of Hunsdon. The cost was between 1,300*l.* and 1,400*l.*

Sedgley.—St. Mary's Church, Hurst-hill, Sedgley, has been consecrated by the bishop of

the diocese. The site of the church is a piece of land (given for the purpose by the late Mr. II. B. Whitehouse) at the top of Can-lane, at the side of, and sheltered by, Hurst-hill. This is in the lower part of the parish of Sedgley, distant nearly a mile and a half from the Mother Church, and is in the midst of a numerous population. The new church is in the Geometric style of architecture and stone built. Owing to want of funds only the nave and aisles are at present erected; and the former 72 ft. long by 28 ft. wide, the latter 14 ft. wide. The accommodation is for 500 kneeling; all the seats to be open and free. The architect is Mr. Bidlake, of Wolverhampton. The builders, Mr. Nelson, of Dudley, for the church, Mr. Hilton for the seating, and Mr. Hartland for the temporary chancel. The total cost of the church is estimated at about 4,000*l.*, but the expense of the work, so far as it has been proceeded with, will be about 3,000*l.*

Blakenall.—Christ Church, Blakenall, Bloxwich, has, after a delay of two years since its completion, been consecrated by the Bishop of Lichfield. The building is in the Pointed Gothic style, and the design requires to be completed by the addition of a spire at the north-west corner, where a square stone tower stands ready for its reception. The edifice is built of the local limestone, with Bath stone dressings and facings, the latter stone being also used in the interior, in the nave and chancel arches and nave columns, which are enriched with foliated capitals.

The seats, which will accommodate 500, are of pitch pine, stained and varnished, and are all free and unappropriated. The roof is of timber, open to the ridge—the joists and rafters being stained, and the intermediate spaces coloured. The pulpit is of oak. The architect was Mr. Naden, of Birmingham. His designs have been carried out by Mr. I. Highway, of Walsall. The total cost of the work will be about 3,500*l.* The site was given by the Lord of the Manor, the Earl of Bradford, who generously presented about two acres, being sufficient for church, schools, and parsonage. The mines beneath the site have been secured by Mr. J. E. Bealey, J.P.

Rousdon, Devon.—The old-fashioned parish church of St. Pancras, Rousdon, a little village situated on the eastern boundary of the diocese, about six miles from Axminster, which was in a dilapidated condition, has been re-erected and opened for divine service. Messrs. George & Vaughan, of London, were the architects. The design is Early English. The edifice has been erected on the old site. Messrs. Moas, of Exeter, have been actively engaged throughout the winter, and have completed their contract. The building is about 50 ft. in length, and capable of accommodating about seventy-five persons. The population of Rousdon is very small, there being only about twenty persons resident in the parish. At the west end of the building there is a square tower and bell turret, the upper part of the former being used as a vestry, which is approached from the church by a circular staircase. On the left-hand side of the entrance are two arcades. All the windows are of stained glass, and represent various scenes in the life of our Lord: among those represented in the east window being the "Triumphal Entry into Jerusalem," "The Saviour bearing the Cross," and "The Crucifixion." The whole of these were executed by Messrs. Lavers & Co., of London. Over the altar is the representation of "The Last Supper," and on each side of this are the Ten Commandments, the Apostle's Creed, and the Lord's Prayer. The whole of this, as well as the pavement of the chancel and the reredos, is formed of mosaic glass. The nave is paved with tile procured from the Poole Pottery Company, Dorset.

Around the pulpit are seven images, carved, and intended to represent the four Evangelists, David, Moses, and St. Paul. This was the work of Mr. Forsyth, of London. The seating, as well as the roof, is of oak. The Bath stone carving was performed by Mr. Hems, of Exeter; and the wood carving, with the exception of the pulpit, by Mr. Seddall, also of Exeter. The ironwork, including grills, was supplied by Messrs. Hart & Co., of London. The estimated cost is 4000*l.*, the whole of which will be defrayed by Mr. Peek, of Wimbledon.

Wednesfield.—The church here has been re-opened for a limited period, until additional funds are obtained to proceed further with the improvements that were decided upon some time ago. The pulpit and the choir seats have been brought forward some few feet into the body of the church, so as to give more room in the chancel, whilst the small half-circular open-

ings by which light to the chancel was formerly admitted have been considerably enlarged, and in their stead are three illuminating windows, the gift of Mr. J. E. Bealey, J.P., to the memory of his late wife. The subjects represented on the windows are,—"The Death of Christ memorialised in the Lord's Supper."—I Cor. i. This is in the centre over the communion-table. Then, on the right hand, the subject represented is the Baptism of our Lord by St. John; and in the window on the left side is the Unbelief of St. Thomas, after our Saviour's crucifixion. The bordering round each window represents branches of the grape and fig-tree entwined. The windows have been supplied by Messrs. Ward & Hughes, of London. Mr. John Bare has promised new churchyard-gates; and the Hon. Augusta Calthorpe, of Perry Hall, will give encaustic tiles for the chancel. To complete the intended improvements upwards of 300*l.* are newly wanted.

Sherburn (Durham).—The newly-erected parish church for the ecclesiastical district of Sherburn has been consecrated by the Bishop of Durham. The building is in the Early Decorated style, capable of accommodating a congregation of about 350 persons, and estimated to cost about 3,000*l.* The architect was Mr. Johnson, of Newcastle, and the builders were Messrs. Robson & Son, Durham.

London.—The Church of St. Benet, Stepney, the first of those to be erected under the Union of Benefices Act, has been consecrated by the Bishop of London. It is in lieu of St. Benet, Gracechurch-street, which parish is now united to that of Allhallows, Lombard-street. The church is situated at the eastern side of Bancroft's Hospital, Mile-end-road, and, in fact, is built upon part of the hospital property, for which the sum of 1,000*l.* was paid. The church is of red brick, and, in that respect, accords with the almshouses adjoining. Its architect is Mr. Ewan Christian, and its style thirteenth-century Gothic, very plainly carried out. It takes the place of a temporary church which was erected but eighteen months since, the parish being taken out of the larger one of Bow. There is a vestibule, capable of holding 200 people, from which the vicar will preach on fine Sunday evenings. The church internally is constructed of red brick, like the outside, and has a nave with aisles, and a clearstory above three arches on either side, which rest upon short columns, the base and capitals of white Douling stone, and the shafts of Pennant blue. The flooring is of encaustic tiles in red and black. All the principal windows are lance-headed, and glazed with tinted glass, that over the sacristy being five-lighted, and that over the vestibule being three-lighted. The font and the pulpit are of stone. The sum of 8,000*l.* has been received from the Ecclesiastical Commissioners, out of which the ground has been paid for; the church has cost 6,500*l.*, and an endowment of 300*l.* has been made. Towards the parsonage-house nearly 1,000*l.* have been promised from private sources. The bells (which were founded before the fire of London), came from St. Benet, Gracechurch-street, as did also the oak communion-table and plate.

Fallowfield.—The Church of the Holy Innocents, Fallowfield, has been opened for public worship. The foundation-stone was laid on the 4th of June, 1870, by the Hon. W. H. Egerton, M.P., D.G.W. of Cheshire, with full masonic ceremonial. The site upon which the church is built is, along with other adjoining land, for a parsonage and schools, and a large donation in money, the gift of Lord Egerton, of Tatton. Messrs. Price & Lindlater, of London and Manchester, were the architects of the new church. The architecture may be described as of the late Early English style. The church consists, on plan, of a lofty nave, 90 ft. long by 25 ft. wide, flanked on either side by aisles, about 13 ft. wide. Each aisle is connected with the nave by five arches, springing from white stone caps, resting on red stone columns. The south aisle is entered at the western end from a south porch, and immediately within the south door is placed a font, made of different-coloured stones and marbles. The nave is joined to the chancel by a moulded chancel-arch, springing from angle and corbel shafts, on the north of which, and in the nave, is situated a pulpit, composed, like the font, of different-coloured stones and marbles and coloured tiles, the gift of Miss Lucas, of Fallowfield. The chancel, which is about 35 ft. long by 22 ft. wide, and terminating in a circular apse, is approached by three steps. The whole of the choir-stalls have been carved, and are the work of Messrs. Winter &

Moore, joiners. From the reredos rises a reredos of three panels, the centre one being crowned by a gable, surmounted by carved finials and crockets. The panels are filled by painted decorations, including a large gilt cross in the middle, and are the work of Mr. Barsley, painter, from designs by the architects, and the gift of the latter. The heating-apparatus is under the organ-chamber, and Whittaker & Constantine's hot-air system is employed. The nave is lighted by a large west window, and also by coupled trefoiled-headed traceried lights in each bay of the clearstory. The aisles have two-light traceried windows. The chancel-apse has two-light traceried windows, under gables, supported internally by wall-shafts, and externally by ornamental buttresses. There are also traceried clearstory windows in the chancel, over the side-arches. The south chapel has a large east window of four lights, and traceried head, and a pair of two-light traceried south windows. The tower and spire are attached to the east end of the south aisle; but for the present the tower has been finished off by a temporary covering at the level of the aisle-roof. A bell-cote and bell, the gift of Mr. Hilton, is for the present placed on the south-east angle of the tower. The bell is eventually to be placed in a niche over the chancel-arch. The tower and spire, which will give the principal feature to the church, and without which the real size and character of the design are lost, will rise to a height of about 150 ft. Large funds are still needed for the completion of the church. Messrs. Ellis & Hincliffe, masons, put in the foundations; Messrs. Cordingley & Stopford the masonry and brickwork of the superstructure, and the roofs, flooring, and slating. They also executed the font and pulpit. Mr. Holt supplied the seats, Mr. Edmondson the glazing, Mr. Berry the plumbing, Mr. Conway the tiling of chancel, Mr. Hart the gas-pendants, Mr. Harwood the plastering, and Mr. Hindshaw the modelling.

Weston.—The parish church of Weston-upon-Trent, near Stafford, has been re-opened for divine worship, after being closed for some months, during which time it has undergone an enlargement and restoration at the sole cost of Miss Moore, of Wychdon. The work which has now been accomplished was regarded at the commencement as the completion of a previous restoration in 1860, but it has in its progress exceeded that restoration in extent and cost. The particular works included in it have been the raising of the roof of the nave by the introduction of a clearstory, the rebuilding and enlarging of the south aisle and porch, the re-arranging and re-fixing of the chancel, the re-ceiling of the tower space, the addition of a vestry, and the introduction of two new stained windows, together with a general restoration throughout. Of the new stained windows, that in the east of the chancel is by Mr. Gibbs, of London. The subject is the Nativity, and while the three lights are separated by a considerable breadth of masonry, the figures in all are parts of the same group. The other new stained window is a single light at the eastern end of the south aisle, and is by Mr. Wailes, of Newcastle. Its subject is St. John the Baptist. Miss Moore, the lay proprietress of the parish, was also the foundress of the new schools in the neighbourhood. The architect of the restoration was Mr. Bitterfield, of London; and the contractors were Messrs. Wood, of Derby; and for the stonework, Mr. G. Trubshaw, of Stafford.

DISSENTING CHURCH-BUILDING NEWS.

Gloucester.—The church and schools erected by the English Presbyterians to the memory of George Whitefield, in his native city, and on the site which tradition says is that whereon he preached his last sermon, have been opened. The church, designed by Messrs. Medland, of Gloucester, is in the Gothic style. It consists of a nave, 80 ft. by 40 ft., and 31 ft. high, and has a tower 140 ft. from base to vane. The walls, outside and inside, are faced with white Shropshire bricks, with hands and devices in red and black bricks; and the dressings are of Bath stone. The windows are filled with cathedral glass; and there is a gallery at the west end. The seats are of stained deal. The roof-timbers are exposed, and are stained. The panelling of the roof is colonaded, and the tie-beams are painted in colours, relieved by gold. The lighting will be by three large coronae suspended from the roof. Haden's heating apparatus has been used, so that schoolroom and chapel can

alike be warmed; and the ventilation seems to be ample. The school, underneath the chapel, has accommodation for at least 300 scholars, and there are also class-rooms, committee-room, vestry, and rooms for the chapel-keeper. The floor of the church is elevated 6 ft. above the ground level. A platform for the minister is placed under a wheel-window at the east end, and the space here can at any time be extended for the erection of an organ-gallery. The seat for preacher and choir are in front of the minister's desk, and near them is an octagonal font, with carved foliage in each front. Over the chief entrance is a bas-relief carved in stone, representing Whitefield preaching to the multitude. In the principal gable is placed the Presbyterian emblem, the burning bush, with the motto, "Nec tamen consumebatur;" and on the corbels on which the moulding over the entrance rests are carved the heads of Knox and Chalmers. The bas-relief, the burning bush, and the font are the work of Mr. Boulton, of Cheltenham, sculptor. The other carving has been done by Mr. Frith. The decorative work and painting have been carried out by Mr. Tanner, of Gloucester. The building has cost 4,000*l.* The builder is Mr. Meredith.

Bristol.—The new Baptist chapel, erected between Elm-grove and Southville-roads, Cotham, has been opened for service, though the contractor will not finish his work on the site for a week or two. The chapel has been built from designs by Mr. H. F. Price, of Weston-super-Mare, and is in the Gothic style. The front is at the Elm-grove-road end of the building, and the chief entrance has a turret, which is to be raised to a height of 70 ft. or 80 ft. Inside are provided stairs, which will lead to an intended gallery at this end of the building. The chapel consists of nave and transepts. From the front wall to the back of the gallery the chapel is 96 ft. long; the width in the transepts is 60 ft., and in the rest of the building 40 ft. The floor will accommodate 500 or 600 persons, and with the present temporary organ the gallery will furnish room for forty or fifty more. The material of the pulpit, gallery-front, and pews is pitch-pine, varnished. Under the gallery (which is reached by stairs from the back entrance) is a vestry, so arranged that it may be used as two separate and independent rooms. Behind these is a sort of kitchen, with large boiler and other conveniences, and the building terminates with a class or lecture room, 42 ft. by 25 ft. The outside walls are of Pennant, with freestone dressings. The cost of the building has been about 3,500*l.*

Bridlington Quay.—The Wesleyans of this fashionable watering-place are about to erect a new chapel to accommodate 500 persons on the site of the present chapel, enlarged by the acquisition of four adjoining tenements. The building is to be of white pressed stock bricks, with Whittby stone dressings. The style of the building, Italian. The architect is Mr. Botterill, of Hull.

Newcastle-upon-Tyne.—The newly-erected United Presbyterian Church in Westmoreland-road, Newcastle-upon-Tyne, has been opened. Mr. Thos. Oliver was the architect, and from his plans the edifice has been erected at a cost of 4,500*l.*, in addition to which 500*l.* were paid for the site; and in order fully to liquidate the cost, the sum of 1,500*l.* or 1,600*l.* is still required. The large school-room under the church was opened some time ago, and services have been conducted in it. The site on which the church is erected is in immediate proximity to the grammar-school new buildings and the group of erections in connexion with the Church of St. Mary Oving to the rapid fall of Maple-street, a school room and lecture-hall, 50 ft. long by 49 ft. wide and 15 ft. high, together with session-houses, vestries, tea-room, stoker, conveniences, and caretaker's residence, entered from the level of the side street, are provided on the basement floor, communication with the church being effected by means of two staircases. The lighting is warmed by a hot-water apparatus, lighted by seven double-light windows of large size, and ventilated by through and through openings in the pier-walls, as well as by specially-arranged ventilators in the windows. A site adjoining has been purchased for a manse. The church, which is an oblong building 90 ft. by 50 ft., is approached from Westmoreland-road by the main entrance. This entrance, which consists of a large projecting porch, with three doorways, is reached from either side by a broad flight of steps terminating on a terrace landing, an

inclosed on both sides by an ornamental pierced wall and stone piers. Between the porch and the church is a large central vestibule, also with doorways leading into the body of the building and on either side by staircases to the galleries and to the schoolroom. The front elevation is broken into three unequal portions, for the purpose of avoiding large gables, and also to record the longitudinal divisions of the interior; and at the same time advantage was taken of the extreme portions for the purposes of staircases, one of which, namely, that forming the abutting angle of the two streets, has been carried up in a turret fashion, with double-staged roof and arched open timber work. The spire of St. Mary's was appreciated by the architect as being overpowering, and he has made the grouping of the structural projections in solid masses throughout. The main gable over the porch is pierced with three lancet-headed windows, and an ornamental quatrefoil wheel window with vertical and horizontal mullions, having moulded caps and bases. The east elevation facing Maple-street has three rows of windows, the lower one, which lights the schoolroom, being specially separated from the two upper rows by means of a plinth course; while the two upper tiers, which light the ground floor and gallery of the church are grouped within the buttresses. The architecture adopted is after the early French Gothic prevalent during the thirteenth century. In the interior tiers of iron columns rise from the ground-floor up to the roof, with arches between. The pulpit is of platform fashion, and is designed and decorated according to its purpose. The walls internally are finished rough stucco, of a pale grey colour. Over the platform in the south wall of the church some plaster arcading has been introduced to break the plain appearance of the blank wall over the platform. The north windows are all filled with coloured glass in geometrical designs. Accommodation is provided for 800 persons in the church, with an additional 100 on hanging seats; and the school-room will hold about 600. Messrs. N. & R. Reed were the sole contractors for the works, and these have been executed by them and by the following sub-contractors satisfactorily to the architect. The sub-contractors were as follow: Slaters, Messrs. W. Pears & Co.; ironfounder, Mr. J. A. Somerset; plumbers, Messrs. R. B. Charlton & Co.; painters, glaziers, and decorators, Mr. Salmon; plasterer, Mr. T. Wallace; upholsterer, Mr. J. A. Porteous; the warming and lighting were done by Messrs. Walker & Emley; stone carving by Mr. Paterson; plaster and wood carving by Mr. Hodley; all of Newcastle. Mr. Robert L. Davidson acted as clerk of the works.

Miscellaneous.

The Leeds Central Market.—Some time ago the Corporation of Leeds determined to alter and improve the Central Market, but more particularly the east front, which now forms one side of New Market-street. The furnishing of architectural designs was thrown open to competition, and from the number sent in for approval an ornate drawing by Mr. William Swallow, of Leeds, was selected. On more deliberate consideration, however, it was thought that it would be injudicious to carry out external alterations of so extensive a character when it was in contemplation to improve the market internally at a subsequent period. A more economical course has therefore been adopted. The shop-fronts, which are now narrow, are to be modernised by the enlargement of the windows, the removal of the brick arches surmounting them, the substitution of large sheets of plate-glass for the existing meagre panes, and the introduction of recess-entrances and wooden cornices and pilasters. The upper windows will also be improved in shape, and surrounded with moulded architraves. The unsightly stove-pipes now spreading in nearly every direction over the front will be rendered unnecessary by the construction of flues in the shops. The front of the block will be plastered with cement stucco, in imitation of stonework. The cost in all will be under 1,000l.

Birmingham Architectural Society.—At the annual meeting of the Birmingham Architectural Society, held last week, the following officers were elected for the ensuing session:—F. B. Osborn, President; B. Corser, Vice-President; J. J. Bateman, Treasurer; and F. H. Talbot, Hon. Secretary.

Cheap Railway Travelling.—A conference of the members of the National Railway Association has taken place at Willis's Rooms, St. James's, for the purpose of considering the desirability of the Government acquiring the whole of the railways, and instituting a system of uniform fares for all districts, on Mr. Brandon's principle. Amongst others present were Sir John Bowring and Sir Charles Dilke, M.P. Mr. R. Brandon, the hon. secretary, read a statement of the objects of the association, and a resolution was carried to the effect that the time had arrived when, in the interests of the country and of the railway shareholders, it was the duty of the Government to acquire on equitable terms the ownership of all the railways in the United Kingdom, and to institute in place of the present irregular rates a system of uniform fares. The following resolution was also adopted:—"That petitions throughout the kingdom be at once collected and presented to the Houses of Parliament for the purpose of carrying out the first resolution, and that a national subscription be instituted, and that the co-operation of all classes be invited." The chairman, Mr. A. R. C. Johnstone, was requested to write to the Chairman of the Parliamentary Committee now sitting, and request that Mr. R. Brandon and three other members of the association should be examined by the committee.

Ammonia as a Motive Power.—This motive power (put to use by G. Bastianelli, of Florence) acts in the same manner as steam, and is as easily controlled; requires but a small amount of fuel to develop its immense force, the heat necessary for producing the pressure of ten atmospheres being limited to 131° to 142° Fahrenheit, and can now, it is said, be readily adapted to any machinery worked by steam, the new engine being quite simple in its construction. The saving of fuel is nearly 70 per cent. The complicated copper boiler, with its 150 tubes, is entirely dispensed with. The ammonia acts in continuous rotation, as it at once condenses and returns into the boiler, the quantity escaping being scarcely observable, and requiring only annual replacement. In sea voyages the saving of 70 per cent. of fuel is naturally of paramount importance, as, besides reducing by two-thirds the daily expense, it also allows of more space for freight. The inventor has laboured incessantly for twelve years in endeavouring to find out a practical mode of applying this new motive power. The machine exhibited in Paris at the International Exhibition was complicated and lumbering. The actual engine is said to be simple, and its advantages and expediency therefore obvious. The inventor has taken out a patent for Italy, and will insure to his invention the same privilege all over the civilized world.

Fall of a Bridge and a Hundred People. A serious accident has occurred at Ithaca, New York. The burning of a barn in this village was the occasion. Two fire-steamers and one hand-engine were promptly on the spot. Part of the Fall Creek was spanned by a wooden bridge, on which one steamer was placed. Dropping her pipe into the creek below, she at once began operations. Soon a terrible crash and agonising cries for assistance arose from the direction of the bridge, which had broken through from the unusual strain upon it. The water at this point is only about 3 ft. deep. At the time about 100 people were standing on the bridge, and many of them were now seen crushed under the planks and rafters or hemmed in and unable to move by the other debris. Measures were soon completed to extricate the unfortunate victims from the wreck, and all who were known to be injured were rescued. Nothing is said of those (if any) that were killed on the spot.

The Newbury Town Surveyor.—At a special meeting of the Newbury Town Council, the Finance Committee recommended that Mr. Sargent, the surveyor, should be paid 60l. per annum, this being an increase of 15l. It included 10l. paid to Mr. Sargent as inspector of nuisances, and it was understood that the duties of surveyor to the council should be included. Plans and estimates, however, required by the council are to be paid for as extras. Alderman Hickman said Mr. Sargent's duties were important, and he was entitled to the proposed increase of salary. The recommendation of the committee was accordingly agreed to.

Theatre Burnt in Michigan.—Another American theatre has met its fate. Squire's Opera House, at Michigan, was destroyed by fire on the 8th of last month.

New Dry Dock, Newport, South Wales.—The new dry dock was to be opened on the 3rd of June. It has been constructed from plans designed by Mr. A. Schenk, C.E., by Mr. Joseph Firbank. Herein vessels of the largest dimensions may be accommodated and undergo repairs. The walls are of Aberbeeg stone, which is of the same vein and precisely similar nature as the stones used in the erection of the walls, locks, and cills of the Alexandra Docks. The length of the dock is 300 ft.; width, 46 ft. 3 in. at the entrance; depth, 27 ft. 9 in. The average depth of water at neap tides is 10 ft. 9 in., and at ordinary spring tide 20 ft. 9 in. The blocks on which the vessel will rest were cast after a design by Mr. J. W. Bebell, the manager. The gates have been manufactured in the yard, and are opened and closed with comparative ease by means of chains worked by capstans and rollers. The height of the gates is 28 ft. 7 in.; extreme width, 54 ft., and they are made of pitch pine. They work upon a segment plate. The sluices are opened by means of a patent screw. On the top there are railed platforms to prevent danger in walking across. The mooring-posts are of oak, placed equi-distant on both north and south sides. A tramway will be laid down through the yard. The dock is to be called the "Alice" Dry Dock, in honour, we understand, of the daughter of the chairman of the company.

Restoration of the Churchyard Wall of Old Lambeth Church.—The churchyard wall of the old parish church at Lambeth, which was nearly 200 years old, has now been taken down, and a new wall is being erected. It is seldom that the formality of laying the memorial-stone of a churchyard wall is gone through; but in the case of Old Lambeth Church, which is associated with so many historical reminiscences, it was considered desirable that some exception should be made, and in accordance with this feeling the ceremony took place in the presence of the Rev. J. F. Lingham, the rector, the churchwardens, members of the Burial Board, and others. The wall will be of Caen stone and Kentish rag, corresponding to the stone of the church, and will be 4 ft. high. The railings, which will be 2 ft. high, making the wall 6 ft. in height altogether, will be of malleable iron, and handsome gates at the entrances will also be erected.

Prospective Abolition of Steamer Funnels. According to the *Swiss Times*, two Austrian marine officers and a marine engineer have discovered by united experiments a method of conveying away under water the smoke from the steam-engine, instead of through a funnel into the air. They make use of double ventilators, which compress the smoke and force it overboard. For propelling these ventilators they employ, according to circumstances, either water-power,—that is, the pressure of the water between the surface of the water and the place where this apparatus is fixed, or, for smaller vessels, steam power. A chief advantage of this discovery will be the greater security of ships of war, as, in armour-plated ships, the only vulnerable part, the funnel, will be taken away. For submarine and torpedo ships and monitors this discovery, it is said, will be of great value.

Economical Watering of Streets, Parks, and Market-gardens.—On the drive at the east end of Rotten-row, Hyde Park, a trial is being made of Brown's permanent system of watering, in order to show "that the services of one man would be ample, with this system, to undertake the watering of the whole park, which at present employs, as a rule, twenty horses and carts and twenty men daily." This portion of horse-and-cart watering is taken as the seventy-fifth part of that of London; showing that seventy-five men, at 20s. per week, for thirty weeks in the year,—equal to an expenditure of 2,250l.—would be about the outlay for labour in watering the whole of London upon Brown's system. The annual cost of watering London is estimated at about 135,000l. by the ordinary system, and 20,000l. by Brown's, which saves both time and water.

Gloucester Cathedral.—The Freemasons of Gloucestershire have undertaken, at their own sole charge, the restoration of the reredos in Gloucester Cathedral, the cost of which is estimated at 1,000l. Of this amount the greater portion has been already subscribed. The restoration of the reredos owes its initiation to Sir Michael Hicks Beach, bart., one of the county representatives, and a Past Grand Senior Warden of the craft.

Architectural Museum.—The Council in their report say they

"had fully hoped to have been able to forward to its supporters a copy of the new catalogue with this report; but the course of completion proved it to be a tedious and intricate work, owing chiefly to the difficulty in identifying many of the casts after their more than one removal from their original positions; still the MS. has been compiled, and so soon as it has undergone the supervision and received the suggestions of those to whom the collection is best known, it will be printed. The Council anticipates that it will not only be found serviceable as a key to those who are inspecting the museum, but that its value will be recognised as a record of architectural history exemplified in the typical examples which it reproduces. As such it may prove a valuable manual of reference to the student, the artist, and the amateur. In order, however, to make the collection as self-explanatory as possible, labels describing the larger casts have been recently placed about the museum."

Proposed Memorial of the late Professor Maurice.—A select and influential meeting, inasmuch as it was attended by some of the principal dignitaries of the university, has been held at Trinity College, Cambridge. The Rev. the Master of Trinity (Dr. Thompson) presided. The object was to raise a fund by means of which the memory of the late Professor Maurice may be most fitly perpetuated. It was unanimously agreed that Mr. Woolner be commissioned to execute a bust of the professor for presentation to the University, and that the surplus of the subscription be devoted to the foundation of a lecture, in the Working Men's College or elsewhere, by a lecturer appointed by the University of Cambridge.

The Bursting of the Canal Embankment, at Birmingham.—In consequence of the unfavourable state of the weather of late, the men employed in repairing the breach in the Worcester canal were not able to proceed with their work as rapidly as was anticipated. It was fully expected that the work would have been so far completed that the canal, which was empty for about a mile and a quarter, could have been refilled, and traffic resumed. The breach in the embankment was about twenty yards wide. To make doubly sure, the wall which has been erected across the breach is being extended on each side of the breach until it will, in its whole length, measure over 100 yards.

The Treatment of Sewage.—Mr. E. Brown's scheme for the treatment of sewage matter was put into operation on a small scale, as a trial of its efficiency, on the grounds of the Union Workhouse at Slough last week. A large tank of wood, of the following size, is made use of,—6 ft. in length, 4 ft. in depth, and 4 ft. in width, containing nearly 600 gallons. About 2½ tons of dry earth are placed in the tank, and the sewage matter, about 200 gallons, is put on it, and allowed to filter through it, which occupies about six hours. It is stated that the dry earth, &c., take up or absorb about half of the sewage, and that the solid matter left in the tank would be sufficient to manure a quarter of an acre of land.

Wisbech Working Men's Club and Institute.—The new rooms which have been added to the Wisbech Working Men's Club and Institute have been opened by the Bishop of Ely. Messrs. Wm. Adams & Son were the architects; and the erection has been carried out by Mr. Girling, builder; 945*l.* being the amount of the contract. The new building has not much pretension to ornament in its exterior. The gable end of the building is seen from the Nonc Parade. The new rooms are attached to the back of Alfred House, and run parallel with Scrimshire's passage, with a frontage of 52½ ft., and 36 ft. in height. The exterior is of red brick, with white brick bands and arches.

Tramway and Omnibus Junctions.—A "Co-operative Omnibus Association (limited)," has been started, with a set of newly constructed omnibuses, in conjunction with the tramways, and running from Westminster Bridge to Charing-cross and Oxford Circus, at 1*d.* as the charge. There are waiting-rooms at each rendezvous. The Camden-road and Tottenham-court-road tramway should, in like manner, be joined with Oxford Circus and the South Tramway system. The Camden-road tramway only awaits its continuation to the Holloway-road, to complete the junction of the Camden district with the City at Finsbury by tramway.

Restoration of Warwick Castle.—The contributions received towards Warwick Castle restoration fund now amount to upwards of 9,000*l.* and the committee propose to close the account, and hand the proceeds to Lord Warwick.

Monument to Shakspeare in New York. A bronze statue of Shakspeare, which has been erected in the Central Park, New York, was unveiled on the 23rd ult., in the presence of about 6,000 spectators. Among the speakers was the poet Bryant, who referred to Shakspeare as one of the most wonderful men that ever lived; a genius, great—far beyond all ordinary greatness, and destined to hold the admiration of mankind, through century after century, in the ages yet to come.

Poplar and Stepney Sick Asylum.—At a meeting on the 22nd ult. of the Board of managers of the Poplar and Stepney Sick Asylum, one of the new hospital buildings lately erected under the direction of the Poor-Law Board, it was unanimously resolved that the building having been completed in a satisfactory manner, and the accounts of all the contractors having been settled, letters of thanks should be sent to the architects, Messrs. Arthur & C. Harston, and to the builder, Mr. Robert Mann.

Vesuvius.—A friend writes,—"The mount is seen about five minutes in the day; lightning and thunder are very frequent. The town is indescribably disagreeable; a dense, smoky atmosphere, and very suffocating in feeling. The waters are out everywhere around. An awful inundation of the Po. Lugano overflowing its banks; Como ditto; boats instead of carriages doing part of the conveyance of passengers to the foot of the passes, which are, strange to say, open."

New Town-hall, Eyemouth.—A movement was recently initiated by the "Lifeboat" Lodge of "Good Templars" in Eyemouth for the erection of a town-hall, but the erection of a suitable building being beyond their means, a general committee of the public has been formed, and is in correspondence with Mr. Milne Home for a site. Mr. Gray, architect, Berwick, is to prepare plans of the building.

Belle Sauvage.—"La Belle Sauvage," of the *Spectator*, it appears, was only a myth after all. Messrs. Cassell, Petter, and Galpin, in raking over their title-deeds, have discovered that the name of the inn upon which their premises stand was formerly the "Bell on the Hoop," or "Savage's Inn," and eventually became contracted to "Bell Savage's Inn," or, shorter still, "Bell Savage."

The Newly-discovered Shrine.—Mr. H. V. Lemcngor, of Watford, has produced some very interesting photographs, which show the newly-discovered shrine as it is now put together, from three different points of view.

St. Giles's Cathedral, Edinburgh.—The restoration of St. Giles's Cathedral, Edinburgh, was commenced on Monday morning, and the work is being rapidly proceeded with.

Yeovil.—Mr. J. Tomlinson, Assistant-Manager of the Luton Water Company, was on Monday appointed Manager of the Yeovil Corporation Waterworks.

The Female School of Art.—The Lord Mayor will distribute the prizes to students at the Mansion-house, on Friday, the 21st inst.

TENDERS

For warehouse, Robin Hood-yard, Leather-lane, for Mr. Hodge. Mr. Reed, architect. Quantities by Mr. Goodchild:—

Shurmer	£3,379 0 0
Mathews	3,169 0 0
Bays & Barnage	3,050 0 0
Wagstaff & Son	3,050 0 0
Nield & Son	2,832 0 0
Atchinson & Walker	2,825 0 0
Kent	2,739 0 0
Howard	2,732 0 0
Langmead & Way	2,713 0 0
Grough	2,675 0 0
Sabey & Son (withdrawn)	2,385 0 0

For Wesleyan Chapel, Northwood. Messrs. Scrivenor & Son, architects. Quantities supplied:—

Jaskip, Brothers	£1,870 0 0
Cook	1,517 0 0
Mathews	1,405 0 0
Redfern, Brothers	1,425 0 0
Barlow	1,304 0 0
Hummersley (accepted)	1,355 0 0

For joiners' work, &c., to four houses, near Acton Green. Mr. Henry Lovegrove, architect:—

Butcher	£640 0 0
Thorp	637 0 0
Tull (accepted)	525 0 0

For the erection of a residence at Bourne, for Mr. J. Gibson. Mr. Chas. Bell, architect. Quantities supplied by Mr. H. Lovegrove:—

	£1,000	Old Credits
Richardson & Son	1,000	40 0
Patterson	1,050	100 0
Hobson & Taylor	1,041	83 0 3
Price, Brothers	1,041	84 17
Chalsons	915	40 0
Hinton (accepted)	865	40 0

For Fulwood Workhouse, Preston,—vagrant wards for thirty inmates, with attendants' rooms, baths, heating apparatus, and fittings. Mr. J. J. Bradshaw, architect:—

Exton, Brothers	£968 0 0
Hall	883 0 0
Barber	837 0 0
Bickerstaffe (accepted)	820 0 0

For additions to the residence of Mr. Emery, Plantation-road, Leighton Buzzard. Mr. Frederick Götto, architect:—

Adams	£390 0 0
Garside & Holdstock	798 0 0
Dendiehill	795 10 3
Edwards	768 0 0
Cook	749 0 0
Agutter (accepted)	740 0 0

For stoneware pipe sewers, Heath-street, for Hampstead Vestry. Mr. Chas. H. Lowe, surveyor:—

Crockett	£190 0 0
Wright	180 0 0
Culverhouse	135 0 0
Thurst	130 0 0
Watts	117 0 0
Killingback	107 0 0

For roads and sewer at Acton brickfields:—

Bloomfield	£653 0 0
Capper	615 0 0
Pizzey	449 0 0
Jones	420 0 0

For the erection of a detached villa, Staines. Mr. Robert J. Wooley, architect. Quantities supplied:—

Fynn & Lyons (accepted)	£324 15 3
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Accepted for the erection of four model cottages, in Hill-street, East Dereham, for Mr. H. Wilson. Mr. Henry Ploorman, architect:—

Bone	£246 14 6
Mumford	176 10 0
Aldis	36 0 0

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Small	£1,875 0 0
Stentford	1,742 0 0
Bridge	1,690 0 0
Cox, Brothers	1,650 0 0
Peters	1,650 0 0
Wallis & Clements	1,648 0 0
Wright, Brothers, & Goodchild	1,636 0 0
Richardson	1,435 0 0
Harnett	1,410 0 0
Clifford	1,390 0 0
Fowler	1,340 0 0

For farm buildings, Wittersham, Kent, for Mr. J. Boddy. Mr. W. King, architect:—

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Bourne	422 0 0
Smith & Saxe	417 5 0
Holt	409 11 2
Pennell	382 16 8
W. G. Peters	350 0 0
C. Peters (accepted)	345 0 0

For the erection of eight cottages at Market Harboro', for Mr. J. Symington. Mr. Chas. Bell, architect:—

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Northam	1,065 0 0
Palmer	1,079 0 0
Sinayon & Son (accepted)	1,070 0 0

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Nightingale	1,777 0 0
Ward	1,735 0 0
Baxter	1,654 0 0
Smith (accepted)	1,645 0 0

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Jackson	£795 0 0
Hubbard	735 0 0
Bloomfield	653 0 0
Carter	620 0 0
Capper	611 0 0
Pizzey	449 0 0
Jones	400 0 0
(amended)	640 0 0

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Stead	875 0 0
Palmer	867 0 0
Bangh	696 0 0
Brown (accepted)	675 0 0
Bowman	479 0 0

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Hunt (accepted)	£252 0 0
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TO MASTER BUILDERS AND GENTLEMEN. WANTED, by a Young Man, possessed of a good knowledge and experience in his trade, a SITUATION as FOREMAN PAINTER, &c. The most unexceptionable references can be given.—Apply to H. L. 12, Bulsey-street, Charenton-square, Soho-square, N.W.

TO BUILDERS, PLUMBERS, AND OTHERS. WANTED, by a Young Man, who is a first-class PLUMBER and PLAIN ZINC WORKER, a SITUATION or JOB. No objection to fill up time at other branches if required.—Address, PLUMBER, 101, Prince of Wales-road, Kentish-town, London.

TO BUILDERS, TIMBER MERCHANTS, &c. WANTED, by a Young Man (aged 29), CARPENTER, SITUATION in a Yard, to ASSIST at the ACCOUNTS, or Getting Out Estimates. Thoroughly acquainted with measuring and measuring English or Foreign Timber. Willing to fill up his leisure time by the best of his own hands.—Address, G. B. 1, care of Mr. Carter, Builder, Annals Cottage, Waltham-green.

WANTED, by a steady Young Man, a SITUATION as IMPROVER to the CARPENTRY. Has seven years in the trade.—Address, G. S. Westbourne Park villas, Bayswater, W.

WANTED, by a thoroughly experienced MACHINIST, a SITUATION to Work Moulding Machine, General Engineer, &c. Can make cast-iron and does repairs of fire-ships.—Address, A. B. Mr. Jennings, High-street, Shipton, Slough.

WANTED, by a practical BRICKLAYER, in all the leading SITUATIONS in a Yard, to Repair, or to Jobbing Builder, in town or country. Ten years' character.—Address, M. S. Post-office, Finsbury, Middlesex.

TO MASTER BUILDERS AND PAINTERS. WANTED, by a steady Young Man, a SITUATION as WRITER. Can do either sign or plus writing. Would be willing to fill up his time painting or graining.—Address, W. M. 1, Mrs. Brindley, Lower Beley-street, Wandsworth, S.W.

TO MASTER PLUMBERS AND BUILDERS. WANTED, a JOB, by a good PLUMBER, or of the Trade, in a large garden and gutters.—Address, PLUMBER, 2, Bolsover-street, Portland-place.

TO CONTRACTORS, BUILDERS, DECORATORS, &c. WANTED, PLUMBERS' WORK, by an experienced Man, with or without assistants, in any part of the country. Formation of plumbers for ten years.—Address, T. MILLS, 719, Broad-street, London, S.W.

TO SOBERLEANS, LAND AGENTS, AND OTHERS. THE Advertiser wishes to meet with a SITUATION as BAILEIFF and FOREMAN on an Estate, or Working Foreman, Carpenter and Joiner by trade. Can prepare plans, &c. Good references to Builders.—Address, D. C. 30, Down-road, Tottenham-lane, Hornsey.

TO ARCHITECTS AND SURVEYORS. THE Advertiser is desirous of obtaining a permanent SITUATION in a large office. There is an extensive, neat, large draughtsman, &c. Has been employed. Salary moderate. To be seen after six p.m. or communicated with by letter.—Address, H. S. College-avenue, Chiswick.

TO ARCHITECTS AND DISTRICT SURVEYORS. THE Advertiser (now in a London Office), certified by the Institute under the Metropolitan Building Act, desires an ENGAGEMENT either to assist in a district work, or in the general practice of a good office. Good Gothic design and draughtsman, will sound knowledge of construction. B.A. Contact.—Address, No. 353, Office of "The Builder."

TIMEKEEPER, WAREHOUSEMAN, or any Place of Trust, by a respectable Married Man, aged 32. Writes well. Excellent character.—Address, W. D. 55, Russell-street, Lower Wandsworth-road, Battersea.

TO SMITHS, GASFITTERS, &c. SITUATION WANTED, by a Young Man, as WHITESMITH and GASFITTER, &c. Well experienced in his work. Country preferred. Good references. First-class pay.—Address, H. W. 4, Chapel-road, Stamford-hill.

TO ARCHITECTS. QUANTITY-TAKER and MEASURER of (twenty years' practical experience, offer TEMPORARY ASSISTANCE upon terms as may be agreed upon.—Address, SURVEYOR, 23, Thornton-street, Brixton-road, S.W.

QUANTITY SURVEYOR, of twenty-four years' experience, wishes TEMPORARY EMPLOYMENT, at very moderate terms. Has had considerable experience in superintending building works.—Address, F. Z. care of Messrs. Fisher & Siddons, Stationers, 13, Moorgate-street, E.C.

QUANTITIES, MEASURING, &c.—A SURVEYOR of long experience, in taking out quantities, measuring, estimating, &c. is desirous of meeting with a temporary or permanent ENGAGEMENT. Is well practiced in Builders' accounts.—Address, SURVEYOR, 116, Camden-road, N.W.

PARLIAMENTARY SURVEYING and LEVELLING done at per mille or per day, by an Engineering Surveyor of sixteen years' standing and moderate. Excellent references.—Address, 850, Office of "The Builder."

TO BUILDERS. PLASTERING WANTED, as GENERAL FOREMAN, or to Take Work by the Yard, or by the Piece only. Good references.—Address, J. A. S. 9, Boury-terrace, Bathurst.

OCASIONAL ASSISTANCE OFFERED, or a permanent APPOINTMENT desired, by a first-class ASSISTANT. Well versed in Gothic and Classic design, details, northern and southern styles.—Address, ARCHITECT, Delany's Library, 333, Falmouth-street, S.W.

GRAINING and WRITING.—A first-class Grainer and Writer is open to a JOB.—Address, B. YOUNG, No. 188, Vauxhall Bridge-road, Finsbury, S.W.

COMPETENT CLERK, ESTIMATOR, and MEASURER desires an ENGAGEMENT. Well up in intricate or neglected accounts. Temporary or partial not objected to. Has a practical knowledge of trade.—Address, A. B. C. care of Mr. Ford, 1, South-street, London, E.C.

A TIMEKEEPER, &c.—WANTED, by a Young Man, a SITUATION in a Town or Country. Has worked as carpenter and builder, undertaker, timekeeper, &c. at various works, contract, clerks, &c.—Address, B. E. 4, Church-lane, Hampstead, London.

TO ARCHITECTS. A GENTLEMAN, with a small connexion, wishes to meet with an Architect in London desirous of LETTING a large OFFICE, and who would in return employ him, say, for two or three days per week.—Address, 805, Office of "The Builder."

TO ARCHITECTS. A JUNIOR ASSISTANT seeks a SITUATION. Is a good and quick draughtsman, and desires employment more on a remuneration.—Address, H. Fostolche, Westbourne Park, Bayswater.

A FIRST-CLASS ARCHITECTURAL and ARTISTIC DRAUGHTSMAN (aged 59), of ten years' experience, seeks a permanent ENGAGEMENT, in Town.—Address, G. M. Hastings' Post-office, Park-street, Manchester-square.

TO BUILDERS AND OTHERS. A GOOD DRAUGHTSMAN wishes to meet with EVENING EMPLOYMENT, in the preparation of drawings for buildings, alterations, &c. Quantities also prepared. Disengaged after four p.m.—Address, A. B. 1, Boscobel-gardens, Regents Park, N.W.

TO ARCHITECTS. A GOOD DRAUGHTSMAN and General ASSISTANT is open to an ENGAGEMENT. Has lately had experience in the design of schools.—Address, 925, Office of "The Builder."

TO ARCHITECTS. A FIRST-CLASS DRAUGHTSMAN, a DESIGNER, and experienced ASSISTANT is at liberty to accept of a SITUATION in a large office, or as a draughtsman or estimator.—Address, ARCHITECT, 34, Stanley-street, Euston-square, N.W.

AS CLERK of WORKS, a RE-ENGAGEMENT required by an experienced Man. Town or country. Good testimonials and references. Good references.—Address, Clerk of Works, No. 95, Dempsey-street, N.W.

TO MASTER BUILDERS, BUILDERS, DECORATORS, &c. A FIRST-CLASS PLUMBER WANTS a JOB. Thoroughly understands all kinds of new and old work, piping, cisterns, bath, distemper, good lead layer. Town or country. Aged 40.—Address, PLUMBER, 6, Soar-street, Upper Westbourne Park, Kensal New-town, W.C.

A PLUMBER, a good Jobbing Hand, is in a WANT of WORK. Can turn his hand to pipe, hot-water, and plain work. Thoroughly understands all kinds of painting and glazing. Can give good references.—Address, T. W. care of Mrs. Johns, 3, Baldwin-street, Good street, City.

TO ARCHITECTS. A GOOD THREE-BRANCH HAND WANTS EMPLOYMENT. Can do gas-fitting, bell-hanging, and plain iron work.—Address, PLUMBER, 4, Prince's-place, Finsbury, London, E.

AS FOREMAN, or WORKING FOREMAN of MASON'S, an experienced Man, accustomed to every class of masonry, public works, and general yard. Neat draughtsman. Good references.—Address, M. T. Post-office, Hooley, Shiffield.

TO BUILDERS AND DISTRICT CONTRACTORS. A person just finishing a RE-ENGAGEMENT as WORKING or GENERAL FOREMAN. Well acquainted with the management of accounts. Good references.—Address, B. E. S. Philip-street, Edmond-street, Canterbury, London.

A RE-ENGAGEMENT WANTED, as a CLERK of WORKS or General Foreman in charge of a Job. Good references. Town or country.—Address, W. F. 1, Prospect-road, Euston-square.

£20,000 READY to be ADVANCED upon MORTGAGE of FREEHOLD PROPERTY. Repayable by easy instalments. No premiums or commission charged.—Apply to Messrs. BALL, NORRIS, & BARLEY, 17, Abchurch-lane, London, E.C.

MONEY.—Several sums, from 2000, to 10,000, to LEND on MORTGAGE of Land or Houses at current rate of interest. Also about 5,000, to accommodate builders.—Apply to Messrs. HUGHES, 20, Tottenham-court-road, London, W.

MORTGAGES.—Several SUMS of MONEY ready to be ADVANCED on MORTGAGE of HOUSES in COVENTRY or BRISTOL, in approved localities.—JOHN F. HAYNES, Solicitor, 3, Warwick-court, Gray's-inn, W.C.

AUCTIONS.—See also page xvi.

PERKHAM.—By direction of Trustees and Executors.—To bid therefor, the property of the above Building Land, with fronting of 100 feet to the Denham-road, and adjoining ample space for the erection of five or six houses, similar to those with which the land is for the most part covered.

MR. MARSH will SELL by AUCTION, on THURSDAY, the 14th inst., at TWENTY O'CLOCK, in one lot two pieces of FREEHOLD BUILDING LAND, situate in the Denham-road, about ten minutes' walk from the Frys-lane-station, and in several particulars of sale obtained of Messrs. HENSMAN & NICHOLSON, Solicitors, 23, Colledge-hill; and at Mr. MARSH'S Office, No. 24, Cannon-street.

LOWER SYDENHAM.—Choice Freehold Building Plot, MR. MARSH will SELL by AUCTION, at the GULLDIAL COFFEE-HOUSE, on THURSDAY, JUNE 13th, at TWELVE O'CLOCK, in one lot, the valuable enclosure MORTGAGE, with a frontage of 100 feet to the Denham-road, and adjoining ample space for the erection of five or six houses, similar to those with which the land is for the most part covered.

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TO CAPITALISTS, BUILDERS and Others.—Minor Street, Manor-grove, and Canterbury-road, 600 Kent-road, within five minutes of the railway-station, and Finsbury Park, known as Canterbury-terrace, consisting of Ground, 100 feet wide, and forty-one Houses, erected and in course of erection, and Land.

MESSRS. HARDING & DEAN are authorized by the Mortgagees to SELL by AUCTION, at the AUCTION MART, Tottenham-court, on TUESDAY, the 19th day of JUNE, at TWENTY O'CLOCK precisely, the undermentioned PROPERTY, in four lots:—

Lot 1. Ground, 200 feet, adjoining to 621, 22, secured upon House Nos. 7, 8, and 9, Canterbury-terrace, also cottages newly erected, Houses Nos. 1, 2, 3, 4, 5, 6, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, and 21, all of which are in course of erection, and in course of erection, being No. 22 to 33, built in 1867, Canterbury-terrace.

Lot 2. Two Houses, erected in course of erection, being Nos. 34 and 35, Canterbury-terrace, with a large Plot of Land in front, adjoining to the Hatched Bank Works.

Lot 4. Nine Houses, erected or in course of erection, being Nos. 39 to 43, both in 1867, Canterbury-terrace.

The property is all freehold. Arrangements can be made for a reasonable proportion of the purchase-money of each lot to remain on mortgage. Particulars will be placed at the disposal of any party in lead of F. L. SOAMES, Esq., Solicitor, 10, New-lane, Strand, W.C., and of J. H. HARDING & DEAN, Esq., Auctioneers, 11, Abchurch-lane, Queen Victoria-street; of EDWARD WITTS, Esq., Surveyor, 11, Abchurch-lane-street; and of the Auctioneers, 17, High-street, Clerkenwell, London.

The Builder.

VOL. XXX.—No. 1533.

Concrete Houses in Folkestone.



SOME assertions reached us not long ago that a building erected of Portland cement concrete had proved damp, and had served to prevent the use of the material any further in its neighbourhood. This is quite opposed to our own experience and opinion of cement concrete, and we have little hesitation in saying that if the statement be true, the work was not properly executed. Good concrete, as we have said before, is an excellent material; bad concrete is simply rubbish.

Somewhat wearied and worn a few days ago, we cast about for an excuse to flit to the side of the sea for eight-and-forty hours, to try what an atmosphere with a little more oxygen in it than that of London would do for us, and recollecting the row of concrete houses at Folkestone, referred to in our pages last year, we allowed that to prevail, and found ourselves in due time housed in "The Pavilion." We hope the present manager, by the way, is not trusting to the former good reputation of this hotel? Certainly we have no praise to bestow on the feeding there provided during our stay. The season had not commenced, and the place was singularly desolate and doleful. A month, however, will change all this. New houses are going up; one of the churches is being enlarged; and, amongst other works, schools are being built near St. Peter's Church, from the designs of Mr. Slingsby Stallwood. The same architect is superintending some alterations in the chancel of the ancient parish church. A large mural painting here over the tower-arch, at the east end of the nave, was executed, we understand, by Mr. Andrew Donaldson, as a free-will offering, while staying in the town with a sick relative. Matters of this sort, however, are not our present purpose. What we want to say is that the five houses forming the commencement of Marine Crescent, close to the Bathing Establishment, and built of concrete, stand remarkably well, and are as dry as a bone from top to bottom. These are largeish houses, six stories in height, including the rooms in the roof; there are no wood lintels over the openings, the tenacity of the material being alone depended on. Each house has a bow in the front wall running up a certain height, and this is roofed, like some of the underground offices, with a thickness of concrete, with a skin of Portland cement over the face of it.

The builders and owners of these houses, Messrs. Pope & Howland, have unlimited confidence in the material, and maintain that walls of it one-third less in thickness than would be required for brickwork are ample.

They are forming an esplanade in front of the Crescent with concrete slabs about 3 in. thick, the slab being laid at 64. a foot superficial, and the curb at 9d. per foot running.

In the composition of concrete for the houses, the materials used were six measures of shingle, two measures of clean sharp pit sand, and one of Portland-cement. "Stuffing" was introduced in the thickness of the walls, such as pieces of chalk, broken bricks, and pieces of stone. In

making the thin slab, about four measures of shingle, smaller in size than that employed for the walls, is used with one of cement. As an evidence of the resistance good cement concrete offers to water, we may mention that there is a cylinder formed of it 2 in. thick, 2 ft. high, and 1 ft. 8 in. in diameter, which is kept constantly full, and allows none to percolate.

The face of the house-walls, we should say, is rendered with cement, and has the look of an ordinary cemented front. At some works now being formed by the builders close to the town, and where they are about to manufacture Portland cement, which promises to be of very good quality, the engine-house, erected of concrete, is left rough as from the mould, and nevertheless resists rain as perfectly as in the other case. The flues are formed with a mould, no pipes being employed, either here or in the houses.

At the works an engine-shaft is being built, which is formed of two thin brick casings filled with concrete, twelve of shingle to one of cement.

We must remind those who find themselves in a locality where cement concrete can be used with advantage, that the absence of a proper quantity of sand is fatal, and that intelligent supervision of the men employed is absolutely necessary.

The brightest things we saw coming back were the railway hedges of gorse, just past Chiselmhurst, glorious in gold.

THE ARCHITECTURAL CONFERENCE.*

Competitions.

At the final meeting of last year's Conference, May 26th, 1871, a resolution was passed empowering the appointment of a committee by the Council of the Institute to take into consideration the various proposals that had been made in regard to the conduct of Architectural Competitions, and to draw up a scheme of conditions to be proposed for acceptance by the Conference of 1872. In order to arrive at a better basis on which to found such a scheme, the committee, in November last year, addressed a series of questions to members of the Institute, to the Architectural Association, to the Royal Institute of Ireland, to the Glasgow Institute of Architects, to the Manchester Society of Architects, to the Birmingham, Glasgow, Liverpool, and Sheffield Architectural Societies, to the Northern and Nottingham Architectural Associations, and to various members of the profession not connected with any of the above-named bodies; the object of the circular being to obtain an idea of the general feeling of the architects of the country as to the points on which information was required. The sets of answers received, eighty-two in number, were scheduled, and upon them in great measure was based the formal proposal of conditions of competition which was laid before the recent Conference for consideration, as we mentioned, at the meeting on the 12th inst.

The discussion on these conditions, although at some points it became very "animated," did not on the whole give evidence of much diversity of opinion, in regard to any point of importance; the degree of unanimity obtained being, however, we must think, partly to be attributed to the rather too evident bias on the part of the chairman towards passing everything with as little alteration or delay as possible. It is certainly highly important that time should not be wasted, on such occasions, in over-much talking; but it was impossible to avoid a feeling that in one or two cases votes involving important principles were passed in rather too hurried a manner. The two first clauses of the proposed conditions (which we shall print hereafter in their revised form), recommending the appointment of professional assessors in each case to advise on the terms of the competition and on the relative merits of the designs when sent, and that any such assessor, and every member of the adjudication committee, must necessarily abstain from taking any part in the competition, were passed without question.

In regard to Clause 3, providing that definite instructions should be given as to the scale and number of drawings required, and as to the size and method of execution of perspective drawings

(if any), Mr. Alfred Smith urged that the perspective view was the most important part of the drawings, and that a fixed point of sight ought to be given for it, so that all could be easily compared. Mr. Street, on the other hand, thought this of little importance: for his own part, when adjudicating, he seldom paid any attention to perspective drawings in such cases, but studied the plans and geometrical elevations. We may add that the idea of taking all perspective views from the same point is very open to objection, because in many cases competitors are competent to take perfectly different ideas as to which shall be the principal front or point of their design; it all depends often on the view each takes as to the capabilities of the site. Clause 4 provided that the competitors should be allowed the option of sending in under their own name, or under a motto. Professor Kerr defended this clause on the ground that "anonymous" competitions were never really anonymous, inasmuch as the author's names in almost all cases got out, or were unfairly divulged; at the same time, there might be those among the competitors who preferred to conceal their names, or the reverse.

To this idea, there were strong objections made. Mr. Street said that in some large competitions in which he had acted as judge, he had not been able to form a conjecture as to the authorship of any one set of drawings, until the names were posted up; and that the anonymous system, when fairly carried out, had this double advantage,—that it not only prevented the adjudicator from being biassed against any competitor by personal feeling, but it also enabled him to do justice to a design which might happen to be the work of a personal friend, but which, if he knew it to be so at the time, he might feel a difficulty in recommending, from the very fear of being moved by feelings of partiality. Ultimately, on the suggestion of Mr. Papworth, the clause was struck out; and, to cover the subject, an addition to the 5th Clause was proposed (that the "Instructions should clearly state whether the amount named to be expended was to be strictly adhered to"), to the effect that the Instructions should further state whether mottoes or names were to be signed: the clause, with this addition, was carried unanimously.

We will add one view of the case in regard to signatures, which does not appear to have occurred to any of the speakers at the meeting: that, in the case of mottoes, a competitor of (what General Schreck we suppose would call) more "enterprise" than his fellows, may take a dishonest advantage by revealing his name to, and canvassing, those whom he thinks likely to aid him, and by using some newspaper to puff himself in, in a manner which more ingenious men would not stoop to; whereas, if all names are openly signed, all are on an equality, as any one might in that case draw attention to what he considered the merits of his own plans, openly and above-board. Clause 6, providing that designs should be excluded,—1. If sent in after the period named, accidents in transit excepted; 2. If in violation of any of the Instructions; 3. If they do not give the accommodation asked for; 4. If they exceed the limits of site; and 5. If the assessor, with or without the assistance of a surveyor determine that their probable cost will exceed by 10 per cent. the intended outlay, or the competitor's estimate,—was, after one or two suggestions, carried as originally proposed: so also was Clause 7, providing for a public exhibition of all the drawings after the award. The 8th and 9th clauses were also carried without alteration; the former provided that in every case (subject to compliance with the conditions previously mentioned) the author of the design declared to be the best should be employed upon the work if carried out. The 9th clause dealt with the question of premiums; the first premium not to be less than $\frac{1}{2}$ per cent. on the outlay, and not to merge in the commission, but to be subsequently increased by $\frac{1}{4}$ per cent. if the premiated design be not carried out; other premiums to be offered of an aggregate amount of not less than 1 per cent. on the outlay. In case of works under 10,000*l.* in value, these rates to be increased. In limited competitions, each competitor to receive payment. Clause 10 laid down the very important principle that premiated designs are *not* to become the property of the promoters. If the architects of England can only be got to agree to act generally upon this, they will do much to protect their own interests and to do away with the abuse of competitions; for in many cases the result of a competition lends to the supposition that the promoters really wished to obtain a design from an architect

* See p. 457, ante.

at one-fifth of its real value, and then to make their own use of it. The principle should be laid down and adhered to, that the premium is to remunerate the architect for time expended on the design (which in many cases it does not), and not a price for which he is to sell his property in his ideas. A further clause was added, in addition to those brought forward in the report, that "for small works the employment of an eligible architect or a limited competition is recommended."

Before, however, the code, thus revised, was put to the meeting for adoption, the chairman of the evening (Sir Digby Wyatt) proposed a very important and desirable alteration in the heading or title. It would, he thought, he admitted that, in general, architectural competitions were not a desirable means of dealing between the public and the architectural profession; and though the latter might formulate rules for protecting their own interests in such cases, it was not to be wished that this should be mistaken as an expression of the profession at large in favour of the system. He therefore proposed to add to the title, "General Regulations proposed by the Conference Committee for the conduct of Architectural Competitions," these words,—"in cases in which competition at all should be justified by the extent and importance of the work, or by other special circumstances," which was agreed to *nem. con.* The code of rules in this revised form is now recommended to the Institute and the other architectural societies (as well as to individual architects) of the United Kingdom for adoption; and though, of course, the meeting at which this code was adopted, can only be said in a qualified sense to represent the architects of Great Britain, we must express a hope that those who were not present will give practical proof of their appreciation of the labours of their brethren for the common good, by unanimously adopting the conditions passed at the Conference, and declining to enter competitions on any other terms. This is the only way to secure fair dealing in such matters, at the rate at which the competition system is being carried on now; and if the public find they cannot obtain the entry of any architect of good standing into a competition except on these terms, they must perforce either give up the system or so modify it that architects will be able to compete if they choose, without the conviction that they are going in for a lottery in which, whoever gains, they are pretty sure to lose.

We should mention that at the close of the meeting Professor Kerr read what he termed a "tentative" form of competition conditions or instructions, which he had been requested to draw up, together with the comments of several other members of the Institute on the various clauses contained. This, though rather too elaborate for practical use, contained some valuable and original suggestions.

Construction and Materials.

The sectional meeting for the consideration of structure and materials was held, at two p.m., on Thursday, the 13th, under the presidency of Mr. Horace Jones, and included, according to the programme, a paper from Major-gen. Scott, "On the Selenitic Method of Treating Lime," and one from Mr. R. W. Edis, "Notes on the recent Conflagration in Paris." The title of the first-named paper, however, was changed to that of "Clean Drains and Improved Mortar." This paper was of great practical value, and will doubtless be printed *in extenso*. It may suffice just now to say, that the subject was mainly the description of Major-gen. Scott's plan for depositing, deodorising, and utilising the solid inorganic matter held in suspension in sewage water, and which, under ordinary circumstances, ultimately becomes "sewage mud," and deposits itself in the inverts. The rapid precipitation of this solid matter is effected by the introduction into the sewage water of a mixture of lime and clay, the chemical result being illustrated to the meeting by the addition of a small quantity of this mixture into a glass jar of sewage water, comparatively clear to the eye, but which almost immediately became thick and muddy, leaving, ultimately, a deposit about an inch in thickness at the bottom of the jar. This deposit, thus formed, and consisting mainly of lime and clay in close connexion (five of lime to one of clay), Gen. Scott stated, contained all the ingredients necessary for a good hydraulic mortar; and the lime introduced acted so far as a deodoriser that the deposit was left with scarcely any unpleasant smell (here the noological inspection of a bottle of said deposit, handed round, appeared to elicit

some difference of opinion on this head); and after the calcination necessary to prepare the deposit for actual use in mortar-making, no vestige of "sewage" smell was apparent. The organic matter found in quantities generally of 20 to 25 per cent. in the deposit disappeared in this process, and in effect formed part of the fuel: the nature and origin of a large portion of this organic matter, so readily combustible, was indicated by the lecturer in an anecdote unfortunately a little too much to the point for repetition here. The best method of utilising the deposit, thus dried and calcined, brought the lecturer round to the subject originally announced in the programme. To make Portland cement from this preparation, though the materials for it were present, would require a very careful preparation and proportioning of those materials and good machinery, and it would probably not prove an economical method of procuring cement of this description. But for the manufacture of the selenitic mortar, with which General Scott's name has been identified, the materials here were exactly suited. The selenitic process, the details of which have been published already, was then briefly described. The advantage claimed for the whole process, however, lay not so much either in the production of mortar or the cleansing of drains singly, but in the fact that these two results were combined in the same process. The sewage mud was not wanted for irrigation purposes; at least the best authorities on irrigation concluded that it was rather an impediment than otherwise, and the farmers were emphatically of the same mind. It was desirable both to get rid of the mud and to deodorise the sewage; the introduction of the lime and clay as described effected the latter process, and at the same time produced a material admirably fit for the manufacture of a hard and stiff-setting mortar. Here there was a real "utilisation of sewage," distinct as that gained by irrigation with the more liquid portions. It was asked, why not avail ourselves of it? It was added that, by the simple introduction of the lime and clay preparation in a liquid state into the flowing sewage a little above the outfall tanks, the mixing of the materials and the deposition was effected as thoroughly as if done by mechanical means; the mixture flows along with the sewage, delects it, and at the same time produces the result, in great measure, of a scour on the sides of the drain.

Effects of Fire.

The paper of Mr. Edis, above named, consisted mainly of the result of the lecturer's observations as to the manner in which various classes of building materials had been affected, in the buildings destroyed by the Communist incendiaries. It is interesting to note that the results, in the main, went far to confirm opinions arrived at during the Conference of last year, as to fire-proof materials. The fires in this case, having been very carefully prepared, by the provision of combustibles and explosive materials, and being lighted in many places at once, furnished remarkable evidences of the effect of great heat on the various materials attacked. As a general rule, what was commonly understood as "fireproof" construction appeared to have signally failed; stone-work appeared to have been quite disintegrated by the heat, and the mouldings and other projections seemed to have been completely "licked off" by the flames. Stone staircases tailed into the walls had all cracked and fallen; but it was noticeable that those which were built in at both ends on solid wall had, in most cases, remained standing. Brick buildings protected by cement had, in general, resisted the fire, so far as the main structure was concerned. Ironwork on a large scale had proved totally unable to resist the heat; and not only had the large girders, as in some of the saloons of the Tuileries, given way as soon as, or sooner than wood, but they had, in twisting from the heat, assisted in the wreck of the buildings in a way which wood could never have done. This was strikingly exemplified in one or two of Mr. Spiers's drawings of the ruins made on the spot shortly after the fire. Brick and tile arches generally went by reason of the failure of the iron shrouments and supports. On the other hand, many beams and story-posts of wood were left standing, not burnt through. Plaster appeared, in most cases, to have acted as a great protection to the material it covered. On the whole, the result seemed to be that wood, and concrete and iron protected by plaster, had remained to a great extent fireproof; stone, and iron uncovered, had not.

Captain Shaw, commander of the London Fire Brigade, made some interesting and valuable statements in regard to his own experience as to fire-resisting materials, in general agreeing with the conclusions to be drawn from what had been seen in Paris. He had not in his whole experience known a single instance of unprotected stone resisting the action of fire. He had observed that hollow iron columns were generally much affected by fire, sometimes giving unexpectedly at a slight shock, when not much heated; but solid iron standards of a cross section would often resist fire successfully. The Chairman stated that he had found wooden uprights or beams, with a thin iron plate on each side of them, very difficult to burn through. Mr. Spiers mentioned that in the Palais de Justice, which was roofed by two long barrel vaults, the arches had been stored between the vault and the roof, but the weight of the cases having caused the vault to spread, a quantity of timber scaffolding had been got up there in order to repair the vault. As far as this timber extended the heat had brought the vault down; in the adjoining parts it appeared unburned; but some time after, when some commencement was to be made towards clearing away and rebuilding, the first workman who crossed the remaining portion of the vault fell through, the stonework, though apparently sound, having been completely weakened and disintegrated, by the action of the fire, from the adjoining portion of the building. A more extraordinary thing was that plaster seemed to have resisted the flames in many cases much longer than stone; and a photograph was exhibited by Mr. Spiers, showing part of an apartment, with the stonework all cracked and destroyed, and the plaster mouldings and ornaments adjoining it nearly intact. Mr. Peddie observed that he believed in some cases the iron wire used by the French architects in forming the ceilings had assisted in the destruction of the buildings; as, when the girders above lost their strength or were fractured and came to lean upon the wire, the latter under the pressure operated in pulling the walls in. Professor Kerr did not wish it to be accepted by the public, in connection of what had been said at that meeting, that timber was to be looked on as a fire-proof material; wooden columns might do well in an ordinary house, but not as main support in a large warehouse, for instance. Nature, he thought, it might be said, does not furnish us with "fire-proof" materials, but only with "building" materials; fire-proof or fire-resisting materials were usually of artificial construction. He should wish to know on this head how Ransome's artificial stone stood as a fire-resisting material? In reply, it was stated by a member that the only stone in Chicago that had proved fire-resisting was artificial stone of that nature. Gen. Scott, referring to what had been mentioned by Mr. Spiers as to the resistance of plaster to the fire, thought that in some of the cases alluded to, when the plaster was in connexion with the fireplace, it would be much protected by the in-draught which under the circumstances would take place through the chimney, and would carry away the heat from the fireplace. In-draught exercised a more important influence in such cases than was sometimes realised. He had always said, when asked as to the safety of the Albert Hall in a fire, that if a conflagration were to take place within the Hall, he had no doubt it would burn tremendously, but that he considered the people would be safe as soon as they got into the corridors and passages surrounding the hall, as the in-draught from without through the various openings would be so great as to keep all the heat and flames confined within the Hall. But another point that must be borne in mind in regard to plaster was that it almost always held a large proportion of water, which would be brought out to the surface by the heat, and as long as it lasted would contribute to neutralise the action of the fire; when that was exhausted, he imagined the plaster would succumb to the heat in the same manner as the stone. Mr. Waterhouse thought it important they should have some data as to the effect of fire on different kinds of stone; the stone used in the Paris buildings was mostly a rather soft limestone: what would be the relative effect on Yorkshire stone, for instance? Capt. Shaw stated that he had never seen any kind of stone which did not yield almost at once to the action of fire, except gneiss; and that yielded ultimately, and particularly if water fell on it. On the other hand, he repeated that he had never known an instance of a solid wooden post being burnt through so as to lose its bearing

power before a fire could be put out. This did not apply merely to the harder wood, but to such as pine, &c. A vote of thanks to Mr. Edis and Capt. Shaw closed a very interesting discussion. The latter gentleman, in replying, observed that the architects were the best friends of the fire-brigade, and that the more generally buildings were erected on sound architectural principles of construction, the less danger would there be in extinguishing fire, when it might break out. Subsequently, Mr. Hornblower, of Liverpool, exhibited and explained a section of a patent fire-proof construction invented by himself, consisting almost entirely of terra-cotta or earthenware chambers, bedded in concrete, what little iron there was in the construction being entirely shielded from the action of fire by the concrete. The construction, which could hardly be explained without reference to a diagram, appeared likely to answer, as to its fire-proof qualities, exceedingly well; the only question seemed to be as to its rigidity, when loaded, over a large area; on which point, however, Mr. Hornblower said he had amply satisfied himself by experiments.

The adjourned meeting for the purpose of further considering the subject of professional practice, and other matters not gone into at the meeting on the 11th from want of time, was held at twelve on Friday morning, the 14th. As this meeting was private in its nature, as far as the discussions are concerned, we content ourselves with mentioning briefly that, on the revised schedule of charges being proposed from the chair for adoption as a whole,—

Mr. Godwin moved, as an amendment, "that the schedule of 1862 be re-affirmed," and stated his reasons for considering that issuing a new schedule would prove a very injurious step. This was seconded by Mr. C. F. Hayward, and, after a vigorous discussion, was negatived on division, and the new schedule was adopted.

The argument which chiefly prevailed appeared to be this, that many of the provincial members had been assisted in discussing the new schedule had then left London, and that it would seem unfair to them to put that aside and return to the old schedule. We believe the step taken is an unfortunate mistake.

During the Conference the room of the Institute was hung with geometrical and practical drawings sent for exhibition; the array of these was, however, rather smaller than last year, and did not present anything particularly new. As far as we observed, they were entirely the work of London architects, no provincials having sent anything. It is to be wished that on a future occasion this exhibition might be more fully contributed to, and arranged in a systematic manner if possible, so as to give opportunity for comparing different methods of work from different quarters. Of the drawings that were hung, conspicuous were the very large ones for the St. Pancras Hotel by Mr. G. Scott, now well known in its main features. Mr. Street exhibited drawings of his All Saints' Church, Clifton, including the design for the metal chancel screen and the reredos, a sculptured bas-relief. Drawings were also there of the Bristol Cathedral additions (they can scarcely be called "restorations") showing the west end as it will be completed. The large section of Mr. Marrahe's Church of St. Peter, Deptford, showing the construction of the roof by what may be called solid brick arched principals, was one of the best; we had occasion to commend the perspective view of this building, if we remember rightly, in last year's Academy. Mr. D. Brandon's Carlton Club and Mr. John Gibson's National Provincial Bank afforded specimens of clear, precise elevation drawing on a large scale; and the section of the staircase of Dobroyd Castle, by the latter architect, was one of the best specimens of a neat, clearly-executed working drawing of an elaborate description that we have seen. There were drawings by other architects more or less known among us, but nothing of much note. The absence of large-sized ornamental details from the collection was to be regretted; these form the most interesting portion generally of such an exhibition.

Of the dinner which closed the Conference we give some particulars separately.

In taking leave of the Conference of 1872, we may perhaps say it was characterised, as we characterised the exhibition of drawings just now, by "absence of ornamental detail." The subjects entered into were almost entirely of a practical nature, and concerning the business working of the profession. Perhaps this is the kind of work which is best done by such a Con-

ference, and should be its main object; and there is no doubt that in this respect some good practical work was done last week. But how far this shall turn out to have been time profitably employed, must depend, we repeat, not so much on those who were present, as on those who were not present at the Conference. If they, i.e. the large mass of respectable architects, will back up the minority who have been working for their interests in London, by joining with unanimity in adopting the rules of practice then laid down, they will have made a great step towards placing the profession not only on a more profitable, but (we would particularly point out), on a more "respectable" footing. It is the unfortunate want of common feeling and *esprit de corps* among English architects which we fear may operate in neutralizing some of the good that might have been done; let us hope, however, that one good effect of the Conference has been to modify this feeling to some extent. And if we can avail ourselves of the practical advantages to be derived from the results of this year's Conference, we may be in a position to give larger attention, at the next similar meeting, to the more widely-interesting subjects connected with the progress and practice of architecture as an art.

ARCHITECTS AT DINNER.

THE Conference dinner took place on Friday, 14th June, at Willis's Rooms, King-street, St. James's; the president, Mr. T. H. Wyatt, in the chair. Among the invited guests were Mr. A. J. B. Beresford Hope, M.P.; Mr. Thos. Hawksley, president of the Institution of Civil Engineers; Mr. Chas. Manby, Sir John Gilbert, Mr. W. H. Barlow, Mr. C. Landseer, R.A., Mr. H. Carr, Captain Shaw, Dr. Percy, &c. There were noticed by us in the general company, Sir Digby Wyatt, Messrs. Salvin, G. E. Street, T. Bury, B. Ferrey, Calderon, R.A., John Gibson, Waterhouse, H. Jones, O. Hansard, Marrable, W. Burgess, J. Norton, T. R. Smith, Mitchell-Withers of Sheffield, Honeyman of Glasgow, A. Strong, J. D. Mathews, R. J. Withers, M. Wyatt, R. Plunbe, Beavington Atkinson, W. Papworth, R. Kerr, Bromhead of Glasgow, Law of Northampton, Chatfield Clarke, Shoppes, and numerous others. The menu and service were considered not unsatisfactory,—in fact, received, after the conclusion, a public expression of contentment from Mr. Octavius Hansard, the active secretary of the dining section, by whom the allotment of the seats and other services were performed.

The President commenced the second section of the business by giving "The Queen," and "The Prince and Princess of Wales and the rest of the Royal Family,"—all drunk with the usual cheers. The next toast, in honour of "The Army, Navy, and Volunteers," was responded to by General Scott. After stating that science does not absolutely require popular recognition, but may successfully pursue its aims silently and almost secretly; that the members of the Royal and similar societies need not work under the public gaze, nor within reach of the general voice,—he drew attention to the differing conditions required for the flourishing of the fine arts. They must have, as a necessity of their existence, a large educated public,—prepared by nature and culture to find delight in the recognition of the finer qualities in art-work. The yearly exhibition of the Royal Academy, mainly devoted to oil-painting, might, he thought, be usefully imitated for architecture by an exhibition comprehending drawings of all, or almost all, the works of importance throughout the country; held in a building in which numbers of people are, for other reasons also, sure to visit. Whether the Royal Institute of British Architects would undertake such a task, and use all possible influence towards its success, he was, of course, unable to say,—any more than whether the Commissioners for the South Kensington International Exhibitions would be willing to grant the Institute a suitable space under its own control if applied for; though he would confess that this course and place had been in his mind. Having thus ventured, notwithstanding the earnest expressions of dissent from his views proceeding from some parts of the room, to give this statement of them, he trusted that, as credit had of course been given him for a somewhat obstinate perseverance when his name had been received with cheers as a representative of the British army, no surprise would be felt at his further statement that he believed it would be possible to form such an annual exhibition of drawings of architecture in London,

as would actually put to shame the other nations of the world. After Mr. Barlow and Mr. C. Manby (as Lieut.-col.), had briefly responded for the Volunteers,—"The Artistic and Scientific Societies of England,"—elicited in reply a few kindly words from Sir John Gilbert; and Mr. Hawksley, Pres. I.C.E., representing science, enlarged on the recent services, in addition to the comfort of mankind, and to his mastery over his dwelling-place, rendered by the kindred professions of architecture and engineering,—confessing that architects had some justification, for their reproaches of engineers, in the ugly burdens they had laid upon their Mother Earth: he still claimed for his profession, new creation as it was, of the last half century, a power and resolution in grappling with new problems, and bringing gigantic projects into the domain of the possible, and even of fact, not seen afloat in all the history of the world. Engineers,—the children of the steam-engine, the pickaxe, and the shovel,—not ashamed of, nor forgetting such lowly origin, see in their own work that sense of equal service to mankind at large which gives it kinship with all the arts. Above all, in the special attention to the happiness and health of the great masses of the people, one of the aims of the architecture of the present and the immediate future, likely to distinguish this age from the times of monumental building in the nations of antiquity, and from the temple-building Mediæval times; in the endeavour to descend to the level of the lowest needs, and bring reason and order, and it may be beauty, into every domain of life,—the two professions may and should progress in thorough amity, with that intercommunication of knowledge and impulse which is certain to be beneficial to both.

The special toast of the evening was then given by the President,—"Success to the Conference and to the attempts to make it useful." He said that, in the actual hard work done by some that week in furtherance of this, endeavour had been made to concentrate and realise the suggestions of last year's meeting,—to bring into tangible working form statements which the greater number of the architects of the United Kingdom were prepared to recognise as the guides of their practice. This attempt to limit the business of the Conference,—not exclusively, but mainly,—to matters of professional practice, had probably made it less generally interesting than the last; but, in the presence of pressing practical questions, he was happy to state that general interchange of thought, marked by much cordiality of feeling, had also never been wanting.

Professor Kerr, on behalf of the Institute, said that he had in truth considered this year's Conference more interesting than that of 1871. Then we had discussion; now we have results. Without claiming so complicated a pedigree as Mr. Hawksley had drawn up for engineers, it might, nevertheless, not be amiss, especially on such an occasion as this, to imitate that proclamation of relationship, and acknowledge the fraternity existing among architects generally as a thing not wisely hidden, nor ever to be forgotten. Upon that he rested all his hopes of real success in the labours now being brought to an end.

Mr. Rowland Plunbe, on behalf of the delegates to the Conference, said he hoped that eventually a strong society would be formed, comprising all the properly-recognisable practising architects throughout the United Kingdom, with settled rules of practice conformed to by all the members.

Mr. Stangos, a member of the American Institute of Architects, on being called upon, responded for the foreign visitors. In America, he said, the architects look to the mother country for architectural guidance, and follow a long way off the examples set them of the application of forms of beauty to the service of modern needs. Though not wanting in hardihood, he did not dare to express fully his sense of the kindly reception accorded to him, on account of his nationality and his devotion to kindred pursuits; but when he returned home he would be careful to speak out heartily what he now felt, unspoken, to the imagination of his hearers.

Mr. Honeyman, of Glasgow, for the provincial societies, expressed the satisfaction felt by himself and by many provincial architects, in being called to attend the Conference. Knowing the immense importance to the profession of internal agreement and uniformity of practice on important matters, he felt it a considerable privilege, as well as a duty, to aid in the promotion of the solid results that had been agreed upon as the outcome of substantial accord, expressed with

personal cordiality. All architects practising out of London owed, in his opinion, a real debt of gratitude to the Institute for originating the Conferences and driving them towards definite and practical conclusions.

Mr. Beresford Hope, M.P., said that although a layman, having for two years been President of the Institute, and knowing therefore fairly well the condition of the questions settled at this Conference, he was entitled to heartily congratulate the present president, to whose exertions in no small degree the results arrived at might be considered due. The Institute, in matters affecting the welfare and honour of the profession, had never claimed supremacy; but in this Conference, as in other things, had found itself called to the leadership of the architects of the United Kingdom. As liberally accepted as it had been generously put forward, the Institute, in this position of leadership, had marked out clearly the principle that architects at large must assert and maintain an internal unity in order to effectually assert themselves before the world. The Institute, not deeming itself a mere club for the promotion of good fellowship, nor a mere battle-field of the styles, has aspired to plan the future binding together of the whole profession, and has actually seen a Conference held, at which has been drawn up what may come to be regarded as the Magna Charta of professional practice,—in itself the dawning of a better time,—to be followed, let us hope, hereafter by other measures that shall extend and consolidate the work of to-day. He felt bound, by the way, in the interest of the Medieval times to which his mind always reverted with pleasure, not to allow Mr. Hawksley to exult the present by too great a depreciation of the past. He remembered among old works of scientific skill many a great assertion of the empire of man over nature; and in thinking of the silent highways of Venice, the streets of Nuremberg, and our own Chester, he could not forget that one was forced to see there much more than mere convenience,—that in older days also a tender, delicate, and beautiful art moulded the general forms and the minutest details of the private dwellings of the people. But when he rose it was not for debate; on the contrary, wholly for good fellowship, to propose the health of the prince of good fellows,—of the President,—a man who, having for long years won the favour, approbation, and confidence of all with whom he has come in contact, has been elevated by the votes of the members of his own profession to the highest office they can bestow;—who, though most genial and bland, has shown that in difficulty he can be stanch and firm, and is, in a word, as fit for the chair he occupies as that chair is the right place for him.

Mr. Wyatt, who was most heartily cheered, after his health had been drunk standing, with vigorous hurrahs, briefly returned thanks, saying that he had always aimed at the independence and advancement of the profession to which he had the honour to belong. Architects generally had no wish to constitute anything resembling a trade union,—that should look mainly, or only, to the supposed interests of its members; putting out of sight the co-existing rights of their employers, and of the rest of the community. They wished, if possible, to keep alive a personal sympathy and good fellowship among the whole of the members of the profession, and to secure so much uniformity of action and practice as would enable them to take a fair and reasonably-assured position before the world. The real interests of the public were served by such coherence in a profession,—not based on merely selfish motives, but on a desire to know one's but such honourable rivalry as shall serve the useful purposes for which the profession came into existence. The rules decided on at this Conference stated, he considered, as nearly as possible, the customs generally prevalent at this present date. Such minor modifications had been made in one document as represented the changes growing up in our quickly-moving social state during the ten years last past. He thought it possible that at least as much alteration might prove to be necessary at the end of another ten years, under the influence of the constant change that must affect our profession as it does everything else. Changes need not however, be injurious, either to architects or to those who commit interests to their care. And changes in mere details of practice need never bring about the slightest change in that high spirit which he so gladly saw in the profession. When he left the chair he now occupied as President of the Institute, he should wish to leave to

his successor an example and a precept urging to such leading of the profession as would tend to its winning sure and lasting honour,—from all whose suffrages are worthy.

Sir Digby Wyatt gave "The Sister Arts and Literature," insisting that, as in the great time of the Renaissance, so now, no success will attend the attempt to undertake more than a man's wit can master, or his hand can do. For an architect, however, a complete understanding of the theory of all the arts, and of the method of amalgamating their productions into a thorough unity, he considered of primary importance. Mr. Street replied for Literature—his "Italy" and "Spain" having been alluded to as showing extreme aptitude in reaching new information, and conveying it with skill to a large and increasing audience. He said that he owed no small debt to the exact study which had been necessary in order to adequately describe buildings he had visited. The possession of a distinct purpose of this kind tenaciously clung to, must, he thought, be of much service to every architect who visited many buildings. He therefore never regretted that he had cultivated literature as far as the other pursuits of his profession would allow. He regretted, in speaking on this subject, that it was impossible, on occasions of that kind, to secure the presence of a man who, more than any one that ever lived, had extended the possible range of architecture, and given the contemplation of its works subtle and strong powers of affecting the observer—in ways that before Mr. Ruskin, with his courageous insight, undertook his expositions, were almost absolutely non-existent, at least for the mass of people, because so completely unspoken. He considered that the debt to Mr. Ruskin could never be repaid either by the architectural profession or the rest of his countrymen. He hoped, in future Conferences, literary and artistic disquisitions would assume their proper prominence; that it would be possible to lay more stress on the fact that architects are artists as well as professional men.

Mr. Calderon briefly replied for Painters, Mr. Beavington Atkinson for Art-Critics; Mr. Walter Thornbury for General Literature.

Thereafter, "The General Committee for Managing the Conference," was responded to by Mr. B. Ferrey; "The Secretaries of the Conference Committees," and "The Special Secretaries of Sections," by Mr. Strong and Mr. O. Hassard (who was responsible with Mr. Jones and Mr. Marmale for the dinner arrangements); "The Secretary of the Institute" (Mr. Eastlake), completed the list of toasts; and when all present rose, they were no longer Members of the Architectural Conference of 1872, which had come to the end of all the tasks, pleasant and irksome, to which its attention had been devoted.

EARLY HISTORY OF RAILWAYS.*

THERE were legislators who did even worse things than those we have mentioned. It was known that several members of the Commons took their five guineas daily from the railway secretary for supporting a Bill in committee, and one case came under the writer's notice of a peer, miserably poor indeed, and of a title now extinct, who refused a note for 50*l.*, saying he was engaged on the other side,—a curious mixture of honour and roguery. It was, however, understood, that there were but two members of the Upper House who were accessible to direct bribes, and the few who did so in the Commons were men of very bad general characters, who paid for their lodgings with franks and Parliamentary papers.

With such examples it can scarcely be marvelled at that solicitors created business, and engineers charged four horses and used two, and introduced other fictions into their charges. "I really must go and look at the line," said an engineer, now alive, who had been paid his expenses, and had given his evidence in aid of another engineer's Bill in the Commons. "You want me to go before the Lords, and there you know I am upon oath." Such practices indeed were very, very far from either Brunel, Stephenson, or Locke.

But the original vice was in the Legislature. A Parliamentary committee was never looked upon as an impartial tribunal. It was an assemblage of advocates. Few, indeed, were actually bribed with money, but scarcely any judged of the scheme upon its merits.

Most of the members had been canvassed by ladies or private friends, or public bodies, and men of the highest reputation or rank, Royal Dukes, Bishops, and great lawyers, came down, not to hear, but to vote. It was well known that the London and Birmingham scheme owed its first year's defeat, and the loss of many thousands of pounds, to the enmity of a great lady or leader of fashion, whom the Board had neglected to conciliate, and the Provost of Eton, in person, posted himself at the door of the House of Lords, and canvassed every Eton peer against the Great Western. The violence of the Eton masters descended to personal quarrels with the promoters; and the Oxford opposition, a few years later, was of the same character.

Indeed, nothing could well be more discreditable to a legislative assembly than the proceedings of the committees of either House upon Railway Bills, and of the Commons also upon election petitions. Sitting judicially, and dealing with important private interests, the election committees were mere trials of party strength, and the proceedings in railways seemed devised to put the applicants to as heavy an expense with as little result as possible. For some time a peers' committee was open to every member of their House, and men of high character, such as the Duke of Wellington, were not above voting in committees, of the proceedings of which they knew nothing. Nevertheless, the proceedings in committee upon a great railway, with a good chairman, able counsel, and intelligent witnesses, were of a most interesting character. Lord Wharfedale, long a Yorkshire chairman of Quarter Sessions, was by much the ablest chairman in the Lords, and the Great Western was fortunate in having him for the chairman of its committee, and the late J. C. Talbot, Lord Wharfedale's son-in-law, for its leading counsel.

In some railway projects the secretary was the leading spirit; in some the solicitor or a director; in others the engineer. This was remarkably the case with the Great Western; for although possessing, in their chairman, Mr. Sims, an excellent man of business, and in Mr. Saunders a first-rate secretary, in Mr. Talbot a most influential counsel, and in Mr. Burke a leading Parliamentary agent, in the committee-room Brunel was all and everything. The Great Western affected the property of an unusual number of peers, and the local opposition was peculiarly strong. The celebrated Dennis or Dionysius Lardner, at that time in the height of his celebrity as editor of the "Cabinet Cyclopaedia," was engaged to oppose on points of science. The influence of Windsor and Eton, represented by the Duke of Cumberland, was strong, as were certain other interests represented by the Bishop of Hereford. Brunel's duty was to show the precise course to be taken by the railway, and the manner in which it would affect the canals, roads, and private property. With the peers were the road surveyors, canal agents, and land agents, ready to suggest questions and criticise the answers; but Brunel, who had gone over the whole line, and possessed a wonderful topographical memory, was armed at all points; his knowledge of country was superior to that of a geologist and fox-hunter combined, and the landed interest told after him in vain. Besides a month spent in walking over the line, as soon as the committee broke up at four o'clock on Friday, he was off with four horses to the district next for examination, and appeared on Monday in the box, with the recollections of the points likely to be disputed brushed up and fresh.

The scientific opposition completely broke down. Lardner, really a clever man, though, as some think, a charlatan, endeavoured to bring his knowledge of mathematics and of the differential calculus into the field, and was great upon the impossibility of high velocities, the weakness of ropes upon the proposed Box incline, and various points connected with the theory of the locomotive. But Brunel was not only a skilled mathematician and a practical engineer, but he had been at school in France, and his power of mental calculation, great naturally by inheritance from his father, had been educated by that father to a marvellous pitch; and upon all points, whether right or wrong, he carried it off before him. The Great Western, in its first form, was fifty-seven days in the committee of the Commons, and was, after all, thrown out in the Lords, in 1834. In 1835 it again passed through a severe struggle, and was in the Lords' committee forty days. On one occasion, Brunel was eight days in the witness-box, with a whole host of professional

and scientific witnesses against him; and never did he need assistance, nor refer to notes or memoranda for his answers. People crowded to the committee-room, as to a high intellectual treat. Robert Stephenson, equal to Brunel in many respects, and also a very safe witness, never created so great an interest. Perfectly master of his profession, he was not much of a mathematician, and wisely confined himself to points of practice. George Stephenson was also a good witness, and his immense experience and thorough common sense gave him great weight. His Northern accent and habits also gave force to what he said, as did a certain simplicity and absence of finesse, mixed with a dry, caustic humour, and now and then a burst of feeling, and sometimes of temper. His answer about the "coc" everybody knows. On one occasion, he was pressed for his authority for some fact. "Authority?" said he: "I know it,—is not that enough?" "Well, Mr. Stephenson, but how do you know it?—do you know it of your own knowledge?—did you see it?" "See it! know it of my own knowledge! Why, my son Robert saw it, and he told me, and was he mistaken, think ye, man, or he telling me a lee?" The burst of paternal feeling, the pride and confidence in his son that lighted up his countenance, electrified the whole room.

Nothing could exceed his love for and pride in his son. When the Great Western was in progress, Robert Stephenson was requested by Brunel to try his hand at one of the new broad-gauge engines. Robert, opposed to the broad gauge, but determined to show what he could do as an engine-maker, loyally did his best, and produced the "North Star," and sent her to Paddington, with the well-known "Applyly," the best engine-driver in his employment. Soon after the Star was put upon the line, then open to Maidenhead, Stephenson was invited to meet the directors, and witness a trial of his engine. He came to Paddington, decided to accompany the engine himself, and, attended by Brunel and a tenderful of directors, started down the line. A few minutes later a cab drove up at a gallop, and out got George Stephenson, who had come to see his son's triumph. He was too late. However, though in a state of great anxiety, he remained, and wandered about the station, asking questions about the gauge, until, an hour later, the approach of the engine was signalled. As she came into the station, evidently having done her work well, and the figure of his son at the driving-handle came in view, the old man's excitement became almost ungovernable. As the engine stopped, Robert jumped down, and was greeted by his father, who, for a time, saw and thought of nothing else but his successful son.

The Parliamentary committee erred seriously in encouraging professional witnesses. Men of science,—especially Lardner, and many of the inferior engineers,—hired out their services as professional witnesses, and justified the practice by pleading the custom of the Bar. Of course, the cases are not analogous. The barrister is understood not to express his own opinion, not to assert his own facts: he is to argue from the evidence of others as best he may, and to be met by arguments on the other side. But the scientific or the medical witness, for both were employed, is dishonest if he accommodates his facts or opinions to the side on which he is engaged, as was notoriously the case before the early railway committees.

After the committee had reported and the House approved came the royal assent, and then, joy of joys! the actual commencement of the works.

The first step, while the lawyers obtained possession of the land, was to divide the line into lengths of from ten to twenty miles, according to the nature of the works, and to place a resident engineer in charge of each, whose duty it was to set out the boundary-lines, called technically half-widths, prepare the estate or property plans for the lawyers, take the levels with close accuracy, and calculate the quantities of earthwork. Stephenson left much besides this to his residents. In many cases, they designed the bridges and culverts, prepared the draft specifications, and had more or less to do with letting the contracts. Brunel, on the other hand, gave his assistants no discretion. They supplied him with the plans and sections,—the facts, that was all. He personally designed every piece of brickwork or masonry, whether bridge or culvert; took no man's advice upon any point; himself drew up the specifications, leaving to the lawyers only to approve the legal part of them; and the contracts were let in London, in his presence

only and that of the directors. Stephenson's residents had much to say to the Board; Brunel's seldom attended the central office, and scarcely even knew the secretary. They were his men, and his alone. The consequence was that Stephenson founded a school of engineers, and Brunel did not; but, on the other hand, Brunel's works have a stamp of personality upon them, a uniform character pervading the whole, which is not found in the works of any other railway engineer.

The designs completed and the quantities calculated, the next step was to let them, usually by public tender, to a contractor. The contractor of 1830-40 stood in a very different position to the contractor of the present day. There was no sham about the capital. The promoters found it themselves, and, subject to certain reservations, the work was paid for month by month, and often week by week, as it was executed. Contractors were seldom great capitalists, and when they were, like McIntosh, they were very independent, and often very troublesome. The early contractors, besides, were not clever in their arrangements: as they took contracts below the proper cost, and the work went on became timid, often tried to save money by scamping the work, and not unfrequently came to grief, especially under Brunel. The early contractors upon the Great Western had no idea of what the specifications really meant. The bridges were designed with arches so flat that, unless the joints were very thin, the compression of the mortar caused them to fall, as actually did very many of them. In the larger works, especially, the economy of material was so close, and its strength so nicely calculated, that it required to be of the best quality and put together in the best manner. A curious example of this occurred in one of Brunel's chief works, the bridge across the Thames at Maidenhead. This was to be a bridge of two arches, the pier being on firm ground in the mid-river. Brunel had not only designed this bridge, but had it modelled in plaster, and inserted into a landscape drawing, that he might fully judge of its effect. The arches were to be of brick, of large span and slight rise, therefore unusually flat and graceful, and, abutment being of immense importance, the thrust was calculated to a nicety, and distributed by a complex system of sub-arches and buttresses, which were for the most part concealed within the wing walls. The contract was taken by a builder at Windsor, whose idea of a bridge was probably derived from the existing one at Maidenhead. Once committed he began to quake. He discovered that the arches were broader and flatter than any brick arches existing, and he supposed that the material would be crushed by its own weight. In his distress he consulted the late Mr. Chadwick, then a great London builder. Chadwick called on Brunel, stated the difficulties, and entreated that his client might be let off, hinting that the design was impracticable. Brunel, finding that Chadwick, though no geometer, was a man of sense, took great pains to explain to him how safe the design really was, if properly executed, and proved to him that the maximum pressure on the bricks was very considerably less than upon the lower courses of the wall of the Fleet Prison, then a well-known structure. After an hour's conversation Chadwick was convinced, and himself accepted the contract and built the bridge. The subsequent history, however, is curious. The specification directed the arches to be turned in mortar, finely ground and laid in very thin joints. The arch was so built; the compression allowed for in the drawings took place when the centres were eased, and the structure stood, independent of mortar, in equilibrium. When another arch was about to be turned Chadwick got alarmed; he understood nothing about equilibration, but his experience told him that the flatband of a London window was more likely to stand if the principle of the arch were set aside, and the material converted into a rigid beam by the use of cement. He proposed to apply this experiment to the Maidenhead arch, and as he was rich enough to take the consequences, and very persistent, he was allowed to take his own course. He turned the arch in the best Portland cement; but this done, he forgot his beam theory, and eased the centres while the work was green. The cement, setting quickly where exposed, had converted the exterior shell into a rigid mass, while the interior work, still unset, yielded to the pressure, and the arch of course gave way. The result was expensive to Mr. Chadwick, who had to

make the crown good with York landing, besides pulling down much of the work; but he profited by experience, built the two fine bridges over the Thames near Stratley, and did a good deal of work for the company.

The Wharfedale Viaduct across the Brent at Hanwell was another great work in brick which tried sorely the means and skill of the contractors. This was a viaduct of eight main arches, each 70 ft. span and 17 ft. 6 in. rise, upon very lofty piers. The foundation was upon London clay, rather a treacherous material, and the piers rested upon a thick bed of concrete. As the piers were double, and as light as was safe, great care was necessary in their construction. With so broad a base and so enormous a mass of brickwork, the bricklayers could not be made to see that the bricks must be laid closely throughout. Their idea was to fill up the core with rubbish and grout it. Then when the piers were half height, the water appeared rising up round the bases, and alarmed the overlookers, who sank a well and began to pump at the risk of washing all the lime from the concrete. At last the arches were turned, and Brunel caused the centres to be completely let down, some feet from the work, which came down about 2 in. only. Nothing could exceed the beauty, or the apparent fragility of the eight light rings of brickwork, standing without sprandrel or parapet walls at so great a height. They were the first large brick arches Brunel had turned, and he took unusual interest in them and often visited the works. In reply to some remark as to their stability, he said one morning, "Well, they certainly do look slight, and I sometimes think I might have made them stronger, but I have calculated the material, and I know it is impossible they should give way." This was the self-confidence that impressed all about him, and allowed none of his subordinates to doubt their chief.

Each resident had a staff, often a very large one, of assistants, gathered from all quarters without the least regard to their social rank. Some were ordinary surveyors, some retired lieutenants in the navy, some more draughtman ambitious of field work, some pupils in engineering, occasionally the sons of county gentlemen along the line, and now and then sons or nephews of peers. When they went down to reside upon their work in country villages, the squire and clergy were much puzzled when they found them gentlemen. On one occasion a rather pompous county member came to look at the works, and asking for the engineer was shown a man in fen hoots up to his thighs in mud, giving directions about cleansing an old pond, just drained, in which he stood. The visitor's card was put upon a stick and handed across. The engineer in due time came to the bank, and very civilly accompanied his visitor over the works, explaining everything, but without altering his costume. The M.P. ought to have discovered by his conversation that his friend was a man of education, if not of birth; however, he thanked him in a patronising way, and seemed to doubt whether or not he should offer him a crown, which, however, he did not. Two days after his surprise was not small when he recognised his dirty friend as rather a well-got-up gentleman, with an "honourable" before his name, dancing with his daughter at a county ball. Some of these assistants married farmers' daughters and settled down as land agents, some took to drink and were dismissed. One or two of higher pretensions married heiresses; and others, on the death of elder brothers, inherited estates, and found their railway experience exceedingly useful to them.

The class of men employed in earthwork were very peculiar and very unlike the ordinary labourers of the country. They were called "navvies" from having been employed originally upon works of internal navigation, and they came from the northern counties, especially Lancashire. They were usually magnificent animals. Tall, broad-chested, heavy, but not stupid. Never drunkards, though often intemperate, rough rather than brutal, good-natured if treated kindly, but very unpleasant customers if affronted. They were fond of dogs, especially of a sort of cross between the tinker and the greyhound, of great use in capturing hares. Pouchers in the usual sense they were not, but if game came in their way it was welcome.

Such were the men by whom the railways of England were designed, carried through a somewhat unwilling Parliament, and executed. The railway engineer, though scarcely superior in ability to such of his predecessors as Smeaton,

Brindley, Telford, or Rennie, dealt with larger resources, and commanded the use of machinery of a far more powerful description. The surveyors and assistants employed were altogether created by the demand. Those formerly employed were little better than superior workmen. The contractors, indeed, already existed. Telford's great bridges, whether of stone or iron, and the docks at Hull and Liverpool, had been executed by a very superior class of contractors, in one respect greatly superior to their successors,—that they did not meddle with speculations in stock or shares. The navvies were called into existence by the making of the canals, and those employed on railways did not differ materially from their predecessors. But the general result of the new and marvellous demand was to create an ample supply, and for skill, for quality, and for quantity, the works executed during the first ten years from the commencement of the line between Liverpool and Manchester may be advantageously compared with the engineering operations of any country, at any period.

INTERNATIONAL ANNEXES: EASTERN AND WESTERN ORNAMENT.

THE French annex, which formed such an attraction last year to lovers of modern *bijouterie*, is now filled and arranged with the similar display for the present year, and makes a show scarcely inferior to the last, possessing the same merits and the same defects. The merits are, as every one knows, good workmanship and finish, and a certain amount of elegance in form and detail, especially in those smaller costly trifles which form the toys of the wealthier classes. The defects are, we fear, not so obvious to the taste and perceptions of the majority of the visitors, least of all to the young ladies who wander delightedly about characterising everything as "sweetly pretty." What makes these pretty toys less satisfactory to the philosophical eye, is the predominance of matter over mind which so many of them display; costliness of material and brilliancy of finish taking the place of artistic thought. Looking at the large and rich collection of Messrs. Susso Frères, for instance, one could pick out but a small proportion of these marble and gold timepieces, candelabra, and other articles, which have any value beyond the general appearance of costly glitter which appears to be the main object. There is no thought in the use of the material; no reference in the design to the end for which the object is made. We find what is apparently a paper-weight, in the shape of a bronze imitation of a dead bird, very well done, but looking completely purposeless in regard to such a use; there is a gold-branched candlestick with a figure on one side of the base running at full speed, with one leg out in the air looking as if it was meant as a means of upsetting the whole affair. This is the kind of thing we meet in French work of this class—brilliancy of material and manipulation shown merely for their own sake, apparently, and as an end in themselves. The work of Denière is much of the same class; so is great part of the splendid show of F. Barbedienne, round the top end of the saloon, by far the best part of his work being the bronze vases and platters, in which the material being less costly and attractive in itself, a proportionately greater amount of artistic thought has been bestowed upon it; an instance of what we have more than once remarked upon, that costliness of material often seems to prove the bane of artistic feeling and design in ornamental art, the mere money value of the thing being sufficient to recommend it to those who have money to spare. French notions of colour in these matters, too, seem to run in a very restricted groove, and to be confined mostly to a blending of blue and gold. It is curious to see among the last-named collection of Barbedienne a single Japanese vase (why there we know not), reading its unheeded lesson on colour-harmony to the Western ornamentist.

Nor can we say much, in an artistic point of view, for the porcelain work of Deck, which, however, is far less showy and pretentious than other work in the room, and shows some pleasant colour, but not good form. There is one firm represented which in fact seems to have nearly all the good taste to itself; that of Christoffe & Co., whose works are mainly in the large case in the centre of the room. Their bronze work, inlaid with arabesques in silver, is really charming, not only perfect in finish and execution, but evincing a true feeling for the treatment of material, and for style in ornament-

tal design, which we look for in vain in other parts of the room. The ornamental designs carried out in this silver inlay are not in all cases directly symmetrical, but show a very pleasing freedom and irregularity of treatment in many cases, without going so far as to lose the appearance of design. In their small vases, in coloured *cloisonné* enamel, they show also a feeling for harmony of colour quite different from the staring gold and blue we see so much of in French work of this kind; many of the designs are exceedingly happy in treatment of conventional foliage, and almost all good in outline, one of the points indeed in which on the whole the French are generally successful: it is rare to see a had or clumsy outline in their work of this kind, although one becomes rather tired of the continual over-elegant and somewhat emasculate curves into which they constantly run. Two sets of claret services, the glass ornamented with thin flower sprays in coloured enamel, are peculiarly elegant and refined. But in a general way it is sadly disappointing to find in this saloon so much splendid material and workmanship thrown away upon such commonplace, vulgar, and meretricious design. One or two of the drawing-room carpets hung up here are really fearful, and can only be pointed to as a warning. Matters are not better, perhaps rather worse, in the Belgian annex (entered through the machinery annex out of the east wing); the Belgians in their ornamental metal and furniture work seem to have all the faults of style of the French artists without their finish and elegance of form: the Compagnie Anonyme des Bronzes, which occupies all one end of the room, has scarcely an object worth attention for its purely artistic merits. There is some good woodwork in this saloon in the shape of one or two carved sideboards of somewhat nondescript style; and the ornamental lacework exhibited is, as might be expected, of very high elaboration and delicacy.

What is the real cause of the distinction at once felt between most of the work to be seen in these Belgian and French annexes, and that which we find in the Indian Court? It lies probably in two qualities found in the latter and not in the former. One of course is, natural feeling for harmony of colour; but a more important element is to be found in the appropriateness of design and treatment, in the Oriental work, to the material in which it is carried out. Take the carpets, for example; the Indian specimens, though palpably richer and more varied in colour than the Parisian, might by a hasty critic be said to be less artistic in design, inasmuch as lines of pattern are not strongly or carefully marked upon them, the pattern seems rather left to find itself, in a broken irregular manner, and with no main lines to define it strongly. But, in fact, this is just the kind of treatment which falls in naturally with the production of a woven material, and nothing else could well imitate the effect produced; whereas the Paris carpets, if their design could possibly be supposed to look well any way, would look as well pointed on canvas as woven. The same thing is notably the case with the silver and gold ornament of the Indian artists; there are no masses of lullion here attracting solely by their cost; the gold is in thin plates and inlays, the silver in frost-like and lace-like forms which bring out all the bright lustre of the material; the purchaser of such objects pays for art-work and not for mere material. Some of the silver work from Madras is of exquisite beauty, comprising ear-rings and bracelets as remarkable for elegance and originality of design (in the former articles especially) as for their wonderful delicacy and minuteness of execution; and in one of the cases against the wall there is a lady's silver belt (among the Bombay contributions), consisting mainly of minute chainwork of silver, with a joining plate in front covered with large projecting bosses symmetrically arranged, which is a perfect piece of work of the kind. The large octagon case in the middle of the room deserves particular attention; and, besides the more delicate works in precious metals, may be noted here the brass and copper vessels from Madras, some of them of almost Greek elegance of form, and in this respect superior to the productions of some other Eastern people who have been much run after of late. Then there are the sandal-wood carvings, enough to raise despair in the mind of the Western wood-carver, from their wonderfully minute elaboration combined with freedom of line and design. On the lower shelf at one end of the principal case of these works is a pair of cabinet doors,

each about 12 in. by 7 in. The amount of work crowded into this space is extraordinary, and mostly as beautiful as it is profuse; the little dainties in the niches, with heads no bigger than a pea, have their curious little twisted moustaches shown with almost microscopic minuteness. This specimen is, however, surpassed by the one above it, a small casket, representing in bas-relief on its top and sides "Huthee Sing's Temple" (whoever he may be): there is nothing much in the temple, which is rather the same sort of architecture that our designers put into stained-glass windows; but the flowing conventional foliated ornament which fills the spaces over and around it is really superb, both in freedom of line and in execution; the interspaces of the foliage are deeply cut, and the centres of the leaves considerably sunk, leaving the points and edges coming up to the original surface of the wood: the beauty of the whole, small as it is, is a thing to be seen and studied by all who are practically interested in ornamental wood carving. The general expression of harmony and richness of tone among even the coarsest of the fabrics exhibited, contributes to the satisfaction of the eye in going round this apartment, and to the pleasurable recollection one carries away on leaving it,—a recollection which raises a greater distaste than ever for the (in the main) flanneting, vulgar work of Belgium and France. This has been remarked before,—and will probably have to be remarked again.

COVENT GARDEN CHURCH.

THE visitor to Covent Garden Market will notice some bricks piled in the churchyard of St. Paul's, and various other signs, that the church is closed for repairs. It has been reported that the interior is to be remodelled, the galleries cleared away, and the closed pews replaced by open ones. We shall be sorry if this is true, because any such alteration would be in direct violation of the spirit of the building. The interior has few architectural characteristics, and when the oak columns that at present support the gallery are taken away, nothing will be seen but four bare walls.

All London has an interest in the proper preservation of one of the few memorials we possess of our great architect, Inigo Jones. Not many churches have such claims upon our notice as St. Paul's, Covent Garden; and in historic association with the celebrated dead, it is second only to Westminster Abbey, for more noted characters of the seventeenth and eighteenth centuries have been buried here than in any other church in London.

About the year 1630, Francis Earl of Bedford, planned out a building site on his estate of Covent Garden, behind his mansion, which stood where Southampton-street now is. The Piazza was built according to the designs of Inigo Jones, and soon after the church was erected by the same architect, at a cost of 4,500l.

"Where Covent Garden's famous temple stands,
That boasts the work of Jones' immortal hands,
Columns with plain magnificence appear,
And graceful porches lead along the square."

The story is very improbable that Walpole relates, to the effect that on the earl expressing his wish for a plain structure, little better than a barn, Jones replied that it should be, the handsomest barn in England.

The church was built of brick, with a portico at the east end, consisting of a pediment supported by four Tuscan columns of stone, the two outer ones being square. The chief entrance was at the west end, but there was a door on each side of the altar under the portico which led into the church; these two doors have, however, been bricked up in the present alterations. The roof was covered with red tiles, and at the apex of the pediment was originally a stone cross, which is referred to in R. Brome's "Covent Garden Weeded."—"Come, sir, what do you gaze and shake the head at there? I lay my life he has spied the little cross upon the new church yond," and is at defiance with it."

The ceiling was painted by Edward Pierce, senior, a pupil of Vanduyck, and an inhabitant of the parish. His works, which principally consisted of altar-pieces and ceilings of churches, are now very scarce, as they were mostly destroyed in the Fire of London.

The church was not consecrated till a year or two after it was finished on account of a dispute as to presentation between the Earl of Bedford and the Vicar of St. Martin's (Bray). The earl claimed it because he had built it at his own

expense; and the vicar claimed it because, not being then parochial, it was merely a chapel of ease to St. Martin's. The question was heard before the king in council, at Whitehall, on the 6th of April, 1638, and decided in favour of the east; therefore the church was consecrated on the 27th of September, of the same year, by Bishop Juxon. Political troubles, however, prevented an Act of Parliament being passed to make the church parochial, and it remained as a chapel of ease to the parish church of St. Martin until 1645, when the Lords and Commons, in Parliament assembled, made an ordinance, by which the district of Covent Garden was separated from the parish of St. Martin, and constituted a distinct and independent parish. At the Restoration this Act, and a subsequent one in 1657, were superseded as illegal, and the first ordinance passed by the Parliament of Charles II. in 1660, provided that thenceforth the church and parish of St. Paul, Covent Garden, should be separated from St. Martin's-in-the-Fields.

In 1674 Sir Peter Lely gave 5*l.* towards the expense of erecting a new gateway at the west end of the church; and in 1684 Captain Johnson surveyed the building, and made drawings of it, as it was, and as it was proposed to be altered. In 1688 extensive alterations were made at a cost of 11,000*l.* The walls of the church were cased with Portland stone, and the gateways at the east front which Inigo Jones had initiated from Palladio in brick and plaster, were rebuilt with stone. At the beginning of the eighteenth century, however, the church was again in a bad state, and in 1727 the architect-Earl of Burlington gave 300*l.* or 400*l.* to restore the portico, which had been spoilt by some injudicious repairs. The London atmosphere soon dirtied the stonework again, and the authorities, in 1770, tried to make the church look smart, as we learn from the *Public Advertiser* of that year, which describes the tasteless "improvements" as follows:—"The elegant portico of Covent Garden is now rendered visible, the pillars being painted white, and the pediment with all the rest of a royal yellow." In the same paper we are also told that at this time "the wooden rails in Covent Garden Churchyard, which casually admitted dogs and idle boys among the graves, are taken away, and a new parapet-wall, with an iron balustrade at top, is now finished, and is not only useful but ornamental."

The church escaped destruction at the time of the Great Fire of London, which did not come nearer than 970 yards; but on September 17, 1795, owing to the carelessness of some plumbers who were repairing the roof, the whole interior was burnt out. The roof, stained glass, some pictures (including one of Charles I. by Lely), and the monuments (amongst which was the bust of Sir Peter Lely, by Grinling Gibbons, on the north wall) were destroyed. The building was restored by John Hardwick, and on Aug. 1, 1798, it was consecrated by Porteus, Bishop of London. Dr. Bullock, the rector, preached the consecration sermon, and Dr. Calcott, the organist, played the voluntary on this occasion. The east front is a very familiar object to most Londoners from its position opposite to the market. It was sketched by Hollar, and is to be seen in Hogarth's print of "Morning." Until lately the vestments of the Westminster clerics were erected in front of the church. There is a very good view of the west front engraved by E. Rooker, after Paul Sandby, and dated 1766.

In 1641, a pendulum-clock, by Richard Harris, was placed within the pediment of the east front, which is stated in an inscription in the vestry to be the first one made; but this fact has been disputed. Previously to the Act of Parliament which constituted St. Paul's a distinct parish, the Vicar of St. Martin's had the power of appointing a curate, but the Earl of Bedford could also appoint a preacher to the church. In 1641 Archbishop Usher was accustomed to preach here, and it is recorded that Charles I., wishing for a consultation with his bishops, sent to St. Paul's, Covent Garden, for the Archbishop of Armagh. Usher came down from the pulpit and told the messenger that he was then employed about God's business, but when he had done he would attend upon the king to understand his pleasure. Obadiah Sedgwick, B.D., tutor to Sir Matthew Hale, at Magdalen College, Oxford, officiated as minister to this church during the Commonwealth. About the year 1654 he retired from the charge, and was succeeded by his son-in-law, Thomas Manton, D.D. After the Restoration, Manton would not read the

Liturgy, and left his church on St. Bartholomew's Day, 1662. He afterwards set up a chapel in Covent Garden, and died in 1677. The learned Simon Patrick, Dean of Peterborough, was appointed rector in 1662, and retained the cure until 1689, when he was promoted to the bishopric of Chichester. In 1691 he was translated to Ely. Samuel Freeman, Dean of Peterborough, succeeded Patrick, and was followed by the Hon. and Rev. Robert Lumley Lloyd, who petitioned the House of Lords, unsuccessfully, in 1724, for a writ of summons, as heir-at-law to the barony of Lumley. Charles Fough was the next rector, and was followed by James Tattersal, who was appointed and resigned, on obtaining the rectory of Stratham, in the same year, 1754. Dr. John Craddock was rector from 1754 to 1757, when he became Bishop of Kilmore. He was translated to the archbishopric of Dublin in 1772. Succeeding rectors have been the Rev. Richard Bullock, Rev. Mr. Vicary, Dr. Bowers (now Dean of Manchester), the Rev. Henry Hutton, Rev. C. E. Oakley, and the present rector is the Rev. Berdmore Compton. The notorious Dr. Dodd at one time officiated in this church, and large congregations (principally consisting of ladies) were drawn together to listen to his studied elocution.

Among those who have been baptized at this church, and have afterwards been distinguished, may be mentioned Lady Mary Wortley Montagu, and Turner, the painter. Covent Garden Church was the scene, in 1764, of a runaway match between Lady Susan Fox Strangways, eldest daughter of Stephen, first Earl of Ilchester, and William O'Brien, the actor. After the marriage the couple set out for the bridegroom's villa, at Dunstable.

We will now proceed to make good the assertion at the beginning of this article, by giving a list of the noted characters who have been buried in the church or churchyard. One of the earliest was the notorious Robert Carr, Earl of Somerset, who died in 1645. John Taylor, the water-poet (died 1654), was the next man of any note to be buried here. Then follows Dr. John Donne, junior, son of the famous Dean of St. Paul's (1662). Claude Duval, the highwayman, who was executed at Tyburn, on January 21st, 1669-70, is said to have been buried in this church at night, amidst a numerous train of mourners (mostly ladies), bearing flambeaux. Sir Henry Herbert, Master of the Revels to Charles I., and brother to Lord Herbert of Cherbury and the poet, George Herbert, was buried here, in 1673. Richard Wiseman, Sergeant-Surgeon to Charles II., was buried, on August 29th, 1676, at the upper end of the church, by the side of his first wife. He left, by will, 20*l.* to the poor of the parish. In 1680, three celebrated men were buried here,—viz., Samuel Butler, who died in Ross-street; Sir Peter Lely, who was living in the Piazza at his death; and Dr. Edward Greaves, Physician to Charles II. Richard Gibson, the dwarf painter of the reign of Charles I., in 1690; Sir Dudley North, in 1691; Dick Estcourt, the actor, in 1711-12; Edward Kynaston, the actor of female parts, in 1712; and William Wycherley, the dramatist, who died in Bow-street, 1715, were all buried here. Strype describes the interment of the body of Marmaduke Conwey, on December 23rd, 1717, as "of great remark and a little wonder." This man was said to have reached the great age of 108 years and some months, and to have died of sheer old age. He had been in the service of the royal family from the three last months of the reign of James I. to his death. He attended at the coronation of Charles I., and bore arms for the king during the whole civil war, in which his father and himself lost an estate of 1,000*l.* a year. At the Restoration, he was rewarded for his loyalty by Charles II., with whom he was much in favour, partly from his great skill in hawking. Pierce Tempest, who drew the cries of London (died 1717); Grinling Gibbons, the great sculptor and carver (died 1721); and Mrs. Susanna Centlivre, the dramatist (died 1723), found their last resting-place here. Robert Wilks, the famous actor, was buried here, in 1731. Eighteen years before, his wife, Elizabeth, had died, when he erected a monument to her memory in the church, with this inscription,— "The purity of her mind (which appeared in all the duties of a virtuous life) made her a good wife, daughter, mother, and friend. Her affection was like her piety, constant and unfeigned to her last moment." Henry Jerningham, a goldsmith and jeweller, in Russell-street, was buried in the churchyard, November, 1761, and

the following lines by Aaron Hill inscribed on his tomb:—

"All that accomplish'd body lends mankind
From earth receiving, he to earth resign'd;
All that e'er grac'd a soul from Heaven he drew,
And took back with him, as an angel's due.

James Worsdale, the painter, who died in 1767, was buried in the churchyard with the following inscription, which he composed himself:—

"Eager to get, but not to keep, the pelf,
A friend to all mankind except himself."

This epitaph was removed in 1818.

Dr. John Armstrong (the poet and physician (d. 1779); Tom Davies, the bookseller (d. 1785), and his pretty wife (d. 1801); Sir Robert Strange, the great engraver (d. 1792); Charles Macklin, the actor, specially distinguished for his *Shylock* (d. 1797); Thomas Girtin, one of the earliest of water-colour artists (d. 1802); Thomas King, the hero of Taylor's "Monsieur Tonson," and celebrated impersonator of *Lord Ogleby* in the "Clandestine Marriage" (d. 1805); and Dr. John Wolcot, more celebrated as Peter Pindar (d. 1819), must close our list of the distinguished characters who have been buried here.

The fire destroyed all the monuments, among which was the bust of Lely, by Grinling Gibbons. Some new ones have been set up since the restoration. There are two tablets erected by the Whig Club to the memory of John Bellamy, the father of the club, and of Edward Hall, M.D., its secretary. The memory of Mrs. Linley, the mother-in-law of Sheridan, and friend of Dr. Parr, is honoured by a tablet set up by her two sons.

The interior of the church is very plain, more especially the flat ceiling, which seems to require the painting that Edward Pierce made for it; but the oak fittings are handsome, of their kind. The altar-piece consists of four fluted Corinthian pilasters, an entablature, and a pediment, on which are two angels, sculptured by Banks, the Royal Academician, and called by Malcolm "vile imitations."

The set of communion-plate is large and handsome.

THE SANITARY CONDITION OF LAMBETH AND OVER-CROWDING.

ERECTION OF MORTUARIES.

SOME time ago the Lambeth vestry appointed a special committee as to the future sanitary administration and regulation of the parish. This committee desired the surveyor to report to them as to the condition of the sewers and house drainage, and also requested the medical officer of health to report on the evils of over-crowding in tenements, on the nuisance arising from dust-yards, and as to providing mortuaries. Both these officers have just reported accordingly, which has led to the vestry taking several important steps for improving the sanitary condition of the country, one of which is the erection of mortuaries in the parish.

The medical officer of health states that the various dustyards are in a filthy and unhealthy condition owing to large accumulations, and his statements as to over-crowding in various portions of the district are somewhat alarming. In dealing with this subject, the medical officer incidentally, by way of illustration, refers to the shocking condition as to over-crowding. Of certain other districts, "a very striking return," he states, "has been lately obtained by the vestry of St. George's, Hanover-square, from which it was found that in 25 houses in that district there were packed no less than 450 persons; or, in other words, allowing for each person 500 cubic feet, it was found that in the 25 houses referred to there was a surplus population of 252 people. From statistical returns bearing on the condition of St. Giles's, it appears that in one district there were 600 families, and of these 570 severally occupied but one room. In another of 700 families, 550 occupied but one room each. In one room visited in this parish, which was 12 ft. by 13 ft., and 7 ft. 6 in. high, eight persons lived, thus giving but 137 cubic feet to each individual. In continuation, the medical officer remarks, "Whilst I would hope that no such abominable state of things will be found existing even in the worst parts of this parish, there cannot, I presume, be any doubt but that we shall find several cases requiring to be dealt with, and which, if remedied, will produce a vast improvement in the healthiness and also the death-rate of the dis-

trict." He then proceeds to give several instances of overcrowding in the district, stating that in Princess-square Commercial-road, he found eighty families, comprising 450 persons, mostly occupying only one room. In one house there were seventeen persons in two rooms, and at one house with only four rooms there were twenty-four occupants. In Stamford-street he found as many as six, seven, and even nine persons, occupying one room, and several other streets named in the report in the same condition. As one remedy for the evils of overcrowding, he recommends the providing of mortuaries, observing that "the necessity for such places does not admit of a moment's hesitation, especially for those localities where the population consists of the poorer classes, occupying in many cases hut one, or at the most two rooms, where, if a person dies of an infectious or contagious disease, it is of the utmost importance that the dead body should not be left longer than can be avoided, poisoning the atmosphere of the rooms inhabited by the survivors."

In accordance with the recommendation of the medical officer, the vestry have decided to build mortuaries, one for the inner wards, and one for the outer wards of the parish, in places of easy access, and the buildings are to be at once proceeded with.

BUILDING ON THE WALWORTH COMMON ESTATE.

NEARLY the whole of the land on the Walworth Common estate, which has from time to time been disposed of for building purposes, has now been let, and almost the entire area is covered with buildings consisting of dwelling-houses, places of business, and other structures. Up to last week 918 plots on the estate had been let, realising ground-rents to the extent of 4,936*l.* per annum, and on Monday the eighteenth letting, which almost completes the land to be disposed of, took place at the Elephant and Castle Tavern, Newington, Messrs. Stuart, Barker, & Sons officiating as auctioneers. There was a numerous attendance of builders and others interested; and, as on former occasions, there was an active competition for the several plots offered, which realised average ground-rents. The amounts were as follow:—Six plots at 4*l.* each, fourteen at 4*l.* 5*s.*, two at 4*l.* 15*s.*, thirteen at 5*l.* each, one at 5*l.* 5*s.*, one at 5*l.* 15*s.*, fifteen at 6*l.* each, one at 6*l.* 10*s.*, one at 8*l.*, and one at 8*l.* 5*s.* per annum, being fifty-five lots, realising in the whole 281*l.* 15*s.* per annum, and bringing up the aggregate annual rental now received from the estate to upwards of 5,217*l.* Amongst the new buildings about to be erected on the estate, is a school for the London School Board, and a large church to seat upwards of 800 persons.

SCHOOL BOARDS.

London.—The committee have considered the designs submitted in the limited competition for the schools to be built on the site in St. Paul's-road, Bow-common, and also the designs submitted in the open competition for the schools to be built on the site in Beazley-crescent, Old Ford, and recommend that Mr. Phené Spiers be appointed the architect for carrying out the erection of the schools on the St. Paul's-road site, and that Mr. Keith D. Young be appointed architect for the schools to be built in Beazley-crescent, Old Ford; and that it be referred back to the Works Committee to draft specifications, obtain tenders, and bring up a contract in each case to the Board for sealing. That for the schools to be erected on the following sites there be a competition of four architects in each case, and that it be referred back to the Works Committee to select that number of architects, and to submit the plans prepared to the Board:—1. Finshury, New Winchester-street. 2. Finshury, Blundell-street. 3. Greenwich, Woodpecker-road. 4. Hackney, Turin-street, Bethnal-green. 5. Hackney, Maidstone-street, Haggerston. 6. Southwark, Russell and Riley streets. The Board have named Mr. Biven architect for the school in Old Castle-street, Whitechapel; and Mr. A. G. Connell for the school in Essex-street, Stepney.

Scarborough.—Mr. Watson, architect, attended at the Board, and submitted his amended plans of the proposed infant school at Falsgrave, and it was resolved that advertisements be issued inviting tenders for the execution of the work required, with reference to the school for the south-east district. A letter, dated the 30th ult., was read from the Education Department,

requesting that a plan of the enlarged site for the proposed school near Cook's-row should be submitted for inspection; it was thereupon resolved that the clerk be directed to give the necessary instructions to Mr. J. Petch, architect, for the preparation of the plan required, and that such plan when completed be forwarded to the Education Department for approval.

Wolverhampton.—The Board considered tenders sent in for the erection of the Dudley-road schools. Six tenders had been received. Ultimately it was resolved that the tender of Mr. Horsman, who built the town-hall, be accepted. The tender was, for the schools, boundary-walls, and fittings, 2,540*l.* 16*s.* Mr. Bidlake laid before the Board plans of the schools to be erected in Red Cross-street. The plans were approved of. The clerk was also instructed to advertise for tenders for the erection of the schools. The clerk was instructed to write to the Education Department with the view of obtaining a loan. The chairman said he thought it would be about 8,000*l.* The plans would first have to be approved of before they could tell the exact amount that would be required.

Staplehurst.—A public meeting has been held by the ratepayers for the purpose of memorialising the School Board, with a view to induce them to re-consider the proposed expenditure for building the new schools, as exorbitant and preposterous for a population of 1,700 inhabitants, and to ascertain the feelings of the parishioners on the subject. The Rev. T. Crick occupied the chair. The plan proposed by the School Board was tendered for on the 1st inst.; the following tenders were received:—Hanbridge, 4,621*l.*; Vaughan, 4,530*l.*; Cook, 4,527*l.*; Jarret, 4,500*l.*; Suall, 4,450*l.*; Richardson, 4,421*l.*; Wickings, 4,392*l.*; Reeves, 4,298*l.*; Cox, 4,275*l.*; Bridge (accepted), 4,200*l.* The matter was very warmly discussed, and it was resolved that the cost of the school should not exceed 2,000*l.*

ACCIDENTS FROM LIGHTNING.

THESE still continue to be beyond the average even at this time of the year. The spire of Chiddingfold Church suffered slightly in a recent storm; a large piece of stone near the summit was, it is supposed, struck by lightning, and came down in thirty or forty pieces. The tower of All Saints' School at Little Horton has been struck, but not seriously damaged. The north gable of Kibblesworth Wesleyan Chapel has been injured, a large portion of the wall and roof being torn away, and the plaster and woodwork scattered over the interior. The pulpit and preacher's seat were injured. A house at Doncaster has been struck, but not seriously damaged; and at Healdy-hill, Heywood, in Lancashire, three houses have been struck. Many accidents to persons and to live property are also occurring; and this week a series of unusually severe thunder-storms are reported anew from the provinces.

PROVINCIAL MUSEUMS OF SCIENCE AND ART.

THE question is not unfrequently asked, "Of what use is the South Kensington Museum to the provinces, and of what value is it to the great centres of industry throughout the nation which pays the cost of its establishment and maintenance?" This question has, no doubt, been answered over and over again to the satisfaction of the querist, whose only object was to show how utterly useless and valueless he, and those who thought with him, considered an institution which all are now pretty well agreed is a glory to England, and which even the cynics who cry *cut homo* would not like to see abolished.

Now, there is one point on which a serious misunderstanding has existed in the public mind. The museum at South Kensington has been placed in the same category with the British Museum and the National Gallery, both of which are essentially founded on the principle that all they are, and all they can be, is within themselves. They throw out no offshoots; they receive, but never give; and whatever may be the excess beyond the accommodation within their walls, or even above their absolute wants, it is never utilised outside, nor in any way rendered available for the purposes of any similar institution, even in the way of exchanges, still less in that of gifts or loans.

The action at South Kensington has been for many years past the very reverse of this; for so soon as a sufficient collection of articles had been got together,—in fact, within three or four years

after the establishment of the museum at Marlborough House,—a very interesting and instructive series of examples was set aside for the purpose of circulation in the provinces, and especially in connexion with the various schools of art throughout the country. For some years this collection was kept moving from place to place, until having so far fulfilled its mission, it was finally withdrawn, as a special selection of objects forming a travelling museum, and a very much larger and more general series of objects was set apart in the museum itself, to meet the demands of those localities which, from time to time, cared to avail themselves of the privileges thus afforded by the central collection of art objects got together by the Science and Art Department.

As may be supposed, certain conditions were attached to the advantages offered, such as the provision of suitable exhibition-rooms; the admission of the public at a very low fee, at stated periods in each week; and above all, the collection of objects from local sources, as a supplementary contribution to that afforded by the authorities at South Kensington.

There can be no doubt that the latter provision was a wise one, since it secured that amount of self-help which is always the best guarantee that the assistance given will be earnestly and intelligently utilised.

As a matter of course, people who do not care to take trouble, and who consider that if *anything* is done *all* should be done, and who generally leave the work to some one else to do, did not like a regulation which involved the necessity of a distinct effort on their part, and wondered why South Kensington could not do all that was required, even to the denudation of the central museum, of the use of which, to the provinces, they were sceptical; even when a portion of it could be brought to their own doors, if they would but take the trouble to render some little assistance to get it there.

Who may safely leave this class of people to their own devices, for happily there are others who, with well-directed energy and intelligent efforts have, from time to time, so mastered the subject as to see the advantages offered by the South Kensington authorities in the true light; and there is now a growing desire in many of our large provincial cities not only to have an occasional exhibition of works of science and art, supplemented by contributions from South Kensington, but to establish permanent museums, which shall, as circumstances permit, share in the advantages of the growing central museum, through loans of objects for more extended periods than mere periodical exhibitions would permit.

Birmingham has already commenced a permanent museum, the foundation of which was practically laid in 1868 by a pretty extensive loan of glass cases and objects sent from South Kensington. Sheffield has also moved in the matter, but from some local cause the effort hangs fire at present. Nottingham, as a central position in the midland counties, has recently made a most important beginning in this direction, which not only promises to result in a success which cannot fail to act as a valuable example to other cities, but to establish a healthy precedent on which the Government, acting through the South Kensington Museum, will see its way to the utilisation of a vast amount of national property at present out of sight in the British Museum, as also of pictures which are practically useless to the National Gallery.

Why this property should not be so utilised no one can tell. The only approach to a reason is that the trustees have not the power, as in the case of the authorities at South Kensington, to lend, still less to give, duplicates of objects or such articles as are not required in the central national collections. This being the case, surely Parliament, which votes the money to purchase the objects and sustain the institution itself, has the power to give the trustees the requisite authority; and certainly the time is fast approaching when this will have to be done. Nottingham has moved so seriously and so successfully in the direction of a permanent museum of science and art for the Midland Counties, that it may be well to give some further account of this important step, which cannot fail to have a great influence in other quarters, not only as regards the purpose of the movement, but as regards the mode of procedure.

In February last, the Mayor of Nottingham (Mr. W. G. Ward) and the town council, discussed the possibility, as also the desirability, of establishing a permanent museum of science and art in that town, and connecting it as a pre-

liminary step with the school of art, since it is well known that no institution of its kind in the country has had a more legitimate or more beneficial influence on the industry of the locality in which it is situated. The character of the designs for machine-lace, especially the designs applicable to curtains, have been completely revolutionised through the influence of the teaching of the school of art in Nottingham. Resolving to take advantage to the fullest possible extent of the privileges offered to this school in its connexion with the Science and Art Department and the South Kensington Museum, the town council, in conjunction with the committee of the school of art, proceeded to make arrangements for the inauguration of a local museum at once, the corporation authorities giving up a suite of rooms in the Exchange-buildings for the purposes of such museum. The result of this energetic course of action was that the South Kensington authorities were called upon to state distinctly what assistance they could render, and in March Mr. Cole visited Nottingham to discuss the whole question with the corporate authorities, and pledged the museum to an extensive and suitable contribution, to be ready early in May; and the efforts of the joint committee above named were at once directed to the necessary preparation of the building in which the collection was to be located, at least for a time, and obtaining loans of suitable objects to supplement the South Kensington contribution, which it was arranged should be lent for one year, and be changed at the end of that period if the effort proved as successful as its promoters anticipated. Lace being the great staple of art-manufacture at Nottingham, is of course largely represented in the collection; oil paintings, a series of water-colour drawings illustrating the progress of painting in water-colours in England from 1776 to the present time, pottery, ancient and modern porcelain, and metal-work, from the leading features of the museum in combination with loans of oil paintings, a superb collection of carved jade, agate, and crystal, lent by Mr. A. Wells, of Nottingham, and a miscellaneous collection of porcelain, earthenware, &c. As a matter of course, Nottingham lace is represented from its earliest to its latest development.

The important character of the experiment, and its probable bearing on the future, appear to have been fully recognised, and the direction of the arrangements was undertaken on behalf of the South Kensington Museum, by the keeper of the art collections, Mr. George Wallis. The Mayor of Nottingham, with a spirit and liberality which cannot be overestimated, decided to inaugurate the new museum by inviting his fellow-citizens, and the corporate bodies of the neighbouring towns, to a series of three *conversations*, to be held in the Museum rooms during the week prior to the opening of the collections to the public, which was fixed for Whit Monday.

This was a happy idea, carried out without stint, in a tasteful and effective manner. The mayor was enabled to distribute his guests over the three evenings, without inconvenience to them or himself, and thus some 1,500 persons interested in the success of the undertaking were brought into social contact amidst works of industrial and fine art, intermingled with plants and flowers as decorative adjuncts, with music and refreshments suitable for such an occasion. These gatherings formed a striking contrast to the usual corporation festivities of some of our large towns, which are frequently as useless as they are costly and ostentatious.

On the occasion of the opening to the public on Whit Monday, the corporation and committee of the School of Art formed in procession from the mayor's parlour to the large room of the museum, when the mayor, who presided, delivered an admirable address on the whole question, and very distinctly enunciated the intention of the promoters of the undertaking to follow it up until such an institution was located within the walls of Nottingham Castle, now in ruins, from the effects of fire on the occasion of the Reform riots in 1831.

The palatial character of this building, its remarkable situation, as overlooking the town and the surrounding country, the terraces and open space around it, so easily convertible into a public garden, and of ready access from the centre of Nottingham, together with the fact that the trustees of the present Duke of Newcastle wisely desire to utilize the site, all combine to make the proposal one of great interest to all who desire to see public institutions calculated

to elevate the taste and refine the manners of the people established in our large manufacturing cities.

The walls of the building are in sound condition. It is a very striking example of the school of Inigo Jones, being of unusually grand and noble proportions. At present it stands, as the grandfather of the present duke declared it should stand, so far as he and his family were concerned, a monument of disgrace to Nottingham. To secure it on a long lease, and restore it for such a purpose as that proposed by Mr. W. G. Ward, as mayor of Nottingham, would be a graceful act of justice on the part of the town, carrying with it its own compensation, in years to come.

Mr. Cole, who, with Mr. Wallis, represented South Kensington, at the opening ceremony, followed the mayor, in a speech declaratory of the policy of the Museum authorities in relation to these proposed provincial or local museums, as applicable not only to Nottingham, but to every important town in the country.

The local newspapers represent Mr. Cole as correcting the mayor upon an important point, the latter having stated that he, Mr. Cole, had specially offered the requisite assistance to establish the museum, on the occasion of a former visit. He said, "The fact is, we have been offering this to your town and to all other towns in the country for the last fifteen years. If you will only take the trouble to look into our blue-books, which we issue annually, you will find that we are bawling out to the people to get all the advantage they can out of the Kensington Museum and its instruction; therefore, it is not correct to say that the offer was made for the first time to Nottingham. The offer is always being made. We cried and howled, as it were, in the wilderness, but no one would listen to us."

Mr. Cole congratulated Nottingham as being "the first municipality of this country which has had the courage to tell the rate-payers that they would have to pay a little on behalf of an institution of this kind for the benefit of the town and themselves generally;" and showed that the collection was "not altogether a scratch collection, a harum-scarum bringing together of all kinds of things from heaven and earth, but one made for the distinct purpose of showing the application of fine art to industry." Alluding to the Lyons Museum, in its relation to the silk trade, Mr. Cole said that "though Lyons had been going on for 100 years, you have already made a beginning here, as bearing upon the industry of the locality, such as Lyons has only got after a hundred years' experience." Pointing out that the South Kensington Museum was gradually becoming the store-house of the nation in such matters, Mr. Cole urged that the locality had a great part to do in the business in hand, in providing a proper house for a permanent collection of objects, and the periodical loans from South Kensington and elsewhere; and gave it as his opinion that no better position in the Midland Counties could be found for the museum than Nottingham Castle, properly restored and fitted for the purpose.

The proper use of the museum was advocated by Mr. Wallis, in replying to a vote of thanks to Mr. Cole and himself for the manner in which the arrangements had been carried out, and pointed to the value of special study on the part of designers and the students of the school of art.

It will be thus seen that South Kensington is pledged to the future support, and to rendering not merely passive, but active assistance to localities, and especially municipal authorities taking up this question of local museums of science and art. Henceforth there can be no possible mistake as to the extent to which it is the duty of the custodians of the national property in the great "storehouse" at Kensington to assist all well-directed and properly organised efforts in this direction. Mr. Cole spoke distinctly in the name of the Lord President of the Council and the Vice-President, and stated that they had sanctioned his visit to Nottingham in March last, when the matter was fully discussed by the corporation.

We have deemed it desirable, with a view to promote the extension of the facilities for art-education amongst the people, to emphasize the facts connected with this successful and spirited effort at Nottingham, in the hope that it will be a salutary lesson to other towns, which by the proper use of local advantages and opportunities on the one hand, and the facilities held out from South Kensington on the other, may see a way to realise an important addition to the educa-

tional and refining influences of their respective localities, by the means of which those who labour may be lifted upward, and at least deprived of their present excuse for merely sensual enjoyments, by having brought within their reach places of public resort, which, whilst competing with the gin-palace and drinking-saloon shall give them the means of social intercourse, in which elevation, not degradation, shall result.

The question is a very practical one. It needs no speculation, nor any of the mystifying declamation which too frequently accompanies efforts to act upon the social habits and manners of the people. It is simply a question of doing, not of talking,—of placing before the people those counter attractions which cannot fail to gradually, and, no doubt, almost imperceptibly, but not the less wisely, tend to wean attention from vulgarising attractions, now all too powerful, to the quieter but eventually not less potent means of enjoyment of which the South Kensington Museum gives such strong evidence on its free evenings, Saturdays, Mondays, and Tuesdays in each week, and on all holidays of the people.

We cannot better conclude these remarks than by stating the arrangements for admission with which it has been considered expedient to commence at Nottingham, as the great purpose we have in view is to bring this effort forward as an example to other large towns. There is to be no free admissions, but the museum is to be open from noon each day to ten o'clock at night. The fee for admission on Mondays, Wednesdays, and Saturdays is 3d., and on Tuesdays, Thursdays, and Fridays, which are students' days, the charge is 6d. Annual tickets admitting families, as also single tickets, are issued at a moderate charge, and the sale, so far, has been very satisfactory.

THE ROYAL PATRIOTIC FUND: NEW BOYS' SCHOOL, WANDSWORTH.

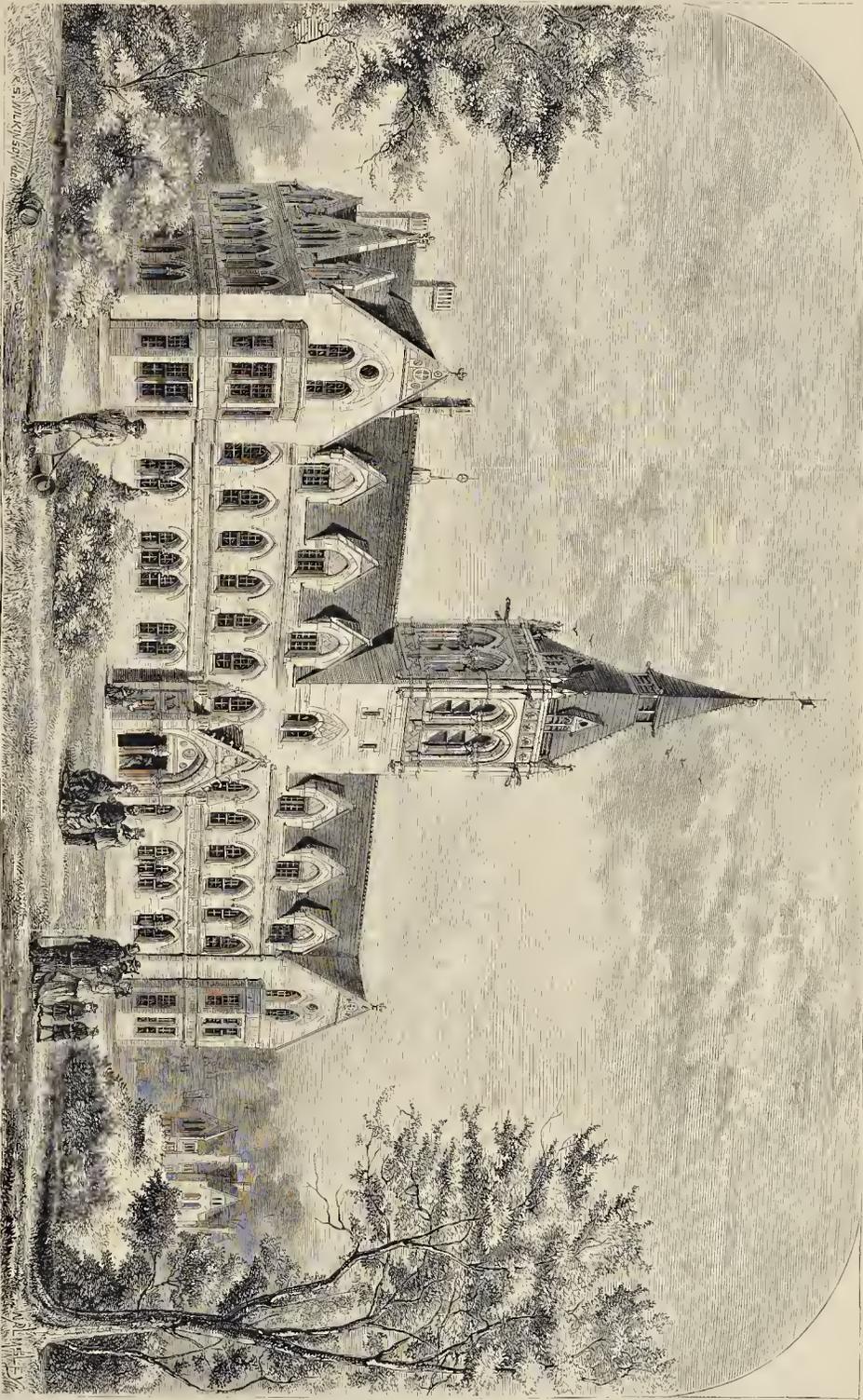
It will be remembered that, at the close of the last Russian War, a large sum of money was raised by public subscription towards the support of the poor widows and children of the soldiers killed during that sad struggle. The expenditure of this fund has been watched over by a commission, consisting principally of military and naval officers of eminence, and his Royal Highness the Duke of Cambridge its president. Provision has been made for all the widows whose husbands lost their lives in the Crimea, many of the children have been maintained and educated up to fifteen or sixteen years of age, and in other cases allowances have been made whilst they remain with their mothers. Some years ago a school for girls was established and endowed out of the fund, and the erection of the building, on Wandsworth Common, was entrusted to Mr. Hawkins, architect.

The success of this institution, under the eye of the secretary to the commission, Mr. W. Mugford, R.N., was such that the commissioners recently decided upon the erection of a school for boys, on an adjoining piece of ground; and as Mr. Hawkins's duties under Government precluded his undertaking the erection of this building, the commissioners had to seek another adviser. With this view they invited Messrs. Blomfield, Dawson, Giles, Saxon Snell, and Tasker to submit designs, and from these, after consideration, they selected that by Mr. Saxon Snell, the exterior view and plan of which we illustrate in our present number. The funds so liberally subscribed, and with equal liberality expended, have necessarily by this time much dwindled, and the new building is consequently more modest in its pretensions than its neighbour the girls' school. The latter building cost over 60,000l.; whereas the present new one will cost, when completed, with all its fittings, about 25,000l.

The new building is capable of accommodating 230 boys, who will be transferred from their present temporary school in a few months' time. The exterior is of red brick, with Portland stone dressings.

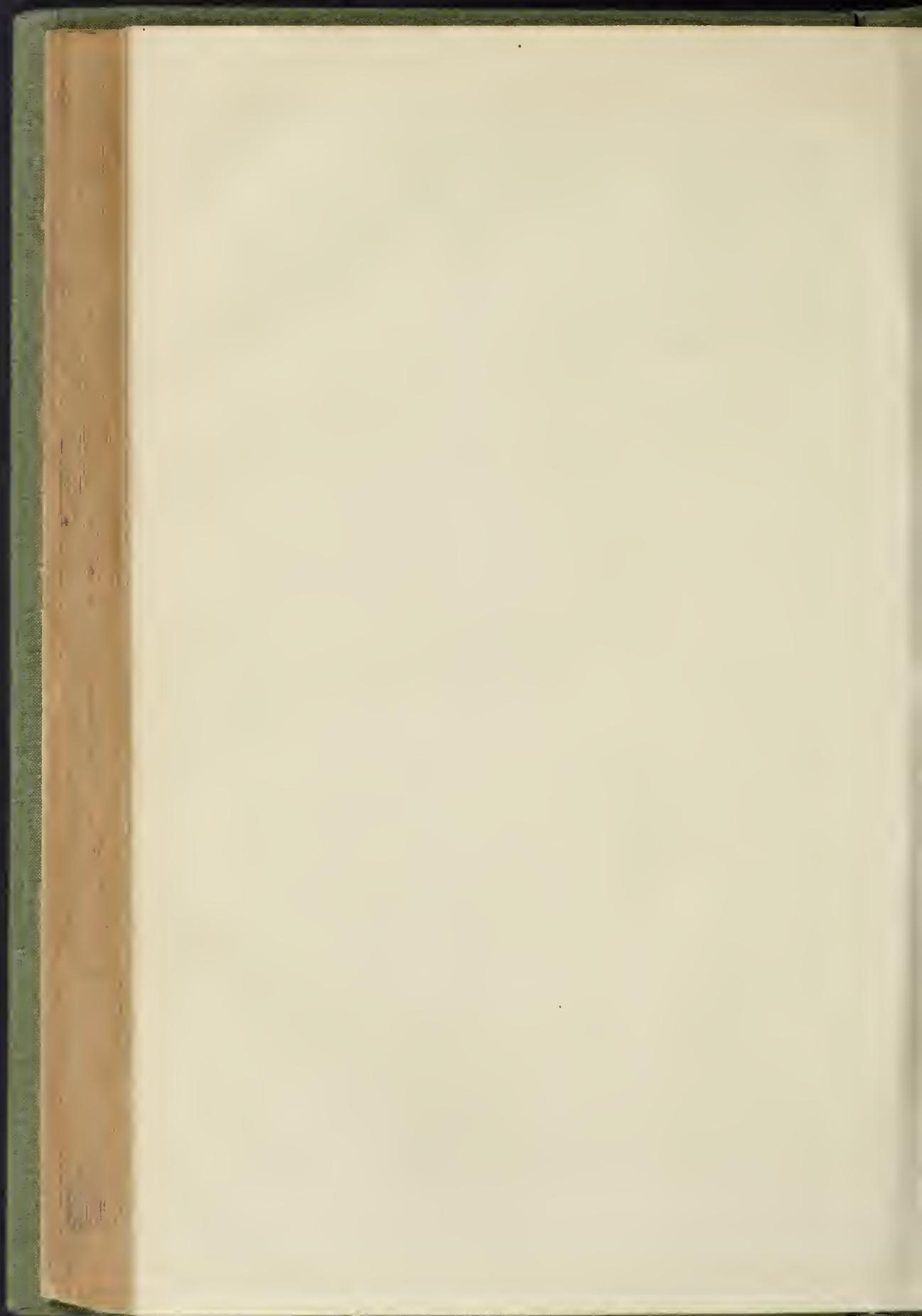
The sewage from the girls' school is conveyed to a tank about midway between the two buildings, and thence is pumped up and distributed over the land. The sewage from the upper closets of the new building will be similarly treated; but on the ground floor Moule's earth-closet system is to be brought into operation. The wisdom of this, with a system of drains ready to hand, seems questionable.

The contractor for the erection of the building is Mr. John T. Chappell.



THE ROYAL PATRIOTIC FUND: NEW BOYS' SCHOOL, WANDSWORTH, SURREY.—MR. SAXON SNELL, ARCHITECT.

5, 1/2 (1/2) 59/64



FURTHER OPENING OF THE GREAT EASTERN METROPOLITAN EXTENSIONS.

We understand that during the present week the Government Inspector has officially passed over that portion of the Great Eastern Metropolitan Extension Line which lies between Tottenham and Lea Bridge, and by which the Extension Line joins the Great Eastern Main Line at Cobham-mill Junction. The works having thus been officially inspected, and, as we learn, sanctioned by the Government representative, it is intended to open this portion in the course of a week or a fortnight from the present time, and that in the meantime the railway staff has all been arranged. This will make the second portion of the Extension Line which has been opened for traffic, the first length, from Bethnal-green to Stoke Newington, having been opened about six weeks ago; since which time the local traffic has enormously increased, and proved that when the line is completed to Liverpool-street, and the large station about to be erected there is finished and ready for opening, the local and suburban traffic of the Great Eastern will repay the company to a large extent for the heavy outlay which has been incurred in the Extension Lines. The traffic to and from the several stations between Bethnal-green Junction and Stoke Newington, namely, Cambridge Heath, London Fields, Hackney-downs Junction, and Rectory-road—has been very considerable since the opening of the section, and there is every reason for concluding that it will be materially increased when the resources of the extension are fully developed.

A NEW RAILWAY BRIDGE ACROSS THE THAMES.

Steps are being taken for the construction of a new railway across the Thames at Fulham, which will practically be an extension of the Metropolitan District Railway, and give that company access to Richmond by a junction with the South-Western Company. The new line commences by a junction with the Metropolitan District Railway at South Kensington; and, after passing through Fulham, crosses the Thames, and finally joins the South-Western line by a junction near Barnes Station, the entire length of the line being about three miles. The entire cost of the line is estimated at 2,000,000, one of the heaviest items in the expenditure being the bridge across the river, which it is proposed shall be of a substantial and ornamental character. Although not the actual promoters of the new line, the Metropolitan District Company are deeply interested in its favour, as being an important feeder to their present line.

BUILDING FOR THE LONDON SCHOOL BOARD.

The London School Board have secured a site on the Victoria Embankment for the erection of offices thereon. The cost of the land, as fixed by arbitration, is 17,920l., and it is estimated that the building itself will involve an expenditure of 25,000l. The Works Committee recommended that the preparation of plans should be entrusted to the Board's own architect, Mr. Tolson, and that competition should not be invited. Several members objected to this, and the consideration of the recommendation was eventually deferred to the next meeting.

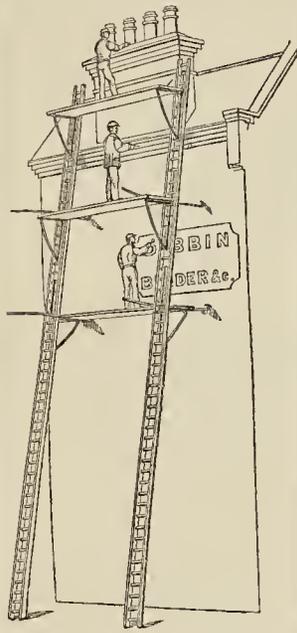
POCOCK'S BARREL MORTISE LOCK.

An ordinary mortise lock requires a large hole to be cut through the stile and middle rail of door, and the operation of properly fixing it occupies usually more than two hours. The barrel lock invented by Mr. Pockock (son, we may mention by the way, of Mr. W. W. Pockock, architect) may, on the other hand, be fixed in a quarter of an hour. It is simply a barrel about 1 in. long and 1 in. wide containing an ordinary spring bolt, convertible into a lock by the action of the key, which prevents the bolt from moving. The barrel is not exactly cylindrical, but flattened, and for this reason, the hole is formed for it with a centre-bit, and as it is not always bored quite true the shape of the barrel allows of a certain amount of accommodation, whereas if the barrel were circular it would have to follow the hole, and so might be thrown out of position. To prevent oscillation there is a

screw at the end of the barrel, which, worked by a spanner, passes into the wood beyond the hole made by the centre-bit and keeps it steady. The spiral spring used might be thought slight, but the inventor has set that question at rest by causing the bolt of one of them to be shot about 700,000 times, which, taking the average use of a door at forty times per day, represents the wear of over fifty years,—quite long enough for us.

We have very little doubt that Mr. Jas. Hill (Thames-street), who is the sole factor for this lock, will soon have a brisk demand.

DUBBIN'S PATENT LADDER-SCAFFOLD.



This ladder-scaffold will probably supersede the old ladder "cripple," and will save the use of scaffolding in repairing roofs, gutters, caves, fixing chimneys and sign-boards, cementing and painting houses, and so forth.

It consists (as may be seen) of two pairs of light iron brackets, which are fixed inside and outside two ladders, each bracket being made with three hooks, fastening respectively on to three staves of the ladder, in such a manner that the strain is vertical, and so distributed that the bracket cannot break, or become detached, and it also takes an equal pressure on the back and front of each ladder. The brackets have stays, which fix on to the pin of the bracket, and, placed against the house or building, straighten and support the ladder, thereby preventing it from bending or shaking. The invention can be seen in use near the London Bridge Station.

THE LOCK-OUT IN LONDON.

The result of the negotiations between the master builders and the carpenters and joiners, and the masons, arranged for since last week, is, we regret to say, that all hopes of an amicable settlement of the dispute have been disappointed, and that the men have refused to withdraw the partial strike, and hence the masters have ordered the general lock-out. It was stated that there were more than ten to one of votes against the men on strike from Mr. Brass's and Messrs. Jackson & Shaw's resuming work at once upon the old terms pending any arbitration that might take place, and about the same number in favour of a conference of masters and workmen to arrange a code of working rules. Upon the resolution to refer the rate of wages and the nine hours question to the arbitration of disinterested persons chosen by both sides there was a large majority against it, though it should in strict fairness be stated the minority was by no means insignificant; and some of the masters are not

contented to accept a mere assertion as to the result of these votings. It was also intimated that after the state of the poll had been declared to the delegates, it was moved that a deputation of four should be appointed to convey the result to the masters' committee, with power to make an offer to accept 8 1/2d. per hour for 5 1/2 hours per week up to the 1st of March next, and after that date the pay to be 9d. the hour, but that the delegates indignantly refused to entertain the proposal, and an amendment was carried by an overwhelming majority, directing the communication to be made in writing through a simple messenger. Subsequently a full committee of the Central Association of Master Builders held a short consultation upon the rejection of their overtures to the men, and it was finally agreed to issue the following circular, to be addressed to all the master builders in London, viz. :—

"Sir.—The carpenters and joiners and masons having refused to refer the question now in dispute between themselves and the master builders to arbitration, or to withdraw the strike at Mr. Brass's and Messrs. Jackson & Shaw's, you are earnestly requested to carry out the resolution passed at the meeting of master builders on the 7th of June last, by closing all shops and works belonging to you within the district over which the district surveyors have jurisdiction, from to-morrow, the 10th instant, until such time as Messrs. Jackson & Shaw and Mr. Brass shall inform the Committee of the Master Builders' Association that they have been able to resume their work. (Signed) STANLEY G. BIRD, Honorary Secretary."

The latter part of this notice was a good deal canvassed outside the trade. At the last great lock-out it was to last until "the dispute with the men, as a body, was settled;" but now it is only to continue in force until the two firms from which the carpenters and joiners have been withdrawn are able to resume work; and it is not impossible that such an event might happen within the next week. The committee sitting at the Brown Bear Tavern profess to see through all its meaning, and intend to take immediate action upon it, if, indeed, they have not done so already. There are fully 250 large building establishments, and of those a sufficient number may deem it expedient to close their doors, so as inevitably to throw at least 20,000 artisans out of employment at once.

The following are amongst the firms who have closed their shops:—Messrs. Holland & Hannen, Bloomsbury; Myers & Sons, Lambeth; Colls & Co., Camberwell; Renshaw & Co., City-road; Adamson & Son, Turreham-green; Ashly & Horner, Whitechapel; Cubitt & Co., Gray's-inn-road; Baker & Co., Stangate; Gammoun & Co., Lambeth; Manley & Rogers, Camden-town; Simpson & Co., Tottenham-court-road; Patrick & Sons, Westminster-road; Smith & Taylor, Pimlico; Freake & Co., Chelsea; Doves, Islington; Hill & Sons, Islington; Macey, Strand; Trollope & Sons; Lucas, Brothers; Dines & Co., Pimlico.

Discussion of the matter would seem to be useless; one side insists on certain terms before going to work, the other side declines to grant those terms unless disinterested persons, in the shape of arbitrators, say it ought to do so. The lock-out may end in a week, or it may go on for three months. Nothing that we can say will hasten or retard it.

THE TRADES MOVEMENT.

Rotherham.—Messrs. Logan & Hemmingway, the contractors who have undertaken the formation of a new reservoir at Ulley Brook, about five miles from Rotherham, for the supply of the town with water, are likely to have some trouble with the large staff of navvies, masons, &c., in their employ. On Thursday in last week the navvies excavating the trench for the foundation of the puddle wall suddenly ceased work. They made their way in a body along the valley, and succeeded in inducing the remainder of the navvies to desist working. Thus reinforced, the body of navvies proceeded to the working-places of the masons, who number about forty, and who are occupied in building the viaduct, and the bye-washes and sluices. The masons, after refusing for a long time, at last gave way. The quarrymen and a small gang of men who carry clay from a considerable distance up the valley to be used in the construction of the puddle walls were next induced to join them on strike. Several fights occurred between some of the navvies, but no general encounter took place. A large meeting of the men was then held on the works at Ulley Brook, when a resolution was carried that work should not be resumed until the whole of the concessions demanded had been granted. They want less work and more pay, but their demands vary.

Bolton.—The master brickmakers have acceded to the application of their workmen for an advance of 1s. 6d. per 1,000 bricks. The advance is to be divided as follows:—To the temperers, 3d.; per 1,000; molders, 3d.; wheelers, 3d.; carriers, 1½d.; wallers, 1½d.; kilners, 1d.; and burners, 2d.

Bradford.—A meeting of the carpenters and joiners has been held at the Secular Hall, to consider the propriety of asking for a reduction of one hour per week and an advance of wages, when it was resolved that, considering the increase in rent and the price of provisions, the meeting was of opinion that the present rate of remuneration was inadequate to the present requirements; and taking into consideration that the rate of wages in Bradford is lower than in many towns of less importance, they respectfully request that employers pay 7½d. per hour, or 11.9s. 10½d. for 49½ hours per week; that they request that this should be paid to all men of the trade as a standard rate of wages; that the foregoing alterations come into operation on the 1st day of June, 1873; that they commence work at seven o'clock a.m., and leave at half-past five p.m., and noon on Saturdays; and that these rules should be binding on both men and employers; and when any future alteration should be desired, six months' notice should be given by either party, and that the notice should expire on the 1st of March or the 1st of August.

Farnworth.—The bricklayers of Farnworth have been locked out in consequence of their refusal to accept payment by the hour instead of by the day, as heretofore. Three months' notice had been given of the intended change, but the men had, from the first, expressed their opposition to it, alleging that it was equivalent to a reduction of wages. Up to the present time their wages had been 36s. per week, and their masters desired to substitute payment after the rate of 8d. per hour.

Swansea.—The masons and carpenters employed by the principal builders of the town have been on strike, for a week or ten days, for the "Nine-hours movement." The employers, at the onset, said they were quite prepared to accede to the request of the men, but they required the fulfilment of the terms of an agreement solemnly entered into and signed by both employers and men at the termination of the last strike, to the effect that six months' notice should be given on either side, before any deviation of the terms then agreed to were made. The men only gave three months' notice of the present demand, and the employers consequently required three months more notice, but they offered to leave the whole question to be settled by arbitration. All these offers on the part of the masters were refused by the men; they would have the nine hours per day at all risks and at any cost. All means of conciliation failing, and the employers being pressed by contracts, they were compelled to yield to the demands made upon them, and gave in, and the men resumed work upon their own terms.

Belfast.—A strike has taken place among the employes of Messrs. McLean & Co., builders, of Corporation-street, Belfast. The men have been working sixty hours weekly, and on making a stand for the substitution of fifty-four hours, the firm consented to meet the men by reducing the hours to fifty-seven. This has been refused by the employes, and accordingly between sixty and seventy of them have quitted their employment.

A Confederation of United Trades of Scotland. A meeting of delegates representing the various trades throughout the principal towns in Scotland has been held in the Tontine Hotel, Glasgow, for the purpose of forming an association, to be designated "The United Trades Confederation of Scotland." The Glasgow United Trades Council, was represented by Messrs. Bennett, Campbell, Laing, Robertson, Inglis, Golly, Glen, Kirkwood, Goodwin, Hill, and Paton. A number of representatives from various other trades throughout Scotland were also present. Mr. John Holborn, Edinburgh, was appointed chairman, and Mr. Charles Laing, secretary. A code of rules was submitted for approval, which bore that the objects of the confederation are to render all moral and pecuniary assistance to the trades connected with the association. The confederation shall be governed by a president, secretary, treasurer, executive committee, and judicial council, always subject to a conference of delegates and the votes of the members. The executive committee, when benefit is claimed, shall levy on every society in the confederation, according to the number of its members, to meet the amount required so long as such dispen-

continues. The meeting was engaged during the day going over the rules. The conference was continued next day. A code of rules was adopted, and a president, secretary, and executive were appointed.

"TRICKS OF PICTURE DEALERS."

Sir,—I see my name abused in your paper of the 15th in a letter entitled "Tricks of Picture Dealers." I am sorry that this is not a very rare occurrence. I never sent any one to anybody for an opinion on a painting of "The Pilgrimage to Canterbury," or any other picture. I am very often applied to for opinions, which I do not give, but commonly refer the applicants to "some known dealer" for what they seek. Your correspondent might have applied to me before making such free use of my name in a public print.
R. N. WORKMAN.

RULES FOR PLANNING AND FITTING SCHOOLS.

THE Works Committee, of the London Board, have had under consideration the letter from the Education Department with reference to the rules which they had drawn up for planning and fitting schools.* To meet the objections raised by the Department, and also to embody certain amendments which appear to them desirable, they have drafted the following alterations in the rules sanctioned by the Board. In addition to the alterations which they propose, they subjoin an alternative scheme, to be adopted when desired in graded schools.

Infant Schools.

SUGGESTED ALTERATIONS.

1. An infant school should always be on the ground floor, in the case of a single school. Where a second infant school is intended, it may sometimes be necessary to place it above the other, approached by an easy staircase.
2. It shall never be without a playground of ample size, of which a portion must be covered.
3. It is not desirable that, in London, any infant school should be organised for less than 120. The maximum number may be taken as 240. And, where the number rises considerably above this, there should be more than one infant school.
4. In every case there should be two class-rooms, one for babies, and another for the most advanced infants. Up to 120 these should be arranged for 20 each. In the case of a school of maximum size, there should be a third class-room of larger size, and the two smaller class-rooms should then be capable of being thrown into one. In consideration of the noise caused by infant teaching, there should be no sliding or wooden partitions in infant schools other than those necessary for throwing these two smaller class-rooms into one.
5. The fittings should always comprise two galleries of unequal size. No gallery in a class-room for infants should hold more than eighty to ninety. The large gallery in the schoolroom should be capable of accommodating two-thirds of the infants at one time, for collective teaching. The advanced infant class will require a small group of benches and desks, and a cupboard for books, &c., about six feet high.

Graded Schools.

1. In arranging a school for children of seven years and upwards, the junior mixed school should embrace standards one to three, and the senior schools the three higher standards. In point of number, any multiple of thirty, thirty-five, or forty will be found most convenient. Forty, as a unit, is preferred in the class-rooms of the first four fifth and sixth.
2. A school of the largest size should have two double class-rooms, calculated at 8 ft. to 9 ft. superficial per child, arranged with sliding partitions, so as to be subdivisible into four.
3. The best width for the general school-room is from 18 ft. to 22 ft. (This allows for three or four rows deep of benches and desks ranged along one wall.) The lighting should be from the back. In all cases there should be "through" ventilation.
4. Five rows of benches and desks are allowable in a class-room. The lighting should, if possible, be chiefly from the side.
5. Generally an allowance of 20 in. on each desk and bench will be necessary, otherwise the children will be cramped in writing. The lengths will, therefore, be as follows, viz. —

For 4 children, a length of	6 3
" 5 " " "	8 4
" 6 " " "	10 0
" 7 " " "	11 8
" 8 " " "	13 4
6. For senior classes the provision should be 22 inches. Junior schools should have at one end of the general room a gallery for collective teaching, capable of accommodating about one half of the school at a time. Also provision in benches and desks for a double class of sixty to eighty. But the room should be so planned, that the removal of the gallery and the substitution of benches and desks can be easily effected hereafter if desired.
7. Senior schools, as a general rule, do not require the gallery.
8. Benches and desks are required for all the children (except for one class occupying the gallery), and they should be of various heights according to the varying ages. The desks should be very slightly inclined, and the seats should have backs. It is not necessary to fasten the fittings to the floor. They should be either placed on slightly raised platforms or (if made to move on casters) should themselves be graduated. Each of the six classes (or standards) should have a cupboard for books, &c., about 6 ft. 6 in. high.

School Residences.

In cases where the erection of a residence for the master or mistress has been determined on, it should contain a parlour, a kitchen, a bedroom, and three bedrooms, of not less than the following dimensions of superficial area, viz. —

	ORIGINAL.	Ft. In. Ft.
(a) For the parlour	12 0	13 0
(b) " Kitchen	12 0	10 0
(c) For one of the bedrooms	12 0	10 0
(d) For two other bedrooms	9 0	8 0
(e) The height to be in no case less than 8 ft. to wall-plate, if ceiled at the wall-plate; or 7 ft. to wall-plate, and 9 ft. to ceiling, if ceiled to the collar.		
SUGGESTED ALTERATIONS.		
(a) For the parlour	14 0	12 0
(b) " Kitchen	14 0	10 0
(c) For one of the bedrooms	10 6	8 0
(d) For two other bedrooms	10 6	8 0
(e) The height to be in no case less than 9 ft. to wall-plate, if ceiled at the wall-plate; or 7 ft. 6 in. to wall-plate, and 9 ft. 6 in. to ceiling, if ceiled at the collar.		

Alternative System for Graded Schools.

1. Each of the graded schools (whether junior or senior, boys or girls) should consist of three or more double class-rooms, according to the size of the department, and although the space per child will be greater than in the junior schools, one double class-room may be smaller, and the whole area the same.
2. The entrance should be by a porch to the largest and most central room.
3. As the number of children in Standards 5 and 6 will usually be one-fourth or one-third smaller than any of the lower standards, the smaller class-rooms should be devoted to these two standards. Thus, in the case of a department of 100 children, the double class-rooms should be 50, 60, 70, or 80 children, according to the size of the department.
4. The entrance should be by a porch to the largest and most central room.
5. Two of the larger rooms should be separated by a movable partition, so as to be thrown together for singing, collective lessons, or any section requiring accommodation for the whole (or a large proportion) of the department. As children are placed during collective lessons much closer together than usual, it is necessary only between so many as will admit all the children of one department to be closely seated at one time.
6. The entire area should not exceed 10 superficial feet per child.
7. Class-rooms may be planned with only three or four rows of desks and benches ranged along one wall.

DISTRICT SURVEYORS' FEES UNDER METROPOLITAN BUILDING ACT.

ARCHES UNDER PUBLIC WAY.

Power v. Wigmore.—The defendant had erected fifty-two arches under a public highway, forming four sides of a square in Newgate market, and the plaintiff, as district surveyor of the southern division of the city of London, summoned him before Sir Walter Carden for 25l. 10s. They were not arches attached to houses, but were built on a vacant piece of ground, ready for houses.

Each arch or vault was separated by a pier in brickwork, and open in front, and there was no internal communication or mode of access whatever from one vault to another. On the part of the plaintiff it was contended that each arch was a separate structure, and that he was entitled to a fee of 10s. for each. On the part of the defendant it was contended that the words in the schedule, "for inspecting the arches or stone floors over or under public ways, 10s." meant that the appellant was entitled to one sun of 10s. for inspecting any number of arches under or over any public way, and that a greater fee could be demanded. The magistrat was of opinion that the contention of the defendant was correct, and that the surveyor was only entitled to the sum of 10s.; and gave in determination against the larger claim, but granted a case for an appeal. The appeal was heard in the Common Pleas, Westminster, on the 4th of June, before Mr. Justice Willes and Mr. Justice Keating.

Mr. Justice Willes, in the course of delivery of judgment, said,—

"The point of law is this:—It may be represented that the question whether a number of arches are made under a public highway—whether a public highway of any length, or a public highway surrounding a square, whatever be the number of arches which are made, provided these arches are in one continuous public way, the surveyor is to be satisfied for the inspection of them all by a fee of 10s. only, under the second schedule of the Building Act, Part I.; whether the Act gives only one fee for any number of arches, provided these arches are all under one continuous highway, whether in a straight line or not?"

"Supposing a man gave notice to the surveyor that he was going to construct one arch over or under a public highway, and the surveyor inspected it, and sent in a bill for 10s., and proceeded before the magistrat, and the magistrat gave the bill for inspecting the arches in the plural, stone floors in the plural over or under public ways, would the surveyor be entitled to the fee of 10s. for inspecting the public arch? Would that be the reasonable conclusion to come to? or would the reasonable conclusion be to come to, that the schedule, although it speaks in the plural, is describing the genus, and that the 10s. are intended to apply to each individual com-

* See p. 343, ante.

CONCRETE BUILDING AND THE METROPOLITAN BOARD OF WORKS. THE PEABODY INDUSTRIAL DWELLINGS AND THE CONTRACTORS.

On Saturday, the 15th inst., Messrs. Tall & Company, patentees and building contractors to the Peabody trustees, carrying on business at 8 and 9, Lawson-street, Great Dover-road, were summoned before Mr. Benson (Southwark) by Mr. E. Cheffins, hon. secretary, under the 56th section of the Metropolitan Building Act, for unlawfully erecting certain buildings, called the Peabody Industrial Dwellings, in East-lane, Bermondsey, without having previously sent in plans, specifications, &c., to the surveyors of the district; and secondly, with refusing and neglecting to pull down a certain wall of the same building alleged to be not conformable to the rules of the said Act.

Mr. Biron, instructed by Mr. Ward, solicitor to the Metropolitan Board of Works, supported the summonses, and Mr. Meadows White, instructed by Messrs. Ashurst, Morris, & Co., appeared for the company.

Mr. Biron, in opening the proceedings, said he was instructed to appear on behalf of the Metropolitan Board of Works to proceed against the Company on two summonses taken out by Mr. Hesketh, the district surveyor, under the 56th section of the 18th and 19th Vict., cap. 122, for erecting a block of buildings, consisting of twenty-eight rooms, called The Peabody Industrial Dwellings, in East-lane, Bermondsey, without having first sent in plans and specifications, for the approval of the Metropolitan Board of Works. There were other sections of the Act. If not properly done, the offenders came under the 45th section. The 47th section gave two magistrates power to inflict penalties, &c. The defendants caused these buildings to be erected contrary to the rules of the Act. A notice was sent to them by the district surveyor, and they were liable to a penalty of 20l. for every day they neglected to comply with the Act. The third or last rule in the miscellaneous portion of the Act sets forth that every building must be built in brick, stone, or other incombustible material, properly bonded together. The buildings complained of were not so. The walls were put together in a liquid state, which did not harden for twenty-four hours.

Mr. Benson observed that he had seen the buildings in question, and he thought the materials used were incombustible.

Mr. Biron considered they were not built of a hard substance, such as brick or stone. They charged the defendants for infringing the law by not coming to the Metropolitan Board of Works for their sanction, according to a notice served on the company by the district surveyor, according to the Act of Parliament, as follows:—"That the walls of such buildings are being formed with masses or lumps of hard materials, grouted with and embedded in Portland cement concrete, used in a semi-liquid state, to which the rules of the said Act are inapplicable, without the licence or authority of the Metropolitan Board of Works having been obtained, in accordance with the 56th section of the said Act; and I require you to take down the said walls, &c. Dated 8th of May, 1872." The company disobeyed that notice, and took the law into their own hands. Heretofore they had on all occasions applied to the Metropolitan Board for licences.

Mr. Meadow White contended that, under the circumstances, the company had no occasion to apply for licence from the Metropolitan Board, and the district surveyor had no authority to make a requisition upon them to pull down the walls.

Mr. Benson was of opinion that the first summons must fall, as he did not think the requisition was such as was required by the Act of Parliament,—"to pull down all."

Mr. Biron submitted to his worship's decision, and proceeded with the second summons. He called,

Mr. Macey. He said he had been thirty-five years a practical builder, and was perfectly acquainted with the Metropolitan Buildings Act. He visited the buildings complained of in the course of erection in East-lane, Bermondsey. He observed the way in which the packing was done, with pieces of broken bricks and stone among the concrete. They were all thrown in together.

Mr. Biron asked whether they were "bonded?" Mr. Meadows White objected to that question. Witness said they were not bonded, in the ordinary acceptance of the building terms.

In cross-examination, witness said a "rubble wall" was not bonded. With regard to the present building, it was softly put together, but he did not think such a system would be safe in other builders' hands except the company's. It was admirably put together. Witness added that he had not been in the company's works.

Mr. Walter Newhall, chief clerk in the Buildings Act Department of the Metropolitan Board of Works, said he had examined the buildings in the course of erection, and he did not think there was sufficient cohesion. Some of the bricks used seemed quite rotten.

Mr. Robert Hesketh, the district surveyor, proved that the defendants had not received his authority, and that they had refused to comply with the Act of Parliament. He thought the walls were properly bonded.

In answer to Mr. Benson, he said the concrete bonded it together. This was the first requisition he had served on a builder where concrete was used.

Mr. George Frederick Fry, surveyor to the Strand district, did not consider the work properly bonded together.

At this stage of the proceedings Mr. Biron asked for an adjournment, and after a short consultation,

Mr. Benson adjourned the further hearing until Saturday, the 29th instant.

RHYMING COMPLAINTS.*

Oh, why, my Muse, so vast a theme select? Can human words describe an architect! At his command do glorious cities rise, To give us shelter and delight our eyes. Yes, 'tis to him our very homes we owe, And how much more the world can never know.

First of professions, architecture stands: Its age sublime, our reverence demands; Oh, how can they from noble pride refrain, Who trace their line unbroken back to Cain? He first of architects went forth to build, Bearer'd a great city, and his brother kill'd; And, certain pamphlets made us think of late, Left to his followers his envious hate.

Go, ask the builder if he ever found The knowledge of an architect unbound? Go, ask the client if he ever knew One undertake a thing he could not do;

Or spend his money when he was not forced; Or under-estimate a building's cost? He'll answer, "No; and fain I'd pay them more."

Had not the Institute just fix'd the score?"

RESTORATION OF BURNT EDIFICES IN PARIS.

THE Municipal Council of Paris has determined on the reconstruction of the Hôtel de Ville upon its present basis,—that is to say, using all the portions of the building which remain uninjured by the fire. According to the "Journal of the Society of Arts," the work is to be thrown open to public competition. The rebuilding of the Tuileries, which had been announced in error as determined on, is not likely to be undertaken at present. It may seem surprising at first view that the architectural portion of the Salon now open contains no projects for the reconstruction of the Hôtel de Ville, and only one for that of the Tuileries. This is really not extraordinary, as architects who hope to compete for those works can scarcely be expected to lay their crude plans open to others, and the production of complete sets of drawings for such undertakings is a formidable undertaking. Two young architects, MM. Chardon and Lamhert, form, however, exceptions to the rule, they having sent in a series of elaborate plans for the complete restoration of the palace, with this difference, however, that they propose to make a grand public way in the centre of the new building, corresponding somewhat to the great porticoes of the Louvre, which would thus give direct thoroughfare from the Place de la Concorde to the Rue de Louvre, opposite the Church of St. Germain l'Auxerrois.

It is not often, happily, that the reconstruction of great public establishments is suddenly

* An architect (signing "C. C. O.") sends us some metrical complaints, of which we give a specimen. Like some with whom he properly finds fault, he casts stones upon his profession (in the course of his rymes), which, when made, ought to be proved. These we omit.

under the genus, or more properly species? I think the latter certainly is the proper conclusion. You say to a watchmaker, "What do you charge for your silver hunting watch?" "Six guineas." Well, that does not mean that a man is to have two watches if he pays six guineas, but it means that he is to pay six guineas for each watch. And so here, with respect to the arches or stone under or over public ways, 10s.,—not inspecting any number of arches in the plural, but 10s. for each of the arches mentioned in the schedule. Therefore, under the schedule, should be 10s. for each arch. That is said to be cut down, and I think it is cut down by the 49th section. It is cut down by the 49th section not in respect of their being under one highway, not in respect of their being in one notice, although they must be included in one notice to escape with one fee under the 49th section, but in respect of their being done for one building, in order to cut down the 10s. for each arch to 10s. for a number of arches. You must show that that number of arches is in one notice, and that it relates to some one building. Then you charge 10s. in respect of the arches under that building, not by reason of the schedule using the arches in the plural, but by reason of the 49th section cutting down the claim in respect of arches included in one notice in respect of works done upon any building."

"I think there ought to be an inquiry, which inquiry is to be one of fact, as to whether these arches which are considered as one building, or whether they should be distributed in two or three, or any other numbers, with respect to the buildings to which they belong. Are they buildings, or part of buildings, other than, and beyond, and besides the arches themselves? If they were a viaduct, do not only 10s. would have to be paid; but a viaduct would be one building; at least the magistrate might come to that conclusion. If there were arches of houses in course of construction round the square, they might properly be several buildings, and they might be divided according to the number of houses which the magistrate might consider to be attributed to the arches to be built. I think this will be the question—How much ought to be paid in respect of the number of buildings which the magistrate is satisfied these arches ought to be attributed to?"

The practical result is to declare that the district surveyor is entitled to receive 10s. in respect of the arch or arches appertaining to each house or intended house.

CHELSEA EMBANKMENT.

Table with 2 columns: Description of work and Amount. Includes entries for 1869, 1872, and 1871.

TESTING MATERIALS.

SIR.—Captain Seddon, R.N., deserves the thanks of the profession for his very interesting paper, and I do not wish to detract from its value, at least, but I still think that for girders which admit of a constant being obtained by experiment the formula he proposes has no advantage over that which he condemns, although would not claim for the latter more than it serves. This may be shown more clearly by expressing both formula in the same terms, and ranging them as follows:—

Hurst ... lw/ad = C
Capt. Seddon ... lw/ad = 4f

which differ only in the "4f" of the latter being substituted for "C" in the former. "C" representing a constant number obtained by breaking similar girders, a process which takes into account all imperfections involved in the construction of the girder, and which might be repeated for various classes of iron; while "4f," Captain Seddon's formula represents merely four times the tensile strength ascertained by breaking of specimens of the iron, or, as Captain Seddon has put it, "the limiting stress tons per square inch,"—a value which, in the present state of our knowledge, is only conventional.

Both formulae were fully investigated twenty years ago, during the consideration of the objects for the Britannia and Conway bridges; and those who wish to pursue the subject further need do better than refer to the description of these bridges, by Messrs. Clark and Fairbairn.

As regards my "Hand-book," I am well aware of its imperfections, and have been for some time engaged in preparing a completely revised edition.

Mr. Molesworth's book was thoroughly revised last year, and to my mind, at least, it leaves very little to be desired as an engineer's pocket-book. J. T. HURST.

forced upon a city, and the projects put forth under such circumstances cannot fail to supply valuable opportunities of study. The decision of the municipal council in favour of public competition in the case of the Hôtel de Ville adds to the general interest. Conditions are now being prepared.

VALUE OF LAND IN ROME.

In a fresh appeal for aid to purchase certain sites in Rome for excavation, Mr. Parker, C.E., says,—

"It is much to be regretted that my plan was not acted upon when first proposed in the spring of 1871: since that time the value of land in Rome has increased enormously. Mr. Spithover has just sold to a building company for 200,000L. sterling the same land for which he gave 5,000L. five or six years since (he had built a house on it and had added to the property; altogether he had probably expended 20,000L. at the outside upon it). Another large vineyard, on the eastern side of Rome, which had been bought for 500L. about ten years since, has just been sold to another building company for 10,000L. The property of Monsignor Di Merode, in the valley between the Viminal and the Quirinal, in the line of the new street, called the 'Via Nazionale,' is now being sold at the rate of sixty francs per square yard: it was not worth more than one franc the square yard ten years ago, when he first formed this project which is now being carried out."

Books Received.

The History of the Church of St. Mildred the Virgin, Poultry, in the City of London; with some Particulars of the Church of St. Mary Colechurch. By THOMAS MILBOURN. London: R. Smith, Soho-square. 1872.

ST. MILDRED'S CHURCH is now being destroyed; and this book is a fitting one for those who desire to have in their libraries a record of this church when it no longer exists. The associate church of St. Mary Colechurch was destroyed in the Great Fire of 1666. Mr. Milbourn was lately honorary secretary to the London and Middlesex Archaeological Society, and is the author of various papers on kindred subjects. The basis of this volume was a paper read at the London and Middlesex Archaeological Society in continuation of a proposed series of papers on City churches required to be removed to make way for City improvements.

VARIORUM.

"The Law relating to Vaccination. By Danby P. Frey, Barrister-at-Law. Fifth Edition. London: Knight & Co., Fleet-street. 1872." This small volume contains copies of the Vaccination Acts of 1867 and 1871, repealed statutes; the Local Government Board Act (34 & 35 Vict., c. 70), with notes; and the instructional circulars, orders, and regulations issued by authority; with introduction and index. The book is a useful one, even to those who disapprove of the law, which, so long as it is law, must be obeyed, however severely it may press upon those who conscientiously (but wrongly) believe that their duty to their children compels them to resist its enactments.—Messrs. King & Co. have commenced well "The Cornhill Library of Fiction," a cheap issue of good stories, with "Robin Gray," by Mr. Charles Gibbon. It has passed the ordeal of criticism in its original shape, and we need only say that it is a charming novel, full of interest and truthful touches.—The Rev. Jas. Harris's "Graduated Exercises in Arithmetic and Mensuration" has been adopted by teachers to a very considerable extent. Many of them will be glad to know that Mr. Harris has now issued a "Key" to the "Graduated Exercises" (Longmans, Green, & Co.), evidently prepared with care.—Messrs. Cassell, Petter, & Galpin will shortly publish a work on Applied Mechanics, by Professor Robert Stawell Ball, M.A., illustrated with numerous diagrams.

Westbury, Wilts.—Mr. A. Laverton has decided on erecting a new Literary Institution and Boys' School in the town. The plans have been furnished by Mr. Stent, of Warmminster, and workmen are busy levelling and preparing the site, which is on the side of a piece of rising ground.

Miscellanea.

Fatal Explosion at Godalming.—A short time ago complaints were made about the pollution of the river Wey arising from the discharge into it of the refuse from the Cotteshall paper-mills. Messrs. Spicer, the proprietors, at an expense of 2,000L., had one of Messrs. Ladelle & Southy's patent evaporators erected, which, by a simple but clever process, takes this refuse, which was before wasted, and from a liquid reduces it to a chemical solid, namely, soda, which can be again used in the manufacture of paper. Up till now the evaporator had admirably answered all the purposes for which the patentee intended it, but there has been an unaccountable explosion, which has resulted in the death of one man, and very severe injury and disfigurement to three others. The evaporator is erected in a detached building adjoining the mills. It consists of a number of trays with a large tank above, and the trays are heated by a furnace underneath. The refuse in a liquid state is connected in the tank, passing thither through a large pipe. The process of solidifying begins as soon as the liquid drops on the first tray, and proceeds much in the same way as the different stages in the manufacture of paper. The residuum, or soda, is valuable. The explosion occurred about twelve, midnight, in the evaporator-room. Five or six men were in the building without permission, some, if not all of them, perhaps, under the influence of drink. It is supposed that "the generation of some gas" may have caused the explosion.

Malvern.—At a recent meeting of the local Board a letter was read from Mr. Ridler, of the Wyche, in which he stated that, in his opinion, the plans, as prepared by the Board surveyor, Mr. Sandoe, were weak and expensive, and that the design was not a good one, and could not be carried out with a certainty of success. The Board were of opinion that their surveyor was fully competent to carry out the work he had designed; and moreover, that the plans having been submitted to the Government Board, and subjected to the examination of their engineer, was a guarantee that the design was an effective one, or it would not have been passed or the sanction for the loan given; and that the proper time for Mr. Ridler to have objected to the plans was at the public inquiry held before Mr. Arnold Taylor, the Government inspector, and before the plans had received the sanction of the Local Government office. It was resolved to purchase a steam roller and crusher, at a cost of about 800L. Tenders were received and opened for the erection of a new reservoir at North Malvern; they were as follows:—T. Morgan, Malvern, 5,000L. 6,912L. 1s.; J. B. Oldham, Malvern, 5,000L.; John Everal, Malvern, 4,750L.; A. W. Ritson, London, 4,750L.; F. H. Dixon, Worcester, 4,698L. 5s.; and John Inwood, Malvern, 3,667L. there was another tender from J. H. Clark, of Warwick, but, as it was not delivered in accordance with the terms of the advertisement, it could not be considered. Mr. Inwood's tender was accepted.

The Tradesmen's Home, Bradford.—In the large central room—which, though originally intended as a reading-room for the inmates, is now used as a chapel, and as the central hall and the only public room connected with the Home—friends of the institution and of the deceased Mr. H. Harris have placed a couple of memorial windows, executed by Messrs. Camm, Bros., of Smetwick, near Birmingham. A third window is, we understand, already ordered, to be paid for chiefly out of surplus funds which were obtained for the first two, and others (either memorial or otherwise) will, it is believed, follow. The windows already completed consist of four lights, containing the following as their central subjects: the Adoration of the Magi, the Baptism of our Lord, the Transfiguration, and the Crucifixion. Above and below these, and divided from them by illuminated texts, are also the following subjects:—The Annunciation to Mary and the Shepherds, Christ and the Doctors in the Temple, the Temptation, Christ Walking on the Sea, the Raising of Lazarus, the Agony in Gethsemane, and the Entombment. The windows are designed so that the central subjects form the principal feature, the minor ones being more subdued in tone. They are placed upon a light ornamental ground, surrounded by a border of a conventional treatment of natural forms in quiet tones of colour. The windows form part of a scheme of Scriptural illustration for the whole of the windows.

New Congregational Church at Buckley, Wales.

The foundation-stone of a new Congregational chapel has been laid here. Attached to the old chapel is a graveyard, half an acre or thereabouts in extent, and in it a prominent ruin of what has been intended as a monument in honour of Nonconformity. Large stones are lying about, on one of which, intended, it is imagined, to form a part of an obelisk, there are inscriptions,—on one face, the names of "Wylliffe," "Crammer," "Ridley," "Latimer," &c., ending with "Miss Preston." The graveyard is not yet filled, and the centre of it is chosen as the site of the new chapel, which is designed by the Rev. Thomas Thomas, of Glandwr, a gentleman who is the architect of a great number of Congregational chapels in Wales, and whose style has been named "the Glandwr style." Over all it is to be 54 ft. in length and 43 ft. in breadth; inside the dimensions will be 51 ft. by 40 ft. There is to be a gallery, and the whole chapel is intended to seat 500. The contract, which is for 1,300L., has been taken by Mr. J. Williams, builder, Buckley, and the work has only just been commenced.

Concrete Building in Chicago.—The local *Tribune* says that Messrs. Farwell are erecting, on East Van Buren-street, a stable, 80 ft. by 100 ft., three stories and basement, the walls of which, 2 ft. thick from bottom to top, are composed of concrete, the elements of which are one part Louisville cement, and three parts sand, ashes, and the finer particles of burnt district *debris*. The stuff is mixed somewhat thinner than mortar, and is poured into the pine-board moulds which shape the walls, and at the same time broken brick and stone from the ruins are embedded as thick as may be in the concrete, which sets firmly in forty-eight hours, and in a few days hardens to the firmness of granite. It is then to be coated over with Portland cement, of which, also, the trimmings are composed. The cost of such a wall, while being far preferable to brick or stone for its fireproof qualities, is not more than one-half of those materials, inasmuch as the *debris* costs nothing but the handling and sorting, while no skilled labour is required in the construction.

Wolverhampton Congress of the British Archeological Association.—At the last meeting of the Town Council, a letter having been received from the hon. secretary of the Association announcing the intention of visiting Wolverhampton during the entire first week in August (5th to 10th), the following resolution was passed:—"That this council learns with pleasure that the members of the British Archeological Association have made arrangements to visit this borough in the month of August next, and that this council begs to assure the Association of the interest and pleasure they take in the proposed visit, which they trust will be made on the terms and under instruction." The mayor said he would ask every member of the council to assist him in the matter, so that he might be able to receive the members of this Association with credit to the town. Personally he would do all that he possibly could; and, considering that it was a matter of great importance to the borough, he hoped that other members of the council would do the same.

Sewage of Paris.—The sewage of Paris has been conceded for fifteen years to the Peat Ene, engineering and Sewage Filtration Company of London. For a long time the sewage has been dealt with by the Lesage Company in the most primitive manner—namely, by spreading the solid matter upon the ground to dry, causing fearful annoyance for miles around, and provoking general outcry against the barbarous practice. In consequence of protests from various Communes, a decree was issued by the Prefect of the Seine in February to the effect that the treatment of the sewage should be assigned to some company capable of dealing with the nuisance, and at the same time a special commission was appointed in whose presence competitors were required to give practical demonstration of their qualifications. Ten competitors were struck off the list as not complying with the requisite condition and the election was limited to eight, with the result as stated.

A Testimonial.—The carvers and other workmen now in the service of Mr. Harry Hemm of Exeter, in various parts of England, present their principal a few days ago,—the thirty-first anniversary of his birthday,—with a handsome scrap album, which had been made expressly for the occasion, and had been subscribed for by the whole of his employes.

Royal Italian Opera.—The production of Prince Poniatowski's opera, "Gelmira," was highly remarkable for the acting and singing of Adeline Patti, which has seldom been surpassed on the lyrical stage: still there is such bright and sparkling music in it, and it seems to us that the opera had not received that consideration which a work of this kind deserves. Performers are tired to death of the stock roles, repeated *ad nauseam*, and sigh for novelty; and yet, when novelty is attempted, it ordinarily receives with the greatest suspicion and unwillingness to be pleased. "Les Huguenots" has been given with great brilliancy, Madame Lucca distinguishing herself. Herr Koehler, who made his first appearance in England as *Marcello*, proved himself to be a sound singer and excellent actor. He made no special impression on the house, but conducted naturally to the success of the representation as a whole.

The Middlesbrough Water Supply.—Complaints have reached us as to the state of the water supply of Middlesbrough, and especially the discoloration of the water. The pollution of the River Tees above the source of the water supply to Middlesbrough, has long been a source of complaint. True the water has many miles to flow in an open river after receiving the sewage of the more populous places on its way before it reaches the more immediate sources of the Middlesbrough water supply; but the sewage of 10,000 persons is a serious consideration. The sanitary committee of the town council lately went to Middleham, Teesdale, Darlington, and Barnard Castle, with the view of inspecting the state of the river, and what they saw was by no means reassuring. Nevertheless, Mr. Thomas Spencer, who has that faith, and rightly so, in the power of oxidation and natural purification, in a river possessing such irregularities and movement as the Tees, links the apprehensions and complaints much aggregated.

The Sanitary State of Huddersfield.—Mr. Buchanan, medical inspector under the Local Government Board, who recently visited Huddersfield to inquire into the sanitary state of the town, especially with regard to the existence of enteric fever, has just made his report to the authorities. The report states that the inquiry made in consequence of forty-four deaths in "fever" being registered in the fourth quarter of 1871 in the sub-district of Huddersfield, with a population of 85,658. Various commendations are made in the report, as to the appointment of a medical officer of health and sanitary inspectors; as to the ventilation or oppression of back-to-back houses, cleaning of drains, cesspools, and privies, and the extension of water-closets, ventilation of the sewers, drains, and utilisation of the sewage, the improvement of hospital accommodation, &c.

Steam Ploughing.—A private meeting of gentlemen interested in agriculture was held at the Westminister Palace Hotel, to inaugurate the formation of a central association to provide steam ploughs at various agricultural fairs, which it was stated would be in great demand by farmers thus enabled to hire them, at rates leaving good profits to the company. Amongst the gentlemen present were the Right Hon. E. Horsman, M.P. (who presided), Mr. M. Bass, M.P., Mr. C. Wren Hoskyns, M.P., Mr. Chadwick, M.P., Mr. Haviland-Burke, M.P., Mr. Caird, C.B., Mr. J. Algeroun Clarke, &c. The following resolution was finally agreed to:— "That the extension of the application of steam ploughing is a subject of great public importance, and worthy the encouragement of all who have the means and opportunity of promoting cultural improvements."

The Early Church, Bradford-on-Avon.—It is being raised with the view to the preservation of this remarkable building, which is, indeed, unique. The church, which is dedicated to St. Laurence, was probably built towards the end of the tenth century. It consists of a nave, aisle, and porch on the north side. In the upper part of the eighteenth century the nave porch were conveyed by a member of the Bacon family for the purpose of a school for children of the parish. At that time the porch of the chancel arch was walled up and the nave and the two portions of the church being as separate buildings, the chancel being used as a cottage ever since. We have before given particulars of this interesting structure, and trust it will be carefully treated.

A Lady Surveyor.—A widow lady has been lately appointed surveyor of roads in a parish in Westmoreland, says the *Taunton Courier*. The lady had complained to the surveyor of the state of the roads, and at the next election he prevailed on the ratepayers to elect the widow herself. She accepted the office; and, as she keeps a clerk, and has ample means, she has no difficulty in obtaining a thorough supervision. It is said that she has made some awkward discoveries as to the state of the accounts. The refusal to undertake the duty of a surveyor of roads may entail a maximum penalty of 20*l*. The word used in the clause relating to the appointment of a surveyor is "person"; therefore women ratepayers are liable to be elected, and may be fined if they refuse to serve.

Monument to Mr. Charles, of Bala.—Thirty-four designs were sent in for this competition, and included several which exhibited much ability. From these a design by Mr. W. Davies, Exton-road, London, was selected; a full-length statue in Sicilian marble of Mr. Charles, in the costume of a Bachelor of Arts, in the act of pronouncing a sentence such as—"From my heart I wish all men to have the Bills." The figure is to be 7 ft. in height, exclusive of a 6 in. plinth. Underneath is a pedestal to be made of the same material, 8 ft. in height, with the base of Portland stone, 9 in. thick. The sides to be filled with inscriptions and sketches of incidents in the life of Mr. Charles. The cost is to be 600*l*.

Suffocation by Gas in a Bedroom.—A sad disaster recently befel the family of Mr. Stewart, postmaster at Mudley, near Plymouth. His wife was in her bedroom, with an infant and nurse. The latter warmed some food for the child, and must unconsciously have failed to turn off the gas in the gas-stove, thus permitting an escape of gas. When Mr. Stewart visited the bedroom about 7 o'clock he was horrified at finding the three inmates apparently dead. All efforts to restore animation to his wife proved futile, but the nurse and infant are still living, although little expectation is entertained of their recovery. Those gas-taps which have no check or catch on closing, but turn round at will, ought to be disused: they are dangerous.

Chelsea Bridge and Battersea Park.—In Parliament, the other day, Mr. Peck asked the First Commissioner of Works whether the financial position of the Government toll-bridge at Chelsea had improved or otherwise during the past two years; whether any of the land surrounding Battersea Park had within such period been sold; and when the freedom from toll anticipated and intended to be provided for by the Act of 1858 might be expected. Mr. Ayrton said the balance of the debt upon Chelsea Bridge in March, 1870, was 101,600*l*. In March, 1872, it was reduced to 92,000*l*. In regard to the land around Battersea Bridge, three-quarters of an acre had been sold for 2,250*l*.

British Association of Gas Managers.—The ninth annual conference of this Association has just terminated, having taken place in the rooms of the Society of Arts, Adelphi. The proceedings commenced with an address from the president, Mr. James Church, M.I.C.E., F.G.S. Dr. Odling delivered a lecture to the members on "The Best Means of Getting Rid of Bisulphide of Carbon." The choice of president fell upon Mr. Angus Croll, Mr. W. H. Bennett being re-elected honorary secretary. At the commencement of the conference the number of members was 360, and during the sitting seventy more were added.

The Damage to Wadhurst Church by Lightning.—A public meeting has been held in the Reading-room, Wadhurst, the vicar in the chair, for the purpose of considering the architect's report respecting the amount of damage done to the tower and steeple of the parish church by lightning. After reading the report, and discussing it, the meeting was adjourned till an estimate of the actual sum required for repARATION be submitted, and measures decided upon for the best means of raising the required amount.

Testimonial to a Town Clerk.—A presentation of several carved antique art works in metal,—namely, a pair of flagons in silver-gilt, a silver parcel-gilt cup, and a silver guild cup and cover,—has been made to Mr. Richard Woolf, lately town clerk of Worcester, and still holding important public offices there. The testimonial cost upwards of 300*l*.

A New Roof at the Walworth Coal Depot.—A few months ago the Midland Railway Company erected a large coal depot at Walworth, alongside the Chatham and Dover line, at an expense of 30,000*l*. This depot, which is, with one exception, the most spacious of its kind in the metropolis, occupying an area of 400 ft. in length by 90 ft. in width, the company are now covering in with an ornamental roof, consisting of one large span extending over the entire width and length of the depot. The estimated expense of the roof, which is composed of corrugated iron and glass, is upwards of 7,000*l*.

Walwyn's Castle Church.—The restoration of this church is shortly to be proceeded with. Some years ago difficulties of one kind or another connected with the locality caused its stoppage, whilst several portions of the sacred structure remained unroofed, and before any of the flooring had been laid. As a necessary consequence divine service has been since held in the schoolroom. Mr. H. Edwards, of Milford, has been commissioned to carry out the necessary works by the architect, Mr. E. H. Lingen Barker, to whom a vestry meeting, recently held and presided over by the archdeacon, has granted full discretionary powers.

National Health Society.—A meeting of this association, which is intended "to unite men and women in a systematic effort to promote health amongst all classes of society," was held on the 13th inst., in the rooms of the Social Science Association, when a paper was read, by Dr. W. H. Corfield, under the heading, "How to keep Typhoid Fever out of Houses." The rooms were well filled. Mr. James Heywood, F.R.S., presided; and at the close of the paper observations were made by Dr. Hardwick, Mr. Codwin, Mr. George Jennings, Dr. Elizabeth Blackwell, and others.

Civil and Mechanical Engineers' Society. At the annual meeting, held on the 7th inst., the following members were elected office-bearers for the year 1872-73:—President, Mr. C. W. Whitaker; vice-presidents, Messrs. Charles H. Rew and Geo. W. Willocks; members of council, Messrs. R. M. Bancroft, F. E. Cooper, Chas. H. Driver, C. Kingsford, William Meakin, C. J. Samuda, A. T. Walmisley; hon. treasurer, Mr. W. F. Butler; hon. secretary, Mr. Owen Ordish; hon. accountant, Mr. J. Wagstaff Blundell.

Inauguration of a Drinking Fountain at St. Alban's.—The inaugural ceremony connected with the drinking-fountain presented to this town by Mrs. Worley, and erected at a cost of 500*l*., has taken place in the presence of a large assemblage of townspeople. The fountain is placed opposite the Clock Tower. The steps and bowl are composed of granite, the final being made of yellow Mansfield Wodehouse stone, and the water issuing in four streams from animals' heads of bronze.

Consecration of a New Burial Ground at Annesley.—A new burial-ground for the village of Annesley has been consecrated. The ground, which measures 70 yards square, has been enclosed with a stone wall, and a mortuary chapel has been erected nearly in the centre. The wall and chapel are both of stone. The cost of the chapel and wall is, we are informed, between 600*l*. and 700*l*. The architect was Mr. Sanders, of Wheeler-gate; and the builder, Mr. Bailey.

Danger in Letting Railway Arches.—Last week, a fire, attended with great loss of property, broke out in the railway arches, the property of the South-Eastern Railway Company, but let out to sundry persons, some as manufactories, and others as private dwellings, situate in Hamilton-street and Payne-street, Deptford, Kent. The fire commenced in the bottle envelope manufactory belonging to Mr. Lloyd, forming three of the arches numbered 183, 184, and 185, in the first-named street.

The Guards' Institute, Westminster.—It is stated that the building known as the Guards' Institute, situated near the site of the proposed Roman Catholic cathedral in Westminster, has been purchased by the Archbishop of Westminster for 12,000*l*., and that it is to be converted into an archiepiscopal residence.

Croydon.—Mr. Baldwin Latham, C.E., has resigned the office of Consulting Engineer to the Croydon Local Board of Health, such resignation to take effect upon the completion of the works at present in progress.

Photo-Mezotint Portraits.—Messrs. Fradelle & Marshall, of Regent-street, have formed an interesting collection of portraits of celebrities, political, dramatic, musical, and otherwise, the getting together of which must have occupied some time. By peculiarities in printing, a dark background is given to each portrait, and the effect of a mezzotint obtained. In the department of literature the collection is weaker than in others.

How to Destroy Ants.—Fill small phials two-thirds with water, and add sweet oil, to float on the water to within ½ in. of the top. Plunge these upright in the ground, leaving only ½ in. standing out, near the nests or runs of the ants. Every ant will come for a sip, and go home to die. No insect can exist with oil in its throat; yet ants are very fond of it.—“C. L.” in the *Gardener's Chronicle*.

Engineering Contract.—Messrs. Andrew Handyside & Co., of London, engineers, have received from the India Government the order for the superstructure of the pontoon bridge over the Hooghly, at Calcutta. There are two bow-string spans of 180 ft., and other spans of 100 ft. and 80 ft., making up the total length of 1,528 ft. The total weight of iron is 872 tons.

Cab Stands.—The Commissioners of Police have applied to the Kensington Vestry for permission to erect a covering over the cab-stand in the Cromwell-road, opposite the South Kensington Museum. The application was referred to the works committee.

Louth Hospital and Dispensary.—The foundation-stone of an hospital and dispensary has been laid at Louth. Mr. Clark, the contractor, is progressing with the building.

The Ordnance Survey.—In reply to a question in the House of Commons, Mr. Ayrton says there is no prospect of the Ordnance survey for Lincolnshire being completed for ten years.

TENDERS

For alterations, repairs, and other works to Holy Trinity Church, Sisan-street. Mr. Arthur W. Blomfield, architect. Quantities supplied by Messrs. Widnall & Trollope:—
Field, Poole, & Sons £1,698 0 0
Myers & Sons 1,898 0 0
Turrell 1,498 0 0
Adams & Sons 1,438 0 0
Nixon 1,835 0 0
Gibson, Brothers 1,267 0 0

For residence, lodges, and stabling at Polegate, Sussex, for Mr. C. Diplock. Mr. R. K. Blesley, architect:—
Cook & Green £4,103 0 0
Nash & Co. 3,984 0 0
Barnes & Moody 3,875 0 0
Hall 3,864 0 0
Peetress 3,612 0 0
Vidler 3,410 0 0
Blackmore & Howard 3,368 0 0
Tomkinson 3,480 0 0
Blackburn 3,459 0 0

For alterations and additions to the Green Man Tavern, Shacklewell, Stoke Newington. Mr. Chester Cheston, jun., architect:—
Turner & Son £950 0 0
Sloner 927 0 0
Brett 897 0 0
Shurmur 889 0 0
Somerville & Smith 820 0 0
Fisher 763 0 0

For Sharnbrook Schools. Messrs. Ladds & Powell, architects:—
Moore £2,782 0 0
Snell 2,715 0 0
Miskin 2,682 0 0
Cooke & Groome 2,445 0 0
Vickers 2,434 10 0
Spencer 2,230 0 0

[The School Board have determined not to accept any of the tenders.]

For residence at Banbury. Messrs. Tarring & Son, architects:—
Residence. Stable. Lodge.
Shepherd £3,170 £680 £330
Orchard 2,999 669 331
Davis 2,959 655 315
Shurmur 2,844 640 296
Kimberley 2,912 639 292

For the erection of malthouses at Louth, in the county of Lincoln, for Messrs. Thorpe & Sons. Mr. Charles Baly, architect. Quantities supplied by Mr. Ireland:—
Hassel £18,363 0 0
Simpson 15,348 0 0
Shurmur 16,129 0 0
Shattoe & Barry 15,164 0 0
Holson & Taylor 14,000 0 0
Dennett & Co. 13,625 0 0
Stevenson & Weston (accepted) 13,000 0 0
Huddleston 11,796 0 0

For the erection of a detached villa residence, at London-road, Enfield, Middlesex, for Mr. Henry Cave. Mr. Francis William Seale, architect:—
Field & Son £1,950 0 0
Bates & Ramage 1,927 0 0
Hobbs & Son 1,696 0 0
Pattman, Brothers 1,685 0 0
Fairhead 1,609 0 0

For St. Paul's Church, Margate, together with parsonage house and fence walls. Mr. R. H. Blesley, architect. Quantities by Messrs. Franklin & Andrews:—
Upper Part Church. Fence
Paramor & Son £7,010 £1,224 £2,804 £255
Avis 1,109 2,212 557
Henshaw & Co. 620 2,216 671
Myers & Son 5,018 830 2,300 638
Hayward 5,709 1,186 2,138 290
Bashell 6,614 890 2,240 553
Gaskin & Co. 6,200 970 2,420 600
Pattman & Co. 5,559 810 2,685 483
Cove, Brothers 5,885 735 2,115 560
Cook & Green 5,185 855 1,940 419
* To late.

For boys' school and residence, Buckhurst Hill, for the Chigwell School Board. Mr. E. Egan, architect. Quantities supplied by Mr. J. W. Morris:—
Einar £2,692 0 0
Kilby 2,692 0 0
Rivett 2,662 0 0
Abraham 2,640 0 0
Jacobs 2,640 0 0
Morter 2,363 0 0
Egan 1,930 0 0

For male and female vagrant wards (for twelve inmates) at the Guildford Union, exclusive of baths and disinfecting oven, &c. Mr. Henry Peak, architect:—
Mason £120 0 0
Strudwick 415 0 0
Pearce & Clark 378 15 0
Garnett 375 0 0
G. & J. Loe (accepted) 350 0 0

Accepted for villas at Jesmond, for Mr. G. Luckley. Mr. Gibson Kyle, architect:—
Masons' Work £1,733 0 0
Joiners' Work 1,050 0 0
Plasterers' Work 510 12 0
Painters and Glaziers' Work 240 0 0
G. G. & J. Laidler 188 0 0
G. G. & J. Laidler 175 0 0

For first portion of warehouse, Northumberland Mills, for Messrs. Proctor & Sons. Mr. Gibson Kyle, architect:—
Scott £3,755 0 0
Dobson 3,325 0 0
Hudspeth 3,510 0 0
Simpson (accepted) 3,453 14 3

Accepted for enlarging Clavering-place warehouse. Mr. Gibson Kyle, architect:—
Harris £925 0 0

For new engine and boiler house at Blenheim Works, Eagle Wharf-road, Hoxton, for the Henri Kildred Barrel Company (Limited). Mr. H. A. Alexander, architect:—
Baxter £507 0 0

For general repairs and alterations to same:—
Baxter £468 0 0

For pulling down the Star Inn, Ryde, and erecting a new inn on a portion of the site, for Messrs. W. B. Mew & Co. Messrs. F. & J. Newman, architects. Quantities supplied:—
New Allowance
Meador £1,380 £100
Barton 1,806 65
Denham 1,300 100
Parsons 1,300 125
Jolliffe 1,279 110
Sibley 1,241 75
Saunders & Bulstrode 1,261 103
Newman 1,250 110

For sewerage work at Beccles. Quantities by Mr. G. W. Dickson:—
Chappell £3,244 10 6
Stevens & Crook 2,380 0 0
Fell 2,235 0 0
Cunnold 2,030 0 0
Hayward 1,795 0 0
Garbett 1,760 0 0
Acock (accepted) 1,745 0 0
Harvey & Burrows 1,688 0 0

For lodge and cottages, Fawkham Manor, for Mr. H. B. Holler. Mr. F. Boreham, architect:—
Blake 675 0 0
Cobham & Co. 601 0 0
Leonard (accepted) 500 0 0

For alterations at 5 and 6, Russell-gardens North, Kensington, for Messrs. Marriott & Smith. Mr. T. Laurie, architect:—
Longmire & Burge £322 0 0
Holland (accepted) 234 0 0

For paving works for the Guildford Local Board. Mr. Henry Peak, surveyor to the Board:—
South-street. Swan-lane. Portsmouth.
Pollard & Son £145 5 8 £90 8 6 £104 18 6
Mason 139 0 0 231 0 0 33 0 0
Burdett 127 4 7 123 5 6 82 3 6
Patrick & Son 125 19 6 125 0 0 *99 12 0
Moon * Accepted. 82 3 6

For the erection of Gothic villa, at Park-hill-road, for Mr. W. White. Mr. H. A. Alexander, architect:—
Baxter (accepted) £2,980 0 0

For new brewery and malt stores, for the executors of the late Mr. J. M. Shirrell. Mr. C. Smeal, architect. Quantities supplied by Messrs. Curtis & Son:—
Foggett £4,295 0 0
Southern 4,100 0 0
Neil & Sons 2,970 0 0
Clay 2,750 0 0
Warburton 2,724 0 0

Ironwork.
Foggett 1,743 0 0
Daves 1,720 0 0
Neil 1,420 0 0
Smith & Wood 1,333 0 0
Horsley Iron Company 1,295 0 0
Head & Co. 1,181 0 0
Warburton 1,163 0 0
Darlaston Iron Company 1,134 19 8
Accepted.

For iron roof, &c., to premises, Bear Garden, South work, occupied by Messrs. Burton & Waller, engineers, for Mr. Moss Isaac. Mr. J. D. Huxter, architect:—
The London Galvanised Iron Co. £345 0 0
Tupper & Co. 285 0 0
Jukes, Coulson, Stokes, & Co. 274 0 0
Tregon, Hickson, & Co. 271 11 0
Braby & Co., Limited 242 6 0

For a new road and sewer on the Standford Estate Brighton. Mr. H. J. Lancaster, architect. Quantities supplied:—
Cheesman & Co. £2,648 0 0
Jennings 2,583 0 0
Chappell 2,524 0 0
North 2,440 0 0
Blackmore & Howard 2,184 0 0
Marshall 2,060 0 0
Reynolds 2,047 0 0

For alterations and additions to coppyhold farm, Coufield, Sussex. Mr. F. W. Holloway, architect. Quantities not supplied:—
Gliver £1,108 0 0
Finch 1,065 10 0
Ancombe 1,000 0 0
Blackmore & Howard 949 0 0
Knight 920 5 0

For completion of drainage works, at Reigate, for Reigate Town Council. Mr. Baldwin Latham, engineer. Quantities supplied by Messrs. Howden & Heath:—
Hemings £10,431 10 6
Wright & Goodchild 8,500 0 0
Kirk 7,917 1 1
Kirk 7,754 0 0
Marshall 7,700 0 0
Symonds 7,109 0 0
Blackmore & Howard 6,859 0 0
Hayward 6,739 0 0

For sewers, &c., James-street extension, for vestry St. Mary-le-bone. Mr. T. G. Browning, surveyor:—
Crockett (accepted) £339 0 0
Neave 359 0 0
Goodair 295 0 0
Fitzzy 295 0 0

For general works, St. James-street extension, for vestry of St. Mary-le-bone. Mr. C. Eales, architect:—
Fitzzy £1,444 0 0
Neave 1,425 0 0
Goodair 1,263 0 0
Crockett (accepted) 1,226 0 0

For works at Greenford Hall, Greenford, Middlesex. Mr. C. Eales, architect:—
General Works £375 0 0
Nye 348 0 0
Gibson, Bros. 335 0 0
Hedges Appenzels 295 0 0
Grainge 2146 0 0
Taylor & Son 113 0 0

For villa residence, Mr. J. Norton, architect. Quantities by Mr. Thacker:—
Burchell £3,300 0 0
Rowden 3,288 0 0
Wagner 3,194 0 0
Dover & Co. 2,903 0 0
Gough 2,900 0 0
Hughesdon 2,850 0 0
Clark 2,568 0 0
Manabridge 2,550 0 0
Stephenson 2,737 0 0
Gooding 2,669 0 0
Ranking 2,610 0 0
Crook & Wall 2,610 0 0
Lovel 2,555 0 0
Lord 2,520 0 0

For schools, Bexley Heath, Mr. Edgar, architect. Quantities by Mr. Backhall:—
Renolds £290 0 0
Masters 854 0 0
Gough 850 0 0
Leatherdale 774 0 0
Richardson 755 0 0
Crook & Wall 710 0 0
Ashdown 675 0 0
Richardson 657 0 0
Clark 647 15 3

For sewer, Blyth-lane, Board of Works, Fulham, architect:—
Novell & Robson £3,950 0 0
Gough 3,630 0 0
Young 3,490 0 0
Marshall 3,490 0 0
Neave & Co. 3,220 0 0
Ritson 3,220 0 0
Wignmore 2,975 0 0
Grasman 2,600 0 0
Williams, Bros. 2,650 0 0

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The Builder.

VOL. XXX.—No. 1534.

On Scale in Art.

THE word "scale,"—originally adopted from the Italian language, as expressive of the steps by which magnitudes increase or diminish,—may now be considered to indicate a special department of aesthetic study. We are in the habit of constantly using the term. It does not mean size, although it is intimately connected with that quality; but it may be most simply defined as expressing the relation of form to size. In the investigation of the subject we, therefore, come in contact with two distinct orders of relation—namely, the mechanical and the optical. Harmony of scale comprehends both the propor-



tions which the parts bear to the whole, the mechanical requisites of both being properly regarded, and the effect produced on the eye of the beholder, the actual size and relative distance of the object being duly determined.

Nature herself has taught those who study her works, how implicitly she is bound by the law of scale. All organic growth and development is limited by this great principle. The range of scale, which is primarily determined by the size of the earth itself, or, more correctly speaking, by the force of gravity on the surface of the planet, applies to the different great provinces of the organic kingdoms with a precision that is distinctly intelligible. Thus the widest range is found, as might be expected, in the vegetable kingdom. Among plants we find a perfect gradation of size, from the microscopic forms of the parasitic *fungi* to the lofty spires of the cone-bearing trees, the monarch of which, the *Wel- lingtonia gigantea*, springs to a height of 300 ft. Among animals, the range of scale is determined by the shade and habit of the class. Thus aquatic animals, of each of the three great provinces which are defined by the character of the nervous system, vary in size almost as much as vegetables themselves. The floor of the Atlantic is gradually rising in consequence of the deposit of the *exuvie* of the microscopic creatures that form the chalk *strata*. The bulk of the whale attains a magnitude which would render locomotion on land painful, if not impossible. Not only the marine animals proper, but the terrestrial animals of marine habits, are remarkable for the large size which they attain, when compared to their earth-inhabiting congeners. A full rotundity of form, admirably suited for flotation, marks the hippopotamus as the representative, in the equatorial lakes and rivers, of the great pachydermatous family now gradually becoming extinct.

In terrestrial animals the scale is more limited. The height of the giraffe and the bulk of the

elephant are small when compared to the proportions of the whale. On the other hand the smallest terrestrial animals are large in comparison to millions of the aquatic tribes. Among the vertebrate animals, the shrew-mouse is one of the tiniest forms. But this little mammal is gigantic when compared to the whitelait or the stickleback. The more minute air-breathing articulate animals, among which some of the spider and scorpion group may be cited, are rather aerial than terrestrial animals. Among those creatures that fill and inhabit the air, again, the limit of scale is still further reduced. From the wren to the condor is a range of size far less than from the shrew to the elephant. The class of insects proper, consisting of the six-legged orders, the greater number of which possess, at one period of their existence, two or four wings, contains no non-parasitic species so small, nor any so large, as those of the earth-haunting spiders and scorpions; a group, again, which is far more restricted as to range of size than the water-breathing *articulata*—the crabs and their congeners. We can understand how this distribution of animal forms according to scale is made, on mechanical grounds. The extreme limit of size attained, in any class or order, is determined by the capacity of the animal for free, independent motion. Those creatures that have their weight borne by the water in which they disport themselves, are able to combine great activity with enormous bulk. Those which have to bear their own weight, and to move, step by step, over the earth, are necessarily restricted to more moderate dimensions. Those that have, by their own mechanical powers, to raise themselves in an element lighter than their bodies, are, with equal justice, the most narrowly limited, not only as to size, but as to plan. Thus a few molluscous species are true terrestrial animals, but there is no aerial mollusc.

The observance of exactitude of scale may thus be seen to characterise the whole order of organic life. Within the comparatively narrow limits which the artist ordinarily contemplates, the mechanical causes which influence scale are less diverse. Still, they cannot with any safety be disregarded. In the variation of human stature, as in that of all moving tribes, the constant energy of mechanical law is to be observed. Gravity never sleeps. While the height of any form increases in a simple proportion, the augmentation of bulk that symmetrically accompanies this increase of height is in the ratio of the cubes of the linear dimensions. A well-grown man exerts on that portion of the ground on which his feet stand a pressure of about 9 lb. on the square inch. In walking, lifting one foot, and throwing the weight of the body on the toes and fore part of the sole of the other, this pressure will rise to from 20 lb. to 30 lb. per square inch. Raise the stature of the man to the 9 ft. which have been attained by well-known giants in modern times,—not to mention the stature of 12 ft., which the students of teratology declare to be not monstrous,—and the pressure on the foot will demand an increase of area to support it considerably greater than will be consistent with retaining the length of the foot at one-seventh part of the height.

It is difficult to tell how far this mechanical aptness is apprehended by the instinct of the artist. Men who are familiar with the construction of machinery attain a very accurate instinctive knowledge of the strength of materials, and of the due proportion of parts. It is thus quite within the limits of possibility that the incongruity which must actually result from enlarging or diminishing the size of a figure, in actual execution, while maintaining the unchanged proportion of its parts, is perceptible and obvious to the true artist. How far this mechanical law of scale may be appreciated, is a matter of individual capacity. As to its existence there is no room to doubt.

With regard to the optical causes that influence scale they are twofold, or, if we separate the study of colour from that of shade, threefold. They correspond to the division laid down by Leonardo da Vinci of linear and aerial perspective.

The first of these conditions is simply geometric. It regards the object,—sculpture, relief, or even painting,—as visible from a given point of view. Thus, if we take a statue of 6 ft. high, the difference in the apparent length of the *tibia*, when regarded from a distance of 18 ft., between that apparent when the figure is placed on the ground and that when it is raised on a pedestal 3 ft. high, is distinctly appreciable. In the case of a colossal figure, the correction that it is necessary to make in order to render the image formed on the retina symmetrical is thus very considerable. Geometry will furnish the leading rules for these corrections. But it can be only by the erection of a model in the proposed conditions, and by correction of the details that will then be found unexpectedly to offend the eye, that the sculptor can hope to succeed in a colossal work.

The laws of linear perspective may, as we have said, be geometrically stated. It is otherwise with that subtle variation of light and of shade which is called aerial perspective. Leonardo conceived that the diminution of clearness in outline which accompanies increase of distance was produced by the interposition of a greater thickness of air, or aerial matter. We now more simply regard it as a result of the decreasing quantity of light, reflected from the object that reaches the eye. But the aesthetic truth is independent of the scientific theory. We know that, independently of any intervening obstacle, objects become more and more indistinct as they are removed further and further from the observer. Not only do colours pale, and shades become less sharp, but (in consequence mainly of the latter changes), features become obliterated. Military men are accustomed to judge of distances by the clearness with which features or forms can be distinguished. The figure of a man, thrown on the sky, or on a background that contrasts with the colour of the skin or of the clothing, can be recognised when it appears almost microscopic. But if we represent the human figure, as did the Greek gem-cutters, of a size such as that which would indicate the distance, let us say, of a quarter of a mile, it is evident that the natural object is totally unlike the miniature sculpture. In the former, a dim, shadowy, indistinct spot has about it a something which tells of humanity. Look at it through a good telescope, and the lineaments become more clear, but they are still subdued and unpronounced. Now look at the gem. There we find clear, sharp lines, indicating both form and feature. Nothing is indistinct, nothing blurred. If we use a magnifying glass, instead of finding the figure gradually become more distinct, as in the former case, we only find that it is less critically perfect than it appeared to a good vision. In fact, the gem-cutter has seized the salient features, and produced what, exquisite as it is, is really a caricature. It is an appeal rather to the educated sense than to the natural perception. It may be beautiful, characteristic, wonderfully perfect and exact; but it is as unlike a man seen at the distance which would produce a corresponding diminution in size as can well be imagined. As an example, we find, by actual enlargement by means of the camera, that the head of Theseus, in one of the finest antique intaglios known, is one-sixth, instead of one-eighth, of the height of the figure.

In indication of any but the boundary outline of the figure, and even in the sharpness of this outline, the work of the microscopic or miniature artist is thus always characterised by a conventional treatment. It may be exquisite,

but it is unlike nature. A natural form can by no means be so presented to the eye. Between actual or apparent size, and sharpness of delineation, there is a relation in nature which does not prevail in art. The difference in shade is a portion of the same optical relation.

There is also another consideration regarding both *chiaroscuro* and colour. If a given quantity of black and white wool be mixed together in a fabric, it gives a certain tone of grey. If the same proportions be wrought into a pattern,—as, for instance, into a check,—the effect on the eye produced by the textile fabric will materially differ, according to the size of the squares. The apparent texture of the material will be appreciated mainly in consequence of this size. A large checked pattern will be visibly particoloured. The homogeneity of the tissue will seem to be greater, the smaller we make the pattern, till we come down to the intermingling of fibre with fibre.

Independently, then, of any fading of colour or of shade, the mere effect of difference of distribution caused by the alteration of the size of the pattern, or of the breaks and shadows in tint, gives a totally different impression to the eye. We speak of it as denoting a difference of texture,—but the result is not that alone. The whole effect of the object is changed. This is most distinctly apparent in the case of the enlargement or diminution of an engraving, by means of photography. We can refer to some of the finest engravings in existence, which have been reproduced by the camera in two or three sizes. Nothing can be more exact than the action of the lens; while keeping well within its optical limit, the reduction is strictly proportionate; but to the effect on the eye, *La Bella di Tiziano*, and the “Congress of Münster,” on a larger or smaller scale, are absolutely different things. No one can compare them without being struck with this fact. The smaller print has little or none of the charm of the larger one, and we think that it is clear, from the above considerations, why such is the case.

We have selected the simplest case, that of the admixture of black and white, in constant proportions, but with differing degrees of coarseness or fineness in the mode of mixing them. In the case of colour, the operation of this same law is even more striking. We have seen instances, lately, of the reproduction by chromolithography, on a reduced scale, of large and highly-finished landscapes. No pains or cost have been spared to make these pictures effective. As many as thirty distinct stones have, in some cases, been employed. The forms of the landscape have been, or may be, reproduced with absolute accuracy of proportion. But it must be remembered that a reduction to one-fourth the length and breadth of the original, is a reduction of any given spot of colour to one-sixteenth of its original size. If the tints of the larger picture be matched, there will be a series of contrasts in the smaller one so bright and glaring, as to produce altogether a different effect. If the tints, on the other hand, be toned down, we require the guidance of an amount of artistic skill and feeling which is tantamount to repainting the picture. No artist can have justice done to a painting, by a coloured reproduction on a smaller scale, without the process of repainting, including the due modulation of tint and shade proper for the altered scale, be judiciously effected.

In this view of the reduction of paintings we see, without any disguise, what actually occurs in all cases of reduction. In engravings the same rule may be shown to apply. No less is it the case with regard to sculpture. Whether we regard sharpness of outline and delineation of feature, or depth and modulation of light and shade, mechanical reduction in size does not give harmonious reduction in scale.

The observance of this natural law is not without its application to the works of that school of art, which has had an episodic existence in this country, under the name of Pre-Raphaelitism. Like theological heresies, it owed its origin to the sudden appreciation of the fact that a great truth had been hidden or overlooked. The leaders of this movement were revolted by the slovenly representations of natural forms which painters were too often contented to employ. They saw that the conventional treatment of nature was imperfect. But, instead of endeavouring to perfect what must ever be to some extent conventional, they sought to introduce what they thought was a natural treatment. Had they, in very deed, attained to this, they would have held the rank of reformers of art. But they failed to

effect this object because they forgot a great truth, no less important than that which they sought to establish. Nature may be studied in the minutest detail; but she is only appreciated in the *ensemble*. Push the investigation of the details a flower to a certain point, and instead of a flower-painting you produce a botanical diagram. Indicate too sharply the muscles, and you have an anatomical, not a pictorial, representation. The flower will entice you from a distance by its brilliancy or its fragrance. It will woo you to pluck it, to wear it,—to decorate the glory of raven or amber locks with its contrasted snow, or ruby petals; or even to tear it to fragments, with the cruel delight of the botanist, to count its anthers, and to admire the mechanism of its stigma. But the flower in the wood, in the hair, and under the magnifying glass, is, to a certain extent, in each case a different entity. In the former cases it is a part, and in the first a very small part, of the scene taken in by the eye. In the latter instance it occupies, not only all the attention, but all the field of vision. Now if, in landscape, or *genre* painting,—where flowers, to keep to the former illustration, form a very subordinate part of the general view,—they be depicted by the limner with the exact knowledge, and clear definition, which a special study of the species renders easy to his hand, the result is not nature, but something worse than slovenliness. A stroke of charcoal, or a dab of colour, rightly thrown in, so as to give the characteristic effect produced by any given detail in glancing at the *ensemble*, is more true to nature, more masterly, and more artistic, than an elaborate finish which is altogether out of scale.

In some of the recently exhibited works of modern English artists, this absence of truth has spoiled pictures that possessed elements of great merit. We see pretty women, in graceful attire, amid garden or woodland scenery. Look how faithfully the artist has laboured. Not only can you tell the very tint of the eye, the texture of the robes, the specific character of the gems worn as ornaments, but the class and order of any flower in the garden. The labour expended on these compositions, truthful as they are, if considered as diagrams, would, if rightly directed, have produced noble pictures. The appreciation of beauty is there, and the power of delineation, but the artist is ignorant of scale.

Nothing will more strikingly contrast with the enamel-like execution to which we refer as the rough sketches of a man of genius. Look, for example, at those of Gainsborough. It is not too much to say that this artist has produced works, especially in portraiture, of equal merit to those of any painter whatsoever. The “Parish Clerk,” for instance, may be advantageously compared, as to all that constitutes a noble and imaginative work of art, with almost any portrait of Van Dyck, of Rubens, or of Titian. But in Gainsborough’s landscapes there is the free, broad touch of the man who looked at nature, when the fresh breeze gives elasticity to the tread, and some slight dimness to the eye, and not under the roof of an academy. His sketches are yet more marvellous. There was one among a group in the possession of the late Dr. Monro, which merely gave a rustic peep, a tree and a hovel,—a donkey and a cart. That donkey, at the distance of the length of a large drawing-room, was *alive*. It did all but bray; and yet, when you came close, you could not distinguish either the eye or—still more essential feature—the ear. Some smudge or blot there was, but what you could not tell; nothing, it would seem, but an accidental mark; and yet, at a fit distance, the whole character and life of the animal had been thrown on paper in that hasty scrawl. A wonderful appreciation of the law of scale was one of the main elements of his grand artistic power.

One result of this view of the subject of scale is an explanation of the generally offensive character of photographic portraits. In the ordinary *carte de visite*, a full-length figure is reduced to from one-twentieth to one-thirtieth of its linear dimensions: that is to say, the area visible to the eye is reduced to the 1,400th, or even to the 1,900th part. In cases where the face alone is represented, we may reckon the reduction at a sixty-fourth. All the relations of light and shade are troubled by this reduction. We have neither the effect which is produced in nature by removal to a considerable distance, nor the effect which is produced in art by the miniature-painter or the gem-cutter, by the prominence instinctively given to the main traits of character.

We have something which has, indeed, perfect mechanical proportion, but which is neither natural nor artistic. It is like the geometric elevation of the architect or engineer,—a design drawn to scale,—a diagram, not a picture.

Photography can never contend with this fatal obstacle, when great reduction in size is made. And the reason why large photographs are so much more satisfactory than smaller ones thus becomes apparent. With the increase of reduction both the change of surface texture and the contrast between actual delineation and that of either nature or true art become greater. The admirable products of the camera, where size is little varied, are familiar to us all. So is the dissatisfaction produced,—we know not why,—by a reduction from which we might not unreasonably expect the most exquisite results. It is not the absolute dearth of beautiful faces to portray which makes the inspection of an album of photographic portraits so different from that of a drawer of gems or of medals. Art has her own province. She reigns supreme within her own precincts. Mechanism can do much, but cannot produce miniature. Perfect as a mechanic, the sun is inferior to man as an artist. Or rather he refuses to apply, under optical constraint, that power which, in simulating the subtle forces or organic chemistry, make beautiful the life of nature.

STREET ARCHITECTURE IN THE NEIGHBOURHOOD OF PICCADILLY.

SOME new shops and offices in Jernyn-street may be cited as an example of the common-sense style of street building, with no pretension, and little ornament, but that little well considered and well applied. The buildings comprise shops on the ground floor, with wide windows with lintel-heads, carried by heavy square pilasters, and offices in the upper stories. The main part of the building is of plain red brickwork, slightly relieved by bands of white, which, however, do not show very strongly now, and will, we fear, even be practically obliterated. The design is of the simplest possible kind; in the offices, long window openings, with round arched heads, are taken up through the first and second stories, the two floors being divided externally by a stone panel, ornamented with carved foliage of the elegant and flowing but symmetrical character which the architect, Mr. Truefitt, has usually adopted in his works: the heads of the windows above are filled with work of the same character. Above these the third-floor windows are decorated with ornamental iron balcony balustrades, somewhat after the French fashion; the keystone of the window arch below is worked so as to form a bracket and support for the centre of these balconies, in a somewhat novel manner. A string course divides off a perfectly plain attic, which is finished by a smaller string course, rather than cornice; the architect apparently regarding a marked projecting cornice as unsuitable for buildings in comparatively narrow streets. There is a good deal to be said in favour of this view; and there is no doubt that street buildings are often designed with cornices and enrichments at the top which, though they look well on paper, aid in shutting out valuable light, while at the same time their details and decorations are perfectly valueless from the position in which they are placed. We should have liked to see a rather heavier pier at the angle of the building on the ground-story, and also some kind of feature above to relieve the extreme plainness of the design at this corner, which can be seen from three different directions. While recognising the good taste and good sense displayed in the treatment of the building, we should stipulate for a little more varied skyline, a little more attempt at picturesque effect in grouping of windows, &c., in future new street buildings in the neighbourhood. Mr. Truefitt’s straight and plain attic, carried along the whole of Jernyn-street, would have a somewhat depressing effect on the mind’s eye.

This kind of charge, at least, cannot be brought against the tall, narrow block of building which has recently risen up in Piccadilly, not far from Burlington House, the specialties of which bring occasional passers by to a stand in the street to look and comment. These are the new premises of Messrs. Sotheman, Baer, & Co., publishers, built from the design of Messrs. Vanhagen & George, a drawing of which we incidentally noticed as among the architectural contributions to the International Exhibition. The architects

have aimed here at a striking and picturesque effect, for which the wide thoroughfare of Piccadilly affords excuse and opportunity. The style may be described as Gothic, of a modern type, and very freely treated, based upon the earlier Medieval style. Above the ground-floor (shop) window, long square-headed window openings are carried through the first floor, the piers between, decorated with small panels of foliage so placed in regard to the height of the openings, as to suggest the idea of an impost, though this feature in reality does not appear. The second-floor windows are deeply recessed, having a balcony before them with columns carrying the superstructure; it is this recess, and the appearance of the columns relieved against the dark shadow, which really gives force and picturesque interest to the front elevation, and one cannot help remarking how much such incidents of light and shadow in a building (not difficult to obtain), would do towards relieving our streets of their tame and monotonous aspect. The third story is occupied, in the piers between the lights, by panels filled with carved representations of scrolls, manuscripts, &c., and the date of erection; over these a dormer serves to break up the skyline and give point to the composition. There is a certain want of unity in the composition of the front; the various portions are not quite in keeping with each other; and some features, as the carved panels referred to in the lower piers, seem a little too accidentally placed. These defects do not belong to the return face of the building, up Swallow-street, which, on the whole, is architecturally the best portion, being simply and broadly treated, with rows of windows connected by bands of carved foliage, and with the spandrels of the pointed arches over them filled up with a wall-diaper. What, however, gives, in the eyes of most spectators, its individuality to this building, is the coloured decoration in the form of pictorial designs on tiles on the front and part of the side elevation. These comprise figure-subjects, about one-third life-size, designed in the flat conventional manner which the material renders necessary, but not without freedom of line and grace of composition. Immediately over the ground-story are allegorical figures, which do not completely explain themselves, but are evidently intended, in a general way, to represent emblematically the virtues and refinements which wait on the study of literature; these are in a low tone of cool colour. Above the first floor (which we must conclude to be one of the working departments of the establishment) are subjects in a somewhat warmer and stronger tone of colouring, representing in the half-realistic, half-emblematic manner we are becoming accustomed to in designs of this nature, the mechanical processes of book-making. Over the second-floor windows are carved portrait-heads, Shakespeare in the centre, and apparently Schiller and Dante at the sides, but that we never yet saw the latter represented with a man's face, though the general features seem to be those of the Florentine poet. While heartily commending such attempts to give increased life and interest to the exterior of our street buildings, let us be permitted to question whether the practice of representing outside a building the processes of the trade for which it is erected be not rather a weak and unnecessary form of decoration. Of the emblematic figures on the lower story we speak with approbation, for such subjects, even if the figures should not be drawn in first-rate style, suggest an interest beyond the mere material uses of the building, and by implication enable the purpose for which it is erected. But the idea of representing also the mechanical operations of the trade, which has frequently been suggested of late years in competitive designs, if not actually carried out, is in fact a reborn of times when people in general could not read, and required signs in what has been called "the universal language;" to give the information they wished for; in the present day this is certainly not necessary, and such external representations, we are obliged to confess, remind us too much of the drawings of animals which are fixed up outside the booth of a travelling menagerie, to indicate what may be seen inside. The principle is precisely the same, and we should like the matter to be reconsidered before our younger architects pledge themselves too much to the practice of style of decoration which has a little too much of the "childishness" characteristic of the Middle Ages to be quite suitable to our own. For the rest, we congratulate Messrs. Vaughan & George on having produced a building which is certainly in the

main an ornament to one of our great lines of thoroughfare, and shows a degree of originality and spirit which, with a little judicious tempering down, may provide better things in future. Messrs. Holland & Hannen, we may add, are the contractors for the work, which, so far as the stonework is concerned, has been exceedingly well carried out; the interior was not sufficiently forward at the time of making our notes to speak of in detail. The tiles referred to were supplied by Messrs. Powell, of Whitefriars; but whether they also supplied the design from the architects' instructions, or whether the latter were the *bona-fide* designers of the subjects, does not appear. The same architects are responsible for the design of a new house in Stratton-street, also displaying considerable originality of treatment. This likewise is a tall, narrow front, of red brick and stone. The upper part of this design is much the best; the width of the building is here occupied by three long arches, a centre one and two smaller side ones, running through two stories, and into which the windows are worked; the arches are connected by rows of panels between them at the impost level, and the gables above them covered with a diaper of small panels, with very rich effect. In the spandrels of the two side arches are life-size carved heads. The lower portion is less satisfactory; the balcony railings to some of the windows here are formed of miniature columns and capitals of "classic" proportions; these look out of keeping with the rest of the design, and more over in such a position and on such a scale have a most frail and insecure appearance. Over the ground-floor windows is a balcony formed of not very thick flags carried on light iron brackets beneath; upon this is built a stone bay-window, coming out as far as the front of the balcony, with nothing whatever under the flat soffit of the balcony to carry off the abruptness with which the feature is thus stuck on. This is a singularly unhappy mistake, which we hope the architects will not make again. The bay-window appears really to have nothing to stand upon; where there is stonework above such a point there should be stonework below, in the shape of corbelling, to carry it: the eye demands this; it is impossible to reconcile ourselves to the sight of the heavy bay and the light web of iron underneath which carries it. The openings on the ground story, too, are arranged without the slightest apparent reference to the width and position of those over them. The upper portion of the building is so good and solid-looking that this failure in the lower part is the more to be regretted as spoiling a good design. The interior is being finished in a solid, substantial manner with wainscoted walls, and a very pleasing and elegant wrought-iron stair-halustrade. We shall not be sorry to see other rebuildings of houses in the neighbourhood of Piccadilly, with the merits and without the faults of this design; and in the meantime are not unwilling to look kindly on such defects when accompanied by talent and originality, and an evident desire to improve on the dull and tame character of most of our existing metropolitan street architecture.

CHRISTIAN ART.

We have a book before us consisting of eleven essays on Art, originally delivered as lectures, during the winter and spring of 1871-2, at Winchester, Bradford, and Halifax.* The author's name will be recognised by some readers in connexion with a series of essays which appeared a little time ago in the *Contemporary Review*, under the title of "Ancilla Domini" wherein an effort was made, with considerable ability and learning, to define the true position and mission of modern art, as the handmaid and exponent of religious feeling, or rather of the author's own peculiar phase of religious feeling. Bearing this in mind, and that Mr. Tyrwhitt is a clergyman, and a friend and *élève* of Mr. Ruskin (who contributes a short and pleasantly characteristic preface), the reader will not be surprised to find that only one school of modern art is recognised as of any value; that Mr. Stanhope (among others) is a great painter; and that the value of a work is to be judged of by its appeal to our moral and religious feelings, rather than by its artistic power. The author, we admit, nowhere makes this last statement nakedly (in his introduction he says almost the

contrary), but it is what his art-principles will come to if reduced to their simplest form, and carried to their logical result. With this is some information, much good sense upon practical art-education, one or two really happy and original efforts of higher art-criticism, and an evidently sincere and genuine enthusiasm. The introductory chapter is occupied with general considerations on the use and value of art-culture, especially in supplying an outlet and scope for the better energies of those whose every-day business is not of an elevating nature, and in opening to the poorer classes, the uneducated at present, a vista of nobler and better enjoyments than are as yet open to them. "Art is a means to this end; that its pursuit gives peace, independence, the power of contemplation, and observation, and delight therein: in fact, it makes a man free in a world of his own." In connexion with this object, we may notice the practical suggestion that "to have art popularised, and made a means of culture for the people, it is practically necessary that it should be made to pay, and that, too, by the patronage of the people. . . . If you get beautiful things into the common market, you get them into common life, and then people begin to make progress from them. You want to get men into the art-world, because they will find comfort and culture there; and you must have accessible means for them. Their life is ugly, and you want it not to be so ugly. This is what our many art-schools and kindred societies want to do,—to get cheaply at the right sort of cup and platter, and wall-paper, and window-curtain, . . . to get the best work into the best place, or fullest circulation." And in connexion with art-education, Mr. Tyrwhitt, himself an old university student and lecturer, particularly urges that art should not only be represented in our universities, as it has (at last) got to be; but that it should be encouraged also by university prizes. This, which is, in fact, merely the application of common sense to the subject, is what we have again and again urged, and we hope yet to see it recognised that the power of appreciating the greatest productions of music and painting may be as valuable a part of higher intellectual culture as the power of translating and appreciating Sophocles and Pindar. There is much else that is well put and suggestive in this introductory chapter. Lecture II, on "Greek and Christian Art," gives, in a vivid, brilliant style, and in the main with much truth, the fundamental distinction between the two, as the art of bodily grace and beauty, and of spiritual expression, respectively. The author does not fail to see that in the earlier periods of Christian art (Byzantine especially), painting was, in reality, concerned much more with giving records and statements of facts and doctrines through the medium of drawing (of a sort), than with any striving after the realisation of beauty: the wide chasm existing between this and an art aiming at beauty (whether in conjunction with moral expression or not) should have been more clearly pointed out and discriminated; but the distinction is not so important in our author's eyes as it would be with a "secular" writer. Lecture III, deals, in a condensed form, with Italian art-history, giving some of the substance of what is to be found in a more extended form in larger works. One of the few references to architecture in the book, which occurs in this chapter, indicates that the author has something to learn on that head. After speaking of the round arch in Roman art, he adds,— "The Lombard or Saracen, or the latter first, or both of them together, pointed the arch like a lance-point, or the Norman noticed the intersections of his round arches; and he foliated it for symbolism of the Holy Trinity, and sometimes because he loved green leaves." We counsel Mr. Tyrwhitt, before another edition may be called for, to look up the *constructive* history of Gothic architecture a little, by the light of the most recent researches and criticisms, and he will expunge this little bit of nonsense. Lecture IV, is occupied by "Symbolism and the Grotesque," wherein, as may be expected, the author attaches far too much importance to the former, forgetting that its connexion with the art of painting was only necessary or advantageous in the pre-writing and pre-printing period. He admits that "the old traditional symbolism is thought of no more; though great works like Hunt's 'Scap-goat' and Schaeffer's 'Christus Consolator,' in some degree take its place." We had really hoped we had heard the last of the 'Scap-goat'; and the

* Christian Art and Symbolism, with some Hints on the Study of Landscape. By the Rev. R. St. John Tyrwhitt, London: Smith, Elder, & Co.

'Christna' is but a very theatrical affair, so deficient in genuine feeling that we really wonder at Mr. Tyrwhitt bringing it in as an example. In the same paragraph we read that if church decoration goes on in fresco and mosaic, there is no doubt that painters and sculptors "must and will go back to the ancient Craeco-Roman work of the catacombs and Christian sarcophagi for the original subjects which appeal from the Gospel to the Law." After this, it is alarming to be told that the feeling in favour of church decoration by fresco is "renewing itself vigorously." Looking at some of the developments in this direction, we should be more inclined to say that in them art has gone into its second childhood.

We can speak with much more sympathy of Mr. Tyrwhitt's lecture on Michelangelo and Raffaele; the critical characterisation of the latter (p. 147) is very good, and more impartial and reverent than we should have expected from a critic of our author's school. In regard to Michelangelo, and the place his genius occupied in the world of intellectual art, there is, we think, a grave mistake, which just now we pass over. The next chapter, on Dürer and Holbein, contains what we quite concur with Mr. Ruskin in thinking the best part of the book, the characterisation of Holbein and of the English whom he painted. The painter is regarded as the "great realist" of modern art, as Michelangelo is its great idealist. The chapter on landscape sketching is, we fear, not in reality so useful as it may appear at first sight. A good deal of it is only what has been said before, put into language which is a palpable (we do not say deliberate) imitation of a more distinguished writer's style, even to its defects of occasional mannered and rather affected colloquialism; and Mr. Ruskin's recipes for the beginner in landscape were, we think, of questionable value in their original form, and are no better coming second-hand through his disciple; and when "the two surviving Hunts, Mr. Brett, and Mr. Inebold" are named in a row as the best modern examples to be studied, this is only telling the student that he is to look at nature in the way in which Mr. Tyrwhitt and the particular school which he favours look at it; which is somewhat narrowing to the student's mind. A remark upon "character" is alike pithy and true. Character is the essence of sketching, he says, "and to say what that is comes to something like this: if you have to draw a fox and goose, the fox ought to look intensely foxy, and the goose intensely goosey; or, if your subject was a cat and a fiddle, the cat ought to be thoroughly feline, and the fiddle should express violinism in general." We would that all the painters who hang the walls of exhibitions with meaningless, characterless works, could get imbued with the principle somewhat quaintly expressed here. The essay on the poetry of landscape is not remarkable, and does not do justice to so very fertile and suggestive a subject; in the final one, on "Art, Craft, and Schools," are some very good remarks, especially on the haughty effect of incessant competing for prizes for dexterity of execution. "It will not do to have a number of senior pupils, especially ladies with great command of leisure, competing year after year in copying casts, and hatching and stippling their lives away, under the impression that they are studying art." It certainly will not do, and there is far too much of it in the places called art-schools, but which we should prefer to call drawing-schools, the word "art" having a much wider sense in reality. We should like to see some attention paid to this matter by those who rule over schools of this description. Appended to the lectures is a small memorial chart of the dates and origin of the principal schools of painting, which will be a useful help to the memory.

We have seen reason to speak with praise of a good deal in this book, and with respect of its author, but we do not the less believe that he is labouring under one very great mistake, which underlies all he has to say about art. He is persuaded that the highest object art can have is to minister to a particular phase of religious feeling. He is perfectly sincere in this, and we may take his word to be, what Mr. Ruskin describes it, "a true expression of the feelings with which a Christian gentleman of sense and learning should regard the art produced in ancient days by the dawn of the faiths which still guide his conduct and secure his peace." But when the said Christian gentleman wishes to draw everything within his own circle, and asks us to repudiate as comparatively valueless all that is without it, we must tell him that

thereby he is only further widening the gulf which separates many of his fellow-countrymen from sympathy with art, by thus inciting them to regard high art as a thing subservient to ecclesiastical Christianity. Mr. Tyrwhitt is, in fact, an apostle of the "great moral heresy" in art; for those who seek the beautiful only, he tells us, "their fall is prepared for them." This is a principle only true in one sense, and liable to be much abused. There is a degree of confusion, too, in his use of the term "Christian art," especially in reference to Michelangelo. He calls that artist the great Christian painter; and Michelangelo might be called so, in the sense that he was opposed to (superior to, if Mr. Tyrwhitt likes) the Paganism of his day. But Michelangelo was no Christian painter in the sense in which Messrs. Rossetti, Hunt, and Stanhope are said to be. His genius was essentially *Hebraistic* (in the wide sense in which the word has been used by Professor Arnold); he was no conventional decorator of shrines or illustrator of doctrines; his painting was simply the expression of the highest physical and moral grandeur which he could conceive and embody in painting. Rather than class him with the modern painters of sacred subjects as "Christian," we would say that he is "spiritual," they are "ecclesiastical." The difference is a wide and deep one indeed; and of the painters who think they can permanently attract mankind by allegorical frescoes of conventional saints and "adorations," we should say that, at least equally with the seekers after mere beauty, "their fall is prepared for them."

THE LONDON PUMPS AND IRON LADLES AGAIN.

OUR notice in the *Builder*, two or three weeks back, on the subject of the "London Pumps and Wells," seems to have obtained some little attention. In addition to this, it is to be noted that a "return" but recently issued shows, with not a few inaccuracies, the number of wells and accompanying pumps still open in the metropolis. It is a very curious matter indeed, and well worth the attention of those who are now so earnestly advocating the cause of temperance, and the putting down of public-houses, and artificial stimulating drinks. What is in store for the working man,—for we may presume the reform is to apply to but few else,—is the simple alternative between the London cistern-water, as supplied by the water companies, and the public-house drinking. Now, our position was, and is, that nothing can possibly be worse to the taste and palate than the hard, undrinkable, cistern, company's filtered water, with or without "organisms." This being so,—and no one can possibly gainsay it,—the pumps become not a little important. "Drink" being abolished, water must triumph. But from whence? There is but one answer,—from wells, either shallow or deep. The water must come from that great natural and perfect filter, the earth itself. Nothing in nature is so typical of purity, and clearness, and beauty, as the flowing water of a natural spring or well. All else may be "dirty" round it, but the water is pure and clean. In London there is dirt and mud enough, and smoke and fog enough, and there being no *art*, in its real sense, visible, would it not be quite an artistic, as well as a sanitary and health-giving thing, to have in London, every here and there, an open fountain or basin of pure spring water always flowing, if possible, but if not that, always ready by dint of pumping? Why, every dirt-hegged urchin would be clean if but the water were always at hand and flowing, and within reach. As it is, they go dirty. Lord Shaftesbury, at a late meeting of some ragged-school, said that "cleanliness being next to godliness, nothing more was needed to bring it about universally than no end of ragged-schools;" and very good things they are; but the water would still have to be got. We really, after a good deal of experience in the affairs, and doings, and *vents*, of Cockneydom, do not know of anything that could be done better by any philanthropist of the Peabody stamp than to go to work for the sake of others,—the whole London public,—and restore the London pumps and wells, properly sinking them out of the way of surface impurities, and adding to them.

It is wonderful what a patient mortal poor John Bull is. All his pumps have been taken from him by nobody seems to know whom, instead of putting them into a proper condition. Those

remaining are there by bappy accident. Some of them take strange fits. Let us name one or two noticed in the "returns" wherein the returning officer, by the way, who made note of it, does not seem to have seen after the pumps quite often enough to find out how they behave themselves. The "Exchange" pump is a variable pump: it was in full work a week back, it was dry yesterday. The Fenchurch-street pump, which, the return says, is now in full use, has been chained up and useless for a twelvemonth at least. We know it well. Butcher's-row pump, and a better once there could not be, has gone to grief within the last week. On Saturday night fortnight it was in active work; it has a large iron basin or tank under it, three parts full of water, and a large cool iron ladle, and a more practically useful and common-sense apparatus there cannot be. The Tower-bill pump has been very dry for a long, long time, but by miracle, or notice in the *Builder*, perhaps, is now all alive again, and vigorous pumping going on all day long! There is a little dripping drinking "fountain" beyond the reach of hoy or girl almost close to it—quite a design, for you must climb up to the basin to get at the tap, and wait patiently till the little dirty cup, not high enough for an infant, is full. We might go on and tell of a number of other pumps still only waiting for the public to insist on their being made again, useful and safe; but one other we must notice, and ask pardon for an error in which we inadvertently fell in our former notice. The pseudo-well, or slate-tank, with company's water, with its accompanying pump, in Dean's-yard, Westminster, is no longer available for utilitarian purposes. There is no water, so that the smart little apparatus (for it is coloured decoratively in quite an orthodox Gothic way) is now a mere "antiquity," and a mere but venerable relic of the past. A pump, with handle and basin, all complete, but no water, among so many thirsty scholars and noisy choristers!

But let us add a word or two by way of practical hint, in the happy event of the London pumps being made useful means of supplying to Londoners pure and refreshing water. The pumps, whether "monolithic" or "designs" or the good old shapeliness "pumps," we will suppose absolute necessities—for the well of water springing up to the earth's surface, and always full and running over, must be beyond imagination in these poverty-struck times, and in so needy a place as London! The pump, better than nothing—provided always, of course, that the source be not a cesspool. Under the pump there should always be, as in the Whitechapel pump, an iron or stone cistern sufficiently large to look at, at least, and deep enough to hold enough water to dabble your hands in, or for a poor dog to drink out of. Quite a novelty this, and a something to look at—the clear surface of the water down the length of a dull modern and improved street—a diamond in the brick-and-mortar desert. There is nothing, too, so good and useful as the old-fashioned iron ladle—a good large one, that will hold a quart of water, and of tough wrought-iron, that cannot be broken by either man or hoy. Another and indispensable requirement is the iron grating through which the waste water empties itself, and the drain under it, which should be so trapped as to be always full of water; thus all smell is avoided, and the pump can be approached without offence, for many is the unfortunate pump, innocent of harm, that has been sacrificed to the badly-constructed and untrapped drain close to it, and which, indeed, it helped to purify. Not the only thing in this world that has suffered from evil company, and neglect, and stupidity.

MR. FREDERICK MARRABLE, ARCHITECT.

THE death of Mr. Frederick Marrable, at the age of 54, will be heard of by many of our readers with equal surprise and regret. On Friday evening last we met him at dinner, and had a long conversation with him, which had in it more of feeling, or rather let us say sentiment, than he usually exhibited. On Saturday morning he left his house, in Avenue-road, Regent's Park, apparently in perfect health; went down to Witley, near Godalming, to inspect works at the Bethlehem Hospital for Convalescents there; and while talking to Mr. Pink, the builder, was seized with a fit. His decease was instant and painless. A medical man happened to pass within a very few minutes, and everything was done which kind-

ness and sympathy for his family could suggest, but in vain.

Mr. Marrable was a son of the late Sir Thos. Marrable, secretary to the Board of Green Cloth in the reigns of George IV. and William IV. If we mistake not, he served his articles with Mr. Rlore, and afterwards went abroad, as was then the usual way with students. On his return he built and altered various private houses and some churches, particularly a church at St. Leonards, near Hastings.

On the establishment of the Metropolitan Board of Works he was elected its Superintendent Architect, and during the time he held that office, designed and superintended the erection of the offices of the Board in Spring-gardens. In settling claims for compensation against the Board, Mr. Marrable displayed much skill, and after his retirement from the office he was much employed by the Board in the same capacity. Amongst his architectural works may be mentioned the Garrick Club House, an asylum at Stockwell, for the Asylum Board; St. Peter's Church at Deptford, of which we recently had occasion to speak; and Archbishop Tenison's Library in Leicester-square. We can personally testify to his honourable and kindly character. He was a thorough hater of all shams, but his desire and willingness to help those needing any services he could personally render will long be remembered by many. His independence and fearless conduct while architect to the Metropolitan Board of Works won him general esteem, and by his death the profession has lost a very distinguished member.

CONVERSAZIONE: ROYAL INSTITUTE OF BRITISH ARCHITECTS.

ROSALIND'S "Good plays prove the hotter by the help of good epilogues" seems to prove a sound quotable maxim. Sometimes, in truth, it is customary to present plays before limited audiences, and to further the circulation of few copies of books of the piece. But even in such cases, at the last shifting of the scenes, a larger number of spectators appear to take part with the actors, and Prospero are released by the help of good bands, and wafled homewards by the "gales of gentle breaths."

If well-greased actors are thus afforded a final appearance among their friends, by all good precedent the epilogue need only be happy in itself, connected, if at all, by merest almost imperceptible web-lines with things antecedent.

Such a last scene was arranged for by the Institute when the evening of Wednesday, June 26th, was appointed for the *conversazione* to terminate the 1871-72 session. The invitations brought together numerous members, and the due proportions of ladies and other guests. From about nine o'clock till midnight the building was well occupied by the more or less conversational groups usual at these reunions. The reception by Mr. T. H. Wyatt, president of the Institute, took place in the meeting-room,—necessarily savouring of many a bit of technicality to most members through "their remembrance of days foregone,"—albeit now well transformed, filled in parts with flowers, some in vases of Milton's modern majolica, and containing also mosaics, cabinets, glass, pottery, statuary, and paintings and drawings in oil and water. Among these may be mentioned Sir T. Lawrence's portrait of Sir J. Wyattville at work on his plans of Windsor Castle; Scenes in Italy, by E. A. Goodall; Portrait, by Mr. Charles Martin, of Mr. B. Hope, to be seen permanently hereafter on these walls,—the characteristic expression not missed, as is evidenced when the living original stands close by; paintings also by P. Calderon, F. Smallfield, D. Maciolo, Copley Fielding, Greuze, &c., and the now well-known dozen drawings of destroyed Paris by Mr. R. S. Spiers. There are also (by Copeland & Sons) Parian groups and figures; mosaics and table-glass by Salvati; modern French pottery imitating the old Ronen and other wares, exhibited by Mr. Oppenheim, in good quality, quantity, and variety; numerous gas standards and other examples of metal work by Hart, Son, & Peard; old Japanese (Satsuma ware) vases, with their pale grounds and vigorously-drawn subdued-tone flower painting, and other Japanese vases lent by Mr. Val. Prinsop. Messrs. Cillow have dark wood cabinets for sides and angles of rooms, their panels variously treated, some with gilt grounds and strong brown outlines and dead yellow figures, and anon with gilded leather and

sunk flowers and foliage in real colour. A drawing-room cabinet and a hanging wardrobe by Mr. H. Capel,—the latter designed by Mr. C. L. Estlake, and made very recognisable by insertion in the panels of varnished subjects from the Nursery Rhymes of Mr. H. S. Marks, A.R.A.; polished hard wood cabinet by Messrs. Hart; Japanese lacquer cabinet inlaid with tortoise shell,—a wonder of patient labour; much church plate; and an interesting collection of flagons and other small vessels in *gris de Flandres* were lent by Mr. Sidney Whiteford, all deserve notice.

In the library were illustrations of the arts of very early times in British pottery, &c.; the large urn, 17 in. diameter and 14 in. high, found in a cistvaen on the lands of the Marquis of Lothian, said to be the largest yet found,—not equalled in the British or Ashmolean Museums. These were lent by Mr. J. S. Phené, the antiquary whose energy and research may hereafter lead to valuable conclusions on the reptile-lumal and serpent-worship, and other works and customs of the early inhabitants of our country now hidden in mystery. The designs made by Sir Digby Wyatt for art-jewelry, exhibited at the International Exhibition by Howell, James, & Co.; terra-cotta hands (very ably) modelled by Rombillac (1695-1762), lent by Mr. E. Corbould; a quaint little Chinese tea-service, of nine pieces, in metal, with coloured enamels on sunk and engraved surfaces, lent by Mr. F. Leighton, R.A.; a large collection of photographs of the Acropolis at Athens, taken by Mr. W. J. Stillman, lent by Mr. Spiers; and the ivory-handled, richly-ornamented sword presented to Lord Napier of Magdala by the Corporation of London, "for his fortitude, skill, science, energy, and promptitude" shown in the Abyssinian war; may be mentioned as interesting for one reason or another.

Also paintings by E. George, an Associate of the Institute, and by Val. Prinsop; hand-painted tiles—children revelling in scenes of plenty in vintage and harvest, shown by Messrs. Brown, Westhead, & Co.; and others by Cox & Son, painted by C. Rossiter and J. Moyr Smith, with odd birds and fishes and grotesque humanities; certain hangings and tapestry, by R. Heilbronner; and church plate, designed by H. W. Lonsdale, B. J. Talbert, S. J. Nicholl, J. Jones, W. Butterfield, &c., and all made by Messrs. Cox & Son. Nor must the Oriental porcelain of all hues, sizes, and degrees of complexity, exhibited by Messrs. Farmer & Rogers, be forgotten; nor the immense Chinese *cloisonné* enamel metal ewer and basin (about 4 ft. diameter), also lent by them, though these and the other Chinese enamels, with their brighter and larger masses of colour, as usual just now, were regarded with some doubt by many an observer, apparently, when contrasted with the Japanese enamels and lacquered cabinets placed near at hand.

In the first lower gallery were shown paper-hangings by Messrs. Jeffreys & Co., designed by Mr. Owen Jones and Mr. W. Burges, set patterns, in subdued tones, enriching surfaces, without forcing the eye to see their forms and colours. And refreshments, satisfactorily served, at the ends of the two lower galleries, must of course be noted to convey anything like a *couleur de rose* impression of an English gathering.

The Coldstream Guards band, conducted by Mr. Frederick Godfrey, performed in the larger lower gallery selections of music during the evening. By the kind permission of Miss Leech, the exhibition of sketches, by her brother, was on view; a most remarkable collection in many ways. Political sketches, that have served to influence, and have now become a part of history made a long generation ago—when the *Builder* had only for a few years watched over and recorded the transactions of the Institute of Architects, mingled here with the first studies of the doings of Briggs, of the Brook-green hero, and of many other equally worthy persons whom we have known intimately since we first saw them years ago with the eyes of that kindly, unique humorist in the absolutely wonderful works of his matured skill.

Excursion of the Worcester Diocesan Architectural Society.—A project, long entertained by the committee of this Society, for an excursion along the Severn Valley, in order to visit the monastic ruins at Much Wenlock and Buildwas, has been successfully carried into effect by a party of about forty ladies and gentlemen, augmented by others who joined them on their way.

THE APPLICATION OF NATURAL LAWS

THERE is a ring of prophetic sadness in the words of Spenser when he speaks of the growth of children to men, and tells us how much is lost,—

"When neither heart nor eye,
Rose-wing'd delight, nor falling hope deceives;
When boyhood with quick thro' has ceased to spy
The dubious apple in the yellow leaves,
When springing from the couch where youth reposed
We find but deserts in the far-sought shore,
When the huge book of Fairy-land lies closed,
And those strong brazen clasps can yield no more."

Ariel has been released from material bondage, and with her have vanished some of the tenderest and most beautiful fancies of the past. The childhood of the world has gone by; and if our age does leave behind it any distinctive feature, it will be in its advance in science, in the faith, not of children, but of men; and yet in many of the early writers we can almost detect the struggle of nature, as it were, to manifest herself through science in the broken language of a child. Through the darkness of superstition which surrounded phenomena in earlier days, the glimmering of the day-star of modern discoveries could be seen,—at least, the herald of approaching day; and in return for the advantages a somewhat ungrateful generation has gathered from the stores of Nature, she only asks of us to apply her gifts,—to strive to understand her teaching, and to obey her laws. A retribution sometimes sudden, often terrible and destructive, awaits on those who disregard her warnings, trifle with her latent forces, or do not properly utilise her power.

Let us take for illustration, as a special question of the day, the natural purification of water. If it be true that rivers are the natural conduits for the water-supply of towns, the water of a river will be purified in its flow by the process of aeration for the use of man, and a portion of the rainfall, will natural filtration through the soil, will come forth again in the form of springs, or be reached by the means of wells, clear and limpid, for our use. Can we expect that the laws of nature will be perverted for our sake, if we empty a deadly poison into our rivers, or allow it to percolate through the earth to the purer waters of our springs? It is folly in a country like England, where our rivers are but as streams in comparison to those of other countries, to put a burden upon them too great for them to bear, or to suppose we can remedy by mechanical filtration the inevitable evils of such a course. When we are dealing with physical laws in ordinary cases—those, for instance, of forces—we are satisfied that only by certain causes certain results can be achieved; yet in another branch of science it would seem we are blind enough to suppose that we shall not reap as we have sown. Science has shown us that, as a consequence of this wilful disobedience to her laws, the seeds of preventible disease and death may be contained in the clearest and most sparkling water.

It is to be hoped that a further report upon the pollution of rivers, which we may shortly expect, will settle, at least, the question between the manufacturers and the public, who have to consume a portion of the refuse of their works.

The laws of nature, though different from the laws of man, if properly applied, contribute to his health and comfort, and even to the luxuries of his life. Over the decay which follows the creation of his hands, the craft of nature often weaves a veil of beauty. Age softens the outlines of his work, and paints with various shades of fungi and with mosses the monotonous colouring of his grandest buildings. The varied mineral components of the earth render the materials of construction more beautiful for his use, breaking up even the uniform surface of marbles with veins of colour, with delicately graduated tints and shadow. The trees themselves live and grow beautiful upon that which would be his death, and give to him again the produce of their growth, grained and painted as no hand of man can paint. But even as they fall to the ground beneath his stroke they obey a natural law, which only a madman would defy.

Few natural laws have been more neglected in their general application than those of colour, and in dress, especially, even they have their revenge, for they hold up to discerning eyes, in those most potent satire, the want of culture in those who outrage their harmonious laws. In this respect music has the advantage of painting, since its laws have long been studied upon known mathematical principles: of the laws of chromatics, especially relating to colour, we have much to learn.

If the simple and well-known rules for the juxtaposition of the complementary colours which renders more intense their brilliancy, and harmonises them with neutral tints, were carried out in their integrity, the glaring faults so often to be detected in decoration could never be perpetuated. It is easy enough to remember that if two of the three primary colours are mixed, the remaining colour is the complementary of the result; red being the complementary of green, blue of orange, orange-yellow of indigo, greenish yellow of violet. Those who have noticed the brilliancy of a scarlet geranium, and the corresponding intensity of its leaves, can understand how easy it is by approximation to enhance or depreciate the glory of colour. It is true, through recent experiments with light, that green has been claimed as a primary colour; and though the argument in support of it appears to be conclusive, it is not only directly opposed to the theory of previous writers upon this subject, but to the actual result of placing green in juxtaposition to red, for in no other combination of the complementary colours is the brilliancy of each so much increased as by the near relation of green to red. Only within the last few years a green has been discovered, and introduced upon the stage, which even in the yellow light of gas has all the prismatic brightness which it exhibits in the light of day, and in combination with red it has been the triumph of the pantomimes ever since.

When we remember how much we owe to colour, and how we can make beautiful by its proper application some of the commonest and most unsightly things around us; and in conjunction with curves how Nature elaborates her work in infinite variety by its use, we can but wonder at its neglect. BING GRAUD.

ENLARGEMENT OF THE GAILEY HOTEL AND RESTAURANT.

The hotel and restaurant which form a portion of the buildings in connexion with the Gailey Theatre, in the Strand, are about to be very considerably enlarged, by the addition of the premises, in Catherine-street, formerly occupied by the proprietors of the *Era* and the *Illustrated Times*, situated between the front part of the Gailey buildings and that portion in Catherine-street at the rear which is a part of the theatre. The premises in question, which have been purchased by the proprietors of the Gailey, are now being taken down, and on the site new buildings will be erected, uniform in their architectural elevation with the Catherine-street elevation of the Gailey next to the Strand. The frontage of the additional portion of the hotel about to be erected, which will extend to the spiral staircase or tower of the theatre in Catherine-street, is 58 ft. in length and 24 ft. in depth, giving an added area to the theatre and hotel block of about 1,400 square feet. The new buildings, which are intended to be carried to the full height of the present hotel elevation, will increase the size of the hotel to almost double its present capacity, and materially add to the architectural character and appearance of this portion of Catherine-street. When completed, the Catherine-street frontage of the hotel and theatre buildings, from the Strand to the rear, will be about 160 ft. in length, and the entire block will occupy an area of upwards of 9,600 square feet.

THE NEW GOODS WAREHOUSES AT BLACKFRIARS,

FOR THE MIDLAND AND GREAT NORTHERN COMPANIES.

A LARGE and extensive block of goods warehouses is now in course of erection at the Blackfriars Station by the London, Chatham, and Dover Railway Company, which are intended for the goods and merchandise traffic of the Midland and Great Northern Companies, in addition to the space which the two companies already occupy there for their goods and merchandise traffic. These warehouses, which, when completed, will be larger than any similar buildings in the metropolis, will involve an expenditure of upwards of 60,000. They are 270 ft. in length and 121 ft. in width, occupying an area of more than 3,600 square yards. The principal frontage of the building, which is in Green-walk, is 58 ft. 6 in. in height to the top of the parapet, and about 66 ft. to the roof, the elevation consisting of the ground-floor and three stories, in addition to the basement, which is 12 ft. below the

ground level. The materials used are yellow stock bricks, the piers being of white galf brick, whilst the window-sills and cornice are of stone. The ground-floor of the building is supported by 180 massive cast-iron pillars springing from the basement, upon which rest iron girders, and between the girders are turned iron arches, the whole supporting a substantial stone ground-floor. All the floors of the building are also supported by strong iron columns resting one upon another to the top of the building.

METROPOLITAN WATER-SUPPLY: CONSTANT SERVICE.

THE Board of Trade having prepared and passed a short Act to amend the Metropolitan Water Act, 1852, a new committee will on once be nominated, as provided for under clause 22, which recently failed by reason of the obscurity of its wording. We are sorry to learn that his Grace the Duke of Richmond may not now have time to undertake the duty, because as chairman of the Royal Commission which recently inquired into and reported upon "water-supply" the metropolitan water-supply question must be familiar to him, and his business habits are well known and highly appreciated. The Board of Trade may probably find a substitute for the Duke in Sir Charles Adderley, M.P., who, as chairman of the Royal Sanitary Commission, must be well up in water-supply questions. Mr. R. Rawlinson, C.B., and Captain Tyler, R.E., will, as before, "advise and assist" at the inquiry.

The inquiry will be as to constant service of water over the entire metropolitan area, and as to any necessary alterations or regulations in the supply-mains and house-fittings. It will be the duty of the committee to hear the several Water Companies, the Metropolitan Board, the City Corporation, and others, as to any proposed fittings and regulations.

LUNATIC ASYLUM COMPETITION, ST. ANN'S HEATH.

At the invitation of Mr. Thomas Holloway, who proposes to build, at his own cost, a lunatic asylum for the reduced middle classes, a limited number of architects have submitted designs, which are now before the intending donor. The conditions prescribe that the structure is to be simple and dignified, and to be designed in the style of the Geometrical period of Gothic architecture. The Cloth-hall at Ypres was pointed out as an excellent example of secular architecture of this date. The accommodation is to be for 200 patients; the cost, 40,000. The instructions were drawn out with considerable minuteness.

NEW BUILDINGS IN THE BOROUGH FOR THE MIDLAND RAILWAY COMPANY.

A VERY large and commodious building has for some time been in course of erection in High-street, in the Borough, and is intended as an extensive receiving house and goods-depot for the Midland Railway Company. The main elevation of the building is 67 ft. 6 in. in length, to High-street, and 54 ft. in height, to the top of the parapet, extending backwards to a depth of 43 ft., exclusive of a spacious shed or goods-depot in the rear. Beyond this, again, at the extreme back of the premises, there is stabling for thirty-six horses, the stables being on two floors,—namely, on the ground-floor and a story above, the upper stables being reached by an incline.

The building, which is four stories in height, is constructed of red patent bricks, with Bath stone window-dressings, cornice, and chimney-caps, and pilasters and piers of fine Derby stone, from the Matlock Quarries. Each story above the ground-floor contains four large and handsome triplet windows, the first-story windows being segment-headed, the second circular, and the third elliptical. The shed or depot at the rear of the building, for the receipt and dispatch of goods, is 138 ft. by 67 ft., containing an area of upwards of 9,000 ft., upon which a large stage or flooring has been erected, about 3 ft. above the ground-floor level, fitted with four powerful cranes, for receiving and despatching goods. This shed is covered in with a handsome roof, composed of glass and iron. The west portion of the ground-floor frontage of the building, in High-street, will be set apart as receiving-

offices, whilst the eastern portion will be let off as shops. The upper stories, which contain a large number of apartments, will be used as offices and storage-rooms, in connexion with the business of the company. The premises are rapidly approaching completion, and are expected to be ready for opening in about a month from the present time. The estimated cost of the structure is 15,000. It has been erected from designs by Mr. J. H. Sanders, of Derby; the architect to the company, Mr. W. R. Gill, of the Polygon, St. Pancras, being the contractor.

THE BETHNAL-GREEN MUSEUM.

Our readers know of all the steps that led to the foundation of the Bethnal-green Branch of the South Kensington Museum. In our last year's volume * we gave a view and plan of the building as then in progress, and more recently we described the structure. Our illustrations show in the front a library on one side of the museum proper, refreshment-rooms and house on the other, with corridors and a clock tower. These, however, have not yet been erected so that the design as a whole cannot be rightly judged of. But even as it is, we must dissent from the critics of the daily press, who pronounce it "dreary and most unartistic." We have no hesitation in saying that it is an excellent piece of brick construction—the design fitting and appropriate. It has been built under the direction of General Scott, from the drawings of Mr. James Wild, architect; Messrs. Perry & Co. were the contractors; the means of ingress and egress will need revision. On Monday last when it was opened, as every one now knows, by H.R.H. the Prince of Wales, the want of other doors besides the one in the entrance-front was greatly felt. The Eastern districts of London were never so gay before as they were on that day; and they might well rejoice, for there, in their midst, has been placed a source of delight, and a means of culture which will surely, even if slowly, work its good way,—an evangelist of art, elevation, and happiness. Nothing occurred to dim the brightness of the day. The Prince and Princess won all hearts by their unaffected geniality, and next to them in popular estimation stood, and rightly, Sir Richard Wallace, who has deposited here his priceless collection of pictures and other works of art, which, beyond the gratification they will afford to the thousands residing in the neighbourhood, will have the good effect of taking the West-end to the East, and making London better acquainted with itself. There are sad sights to be seen in Bethnal-green. Behind the bright bunting and joyful inscriptions of that sunshiny Monday we could have shown the Prince dens filled with festering humanity, which point to direful evils needing reform. The new Museum will help to bring about a change for the better, and we hail with joy its erection. We will make our readers acquainted with its contents before long.

ARCHITECTURAL ASSOCIATION OF IRELAND.

A GENERAL meeting of this Association was held at 212, Great Brunswick-street, Dublin, on the 20th inst. Mr. Jas. H. Owen, B.A., in the chair. The provisional secretaries then reported that several gentlemen had sent in their names since the last meeting.

A letter from Mr. Thomas Drew, R.H.A., was read, in which he said:—

"It has been with the greatest satisfaction and interest I have watched the inauguration of this movement; it is an evidence that all life and energy for improvement is not extinct among us, which I have long hoped for. As I am not enabled to be an active member of the Architectural Association of London, I have been sufficiently intimate with some of the younger and more active spirits in that body to have brought home to me at what an immeasurable disadvantage 'the coming men' of the profession stand here as compared with their London brethren, who have extraordinary advantages now. The present situation is not what it should be. A few persons here are aware what kind of competitors the high standard of education the London school affords is preparing for us, and will take extraordinary exertion on our part if with all our disadvantages we are able decently to hold our own, and send even an occasional Irish genius to the front.

I think the movement comes from the right direction, from the spontaneous desire of the younger men of our profession, inaugurated by the Institute (Irish), and nursed by it, such a movement could not have one-half the healthy vitality. The Institute has proved and very distinctly, the utility of its own, and deserves the support of the younger members of the profession. Had it no existence 'the coming men,' when they did come to the front would find that they had embarked in a profession or

* Vol. xxix, pp. 46, 47, 48.

calling very unsatisfactory to make a living by, and neither respectable nor respected."

A letter was also read from Mr. C. G. Doran, Queenstown, county Cork, in which the following passage occurs:—

"The association which you are now engaged in establishing will, I hope, lead the way to many good results. Amongst them may safely be reckoned one that has been overlooked by the architectural profession for the last three centuries. It is the encouragement and recognition of those classes to whom the architect's designs are entrusted for execution.

In the Middle Ages, the cloister of the monk, the study of the architect, and the scaffold of the mason were frequently occupied by the same person, and the models of architectural skill remaining to-day bear testimony to the excellent working of the combination. But in latter years, when design and execution were transferred to different hands, the harmony of parts was not quite so successful. Why it was not is easily explained. The designer neglected to encourage the craftsman, at whose hands the special features of his picture awaited development, and the craftsman in return 'machined' the design without infusing into it either feeling or spirit; the result being the absence of those happy effects which only mutual understanding could blend together."

Mr. J. J. O'Callaghan, F.R.I.A., was elected president, and the following gentlemen were chosen to form the committee:—Messrs. W. P. Ryan, W. G. Doolin, jun., Dan. J. Freeman, Thos. H. Longfield, Engene S. O'Callaghan, A. W. Robinson, R. S. Swan, John L. Robinson, and W. Butler. The committee as elected then nominated Messrs. T. H. Longfield and John L. Robinson, secretaries; J. D. Freeman, treasurer; and Messrs. W. Mitchell and C. H. Brien, auditors. The general meeting then confirmed their election.

The first session will commence early in October, when the President will deliver his inaugural address. Intending members are requested to send in their names as soon as possible. Forty names have been already received.

A NEW PUBLIC HALL IN KENSINGTON.

The Kensington Vestry have considered the report of a special committee appointed to deliberate upon the advisability of creating a public hall for holding meetings of the Vestry, &c. The committee reported that there were three sites in view, the present site, which was consecrated ground, the National Schools next door, now for sale, and a plot of land, opposite the Kensington (High-street) railway station. The committee believed there were legal difficulties in the way of enlarging the present Vestry-hall. As to the site of the National Schools, the frontage being 96 ft., and the superficial area, 6,263 ft., the committee considered the price asked (8,000l.) too high. The third site had a frontage of 50 ft., and a depth of 140 ft.; and the price was 5,500l., the superficial area being 8,000 ft. The committee, therefore, recommend this last site as the most eligible. Decision was postponed.

FIRE-RESISTING CONSTRUCTION.

At the ordinary general meeting of the Architectural Association, held on Friday evening, the 21st inst., a paper was read, by Mr. R. W. Edis, F.S.A., on "The Paris Fires," being a somewhat amplified statement of the data and conclusions as to fire-resisting construction, given in the paper read at the recent Conference, and noticed at p. 478 of the *Builder*. Mr. Edis insisted especially on the peculiar nature of the fires, on their being carefully planned, assisted, and allowed to obtain away without attempts at suppression. The conditions of the tests were most severe,—unprecedented, and, as he hoped, not likely to be imitated; but he considered that the experience they had supplied was not without its value,—enforcing in great cities, and the value of isolation districts, of blocks of buildings, and of complete separation of single structures, as well as the more obvious lesson with which he had then to deal; that increased attention is needed, and should be given, to the materials of which buildings are composed. Especially in monumental buildings, permanence, in spite of adverse influences, is a fundamental condition of real success; and this permanence is jeopardised by many of the materials and methods of construction now in common use.

Mr. Edmund Sharpe, on being called on by the chairman, said that, although only lately returned from Paris, he had not given careful study to the illustrations of imperfect resistance of the effects of fire, that Mr. Edis and Mr. Spiers had found on special search among the ruins in that city. He considered that the

researches of those gentlemen had been of much value; indeed (as far as he knew), the lessons taught by the disasters at Paris had been learned and stated in definite and intelligible terms only by them. Mr. Edis's observations, made before the fires were quite extinguished, supplied many new facts; samples of roughest practical tests of modern building appliances, supporting, no doubt, the general conclusions he had drawn. "Fire-proof building" had not maintained its character in face of deliberate incendiarism, and of the spread of destruction from artificially-created mountains of flame. But perhaps this might always have been expected, if such circumstances could have been imagined. Nobody had ever looked for endurance under all conditions. The materials available,—especially where restriction of the areas of bearing-piers is all-important, as in modern Western cities,—could not be expected to stand a temperature sufficient to overcome the cohesion of their particles, or to change the elements in their composition. His mind, however, he found habitually considering the real improvement on wooden floors and staircases, effected by the use of non-combustible iron, concrete, and stone. These were in no case perfect,—could not afford absolute security and permanence. Still, in the limitation of the quantity of inflammable material preventing the breaking out of many fires, and in the (at any rate) temporary localisation of a fire once started, the value of such constructions was constantly seen, as also in the actual preservation of life by affording prolonged opportunity for escape. A stone staircase may not eventually escape entire ruin; but a wooden one will probably be a mass of flame licking devouringly into every story of a house, long before the inmates, in the other case, have found any risk in descending their stone staircases. This led to an inquiry as to the effect of the Paris fires on other than calcareous stones, Mr. Sharpe suggesting that the ruin from calcination of the limestone could surprise no one; but that the black volcanic lava of Volvic (Puy-le-Dome, Auvergne), so largely used for the Paris *crochairs*, and for staircases in some parts of France, should have proved more truly fire-resisting. After describing the quarries situated a few miles from Riom, from careful personal inspection, as a solidified lava-stream that issued from the extinct crater called Puy de la Nugère, worked in Mediaeval times, used in the erection of the churches at Clermont, &c., he went on to say that these quarries furnished immense blocks capable of being split with wedges into slabs, &c. He had often thought that for staircases and similar purposes, this lava,—this slender-like, intensely hard material,—was most suitable on many grounds. He was not prepared with any results of practical tests, but thought that as it is clear that stones other than limestones should be used for staircases, for the jambs of iron doors, and similar purposes, the strength when heated, and the behavior under fire and water, of such volcanic products (molten masses cooled) deserved investigation, as well as that of the hard sandstones and gritstones. The millstone grit he knew was capable of standing, without injury, very considerable heat, if gradually applied.

Mr. R. P. Spiers said that the destruction wrought in stone vestibules, almost without furniture, was one of the most curious problems in the Paris fires. A peculiar blue colour on their walls had been attributed to petroleum, filling the space with flames and masses of vapour. Several French architects to whom he had spoken on the subject were of opinion that the unflammable nature of the materials used in modern Paris had largely prevented the spread of fire, even though, as he had stated, much stone architecture had itself been so helplessly ruined. As an example of the limitation of the effects of fire, he might instance the Galerie de Diane at the Tuilleries, where, at the time of making his drawing, in October, 1871, he found the floors erected within the last few years standing on each story (iron girders, filled in between and protected with concrete), while the older portions adjoining were burnt through from ground to roof.

Mr. J. D. Mathews wished for a complete isolation of each floor, in buildings of large area, by a set of fire-proof lobbies, leading to the continuous staircase. The use of iron was, he thought, absolutely beyond the region of choice in valuable City sites: architects were compelled to use it. Could not some solid non-conductor, in the nature of a very thick paint, be applied to the surfaces of iron,—to answer

decorative and protective purposes at once? He could not feel much real satisfaction in lath and plaster casings of important construction. Stone steps, supported only by talling into walls, should be abandoned universally; he thought they had been much less used of late years.

Mr. R. Plumbe, the chairman, mentioned the case of the New York Exhibition Building, of which he had witnessed the destruction years ago. The furniture caught fire, and in less than half an hour, in consequence of the elongation of the ties, the building was a ruin. The same results, from similar causes, at the Sydenham Crystal Palace, everybody would remember. Unless some method of construction can be devised, deprived of the destructive tendencies lurking in all ordinary iron buildings, the non-combustible character of that material must be considered as really of comparatively little importance. With reference to the protective power of plaster, he could give a personal experience, at Kesterton's coach factories, Long-acre, where a remarkable fire occurred some years ago. A brick wall, unplastered, he found split completely up its centre, and on the point of falling. Similar work, covered with two coats of plaster, exposed to similar fire, he cut into, and found in perfect condition. At least half an inch of plaster should cover the surfaces of brick walls, in order to prevent the destructive effects of fire on them. Yet brick he considered comparatively trustworthy; but our Portland and Bath stones are as bad as the Paris stone (*calcaire grassin*). One large London contractor uses his refuse Portland stone for ceilings, obtaining from it a most beautiful lime. For stairs and such purposes, Mr. Plumbe said he wished to see terra-cotta and artificial stones more frequently used.

Mr. Edis, in replying to the vote of thanks accorded to him, said that he had been informed that manufactured stone of flint and sand artificially compacted had absolutely stood severe fires, and had been found not to disintegrate under sudden cooling by water.

CONVALESCENT HOME, AT HIGHGATE.

SIR SIDNEY WATERLOW has done a good thing. Having bought a fine old mansion (Lauderdale House), of great historic interest, at Highgate, he has converted it into a convalescent home, and conveyed it for a period of seven years to the Almoners of St. Bartholomew's, to be used by the male patients of that hospital. There are thirty-four beds. The wards are airy and cheerful, and replete with every accommodation. It is a most charming place, with lovely terrace grounds, croquet grounds, and flower and kitchen gardens, commanding fine views over London to the Surrey hills. Sir Sidney Waterlow has entirely remodelled the building, fitted it with every appliance for the purpose to which it is appropriated, first-rate fixed and movable baths, excellent bedding, linen, crockery, and so forth; while another nobleman has given 300 books for the amusement of the patients, and Mr. Foster White adorns the walls with prints and chromes. Altogether, it is a very handsome present, and the gift is the more gracious as Lauderdale House is adjoining Fairseat, Sir Sidney's own residence; and his first intention in purchasing the property was to improve and enlarge his own grounds. It is expected that the Prince of Wales will open the "Home."

WATERWORKS AND RESERVOIRS.

The New Waterworks at Leicester.—On Saturday before last, about 150 students of the Institution of Civil Engineers accepted an invitation of their president, Mr. Hawksley, to inspect a part of these works, which were designed and carried out by that gentleman. The reservoir at Bradgate is nearly a mile in length, and at its broadest part about half a mile wide. The greatest depth is 38 ft.; but it has been so constructed that it can easily, it is said, bear the strain of an additional 2½ ft. of water which might, in case of violent rain, rush into it. The embankment, which has thus cut off the natural course of the water, and converted a valley into a lake, is made of enormous strength. It was first constructed of a mixture of silicious sand and clay; but as small streams of water were perceived to trickle through, it was found necessary to dig to a depth of 40 ft. below the surface, to make a puddle well, the whole embankment now rising some 50 ft. above the ground, and carrying on its summit the public road from Leicester to

Charnwood Forest. The hyvash, by which the surplus water is carried off into the natural bed of the brook, has been constructed with an eye to beauty as well as use. The four large filter beds to which the water is conducted from the reservoirs are also of a somewhat ornamental character. They are covered at the bottom with a thick layer of silicious sand from the river Trent, by slowly filtering through which nearly all impurities are removed, and the water loses its original brown colour. By a tank in each bed, the surface of the sand, when it has become thoroughly charged with impurity, and has assumed a dark green colour, can be washed and cleaned without leaving the beds. After clarification, the water is pumped up by two double-cylinder expansive steam-engines, each of 80-horse power, erected by Messrs. Nielson, Brothers, of Glasgow. The building in which they are placed is designed in the Mediaeval style, the chimney being concealed by a tower. The watershed is calculated at between 11 and 12 square miles, with an average rainfall of about 29 in. But even the minimum of 8 in. furnishes a daily quantity of four million gallons, which, at the rate of 20 gallons for each person, would supply 200,000 people. The engines pump 1,200 gallons per minute direct into the main conduit pipes, which are about 16 miles in length, although one service reservoir is already constructed, and a second is in course of completion, each of which can contain two million gallons. The Thornton reservoir is sufficiently large to supply the wants of the population should any accident to the pipes or machinery of the Bridgegate works temporarily stop the flow from that quarter. Mr. Hawkesley, Mr. Wyatt, Major-general Scott, Dr. Letheby, Messrs. Pell & Hoygate, the two county members; Mr. Ellis, the chairman of the company; and Mr. Stafford, the mayor of Leicester, were of the party.

Bursting of a Reservoir near Macclesfield.—One of the innumerable accidents resulting from recent thunderstorms was the bursting of a reservoir in Hnrdsfield. The reservoirs (better known by the name of Adshead's pools) are situated at the bottom of the Eastford and Ecton Hills. The water rushed down them at a terrific force, and after overflowing the first reservoir, the main embankment gave way, and the flood swept through the gardens and fields adjoining, flooding the houses in the immediate vicinity, and leaving the most valuable portion of a dye-works, which the reservoir supplied, in *tabris*. Passing on, the flood settled on the farm of Mr. Beard, doing considerable damage to the crops and outbuildings. Near Macclesfield, too, about forty yards of the canal gave way, and the water rushed out with great force, submerging a bridge and several gardens, besides flooding many houses.

Bermondsey.—The insufficient supply of water afforded to the district of Bermondsey by the Southwark and Vauxhall Water Company is creating a stir, and has induced the inhabitants to appeal at once to the Board of Trade, a body which, under a recent Act, is empowered to bring its influence to bear upon the water companies, with a view to satisfy the public requirements.

THE FEMALE SCHOOL OF ART.

On Friday afternoon, the 21st, the Egyptian Hall in the Mansion House was crowded with pupils and their friends, and the Lord Mayor took the chair, with the view of presenting the prizes to the successful competitors.

Professor Donaldson read the annual report, which stated that while in 1870 the largest number of pupils was 155, last year it was 170. This was the only school of art in the kingdom where the instruction was given entirely by female teachers, and the warmest thanks of the committee were tendered to the superintendent and her colleagues. The national awards at South Kensington were open to all the 114 schools of art in the kingdom, numbering 20,255 students, and 61,608 works were selected for the competition. The prizes were only ninety in number, and four were allotted to pupils of the institution. The Queen's Scholarship, of the value of 30l., had been won by Miss Julia Pocock, and her Majesty's prize medal by Miss Mary W. Webb; and the Queen had been pleased to express her satisfaction with the paintings of those pupils. The prize for the best notes of the paintings in the Exhibition of Old Masters had been adjudged to Miss Emily Austin, who also gained the silver national medal. The Gilchrist prizes were awarded to Misses Webb, Coffey, Austin, Ircson, and Rae; Dr. Hicks's prize of

5l. 5s., for the best fan design, went to Miss Ellis; and rewards for designs for playing-cards to Miss West. Two more students had obtained permanent employment in tile-painting at Messrs. Simpson's, who now employed six students from the school.

The Lord Mayor having presented the prizes, about 100 in number, the adoption of the report was moved by Mr. Horsley, R.A., who mentioned that in 1871 upwards of 110,000 works from British schools of art were sent for inspection and examination to South Kensington, and that this year there had been 129,000; and bore testimony to the great and deserved success of the institution, to the ability and energy of the lady teachers, and to the rapid progress of the pupils.

Sir John Bennett, who, it was announced, had offered to present a gold watch for the best design for the ornamentation of watches, dwelt upon the great benefits that might be conferred upon the country if women possessed a practical knowledge of the fine arts, and upon the disheartening fact that England, in some of its artistic manufactures, was being continually beaten by other countries, especially Belgium. He hoped that, before long, by the instrumentality of such institutions as the Female School of Art, this reproach would not exist.

Mr. Burchett spoke of the feeling with which the decoration of St. Paul's was regarded as an evidence of revival of art interest.

Mr. Bennoch proposed a vote of thanks to the managers, which was seconded by Mr. Godwin, who said that in the Mansion House of the richest city in the world there were no pictures on the walls. It was lamentable to contemplate. He hoped the present Lord Mayor would turn his attention to it. We wanted mural paintings. He hoped that St. Paul's would not be left to decorators at 30s. a week, but be made the opportunity for obtaining the highest art England could produce.

The Lord Mayor said he had felt for some time how desirable it was that something should be done to obtain great pictures for the Mansion House, and he had suggested to the Corporation, some years back, the advantage of having high-class pictures by eminent artists in the Mansion House, not only as an encouragement to native talent, but as some means of advancing the artistic taste of the nation.

With reference to the work of the school, which has been recently before the examiners, we are glad to be able to announce that the National Gold Medal has been awarded to Miss Emily Selous (now Mrs. Fennessey), for an admirable statuette of Cimalue; and the National Silver Medal to Miss Julia Pocock.

THE CHURCH SPIRE, BAMPTON.

In the case of the injury to the spire of the newly-restored church by lightning, the Sun Fire Office Company at once repudiated all liability thereunder for damage caused by concussion of lightning. They, however, despatched a surveyor, who inspected the spire and made his report. Subsequently, at a public meeting held at the Town-hall, Mr. Skinner laid on the table a letter from the managers of the Company, in which, although reiterating their repudiation of liability, they offered a donation of 200l. towards the expense of rebuilding. The amount of this offer was based upon a report of Mr. Christian, the architect, who fixed the probable amount of the cost of repairing the spire at from 200l. to 250l. This liberal present took the meeting by surprise, and a hearty vote of thanks was passed amid the greatest acclamation. The cost of repairing the damage will, it is understood, be under 200l., owing to the acceptance of a tender sent in by Mr. Frith, of Coventry, who performs the work without ordinary scaffolding or ladders. The repair is now being rapidly proceeded with.

HOSPITAL CONSTRUCTION.

At the last annual meeting of the British Medical Association, Mr. Henry Greenway, M.R.C.S., Plymouth, read a paper on "A New Mode of Hospital Construction." We print the pith of it as matter for consideration:—

Many will remember the able address "On the Construction of Hospitals," delivered by Captain Galton, in 1869, and the interesting discussion thereon. Having myself been present on that occasion, I was much impressed with the subject, and was led to devise a plan whereby I hoped to secure the advantages of a large

hospital without its dangers, and the safety of the lute system without its inconveniences.

The portion of the hospital allotted to patients consists of one or more substantial plain masonry buildings, not more than two stories high, and of any required length, according to the number of beds. The floor of each flat or story is to be waterproof. I first proposed glass and iron as suitable materials; and I would now also suggest glazed tiles, or wood covered with best Vieille Montagne zinc, or with sheet-lead, if there were no objections against the use of that metal, as it would also afford a very dead sound when walked on. Within each story, and extending nearly from end to end, is a block of compartments made of glass, fixed in iron framework. The block is divided longitudinally by a central glass partition, thus forming two rows of compartments, placed back to back, each compartment being 10 ft. square, 12 ft. high in front, and 17 ft. at the back (the central partition), thus causing its ceiling to be on an incline. The space on each side of the flat, between the fronts of these compartments and the main wall, forms a corridor, 7 ft. wide, its ceiling being likewise of glass. Into these corridors the compartments open. Each compartment receives its supply of air from a large tube which passes through the masonry wall, then across and underneath the corridor and the compartment; the air issuing from the floor of the latter through a long iron grating, which may run either transversely or from before backwards. This tube will be furnished with a valve to prevent excessive draught from high winds. The tops of the double row of compartments unite to form a flat ridge, 2 ft. wide. From this ridge, over each transverse pair of compartments, rises a flue, made of metal or of glass, in iron framework, which leads from the interior of the compartments to the outside of the roof. To prevent the possibility of foul air passing from the top of one compartment into the other, the flue is divided longitudinally by a partition, so as to form two flues; the area of each (beneath the roof) being 4 ft. by 9 in., the partition being continuous with the back wall of the compartments. Through these flues the outlet of foul air takes place. In order to insure an upward draught from the floors of the compartments, the air within the flues will be heated by a hot-water appliance in one of two ways:—1. By placing around the flue, a short distance above the ridge of the compartments, a "jacket" (part of a system which would extend underneath the roof over all the compartments); or 2. By passing a pipe, having an oval bore, through the flues, dividing the partition horizontally, the pipe itself thus forming a part of the partition, as seen in fig. 1. The latter plan is more simple, and would prove more efficient. In the main wall there is a large sash-window opposite each compartment, which gives light to the corridor and compartment. Outside each window is a small balcony for conducting window-gardening. On each side of the door of the compartment is fixed a pleasing transparency, such as a landscape. The corridors can be subdivided by a series of self-closing glass doors, so as to form ante-rooms to the compartments. A proper temperature will be maintained by means of hot-water pipes; the water being heated by a gas-furnace, or by asbestos rendered incandescent in a gas-furnace, thus insuring a constant supply of heat, easily regulated. The compartments will be illuminated at night by transmitted light from the corridors. At each end of the flat are placed the usual "ward-offices," and they are separated from the patients' compartments by a transverse corridor, which unites the side corridors. Doors furnished with springs are placed in the passages leading to the bath-rooms, &c., to prevent effluvia entering the corridors. The nurses' rooms are so placed that the nurse may be able to see the patients through either row of transparent compartments; and if a patient on any emergency require the nurse's attendance, by pulling a string he would ring a bell, and at the same time cause a signal to project from the front of the compartment, thus directing the nurse to the proper quarter. As the "ward-offices" not only extend across the ends of the flats, but project on each side of the building, the ground-plan of this portion of the hospital would somewhat resemble the letter I. The roof of the building to be of the ordinary kind, but furnished with skylights. The expense of such a building of one story for twenty beds has been estimated by an able Plymouth architect (Mr. James Hino) at about 3,000l., or 150l. a bed.

In the opinion of our best authorities, one-

story hospitals are the most desirable, and no hospital should be more than two stories high. I have made no allusion to administrative buildings, as they may be carried out according to taste. I have also abstained from entering into certain matters of detail.

The drawings here exhibited are from the office of Mr. Hine (the engravings are reduced copies). The first is that of a transverse section of a one-story building, or of the upper of two stories; the second is a plan of a story with twenty compartments (ten in each row), and offices at each end. The corridor on one side is shown subdivided into anterooms, the folding-doors being shut. If a building were constructed for a much longer block of compartments on one flat, then the block should be intersected by a cross passage, for the sake of convenience. The plan represents the building as isolated; but it would be connected with the administrative, and, if necessary, other detached portions of the hospital, by means of corridors or covered bridges.

The following are some of the advantages gained by the above plan, and they have been considered unattainable by any other at present in existence. Each patient has the enjoyment of his own special supply of atmospheric air, uncontaminated by exhalations from his neighbour. The supply is also being constantly renewed. The compartments being made of glass, no absorption of morbid product, or of emanations which may eventually become injurious (I refer to those particles which produce the well-known odour peculiar even to our best surgical wards),—no absorption, I say, can take place in their walls, and, by occasionally washing them with water, they will for ever retain their purity. There will be no danger on the score of fire. As the patient lies in his bed, he sees not the transparencies, but can look through his glass door, and across the corridor, at the little garden outside the window. He has also the advantage of an apartment to himself, thus avoiding the unpleasantness often felt in associating with strangers, whose company may possibly be deemed undesirable; also, he would not be so shocked by death occurring around him. Although thus isolated, he would not feel lonely, as he would see those around him, and, with a moderate amount of voice, could, if he were inclined, converse with his neighbour. The patient, although plentifully supplied with air, is not exposed to a draught, as the under surface of the bed acts as a screen. Patients not confined to their beds, and having no infection, may be allowed to associate and take their meals in the corridors during the day. The medical attendant or nurse, before entering the compartment of an infected patient, would see that the doors in that portion of the corridor immediately adjoining were closed. Any escape of infected air would then pass out through the open sash-window, and not be distributed through the whole corridor. If occasion required, as in the event of a patient fainting, an extra supply of air could be gained by throwing open the compartment-door and the sash-window, the corridor-doors remaining closed. Rules would be laid down as to the subdivision of the corridors during certain parts of the day.

It has been considered by Inspector-General Smart and other medical officers of large hospitals, that my plan of placing the compartments is far superior to the grouping them on the two sides of the area, leaving a central corridor. With a corridor between the fronts of the compartments and the main wall, the compartments are not exposed to extreme heat or cold, and those patients who are permitted to leave their beds have the advantage of a cheerful promenade or lounge. The greater portion of the glass to be used in the construction of the compartment will not be stouter than ordinary window-glass, and need not be transparent; but transparent glass, of good quality, should be employed in a small portion of their sides to enable the nurse to see through the range more distinctly. It has been said "that it is as difficult, *ceteris paribus*, to ventilate a cell with four angular corners as to ventilate a ward 100 ft. long." This is true as regards side ventilation; but the same assertion would not hold good in my plan, where the height of the compartment far exceeds its area, the compartment itself becoming a kind of flue, the current of air passing from the floor to the ceiling. I acknowledge that every cubic foot of space is not in the line of draught, nor do I think it necessary; but I believe the air will be more or less in motion in every part

Fig. 1.—Transverse Section.

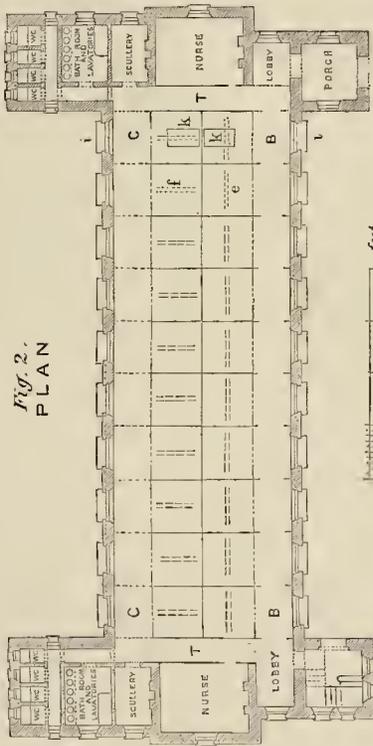
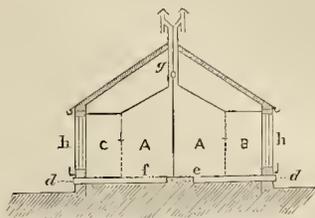


FIG. 1 represents a transverse section of a one-story building through the middle of a pair of compartments. A, A, compartments, separated by a central partition, forming their back. The lower dotted portions of the upright lines forming the fronts of the compartments, signify doors; B, C, side corridors; d, d, inlet ventilating tubes, having a square bore. One of them joins at right angles the side of a trough, which is covered by a grating, c, in the floor of the compartment. The other tube is longer, and has no upper side; underneath the grating, f, is the floor of the compartment. g, Outlet ventilating flues, with hot-water pipe in the partition. A A, Windows, with balconies projecting outside.

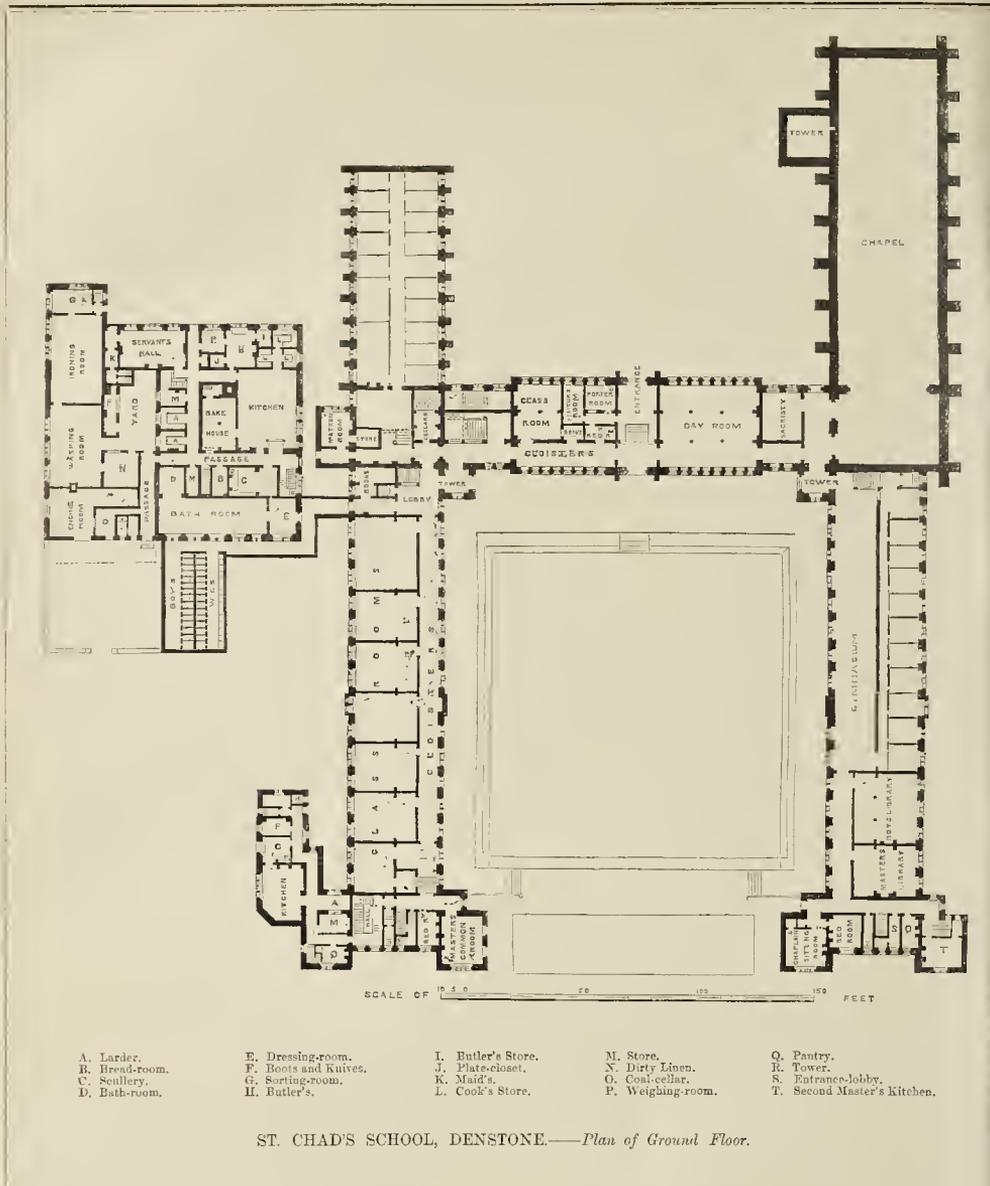
FIG. 2. Plan of a story containing a block of twenty compartments, with offices at each end. B, B, Side corridor; the two rows of projecting points signifying door-jamb, the doors not being shown. C, C, Side corridor, sub-divided by folding-doors (the dotted lines), so as to form ante-rooms to compartments. The dotted portions of the lines forming the fronts of the compartments in the side corridors signify doors. T, T, Transverse or end corridors, uniting the two side corridors. e, f, Gratings in the floors of the compartments, for the admission of air. i, i, Balconies and windows. k, k, Beds [similar letters in the two engravings refer to corresponding parts].

of the compartment, as the ceiling is made to slope, the outlet flue being placed at the summit of the incline. The great hindrance to perfect up-draught ventilation is the horizontal ceiling. Supposing, however, that a current or draught of air were required in every part of a ward or cell, I think I could provide for such condition in the following manner. I should construct my room in the form of a circle, the wall and ceiling having much the appearance of a cylinder supporting an inverted funnel; the entire floor to be perforated for the admission of fresh air, and the neck of the funnel, above the room, to be furnished with a hot-water-appliance. I fear the patients would complain of the excessive supply. At our meeting at Leeds, before referred to, there was a general feeling amongst the profession then present that, in the matter of ventilation, especially across a bed it is possible to

kill our patients with kindness, by producing pulmonary and other complaints.

As regards the oversight of the patients by the nurses, I should say that I propose, in addition to the means already mentioned, employing patrols, who would keep watch in the corridors during a stated period, and then be relieved by others. The patients would also, to a certain extent, watch each other when awake. In cases of extreme illness I have no doubt you would consider the constant presence of a nurse or friend at the bedside of the utmost importance, whether the patient be lodged in a hospital of the kind just described, or in an open ward, or in his own private dwelling.

Although the building just described is intended for the reception of all kinds of cases, I would venture to suggest the advisability of making additions of this character to existing



hospitals, for the reception of infectious cases from the general wards, thus locating without intensifying infection,—a condition which does not obtain in our fever hospitals. I would also advise the erection of such buildings for the upper and middle classes of society, so that infectious cases may be removed thither from private residences, and thus probably prevent the spread of infection in families,—the patients to be treated by their own private medical attendants, and to be charged moderately for board and lodging, nurse, &c.

ST. CHAD'S SCHOOL, DENSTONE.

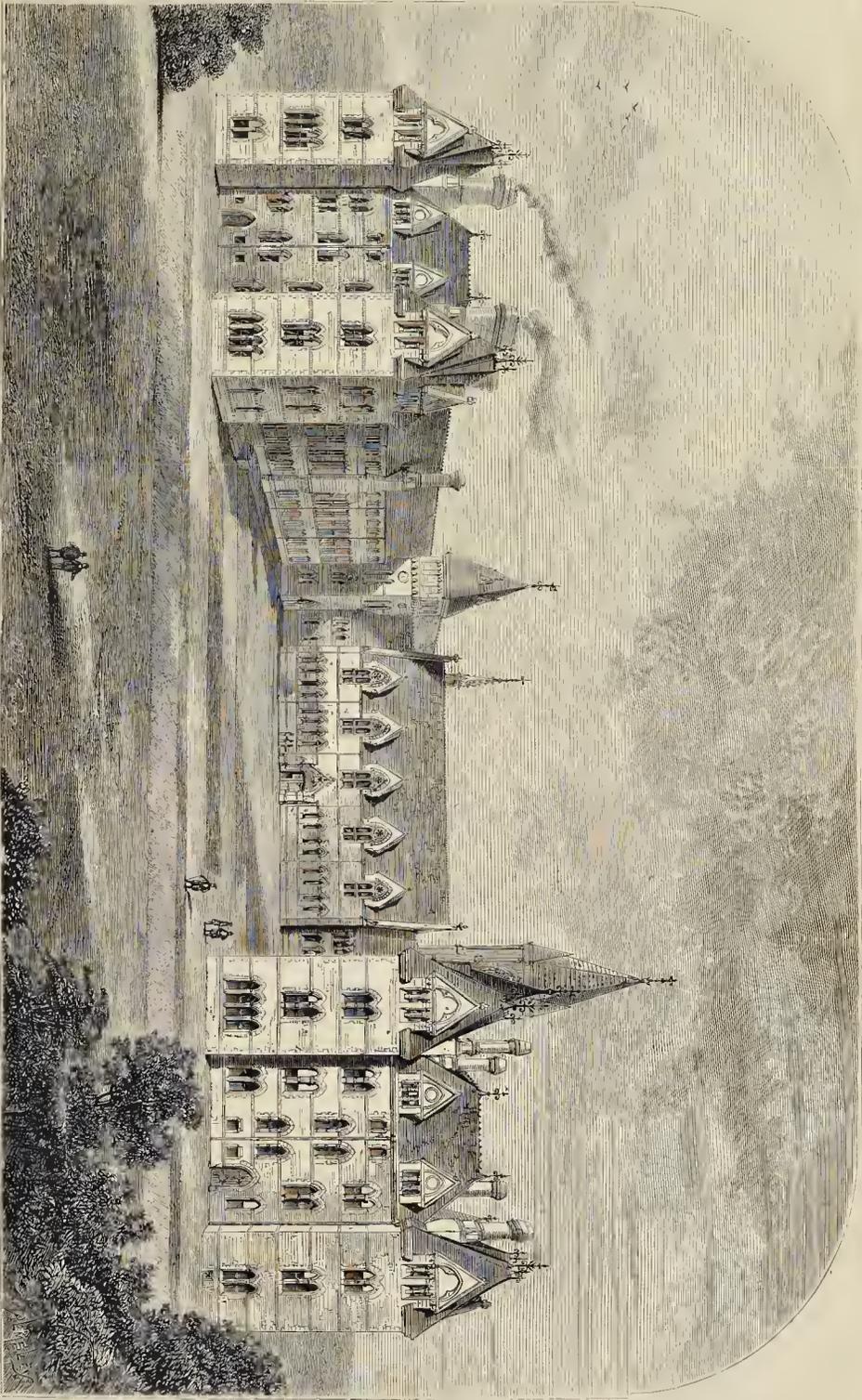
ST. CHAD'S SCHOOL is connected with St. Nicolas College, at Lancing, and is, like St. John's, Hurstpierpont, intended for the middle classes; the education and terms will also be the same. It is one of the three schools for the Midland Counties which are to be carried out in accordance with Canon Woodard's great scheme.

The first stone was laid October 22, 1868, by Canon Lonsdale (in the absence of the Marquis of Salisbury), and since that time the buildings have been steadily progressing. The view shows the western, or Lonsdale Quadrangle, so called in memory of the late Bishop of Lichfield, whose last public act was the presiding at a county meeting on its behalf. The north wing and headmaster's house, together with the central building and offices, are erected; the foundations of the dining-hall and the basement of the south wing are done; and the superstructure of this wing will very shortly be proceeded with. The number of boys will be 300, with dormitories in each wing, having masters' rooms, lavatories, &c., to each dormitory. The great schoolroom is on the upper floor of the central building, with a series of class-rooms in the north wing. The dining-hall will be on the same level as the schoolroom, and will have masters' and music rooms on the ground floor. The offices include a laundry, engine-house, &c.

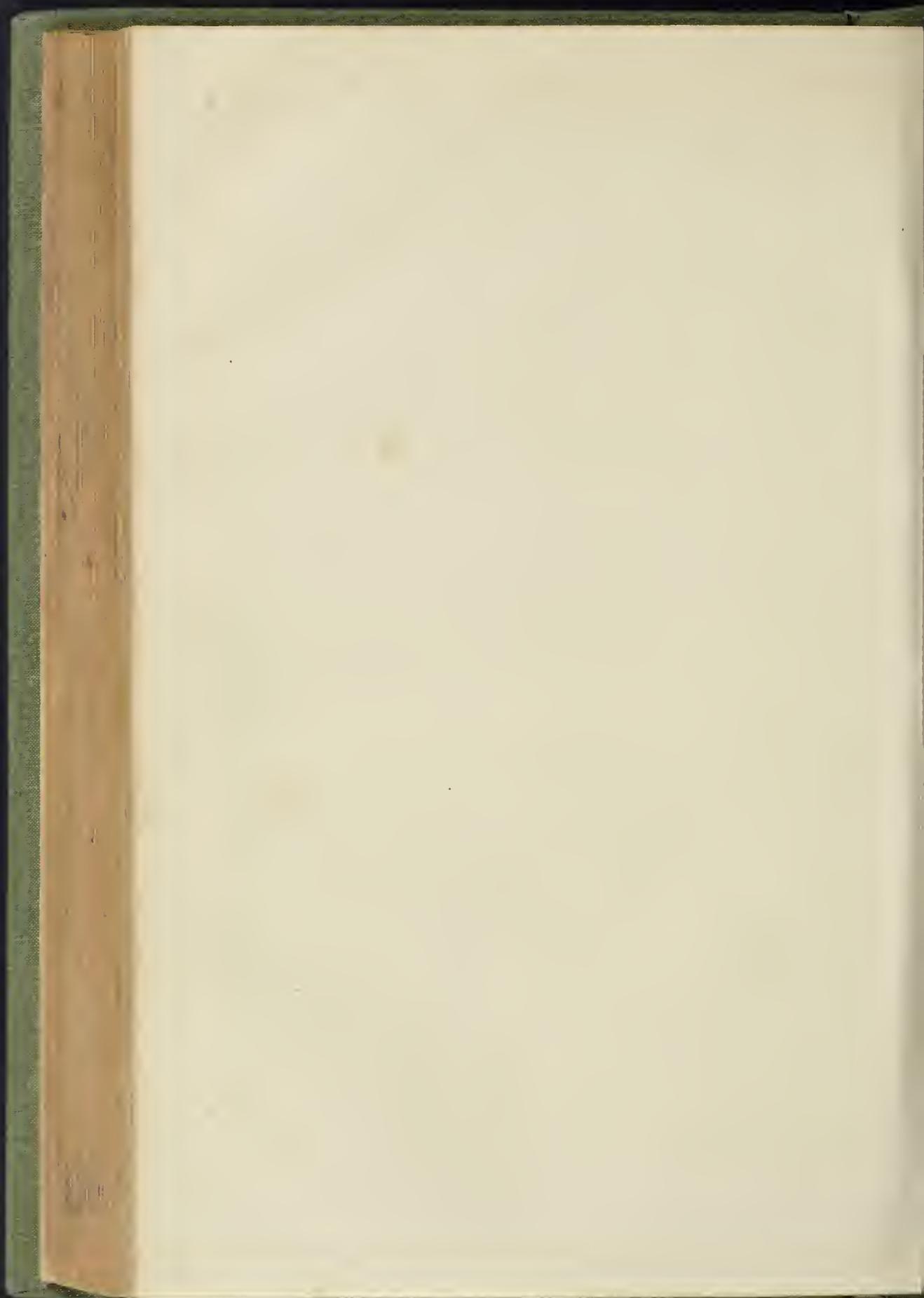
The water is pumped from the well into the tanks of the two water-towers; and at the points where these stand, the five portions of the building are completely divided (except by a door on each floor), so as to prevent the spreading of fire from one portion to the others. The chapel is not yet commenced. The whole is built with double external walls; the outer of Alton stone, which is also used for dressings, with bands of red Alton stone. The bricks for the inner walls were made on the site.

The school stands on the top of the valley side, opposite to the ruined Abbey of Croxden, and within sight of the charming Churnet Valley and the towers and spires of Alton Towers. The nearest station is Rochester, about 1½ mile distant, on the Derby and Macclesfield and Manchester Railways.

The contractor at present engaged on the works is Mr. G. W. Booth, of London and Gosport, under the college architects, Messrs. Slater & Carpenter.



ST CHAD'S SCHOOL, DENSTONE.—MESSRS. SLATER & CARPENTER, ARCHITECTS.



A HINT TO THE CITY GUILDS.

Sir,—Will you allow me to reply to the remarks under this heading in the *Builder* of May II, and to remind your correspondent "X." that I fear he is but imperfectly acquainted with the real good done by the London Livery Companies? I have the honour to be a member of the Ironmongers—one of the too-often wrongly-abused "Twelve,"—and as I have given the history of the City Companies some attention, I trust you will permit me to say that any inquiry instituted by the Crown Commissioners would only harm the "working" of the guilds, to the extent of curtailing the benefits derived from the charities, and involving the companies in unnecessary expenses, as we have seen already in the results of the Bedford Charity, the Tunbridge School, the Emanuel Hospital, Dulwich College, and a host of others too numerous to be here specified.

I would remind the writer of the article that the City Companies are not "trading" companies at the present time: consequently they are neither amenable to the laws appertaining to those companies, nor to be classed with the public insurance companies of the nineteenth century. When the City Guilds were incorporated three to four hundred years ago, they were chartered to oversee the trades under the names of which they were formed; and if we inquire into the manner of their authority, and the results, I do not think the country at that period was any less inconvenienced by the powers exercised by the companies. In course of time, however, Parliament, always ready to pass Acts, at that date, to please the people, granted to outsiders certain privileges, which seriously upset the chartered rights of the companies, and in the end every company (except a few, such as the Fishmongers, Stationers, Watermen, &c.) lost their original powers, and only had the management of charity trusts to carry out. And at the present time, if the trade would only give encouragement, and not oppose the City Guilds to the extent they do, the result would be more beneficial. Of course, in every society there are to be found members who think their position worse than it should be, or the managing body of the company radically wrong. Who can deny that the Fishmongers, Painters, Stationers, and Watermen have been useless? But the trades oppose the supervision of the City Guilds; and if the companies dispense their charities silently yet well, I really cannot see why the "outside" public, who have no interest in the matter, should complain. Let the trades only express a desire to co-operate with the companies, and the companies will not be backward,—as they never are, when any good cause requires a helping hand.

The Irish estates belonging to the City Companies are not such a profitable property as the world imagines, and I think it is much to the credit of the City Guilds that they have used their wealth to place in the north of Her Majesty's Kingdom of Ireland better buildings and a better tenantry than other parts can boast of. When Mr. Maguire's "scheme" to seize the City estates in Ireland was brought before (and subsequently withdrawn from) Parliament in 1869, I had the honour of publishing in the English and Irish papers statistical details, proving that the majority of the tenantry were well satisfied with the Companies' management, and not at all favourable to a change of landlords.

Our early monarchs, especially James I. and Charles II., were very fond of writing to the Lord Mayor of London desiring a loan of a few hundred thousand pounds, and upon receipt of this polite request, the Lord Mayor proportioned the amount among the City Companies, and requested a prompt payment. If the City Guilds refused, the King seized their charter, and charged them, you may be sure, a pretty round sum for its redemption. If they lent the money, all they received in return was the King's letter of thanks, but never to expect repayment. If the members were short of cash, the company had to sell on mortgage their estates (often left to them for charitable purposes), and pawn or sell their plate; and thus it is how many of the companies were ruined, and the property transferred. The Ironmongers' let their Irish estate to the Beresford family, whose only desire appears to have been to make as much out of it as possible; so that when the company regained possession some years since, the property was in a terrible condition, and the reparation of it cost a large sum. Those that live in the sunny reign of Victoria can form but a very imperfect idea of the troubled times of the Stuarts and earlier

reigns. Those that condemn the City Companies should read the history of London during these reigns, and I cannot but help saying that the reader's opinion will be changed; that the companies will be honoured for having so well managed their properties as to be able to have the balance, which outsiders look upon with so much envy, instead of being condemned. If they had not struggled with Crown Commissioners in the days of yore, they would have had at the present time but very little indeed of the estates and property left them for charitable purposes.

Respecting the distribution of charity funds by a City company, I would refer your readers to my article on "Thomas Betton, the Shore-ditch Worthy and National Benefactor," printed in the *Hackney Express*, of April 26th, this year. I have shown therein that Betton left his large property to the Ironmongers' Company, who, among other things, were to expend one-fourth part among the charity schools of the City, and one-half "unto the redemption of British slaves in Turkey or Barbary." They accordingly executed the trust; but after the adoration of Algiers by Lord Exmouth, the applications for redemption ceased. In 1830 the company, finding a large sum in their hands, proposed to set aside 7,000*l.* as an accumulating fund to meet any applications for redemption thereafter, and with the balance to increase the pensions, &c., of freemen, widows, and children, and to extend the number and radius of the charity schools; but the Crown Commissioners actually opposed the scheme; they put the charity to 8,000*l.* expenses, and probably would have done more had not the House of Lords confirmed the company's scheme as a good one. The result is that at the present time every charity school of the established religion throughout England and Wales receives an annual payment from Ironmongers' Hall, the total expenditure being nearly 5,000*l.*, and many pensioners have been added to the list of the company's charity. These facts, I think, speak for themselves; but any further information I shall be happy to supply. I only wish, for the sake of those to be benefited, that every charity, whether under the control of the Crown Commissioners or not, was as ably managed as the trust I have described. There are some companies who have not the means to stand expensive law-suits in the course of right against might. T. C. NOBLE.

QUANTITY AND QUALITY: PIECE-WORK AND DAY-WORK.

A CORRESPONDENT of the *Builder* makes very sensible remarks on the question of piece-work, and, indeed, as a whole, his observations hold good in his application of them to the existing condition of builders' workshops, masters, foremen, and workmen. Piece-work, *per se*, possesses all the advantages attributed to it, and more unthought of; but at the same time it is susceptible of much evil, and has actually worked a large amount of evil to architecture and the building trade in the hands of unprincipled patrons and advocates. From a lengthened experience of the building profession, extending over the kingdom, I have had an opportunity of testing the value of both systems, of seeing their good points and their weak ones; and, as at present conducted, I have no hesitation in asserting that two-thirds of the bad building and bad workmanship executed are attributable to "slush-work" and piece-work.

Slush-work is done by the day, as well as by the piece; but piece-work, as performed for small builders and "jerries," is, *de facto*, slush-work of the most patented description.

I have lately, for my own information, as well as to benefit the community when opportunity was offered me, made a tour of inspection in the suburban districts of London, east and north-east, for the purpose of scanning the method employed in building the cheap class of dwellings now so plentifully erecting.

I found the bricklaying, plastering, and joinery work, and that of other trades, parcelled away by separate contracts, and the small contractors had again sub-contracted with other workmen, who took the work, and with the aid of a man or two and a few boys were engaged like machines in slushing by the piece. The character of the work, if it could be credited with having a character at all, was of the very worst description. The bricklaying was scamped from footings to wall-plate, and was the work of scamps,—the employers instead of the workmen being the

greater criminals. The mortar used was not much better than road mud, and I could have kicked entire fronts down from story to story with the most ordinary thrust. So flimsy and ill-constructed were the majority of the houses I examined that, I undertake to say, none of them would withstand a stiff gale of wind, supposing they were deprived of their roofs of naked timber, and their floor-joists were cut through for sake of experiment.

The thickness of the sash-frames and sashes was, indeed, a matter to marvel at. Were these sash-frames deprived of their external casings, the beholder would see a 1-in. section, a 9-in. board being divided to form the two stiles, $\frac{3}{4}$ in. or $\frac{1}{2}$ in. casings being planted an internally and externally. The thickness of the sashes was about 1 $\frac{1}{2}$ in., or under in some cases. Is it any wonder that windows and window-sashes are always in want of repair where such atrocious work is executed? Sashes hung in such frames are in reality hung for life. Doors, architraves, shutters (where there are any), are in keeping with the other part of the works; and, as for the stairs, they are simply an elongated step-ladder, with "creaks" in them from the very beginning, like a new pair of boots; but, unlike the boots, the creaks in the stairs increase with their age,—the doors and sashes joining in the accompaniment.

These are some of the results of the piece-work system in the hands of unprincipled builders and workmen. Unfortunately the tendency of piecework is not to elevate the workman or his workmanship, but to lead to the perpetration of a vast amount of inferior work. A speculator,—and I have one in my eye now,—buys a piece of ground in the autumn, and he determines by the following July or August to have "run up" a row of two or three story dwellings; and, to carry out his idea, the piece-work system is set in full swing. The houses, twenty or forty in number, have no sooner assumed their carcass shape than hills or painted boards are put up, announcing that Nos. 3, 7, 9, and 15 are sold. This is the bait to kidnap the unwary. In a few days more, one or two *bona-fide* tenants perhaps undertake to rent one or two of the houses in the row; and then, after another short interval, a large painted board is hoisted on the end or angle house, announcing that "All these desirable Residences are to be sold." It is only the simple known truth to say, that the building owner of these new houses for the time being would no more retain them in his possession than he would cut his own head off. Sold they must be, and their purchaser is also sold.

The introduction of the piecework system into regular workshops would not lead to the benefit anticipated, so long as the lax conduct of the majority of the foremen in them remains unreformed. I have known workshops upwards of twenty years ago, where the piece-work system was tried, and tried for a long time, but it brought neither honour nor credit to workman, employer, or foreman. Quantity, indeed, was produced, but quality was nowhere apparent. The same employers (some of them) are now Government contractors, and day-work is the order of the day. The work is a great deal better executed, but the quantity is far too small. Foremen who levy a blackmail in the shape of drink, or accept drink to condone faults, in the shape of botchery or incapacity of any kind, ought to be drummed out of employment at once. It is a fact that "muffs" or hotchers are often kept on while sober and skilled hands are discharged; but even worse than this: many examples have occurred, to my knowledge, where habitual drunkards were kept in constant work, although the broker would not give them 5*s.* for their whole kit of tools. Such men, of course, could never compete with their fellows either at day-work or piece-work. A fair day's work for a fair day's wage is what should be absolutely required of every skilled operative; and I must say, as a rule, in all well-regulated workshops a fair day's work is performed or exacted as a matter of course. The work in general, in a respectable builder's workshop, is decently turned out; but as to any tendency towards artistic finish, or of a more deft, scientific manipulation, on the part of the craftsman, I fear I must write there is little indeed. There is a method for doing each piece of work,—a stereotyped method, known to the trade, the generation, the employer, and the foreman; and in accordance with this method the work is done. The workman has seldom or never a voice in the

matter. Under such a system as this, the brain of a Praxiteles, an Angelo, or a Christopher Wren, were it possessed by a working carpenter, would avail him nought. Happily, however, in these days, the bearing-rein can be cut by those possessed of talent and manhood, and success is possible, though the competition is great.

There are radical evils on each side of the subject we have been discussing, and great dishonesty. Indiscriminate piece-work has flooded, and will still further flood, the country with bad work of every description; and, as for day-work, although it covers a multitude of sins, the public in general are more benefited by the system in the end, though they often, as well as the employers of the workmen, pay rather dear for their whist.

The subject is a wide one, and leads to so many considerations that it would need chapters, instead of columns, of space to discuss it in detail, showing its relative advantages and disadvantages on our present condition of society.

A CRAFTSMAN.

PRIZES FOR LABOURERS' COTTAGES AND DRAINAGE IN IRELAND.

An evidence of the growing value and utility of concrete, as a constructive material for domestic buildings, will be found in the following report of the judges, who were appointed by the Royal Agricultural Society of Ireland to inspect labourers' cottages and drainage, competing for prizes:—

Cottages (Concrete), Mr. Mahony's, County Kerry.—The first cottages we inspected were four, entered by Mr. Mahony, County Kerry. These cottages, which are built of concrete, according to Mr. Tall's patent, are very neat-looking and commodious, containing a very good living-room, 12 ft. by 14 ft.; two bedrooms, 7 ft. 6 in. by 7 ft. each, on ground-floor, and a bedroom or loft over the two ground-floor rooms, lighted in the case of the two cottages by skylights, and in the case of the two end-houses by windows in the gable; the living-room is open to roof. These cottages are very reasonable as to price, considering the amount of accommodation given, and the care and attention with which everything is finished. We could not help remarking the entire absence of damp, which is quite excluded by the complete solidity of the walls, which allows no damp to rise from the ground; the gable walls were papered a very few weeks after they were finished; and, after one of the wettest winters on record, the paper showed no sign of damp, whilst a cottage built in the ordinary way, two or three years' since, the paper on the western gable showed evident signs of damp. Another great advantage arises from the fact of the walls being only 9 in. thick, giving an increase of at least 23 in. of internal width with the same roof. The yards and offices are most convenient, and the whole expense of each cottage and offices complete, as shown on the plan, would be under 70*l.*, or well within our maximum for much less accommodation. The great want that we felt in these houses was there being only one fireplace in each, but as the principal bedrooms are on the ground-floor, this may not be of so much consequence. Mr. Mahony stated for our information that rubble masonry with the necessary cut stone, would have cost at least one-third more per perch than the concrete. We have much pleasure in awarding Mr. Mahony the gold medal offered for the province of Munster.

Mr. Cosby's (Queen's County).—The next cottages we inspected were a pair entered for competition by Mr. Cosby, of Stradbally; they are neat and compact, well built, and well put together; the stairs leading to the upper story are well planned, giving a separate entrance to each room from the landing. The great interior want is a second fireplace in each of the houses; and we think that the privy and pig-stye, both discharging into an open dung-yard within 5 ft. of the door, are too close to the house.

Mr. Napier's (County Meath).—As these cottages compete with Mr. Cosby's for the Letestor gold medal, we will now consider them. Mr. Napier entered two sets of cottages for competition; one near Oldcastle, on which only we need make any observations, as the other pair, situated near Carracross, county Meath, exceed our maximum price. The Oldcastle cottages are built exactly on the plan which gained the Duke of Abercorn's prize, and for the estimate furnished, though we think it improbable that houses of this class will be built for the future for this amount, unless under very exceptional circumstances. These houses give such very superior accommodation, have two fireplaces in each, and such convenience in the way of presses, closets, &c., that we consider we must award them the Letestor gold medal as against Mr. Cosby's.

Sir H. Bruce's (Londonerry).—The next cottages we visited were those entered for competition by Sir Harvey Bruce. They are very neat-looking, and well finished, being built of the black basalt stone of the district, with freestone quoins and dressings. They are very compact, and give a large amount of accommodation. The arrangement of the interior, particularly of the two end-houses, is very good. We award to them the medal for Letestor, and likewise the Letestor Challenge Cup, as against Mr. Napier, he having only two cottages to compete, and as against Mr. Mahony, the plan being superior. Mr. Mahony's are built at a very much cheaper rate, and we have no doubt of the economy in the use of concrete for cottage walls; but having so little experience of the lasting qualities, we felt it hardly wise to award the Challenge Cup on account of superior economy.

In conclusion, we would here leave to suggest for future competition the propriety of establishing an average scale of prices on which all estimates shall be calculated, and to require from parties exhibiting accurate detailed tables of quantities and of qualities of materials, so that the decision of your judges shall be based on the workmanship, convenience, and economy of materials used, and not to be in any way influenced by apparent cheapness, which may arise from accidental circumstances, or the use of inferior materials. One man may be able to build for 7*s.* 6 perch; another may not be able to do the same work

for 10*s.*; in the latter case it is no fault, and in the former no merit. Such circumstances, if not explained, might cause a competitor to lose a prize for perhaps a better cottage.

DRAUGHTS.

We had, we are sorry to say, only one lot of drainage to adjudicate on, Mr. Cosby's, at Tuahoe, in the Queen's County. As we have had drainage works executed on his estate under our consideration, now several years, we need only observe that it is quite equal in quality and promise of durability of work to any we saw in former years; and we were glad to see many fields which we had judged on previous occasions, showing, by the grasses growing on them, the nature of the soil, and their general appearance, how well they were repaying Mr. Cosby for his outlay. We have, therefore, great pleasure in again awarding Mr. Cosby the provincial gold medal and the drainage challenge cup given by Lord Digby.

R. G. WADE,

C. UNLACKE TOWNSEND,

J. M. ROYCE.

HYDRAULIC.

SIR,—I have a well on my property situate in the West of England, the water of which has hitherto been salt and brackish, and totally unfit for anything but ordinary purposes. In addition to the foregoing defects, the supply usually ran short in the summer season. In order to augment the supply, and render the water more pure, I was advised to carry the rainfall water from the roofs of the premises into the well. The well in question is 25 ft. in depth, and the natural supply of water generally about 10 ft. A few copious showers raised the well to overflow, at which time the water is suitable for making tea, grog, &c., and remains so until from 10 ft. to 15 ft. have been pumped out. The pump-pipe is fixed to within 2 in. of the bottom of the well. Having stated the facts of the case, I should be extremely thankful if you or any of your subscribers would solve what to me has been a difficult problem for some months past, viz., "why is it that the rain-water, which I suppose to be of the least specific gravity, is first drawn off, the pump-pipe being, as before stated, so near the bottom of the well?" I should be glad to state that a neighbour who has a well 70 ft. deep, and a force-pump reaching to about midway, finds the same results.

GLASTON.

INSURANCE AGAINST LIGHTNING.

SIR,—May I ask you a question of some importance to all holders of house property? Can a house or other building be insured against damage done by lightning?

I believe that the forms of policy issued by some of the offices cover damage by fire, occasioned by lightning. But I believe they do not cover damage unless there is fire. For example; if a chimney be struck by lightning and knocked down through the roof and floors of a house; or if the wall of a house be rent from top to basement; or a tall factory-chimney rent and shaken down; I doubt if any compensation could be obtained under existing policies.

I should be very much obliged for any information on the subject. I need not point out what a serious event an accident of the kind might be to a tenant who is bound by his lease "to uphold, maintain," &c.

R. J.

TENDERS IN MANCHESTER.

SIR,—Allow me to call attention to the disparity in a series of tenders for a brewery in Manchester. The difference is 1,500*l.* in about 4,200*l.* Had the quantities been taken out in Manchester, 100*l.* would have covered all the difference. The great discrepancy does not arise from the mere fact that the quantities were supplied from London: we find that as a rule similar discrepancies occur very frequently in London.

There is not the slightest doubt that the Lancashire system of quantity-taking leaves less to the imagination of builders than that in use in the South; and that from this very fact works are wound up with more comfort both to client and builder. Manchester architects are not in the habit of publishing tenders. I may therefore be readily excused for pointing out a discrepancy which would (from want of means of comparison) escape your London readers.

R. W. A.

LEGISLATION FOR LABOUR.

There are some Bills of practical importance introduced by private members for which Government finds it difficult to "give a night." One of these is to make further provision for arbitration between masters and workmen. The Bill has been prepared and brought in by Messrs. Mundella, S. Morley, W. H. Smith, T. Brassey, and T. Hughes. The principal object of the Bill is to explain and amend the 13th section of an existing Act of George IV. The proposed provisions are to enable masters and workmen to agree for arbitration; to designate some board, council, person, or persons as arbitrators; to appoint an umpire; to bind themselves by agreement which is to last during the continuance of any contract of employment and service in force at the time of making the agreement, and thereafter, from time to time, by mutual consent. They may agree that the arbitrators shall have exclusive jurisdiction for the bearing and determination of

disagreements, and that on such determination no other proceeding shall be taken before any other court or person for the same matter. The hearing and determination must be within seven days from the time of the act or omission to which the disagreement relates. The Bill also proposes that arbitrators should have powers for compelling the attendance and submission of witnesses, and the production of any books, documents, or accounts bearing upon the matter in issue. It is to be hoped that such a useful and hopeful Bill will have a better fate than to be slaughtered among the innocents at the end of the Session.

Another Bill before the House, which is brought in by Messrs. Mundella, Anderson, Morley, Philips, T. Hughes, Carter, R. Shaw, Hinde Palmer, and Armistead, provides that the existing Factory Acts shall be so interpreted that no child, young person, or female shall be employed after one o'clock on any Saturday afternoon, either for recovery of lost time or for any other purpose; that they shall not be employed for more than 94 hours on any day, nor for more than 54 hours in any week. Although the Bill was introduced at the beginning of April there has not been, as yet, an opening for its second reading, which is postponed to the ominously distant date of July 31st.

SCHOOL BOARDS.

Ipswich.—At the last meeting Mr. Fraser moved that the Board should appoint an architect to prepare plans for the infant school to be built on land adjoining the Trinity National Schools. He thought it unnecessary, with the experience they had, of again advertising for plans. Dr. Chevallier took the opposite view. If they had at the outset appointed their architect to prepare all their plans, nothing could have been said; but having begun with the other system, it would be invidious to one or other of the two architects they had employed to pick out an architect, and, to a certain extent, it would be an imputation on the other architects of the town. Mr. Grimwade and other gentlemen agreed with Dr. Chevallier, and it was determined to advertise for plans from architects resident or practising in the School Board district, as in the former case. A letter from Mr. J. C. Cobbold, with reference to the site of the school, was referred to the committee.

Windlesham.—Considerable additions to the school accommodation at Bagshot and Windlesham are about to be carried out, under the direction of the Board's architect, Mr. E. Ingress Bell.

Brighton.—The design by Mr. Banister Fletcher & Mr. J. S. Nightingale, for the new schools in Richmond-street and Sussex-street, at an estimated cost of 4,357*l.*, has been adopted. Eight designs were sent in competition.

ST. PAUL'S CATHEDRAL.

The following is the text of a resolution adopted at a recent meeting of the London and Middlesex Archaeological Society, and forwarded to the Dean and Chapter of St. Paul's:—

"The London and Middlesex Archaeological Society, feeling concerned that the interior of St. Paul's Cathedral should be completed in the manner in which its architect, Sir Christopher Wren, would have completed it, calls upon the Executive Committee to use every endeavour to ascertain his intentions with respect thereto, and, so far as they can, to give effect to them."

DRAUGHTSMEN'S PROVIDENT SOCIETY.

SIR,—I venture to ask for a little of your valuable space to call attention to a subject which is of considerable importance to a large section of your readers.

In these days of trade strikes and combinations of various kinds for promoting the welfare of all classes of workers, there is one class who never yet have attempted anything like combination or co-operation for mutual benefit. I refer to assistant draughtsmen employed in architectural and other works in London, in very large numbers.

It would be the very last person to suggest any aggressive movement amongst such a body of educated men, but it strikes me as being the proper time, and your journal as being the proper medium through which to make a suggestion, for the formation of a provident or mutual benefit

society of a social character amongst this not-too-well-paid class of industrious and little-anticipated assistants; and if you will allow this subject a space for discussion in your columns (i.e., if it is of sufficient interest to elicit a discussion), I am sure you will be conferring a benefit where it is needed.

This want is not met by any of the existing associations, although they might assist in inaugurating what, I am obliged to confess, would be an important movement.

Some such course as the following might be adopted, viz., a preliminary meeting might be held (say at the Architectural Museum, of which, I imagine, the free use would be granted), and the subject being introduced by a few able speeches by influential men, what development such an idea might take might, I think, be left to the discretion of the meeting then held; and if the result be an ultimate good then no one will be better pleased than one who is not so much for himself as

POUR LES AUTRES.

INSTITUTE CONVERSAZIONE.

SIR,—How is it, Mr. Editor, that this *conversazione* is not what it used to be? Why are not members requested, as formerly, to lend works of art, &c., for the occasion; and why now do we have imitations of old china, had modern French articles, and other works, with their prices attached? Certainly, last night there was too much "shop" about the place; and as to the architectural exhibition-rooms below, the want of the usual architectural drawings, and the dreadfully dull appearance of those rooms last night, made one much regret the *conversations* of former days.

Otherwise, all went off well: plenty of people, plenty of music, and plenty of ices. The re-lighting of the Institute's large room was a great improvement. A.

EXPERIMENTS ON FIREPROOFING.

SOME experiments have been carried out on a cottage, with a stable below, which has been built at Edmonton, under Brannon's Monolithic Stone-felting processes. Pursuant to a circular of invitation, about 100 gentlemen and ladies assembled at the Bell Busk Estate, on Tuesday, the 25th inst. After examining the different stages of the work, which are nearly all illustrated in this little cottage, about sixty of the guests assembled round the little garden on the centre of the flat roof, and in reply to their questions the inventor explained the principles and details of his patent method. The partitions and bracketed-out apartments, of 2 in. to 4 in. thick; the doors, of 1 1/2 in. to 1 3/4 in. thick; and shelves, of 1 in. thick, were tested for strength with a 14 lb. sledge and heavy riveting-hammer, all returning clear, solid, or ringing sounds. The tenant's furniture was then collected into one room, and the apartments below it and by its side were piled with faggots, red pine timber, and coke, quickened with paraffine. The stone-felt door of the furnished room was then closed, and proved the effectual protection of the contents from the vast mass of fire which filled the adjoining room and passage, while as hence a combustion was sustained below. No discomfort was created by the surrounding fire, nor did it appear to injure the building.

CITY ARCHITECTURE: A NEW STYLE.

SIR,—I have been disappointed to find that the suggestion of your contributor, "Nemo," as to encaustic tiling, in his recent communication, on the "Architecture of Great Cities," has not been taken up by some of your professional readers with a view of determining its possible extensive use in out-door architecture. If it is capable of successful adaptation in this way, it seems to open a way out of the barren and interminable controversy as to styles, &c., to present a new point of departure for the development of a fresh system of design and decoration full of artistic promise, and possessed of such material advantages as to cleanliness, durability, &c., that it is a matter of great surprise that its thorough and complete use, as so fully urged by your correspondent in all these respects, has not sooner attracted the serious attention of our architects and builders. The great thing, however, must be its value as artistically developed in harmony of colour and appropriateness of design into perfect architectural expression;

and this would require genius and thought. A partial use of encaustic tiling is often attempted as a means of giving variety and effect; and where skillfully done—not in the piecemeal, scattered manner we often see,—with the happiest results; but I understand your correspondent to mean that the carrying out of his system would involve a study of design for applying it to the whole exterior surface of a building, which would require, as a ground work, good proportion of parts,—a main neutral tint for the major part of the building to give repose, suitably relieved throughout by coloured architectural ornamentation, chiefly of tertiary tints, and very sparingly, by secondary and primary ones. The beautiful tiles we now see about, and employed in minor ways, are very suggestive of what *can* be done. If properly carried out, I am persuaded the result would be so pleasing and refreshing in our cities, whose architecture becomes so dirt-laden and dismal, that a new era in domestic and street architecture would commence, as predicted by your correspondent, if not leading to quite all the results he was perhaps too sanguine in anticipating.

ALPHA.

"EDWARD PEARCE."

SIR,—Referring to the communications to you at pages 410 and 451, I am able to state that at the period mentioned by Mr. Papworth, one Edward Pearce, knight and architect, was a brother to General Sir Thomas Pearce, K.G., and, as I have heard, the architect of parts of the Houses of Parliament destroyed by fire in 1834. I presume this could be verified.

THOMAS PEARCE.

THE LOCK-OUT.

ENDEAVOURS are being made quietly to bring about an adjustment of the differences between the masters and the men, with what success remains to be seen.

A deputation from the London Trades' Council on Wednesday waited upon the committee of locked-out masons, and submitted a resolution suggesting a compromise, by which, on the nine hours being conceded, the question of wages and the code of working rules would be referred to a board of arbitrators. The committee promised to lay the matter before a general meeting of the masons, to be held on the following evening.

SIR,—There is no change. "Nine hours and Ninepence" is the present motto of the men, and nothing will take it out of their heads. We brought the masons' delegates to some reason, but their suggested compromise of fifty-three hours at 8s.4d. was "hooted" at the general meeting. Your proposition of fifty-four hours at 8s.4d. would no doubt be accepted by the masters, but it must be an average of fifty-four hours, or less. Building is an out-door trade, and as there are not more than eight hours' daylight in winter, to fix the same hours all the year round is an *absurdity*. The workmen say, "we need as much to keep us in winter as summer,"—which is, of course, admitting that they are not equal to the lower animals, and have not moral control sufficient to put by in summer for winter use. This strike is a most serious blow to the reviving building trade, and should be put down by public opinion. That all building work should be stopped in the middle of a summer's afternoon at half-past four seems a gross absurdity, and could never be maintained. The masters are quite willing to fix the rate of wages at the market value, but it would be unpatriotic on their part to fix an arbitrary limit of fifty-one hours *all the year round*.

A BUILDER.

A CHURCH FOR RAMSGATE.

WE hear from this favourite watering-place that a feeling is manifesting itself in favour of moderate High Church services, the Isle of Thanet having hitherto been rather a stronghold of the Low Church party, and that it is proposed to build a handsome church in a new district approved by the Ecclesiastical Commissioners, with the consent of the Archbishop of Canterbury. The site has been purchased, the plans have been prepared by Mr. Newton, and the work will be at once commenced. An energetic committee of resident gentlemen is strenuously exerting itself, and intends to appeal to all visitors to Ramsgate for help, as 400 sittings will be provided for their accommodation. That an

additional church was called for is evidenced by the following statistics. The population of the town is about 16,854; the number of visitors at one time is about 30,000; yet there is but present church accommodation for 4,200. The new church will accommodate 700, and 400 of the seats will be free and unappropriated. The Rev. J. Wardell, The Elms, Ramsgate, will furnish every information to those willing to assist in the work.

LONDON SCHOOL BOARD OFFICES.

At the last meeting of the Board, Mr. Langdale moved, against the recommendation of the Works Committee, that the designing of the proposed new offices of the Board be opened to the competition of four architects, instead of leaving it to Mr. Robson, the Board's Consulting Architect, to prepare the plans.

Some discussion arose upon this, and eventually Mr. Langdale's proposition was carried by sixteen against fifteen votes.

DAMAGE BY LIGHTNING.

The thunderstorms of last week have caused wide-spread damage and fatalities in far too numerous instances to be here particularised. Yorkshire has severely suffered from floods and otherwise. At Liverpool there were three thunderstorms in succession. At Oswestry, Mr. E. B. Smith, borough surveyor, and a man employed by him, had an almost miraculous escape. Mr. Smith was engaged in measuring the Pitcher Bank with one of Chesterfield's patent tapes, which are lined with thin brass wires, when the lightning struck him from wrist to elbow, and passing along the wires also struck the man who was at the other end of the tape, knocking him down. The extent of the injuries sustained by both, however, were very slight. At Cefn, Wrexham, a girl returning from school, with an umbrella over her head, was killed on the spot where she was struck. At Halifax, three men took shelter at an iron pillar in a cattle-shed, and one of them was struck lifeless. Another fell only a slight shock, and the third was untouched. A beam overhead was split, and part of the roof fell in. Many more persons, as well as horses, cattle, sheep, and poultry, have been killed in various parts of the country. At Wern, the lightning struck the small spire of the Baptist Chapel, stripped off the shingles, and laid the laths bare. At Penkridge the cattle-market was wrecked. At Stafford 14 yards of the glass roof of a railway-station were torn off. At Utkinton a house was struck and injured, as houses have been at various other places. At Mitcheldean, near Hereford, the Mitre Inn was struck, and both the landlord and his wife, who were in separate rooms, were injured. At South Shields the beacon facing the sea was struck and almost destroyed.

In 1867 and 1868 the increasing frequency and fatalities from lightning, not only in this but other countries, were followed up, as it were, by the crash of the great earthquake in America. We have not heard so much of increasing evils from lightning, during last year and this, in other countries as in our own; but other physical commotions in various countries, as we have already said, have been frequent and notable. It is to be hoped, however, that the strain of these destructive forces, which seem to be all connected, has reached its climax, and that no such shocking issue as that of 1868 is in store for any country, more especially for the more densely-peopled countries of Europe and Asia.

HEREFORD FREE PUBLIC LIBRARY.

ESTIMATES as to the cost of erecting a new and suitable building in Broad-street have been considered, and the lowest tender for the contract accepted. The establishment of this library is due entirely to Mr. Rankin, who presented the city with 5,000l. for the purpose of creditably carrying out the object in view. The sum of 1,750l. having been expended in the purchase of the site, it was found that the balance in hand from this gift was not enough, even with 1,000l. recently added by the corporation, to cover the amount of the lowest estimate entertained by the committee. In this dilemma Mr. Rankin again came to the rescue with the offer of another 1,000l. to carry out the plan in its integrity. The committee gladly availed themselves of this offer, and immediately decided upon accepting the lowest tender, made by Mr.

James Bowers, of Hereford, for the erection of the building at an estimated cost of 4,600*l*. The designs for the new building, which will be erected a few doors south of the Corn Exchange, in Broad-street, have not yet been submitted to public inspection, but it is intended, according to our authority, the local *Journal*, to form the ground-floor into shops. The estimate of Mr. James Bowers of 4,600*l*. provides for the erection of the building in native stone, with a dressing of Camden stone. The use of native stone as dressing would have entailed an extra cost of 575*l*., according to Mr. Bowers's estimate; and we are informed that, in addition to the smaller cost of the Camden stone, the employment of it embraces the advantage that it is more easily worked than the native stone. Subjoined is a list of the estimates:—

	With Camden stone dressing and stone dressing.	Extra with native stone dressing, principal doors in teak.
Collins & Cullis	£5,570	£200
Welah & Son	5,189	264
Colman, Brothers	5,103	130
Bigglestone	4,920	620
James Bowers'	4,600	575
	* Accepted.	

CHICAGO.

I HAVE just returned from the burnt-out city, and must confess all is bustle. Monster hotels are springing up; new shops, or stores, as we call them here—everything flourishing; but, alas! a superfluous number of useless hands are out of employ. The most amusing business is to see the numerous removals going on. I do not mean changing residences, but residences changing places. The "House Raisers and Movers" are now quite an institution. A number of men have banded themselves into a company, and for 50 dollars and upwards, agree to take and place your two-story tenement on their rollers and movers, and deposit it safely and snugly at its new location, with a guarantee not to hurt or injure the furniture.

Water seems to be at a premium—and will be until pipes and hydrants are laid down. Water for household use is somewhat scarce.

I cannot close my note without a word of warning to emigrants. Book-keepers, salesmen, and no-trade bands, are certainly faring very badly; it pains me to see the many emigrants land, looking hopefully, but, alas! there is little opening.

QUEBEC.

CHURCH-BUILDING NEWS.

Thetfordham.—The re-opening services in connection with the restoration of Thetfordham Church have taken place. The whole of the expense of the restoration has been defrayed by the rector of the parish, the Rev. J. C. Sawbridge; and we believe it is his intention to restore the roof, and other parts of the exterior. The unsightly high pews have been removed, and English oak benches have taken their place, which are moulded, the fronts and backs being filled with carved and cut tracery panels, and those in the chancel with carved poppy-heads and various foliages, such as vine and grapes, wheat and tares, wild roses, oak and acorn, ivy and hennies, passion-flower and leaves, forget-me-not and hawthorn, holly, ferns, &c. The entire surface of the nave, aisles, and chancel has been paved with Minton's encaustic tiles. On removing the pews from the nave, the old altar-stone was discovered, which has been placed in its original position; this being so defaced, the five crosses have again been cut thereon. The chancel floor has been raised 18 in., and is approached by two 4½-in. steps from the nave, and two steps of the same depth from the chancel to the sacristium. On the north side of the chancel the original vestry doorway was discovered, the jambs and head of which have been taken down, and fixed 4 ft. from its original position. The doorway on the south side has been raised 1 ft., and a new stone sill inserted, to bring it above the tiled floor. The tower floor has been lowered to within 6 in. of that of the nave. The old heltry floor has been entirely removed, and a new one of yellow pine substituted. The walls of the nave have been rough stuccoed. The arches, columns, and ancient font have been restored and re-faced. The stonework of the windows has been cleaned. The window at the south-west of the building is shortly to be filled with stained glass. The church will be warmed with Gidney's hot-air apparatus, which has been fixed. The north side of the chancel has been restored. The whole of

the work has been carried out by Messrs. Bishop & Son, of Diss. Mr. R. M. Phipson, of Norwich, was the architect, and the work done under his supervision.

Sunderland.—The foundation stone of St. Luke's Church, Pallion, has been laid by Mrs. C. M. Webster, of Pallion Hall. St. Luke's is one of the four districts created by the Bishopwearmouth Rectory Act. Of the other three churches, one has already been consecrated, and the other two are rapidly approaching completion. The church stands on a commanding site, given by Mr. Webster, at the corner of Pallion-road. The edifice, which is of Gothic architecture, and the adjoining vicarage, have been designed by Mr. W. Pritchett, of Darlington. Messrs. Webster, Oswald, & Doxford have undertaken the responsibility of erecting the spire.

Stevington.—The parish church, after having been closed a considerable time for restoration, has been re-opened with special services. New floors have been placed over the north and south aisles and chancel. The nave roof has been restored to its original state, with new timbers where required. The chancel is fitted up with open benches, in oak, with solid ends, and carved poppy-head terminals; the communion rail is of polished oak on ornamental iron standards, and the space within the rail paved with encaustic tiles from Messrs. Maw & Co.'s works. The seats in the nave and aisles are in yellow deal, varnished. In removing the plaster from the wall of the tower, a Saxon doorway and two windows were discovered, indicating the antiquity of the building. On the eastern side of the south porch door an ancient spout was discovered, and over the door a wall-painting representing a distinguished person in a sitting posture, and the east end of the south aisle a lancet doorway was discovered, likewise a stone stair, which apparently at some period formed an approach to the roof loft. In the wall on the north aisle was found a lychnoscope. In the south wall of the chancel a traceried window with a squint has been brought to view, likewise the arches connecting the chapels with the church and chancel. The peal of bells, five in number, have been rehung. The warming apparatus is by Mr. Gidney, of East Dereham. The work has been carried out by Mr. Robert Tooley, of Bury St. Edmunds, under the superintendence of Mr. Usher, of Bedford, architect.

Bloxwich.—Christ Church, Blakenall, Bloxwich, has been consecrated. The church, which has been used for the purpose of divine worship during the last two years, is situated some distance from the village of Bloxwich, in the centre of Blakenall, and erected on a piece of common land, the gift of the lord of the manor (the Earl of Bradford). The edifice is built in the pointed Gothic style, and contains a nave, side aisle, chancel, organ gallery, and vestry. The seats, which are free and unappropriated, are constructed of pitch pine. The church is lighted by windows on each side. The walls of the building are of local limestone, with tracings and facings of Bath stone; the columns and arches in the nave are also of Bath stone, with carved facings. The buildings, together with the vicarage and schools, occupy about two acres of land. The total cost of the erection will be about 3,500*l*., which has been raised, with the exception of about 500*l*.

Swobdon.—The new Church of St. Andrew, Swobdon, which is to take the place of the temporary iron erection within the district of St. Mark, has been consecrated by the Bishop of Winchester. The church, without tower, will cost about 6,000*l*. The tower is an additional expense. The architect was Mr. Bloomfield, and the builders were Messrs. Adamson & Son. The edifice comprises a nave, side aisles, transept, and baptistery. Externally the pinnacles of the building is of red brick, finished with blue Staffordshire splayed bricks; and the principal materials used in the rest of the structure are white and red stock bricks in alternate bands, and the buttresses, &c., have Bath stone dressings. It is roofed in with Broseley tiles, and in finishing the roof the ridge is covered with Cooper's ornamented tiles. The east window illustrates a series of the chief incidents of our Lord's Passion. The west window has the Expulsion from Paradise in the central compartment, and the four lower central figures of Abel, Noah, Abraham, and Melchizedec. There are other stained windows. All the representations have been executed by Messrs. Lavers, Barrand, & Westlake, of London.

Woottonbridge.—A new school chapel has been

opened here by the Bishop of Chichester. The cost is about 1,000*l*. The building was erected by Mr. Morris, of Ashurst Wood, East Gristead, from the designs of Mr. Nonnan Shaw, architect, London. It is 49 ft. long, by 19 ft. 9 in. wide.

Wolverhampton.—A proposal has been before the congregation of St. Peter's Church for re-modelling the seats of the edifice, and Mr. Christian, architect, who furnished the plans according to which the exterior of the church was restored, has been consulted upon the subject. The proposal embraced not only the improvement of the seating of the floor, but also the taking down of the side galleries and the seating of the west gallery for adults, and continuing it across the ends of the two aisles, which would provide good accommodation for those now occupying the side galleries. A letter has since been received from Mr. Christian, in which he gives as his opinion "that a western gallery extended all across the church would be a lesser evil than the three now standing, and that the appearance of the church would be improved." The committee formed to carry out the object have held a meeting and resolved that the floor of the church and the west gallery be fitted with open seats and that the north and south galleries be removed, and they have instructed a sub-committee to procure estimates from three builders for carrying out the work upon the basis of Mr. Christian's plans.

Bickenoller.—The church here, after having undergone extensive restoration, has been re-opened. A small door and all staircases have been discovered during the alterations, no doubt being the approach to the ancient rood-screen. The oak roof, which was in a very dilapidated state, has been replaced by an open red-oak roof, oak stained. A new oak roof has also been placed in the chancel. The church has been refloored throughout, the nave with Bridgwater and the chancel with encaustic tiles. Oak stalls have taken the place of the old pews in the chancel. The church has also been rescaued throughout, but the old carved ends have been utilised. A new font of Bath stone has been presented by Mr. J. Halliday, of Old Cleve, and also a new altar-table by the Rev. and Mrs. Trevelyan. The west end of the church has been thrown open by the removal of a gallery, and the interior of the walls has been stuccoed. The outside walls of the church have been scraped and pointed, and new cathedral-glass has also been placed in the windows, and the parapets and gables reset. The only part which remains to be restored is the tower. The work has been carried out by Mr. H. Davis, of Taunton. The restoration of the chancel has been effected under the supervision of Mr. E. Christian, architect to the Ecclesiastical Commissioners, and the rest of the church under Mr. J. Seddy, of Bristol. The cost has been about 1,400*l*.

Downham.—Alterations in the parish church here at last been begun. The works are under the direction of Mr. Lavrie, of this town, architect. The old vestry has been pulled down to make way for a new one, and a chapel on the north side of the chancel, corresponding to the Lady Chapel on the south side, will be erected, and used as an organ-chamber. During the demolition, several carved stones were found in the old wall of the several architectural periods commencing with the Norman, and a specimen of carving in chancel of the Decorated period.

Hull.—The foundation stone of St. Barnabas' Church has been laid on the south side of the Hossle-road, close to the east side of the boulevard. The church is to consist of nave and north aisle, with organ-chamber and vestry, and chancel, with apsidal termination. Accommodation is at present provided for 512 persons, but ground has been secured for tower and south aisle, and when these are erected the church will seat 800 people. The building will be a red brick structure, with stone dressings, and will have stock-brick facings to the interior, with moulded brick arches, Bath-stone shafts, &c. The roof will be open-timbered, and stained and varnished, and the passages to the seats will be paved with Staffordshire tiles. The work is in the hands of local tradesmen, and the architect is Mr. Samuel Musgrave, of Hull.

Fen Ditton.—The parish church of Fen Ditton near Cambridge, has been reopened for divine service, after undergoing material improvement to the interior. The church has been reset with plain oak benches, refloored with Minton tiles, and fitted with a warming-apparatus (by Mr. Gidney, of Dereham), on the hot-air principle. The work involved an expenditure of

something like 400l., and has been carried out by Messrs. Wilson & Son, of Histon. The architect was Mr. R. Reynolds Rowe, of Cambridge. **Kaversham.**—It being in contemplation to repair the parish church on a uniform plan, Mr. Gilbert Scott, the architect, came down and inspected the edifice. After talking the matter over with the vicar, churchwardens, and the estry clerk, he engaged to send down an estimate for carrying out the improvements.

Penre.—A new school chapel has been opened at Penre, near Flint. The building is Gothic, of fourteenth century. Being intended for use as a day and Sunday school, as well as for public worship, the chancel is so fitted up as to be divided from the nave by means of a movable screen. The dimensions of the chancel are 20 ft. by 22 ft., and the nave 25 ft. by 50 ft. It has an octagonal end, with partially-stained windows. The entire edifice is of red brick, except where relieved by black and white, which has been specially moulded. The open trefoil roof is of rich pine, stained and varnished. The architect was Mr. Daniel Lewis, of Manchester; and the contractors were Messrs. T. & P. Bibby, of Flint. The organ was built by Messrs. J. Bolton & Sons, of Liverpool. The cost of the buildings and fittings somewhat exceeded 1,200l.

Teovilton.—The church of this parish, after being closed for more than a year, has been reopened for Divine service. The church has undergone a restoration, the greater part of the nave and chancel having been rebuilt at the private expense of the landlords and rector of the parish. A heavy gallery has been removed, and no balcony, with its western window, opened into the nave, with seats for school children. The ceilings of both the nave and chancel, which are circular, are of pine divided into compartments by ribs of oak, with bosses at the intersections beautifully carved to imitate the old ones. The pews in the nave, which are open, are of pine varnished, and those in the chancel of oak, as well as the reading-desk. The windows, which are Early Perpendicular, are, with one or two exceptions, of the same character as the originals, and the others are *fac similes* of the old ones. Messrs. Slater & Carpenter, London, were the architects. Mr. Croed was clerk of the works. The carpenter's work was executed by Mr. Hull, of Northampton. The masons were Messrs. Denton & Carey, of Yorkville. The freestone work and windows were supplied by Mr. Trask, of Stoke and Douling; and the glazing was done by Mr. Crood, of Sherborne. The church is paved with Poole encaustic tiles.

Colkirk.—The reopening of the church in this village has taken place. Under the instructions of Mr. Charles Moxon, of London, a new aisle and organ-chamber have been added on the north side, and to the nave and chancel each a new roof, stained and varnished inside. Some carved stone corbels, comprising various kinds of foliage, and an ornamental stone cornice in the chancel, are the work of Mr. Blyth, carver and mason, of Akenham. Mr. Adams has restored the ancient monuments. Messrs. Brown & Son, of Whissonett, have executed the woodwork of the nave; Mr. Nelson, of Colkirk, that of the chancel; and Mr. P. Oakley, of Dereham, has cleaned and restored the stonework of the nave, and furnished the new arcade.

Bathford.—The church here has been reopened after restorations have been effected. In taking down the old chancel arch and other parts, fragments of Norman stonework were found in the walls, also the effigy of a bishop of the tenth century—supposed to be Swithun, to whom the church is dedicated. The south aisle has been widened about 4 in., and extended westwards about 7 ft., and a south chancel aisle, in which is placed the organ and vestry, and also some benches now occupied by the choir, has been added. The church is now seated uniformly on the ground-floor only, with open oak benches, stained and varnished, on wood seats, the passages being paved with stone, except the chancel, where Godwin's tiles are laid within the sanctuary. The roofs are of fir open timbered, and stained, and plastered between the rafters and covered with slates. The walls externally are lined with dressed stone, the niched openings being relieved with shafts and corbels moulded and carved, the foliage having been executed by Mr. Boulton, of Cheltenham, who also sculptured a subject in the centre of the reredos, representing the taking down from the Cross. The windows have all traceried heads of geometrically-formed cusped piercings, and a quarry-glazed in diamond shapes, except those containing stained glass, which have sub-

jects as follows:—The three-light east window of chancel contains in the lower half of the dexter light, "Christ journeying to Emmaus," in the centre, "The Supper at Emmaus," and in the sinister, "The incredulity of St. Thomas." One subject of "The Resurrection" extends across the upper portion of the three lights, surmounted in the centre of the head by the "Ascension of our Lord." This window was the joint gift of Mr. Wiltshire and Mr. Skrine. A three-light window in the south aisle, presented by Capt. Sainsbury, represents in the centre light, "The Adoration of the Magi;" in the dexter, "Christ Blessing Little Children;" and in the sinister, "The Good Shepherd." In the centre piercing of the head is a group of angels hearing a scroll, with the inscription, "Of such is the kingdom of Heaven." Two other stained glass windows have within the last few years been placed in the north aisle, the east window containing in the centre light, "Jacob's Dream," and in the side lights, "Abraham purchasing Macpella," and the "Meeting of Isaac and Rebecca," the head of the window having "Our Lord in Majesty," with angels on either side. In the west wall of north aisle is a window to the patron saint of the church. Across the upper half of the three lights is represented St. Athelwold, and an ecclesiastical procession translating the relics of St. Swithun to a shrine in the ancient cathedral of Winchester. Across the lower half of the lights is seen the Great Feast that took place after the ceremony, in which, as one of the attendant minstrels, is a portrait of a well-known local celebrity who died a few years ago at the age of ninety-three. All these windows are from the studio of the architect, Mr. Frederick Preedy, of London, who superintended the building of the north aisle as well as the recent alterations, the same firms of builders, namely, Mr. Newman, of Bathford, and Mr. Silver, of Maidenhead, having carried out both undertakings. A new organ has just been built by Messrs. Brindley & Foster, of Sheffield, the erection of which forms the completion of the present restoration. The cost of this has been 2,500l.

Swansea.—Christ Church, St. Helen's, Swansea, has been consecrated. The edifice has been erected at the expense of Mr. J. W. Clark. The entire cost of the church, with its fittings and furniture complete, together with the boundary walls and gates, amounts to about 2,800l. The whole 600 seats are free. The ground was presented by the corporation. The architect was Mr. Thomas Nicholson, the diocesan architect of Hereford, who also designed St. James's church, Walter-road, Swansea; and the builder was Mr. T. Gongli, of Bishop's Castle, Salop. The edifice consists of nave, north and south aisles, chancel, north and south chancel chapels, sacristy, and north and south porches. Under the north chancel is a crypt for a warming apparatus. The internal dimensions are 76 ft. in length by 56 ft. in width. The architecture is after the style that prevailed during the latter part of the thirteenth century.

DISSENTING CHURCH-BUILDING NEWS.

Penistone.—The foundation stone of a new Wesleyan chapel has been laid at Penistone. Considerable difficulty was experienced in obtaining a suitable site, but at length an eligible plot of land on the Penistone Green, containing 650 square yards, was bought. The design of Mr. Moxon, architect, Barnsley, was selected as the most suitable. The building will be in the Gothic style of architecture, and will cost about 1,400l. On the basement will be a school-room to accommodate 200 scholars, a class-room, and a minister's vestry. Above the school and two class-rooms, will be the chapel, and an orchestra will be erected over the minister's vestry. There will be an end gallery in the chapel which will seat 100 persons, and in the body of the chapel accommodation will be made for 300. The dimensions of the chapel will be 50 ft. long by 32 ft. wide; 19 ft. high at the sides, and 25 ft. in the centre. The schoolroom will be 32 ft. square, and the class-rooms each about 16 ft. square; the minister's vestry will be 18 ft. by 16 ft. The contract for the mason's work has been let to Mr. John Wainwright, of Thurlstone; the joiner's work, plumbing, and gasfitting, to Messrs. Hayward Brothers, Penistone; ironwork to Mr. G. Beard, Hadfield, near Manchester; and the painting to Barnelough Brothers, Barnsley.

Woodhouse, Normanton.—The United Metho-

dist Free Church body in the neighbourhood of Wakefield are providing additional church accommodation at Normanton. At the present time new houses are being put up—notably so at Woodhouse, where several blocks of buildings are being erected adjacent to the St. John's colliery, the builders being Messrs. Tadman & Benson, of Wakefield. The memorial stones of a New United Methodist Free Church School Chapel has been laid in that district. The building will be two stories high, the ground floor consisting of eight rooms, four of which are intended for chapel-keeper's residence, the remaining four as a cottage, but in future are intended for class-rooms for the chapel which at an early day the trustees hope to build on the vacant land adjoining and fronting the high road from Woodhouse to Normanton. The school chapel will be reached by a broad flight of easy stairs from the entrance in Church-lane, and is to be 50 ft. long, 30 ft. wide, and 20 ft. high, lighted by five windows on each side, the roof open, and the main timbers wrought and exposed to sight. The fittings will be movable bench-stalls, platform, and reading-desk, all of which will be stained and varnished. The building externally will be faced with red bricks, white brick arches, bands, and cornices, and stone dressings. The contractor for the whole of the building and fittings, is Mr. John Foster, of Normanton, whose tender for 710l. was accepted. The architect is Mr. William Watson, of Wakefield and Doncaster.

Woodbridge.—The new Wesleyan Chapel for the town of Woodbridge, has been completed, and opened for divine service. The chapel, which stands in St. John's-street, facing the thoroughfare, is a plain building, of white brick with stone facings. The front entrances are reached by flights of stone steps on either side, while there are three long single-light windows in the centre, the blank wall of the gable above being relieved by a circular stone, with the sacred monogram, I.H.S. The lobbies are paved with tiles, and fitted with double doors. The building is 60 ft. long by 37 ft. in width, and will seat 350 persons, there being no galleries. It is benched with polished deal benches. The front of the platform is of the same material stained, and is of open panel work with blue cloth behind it. At the back of the platform is an ornamental arch, which is coloured a light blue, as is also the plaster work round the windows. The roof is ceiling, but the principal beams of stained deal are seen. They spring from stone corbels between each pair of windows. An organ has been placed at the further end of the chapel facing the platform. At the back of the chapel are a school-room, classroom, infant school-room, and vestry, the three latter being on the ground-floor, and the school-room, which will accommodate 250, above it. The chapel will be warmed with hot air, but the apparatus is not yet fixed. The whole of the work has been carried out by Mr. Fosdike, of Woodbridge, under the superintendance of Messrs. Cattermole & Eade, of Ipswich, architects, at a cost of about 1,900l., of which within 150l. of the whole are raised.

Etruria.—The Wesleyan Chapel has undergone considerable extension and improvement, and the alterations are so far completed that the edifice has been reopened. It has been extended 16 ft. at the rear, so that accommodation is provided for the choir and the Sunday-school children during service. The body of the chapel has been paved, the old forms hitherto used having been removed. The interior has been newly fitted up and decorated; the exterior has been cemented, and the chapel has the appearance of being quite new. The porch has been laid with encaustic tiles, furnished gratuitously by Messrs. Cork, Edge, & Malkin, of Burslem. The alterations have been made by Mr. Barlow, of Stoke, from the designs of Messrs. Scrivener & Son, of Hanley; the gas-fittings and interior decorations being the work of Mr. E. J. Sadler, of Etruria. The alterations involved an outlay of upwards of 500l.

Tunbridge Wells.—The memorial stone of a new Wesleyan Chapel, on the site of the old building, has been laid. The interior appearance of the old chapel was unsightly in the extreme, and was far from being adapted to the requirements of the cause, or on a par with erections of a like character in Tunbridge Wells. The Wesleyans determined, therefore, to build a new chapel. The designs of Mr. Charles Bell, of London, architect, were accepted, and the work has been undertaken by Messrs. Wilkoomb & Oakley, builders, at a cost of 4,700l. Accom-

modation will be made for 700 persons, exclusive of class-rooms, school-rooms, &c.

Tunbridge.—The Wesleyans have laid the memorial-stone of a new chapel in East-street, Tunbridge. The architects are Messrs. Cater, Mole & Eade, of Ipswich, and the builders Messrs. Pannett, of Tunbridge; the contract-price being upwards of 1,700*l*.

Chester.—The Wesleyans of the city, having found their chapel accommodation much too small for some time, decided a few months ago to erect a new building upon the right of the City-road. The design of Mr. Wm. Botterill, of Hull, architect, has been selected from a limited competition. The style adopted is Geometrical, and the design includes a tower and spire. The contract has been entered into with Mr. J. Stringer, of Sandbach, the amount being 4,445*l*. 10*s*., which sum, however, does not include the spire, nor heating and lighting. The building will be of Chester red sandstone, from the Handbridge quarries, and will afford accommodation for 600 persons.

Fornham.—The memorial stone of a new Wesleyan Chapel has been laid here. Mr. Wonsnot is the architect of the building.

Holbeach.—The memorial stone of a new Non-conformist Chapel has been laid in Holbeach, Lincolnshire. The chapel is to seat 350 persons, and to cost about 1,600*l*. The style of architecture is Romanesque. The architect is Mr. Tait, of Leicester.

Trowbridge.—A new Wesleyan Chapel has been dedicated at New Town, Trowbridge. Mr. Stent, of Warmistone, was the architect. The style is a free adaptation of late Italian. New schools are also to be erected contiguous.

STAINED GLASS.

Holy Trinity Church, Halifax.—In addition to the memorial window placed in this church to the memory of the late Rev. H. A. Weston, some time curate at Trinity, and already noticed, we have now to record the fixing of another stained-glass window in the same church. It is from the same artists as the other windows,—Messrs. Ward & Hughes, of London, and is also a memorial one. The window selected is the large semicircular one at the west end of the church. The design differs from the usual studies of church windows, in the respect that it does not portray any given incident from the life of our Lord, but sets him forth in His character as benefactor and friend. The subject may be termed "The Comforter." In the centre is the figure of our Lord, vested in a chocolate-coloured robe and blue mantle, with his arms extended, in the act of blessing. Grouped around him are thirteen figures typical of human suffering, all laying their sorrows before him. At his feet kneels a young mother with her dead babe in her arms; behind is a lame man, and next to him the bent figure of a widowed old woman. Clinging to his arm is the figure of a sorrowing female, and below is the form of a wretched paralytic; in rear of whom is a black slave holding out his manacled wrists to the Consoler or Comforter. Trinity has now five stained-glass windows, and we understand that one or two others will shortly be added.

St. Mary's Church, Halifax.—The first stained-glass window has been placed in this church. It is a memorial one given by Mr. Waterhouse, woolstapler, to the memory of his children, and is the first three-light window on the north side of the nave counting from the east end. The subject is taken from the text, "Suffer little children to come unto me, and forbid them not, for of such is the kingdom of heaven." In the central light is the seated figure of our Lord, with a child on his knee, and his hand placed on the head of another. In the respective side-lights are female figures leading their children to him. The tracery in the head of the window is fitted in with initials, the sacred monogram, and conventional foliage. The glass has been supplied by Mr. S. Evans, of Smethwick, near Birmingham.

St. John's College, Hurstpierpoint.—A window has just been completed at St. John's College Chapel to the memory of the late Bishop Gilbert, of Chichester, the first visitor of St. Nicolas College, who laid the first stone of Hurst College on June 21, 1851, opened the buildings there in June, 1853, assisted at the stone-laying of the chapel in 1861, which, on October 17, St. Etheldreda's Day, 1865, he inaugurated. The window is placed immediately above the stall, or throne, which the Bishops of Chichester, as

Visitors of St. Nicolas College, occupy in the chapel. The size of the window is 20 ft. high, by 7 ft. 6 in. in breadth; and the glass has been executed by Messrs. Clayton & Bell. The subjects represent—1. In the circular tracery in the head of the window, Prester John, surmounted by a mitre, the arms of the See of Chichester; 2. The centre of the three lights which form the window contains in the upper part the Baptism of the first Sussex converts by S. Wilfrid, and in the lower, J. Richards, of Chichester, while at the base are the Gilbert arms; 3. The side-lights represent—the one, the Confirmation at Samaria by SS. Peter and John; the other, the Consecration of SS. Paul and Barnabas. These groups are the centre and more prominent subjects. Above them are respectively St. Edmund, Archbishop, and St. Alphege, Archbishop and Martyr; below them, St. David and St. Chad on one side, and Archbishop Land and Bishop Pateson, of Melanesia, on the other; Bishop Pateson bearing in his hand the five-knotted palm branch, which his murderers had laid upon his corpse.

All Saints', Maidstone.—A new stained glass window has been erected in this church in memory of the late Mr. Alexander Randall. The subject of the representation is typical of the Ascension of our Saviour. The window has been heightened by 5 ft., and new stone mullions and tracery have been put in, but the design of the window is the same as before. Above the principal figures is the text, "Ye men of Galilee, why stand ye gazing up into heaven? This same Jesus, which is taken from you into heaven, shall so come, in like manner as ye have seen Him go into heaven."—Acts i. 11. Immediately under this are the two angels clothed in white, and beneath them again are the Apostles, with the Virgin, the three Marys, and Catherine, making in all nineteen figures. The compartments of the window above the principal group are filled up with allegorical figures: at the top are representations of the lamb and pelican, underneath which are two grape-vines and sheafs of wheat, emblematical of the bread and wine of the Sacrament. The work has cost upwards of 1,000*l*. The artist was Mous. J. B. Capronnier, of Brussels. Mr. Vaughan, of the West Borough, did the masonry of the window.

Trinity Church, Westvale, Yorkshire.—Another stained-glass window has been placed in this church by Messrs. Ward & Hughes. The subject is "The Supper at Emmaus," after the resurrection. Our Lord is represented as seated at a table, with the two disciples left and right, and is in the act of being made known to them "In breaking of bread."

All Saints', Huntingdon.—A new stained-glass window has just been placed in the chancel of this church, as a memorial of the late Mr. D. Veasey. The subject is the Sermon on the Mount. The artists were Messrs. Heaton, Butler, & Bayne, of Covent-garden.

FROM SCOTLAND.

Dunblane.—A short time ago it was resolved to restore the portion of Dunblane Cathedral which is used as the parish church, and subscriptions to the amount of 600*l*. having been raised in the neighbourhood, the work was commenced, under the superintendence of Mr. Mathieson, of Her Majesty's Board of Works. In the course of the work several interesting discoveries have been made. Above the door leading to the church is the transept-arch, which had been built over and obliterated, but which will now be cleared, and the mouldings and pillars of the arch will be disclosed. It is proposed to put in a very thin wall, and fill up the transept-arch with a framework of glass. Above the transept-arch is a double-mullioned window, which has also been blocked up, and which it is intended to open into the choir. The floor of the church, and the chapter-house, are to be lowered to their original level, and the church reseated, while the pulpit will be removed from the south end to the side, and the galleries removed altogether, allowing another window to be opened up. In the chapter-house a number of tiles have been discovered,—one of them bearing a fleur-de-lis upon it,—and also a large stone, bearing Culdee marks similar to those found at Brechin and Abernethy. The chapter-house is to be relaid with tile, the groined arches restored, the gallery-stair taken down, and the compartment which is at present occupied by the stair is to be restored as before. It is estimated that the alterations will cost about 2,000*l*.

Miscellaneous.

A Crystal Palace Prize.—The directors of the Crystal Palace Company having determined to give a challenge-prize, value 1,000*l*., to be competed for at the national music meeting which are about to commence, architects were invited to send in designs. Two premiums, of 50*l*. and 25*l*., respectively,—were offered for the successful candidates, the judges being Sir M. D. Wyatt and Professor Poynter, A.R.A. Eighteen designs were sent in. The first premium has been awarded to Mr. S. J. Nichol, Grove-road, St. John's Wood. The cup is 10 in. across the bowl and 10½ in. high, surrounded by very elaborate flutings and repoussé work, there being four medallions in the centre, two of which represent King David and St. Cecilia, while the two others will bear a suitable inscription. The cover is of a conical form, 18 in. high, adorned by memorial shields, on which the names of the present and past holders will be engraved. It terminates in a triumphal wreath, in which the shield of the winning society will be suspended. The stand is a square pedestal, with a kind of gate running round it, each corner of which will bear a miniature statue of some eminent composer, such as Mozart, Handel, &c. Mr. Owen Gibbons, of Moore-street, Chelsea, takes the second premium. A design by Mr. William Wise, of Saxon-street, Warrick-square, received honourable mention.

The Christian Era.—At the last meeting of the Society of Antiquaries, held at Somerset House, Dr. Gustav Oppert, of the Royal Library at Windsor Castle, read a paper "On the Origin of the Christian Era." He remarked that although the subject was one of great historical and scientific interest, it was one to which very little attention had been given. From the investigations he had made, those who had attempted to settle the date of the Christian era had treated the subject very unsatisfactorily. It was a curious fact that they all began the calculations from the day of Christ's Resurrection, reckoning back to the date of His birth. But even the day of Resurrection was not unanimously agreed on, and hence various conclusions were arrived at. In fact, it was notorious that there had been eras dated twenty-two years before, and others as much as 191 years after, that now in general use. At the present time the era used in Ethiopia and Abyssinia differs by eight years from our own, and this era was followed by all the Byzantine writers.

Accident in a Sewer at Liverpool.—In descent of sewer in Commercial-road, Kirkdale, in connexion with the Liverpool Sewage Utilitarians' Company's reservoir, a man has lost his life, and five others narrowly escaped. A number of men, employed by the corporation, have been engaged in cleaning out this sewer, which is a branch one, 6 ft. in size. The foul gases lurking in the sewer rendered it impossible for the men to remain any time in it, and they accordingly took turns at the work. Five men were working in the sewer, when, having stirred a quantity of putrid matter, a gust of foul air caught the men and instantly rendered them insensible. A man standing at the manhole observed one of the men below to fall down, and, suspecting the cause, went down, and was also made insensible by the poisonous air. With as much speed as possible the men were extricated, but one of them died in a few minutes after the accident. The others quickly recovered consciousness.

The Severn Bridge and Tunnel Bill in Parliament.—The two railway projects for crossing over and under the river Severn, both by a bridge and tunnel, which are antagonistic schemes, having been before Parliament during the past few weeks, have at length both been sanctioned, having finally passed the committee of the House of Lords last week. The cost of the bridge and railway over the Severn is estimated at 227,973*l*., the railway being only a single line, whilst the tunnel project is for a double line of railway, the estimated expenditure being 750,000*l*.

The Tug-Dredger, "Canada."—Advices have been received that the new patent combined screw dredge hopper, *Canada*, has arrived at Halifax, after a voyage across the Atlantic in eighteen days, under steam. The vessel averages 135 miles per day. It was designed, built and engineered by W. Simons & Co., London Work-Shop.

Diamond Stone-Cutting Machines.—The invention of Messrs. H. & J. L. Young, of Stamford, Conn., U.S., relates to that class of stoncutting machines in which reciprocating blades armed with, or protected by, diamonds, are used for cutting or dividing stones into slabs, and which are known as diamond-gang-saws. And he said improvements consist, first, in operating the said reciprocating blades in relation to the stone to be cut thereby, in such a manner that the diamonds are kept in contact with the part of the stone to be cut only when the blades carrying the said diamonds are moving in one direction, whilst when the said blades are moving in the opposite direction the diamonds are kept away from the part of the stone to be cut, either by the blades or blades carrying them being brought away from the stone, or the stone itself having been withdrawn from the blades or blades.

A New Cemetery in South London.—A new cemetery is about to be formed in South London, to meet the requirements of the South Metropolitan district, in which there are only two other cemeteries,—Norwood and Nunhead,—both of which are said to be rapidly filling, as well as nearly all the public cemeteries around London. A public company has been formed for the construction of the cemetery, with a capital of £10,000. The site of the proposed cemetery is in the parish of Beckenham, near South Peckham and South Norwood, and in the immediate vicinity of several railway stations. It is to be 20 acres in extent, and it is stated that the promoters have already secured land for the purpose, which has been purchased from Mr. Morgan Evans, the owner, the property being rehold.

Permanent Shade for Glass Houses.—A correspondent of the *Garden*, says,—The best permanent shade for plant-houses is linseed oil and sugar of lead, in the proportion of about a teaspoonful of the lead to a quart of oil; but the exact tint must be governed by the amount of shade required. Therefore apply the lead gradually, and prove it upon a few pieces of waste glass until you get the tint desired. The *modus operandi* is this: first wash the glass thoroughly clean, and then (having previously prepared the oil and lead) on a dry clear morning, take the oil and paint as thinly as possible over the glass with an ordinary paint-brush; then follow with what the painters call a dust-brush, loose and quite dry, and, dabbing it gently on the dried portion, impart a frosted or ground-glass appearance to it.

Swindon New Town Main Outfall Sewage Works.—These works being now completed, the board have passed a cordial vote of thanks to their engineers, Messrs. Bass & Mims, for the skill and ability with which the works had been designed and executed. The saving to the ratepayers effected is considerable, as it avoids all outlay for labour, fuel, and wear and tear of machinery. The whole of the sewage now flows rapidly by gravitation through a tunnel and invert, 2,000 yards long, on to the highest part of the farm, and thence over every part of it by surface carriers. The tunnel is driven at a depth of 37 ft. in the centre below the surface. The farm, which is 105 acres in extent, is now receiving the sewage, the necessary irrigation works being rapidly proceeded with.

Nuneaton Sewage Works.—These works have been inspected by the directors of the General Sewage and Manure Company, to whom the sewage and works have been handed over, and by whom they have been greatly enlarged. The sewage is mixed with rough sulphate of alumina and lime, and, in tanks, agitated and settled, and thence the water is run off clean into the river Anker, a tributary of the Thames, pure enough, according to Dr. Letheby, for any stream twelve times its volume. The patent is that of Dr. Anderson, of Coventry, who is, of course, opposed to irrigation.

The Sale of the Poultry Chapel and the new Building.—It transpired at the closing services of the Poultry Chapel held last week, at the price for which the land and buildings have been sold is £50,000. This will enable the parties connected with the chapel to erect a new building of a very superior character, and it appears that the structure about to be erected is one of the old edifice just sold is to be large and capacious, having accommodation for 2,500 persons.

Extensive Landship on the Midland Railway.—A deluge of rain during one of the thunder-storms of last week caused the loose shaly rock of the Derbyshire hills, where so many as thirty tunnels exist on the line from Buxton to Derby, to slip. At the Dove-holes, near Buxton, where the slip took place, two tunnels cross each other; and a piece of rock or earth with a surface of more than an acre was displaced, and formed an independent hill on the top of the smaller tunnel. A train was brought to a sudden stand by the *débris*. The driver was injured, and a first-class passenger taken out insensible, with a double fracture in his thigh bone.

Libel.—In a case tried in the Court of Exchequer on Saturday, Messrs. Studd & Bouverie, a firm of auctioneers and estate agents, carrying on business in Westbourne-terrace, obtained damages from Mr. Worthington, an architect, for an alleged libel. In the course of the hearing, a witness deposed that he had himself written the letter complained of, and in consequence of an expression of opinion from the Chief Baron, Mr. Haddleston, the plaintiffs' counsel, retired from the case, saying that he had not been allowed to go to the jury in consequence of the tone which his lordship had taken. The plaintiffs were therefore nonsuited.

An Australian Railway.—A project is under consideration in South Australia to construct a railway from Port Augusta to Port Darwin, with branches, if considered desirable, towards Melbourne, Sydney, and Brisbane. It is anticipated that the first cost will not be less than 10,000,000, and to induce English capitalists to engage in it, a concession of 200,000,000 acres of land, laid out in blocks, along the proposed route, will be asked for. The proposal originates with the South Australian Government.

The Proposed Wet Dock at Maryport.—A correspondent writes:—"We understand that the trustees for the town and harbour of Maryport have taken the opinion of Mr. Lloyd, barrister, as to their ability to compel Mr. Walker, the contractor with them, to construct the new wet dock, they having accepted his tender, which was the lowest sent in." It is reported that the opinion of Mr. Lloyd is that the trustees cannot compel Mr. Walker to fulfil his contract.

Patriotic Fund: Boys' School.—The architect of the building writes:—"With regard to the observation you have appended to the description of the system of drainage (a doubt as to the advisability of adopting the earth-closet system whilst there is another system of drains ready to hand), permit me to say that the acreage of the land over which the sewage is available for pumping is much too small to admit the additional fecal matter of 230 boys, and therefore the resort to the earth-closet system was deemed advisable."

The New Wood-Pavement.—It has been decided to lay down in King William-street, Gracechurch-street, Ludgate-hill, and that portion of the Strand skirting St. Mary-le-Strand, the same kind of wood-pavement which has already been laid in St. Bartholomew-lane.

TENDERS

For new sewer, Blythe-lane, Hammersmith. Mr. A. C. Bean, engineer:—

Newell & Robson	£3,950 0 0
Gough	3,530 0 0
Marshall	3,400 0 0
Young	3,100 0 0
Neave	3,250 0 0
Ritson	3,220 0 0
Wignane	3,075 0 0
Groveham	2,990 0 0
Williams & Co.	2,550 0 0

For villa residence at Sydenham. Mr. John Norton, architect:—

Burchell	£3,300 0 0
Boden	3,228 0 0
Wagner	3,124 0 0
Dover & Co.	2,993 0 0
Gough	2,930 0 0
Hughesdon	2,880 0 0
Lowell	2,865 0 0
Clarke	2,858 0 0
Mansbridge	2,830 0 0
Stephenson	2,737 0 0
Ranking	2,690 0 0
Gooding	2,690 0 0
Crook & Wall	2,610 0 0
Lord	2,320 0 0

For the construction of 420 ft. of 30-inch single ring sewer, and sediment tank, at The Grange, West Mounting, Surrey, for Mr. Alexander J. B. Stewart. Messrs. Bateman & Mather, surveyors:—

Hibbins & Trinder	£2,171 0 0
Condon & Sons	1,710 0 0
Jarvis (accepted)	1,620 0 0
Sease	1,100 0 0

For St. Augustine's Church, Honor Oak, Forest-hill. Mr. W. Oakley, architect:—

Conder	£3,315 0 0
Brass	3,736 0 0
Dove, Brothers	3,775 0 0
Jerrard	3,694 0 0
Roberts	3,263 0 0

For house and shop, Prince Arthur Tavern, Bondary-road, St. John's-wood. Mr. Gribble, architect:—

Scott	£2,777 0 0
Tully	2,750 0 0
Sabey & Son	2,700 0 0
Gough	2,590 0 0
Bowden (accepted)	2,480 0 0

For erecting four houses, being the first portion of the west wing of the London Foresters' Asylum, Bexley-heath, Kent. Mr. W. E. Potter, architect. Quantities prepared by Mr. C. R. Griffiths:—

Beckett	£2,860 0 0
Vickery	2,855 0 0
Keal	2,849 0 0
Sabey & Son	2,820 0 0
Ashtown	2,817 0 0
Hersee	2,800 0 0
R. & J. Butler	2,784 15 0
Nightingale	2,720 0 0
Clark	2,678 15 0
Ellingham	2,665 0 0
Horne (accepted)	2,633 0 0

For alterations and additions to a dwelling-house at New Barnet, for Mr. F. Newth. Mr. John Usher, architect. Quantities supplied:—

Moore	£2,608 0 0
Staines & Son	2,597 0 0
Chavlin	2,590 0 0
Taylor (accepted)	2,528 11 0

For four houses, The Grove, Blackheath, for the Earl of Ashburnham. Mr. Herbert Williams, architect:—

Newman & Mann	£2,298 0 0
Manley & Rogers	2,637 0 0
Poster	2,576 0 0
Adams & Son	2,480 0 0
Turner & Son	2,196 0 0
Merritt & Ashby	2,047 0 0
Jerrard	2,093 0 0

For the erection of schools, &c., in Saint Helen's-street, for the Chesterfield School Board. Mr. S. Rollinson, architect:—

Wade	£2,180 0 0
Forrest	1,819 0 0
Heath	1,810 0 0

For the erection of schools, &c., in Hippo-street, for the Chesterfield School Board. Mr. S. Rollinson, architect:—

Wade	£2,169 0 0
Forrest	1,674 0 0
Heath	1,665 0 0
Heathcote & Son (accepted)	1,631 0 0

For new school in connection with St. Jude's Church, Gryn's-inn-road. Mr. Joseph Peacock, architect. Quantities by Messrs. Northercroft:—

Cole & Sons	£2,538 0 0
Oxford	2,385 0 0
Roberts & Roberts	2,347 0 0
Manley & Rogers	2,338 0 0
Simpson	2,200 0 0
Macey	2,234 0 0
Lathey, Brothers (accepted)	2,173 0 0

For Wesleyan chapel at Bridlington Quay. Mr. W. Botterill, Hull, architect:—

Renard (accepted)	£1,048 6 0
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N.B. The old materials now upon the site to be again used, subject to the architect's approval.

For stabling, coach-house, and buildings, for James Hodgson, Belmont, Hesse. Mr. W. Botterill, Hull, architect. Quantities not supplied:—

Kelsey	£1,825 0 0
Stephens	1,610 0 0
Habbershaw	1,581 15 0
Clarison	1,652 0 0
Lison & Wilkinson	1,544 0 0
Drewery	1,539 0 0
Suddaby	1,510 0 0
Stanley (accepted)	1,473 0 0

For the erection of the new building, No. 55, Ludgate-hill, E.C., for Mr. Henry Ellis, Messrs. Gadsden, Ellis, & Co., architects. Quantities by Messrs. R. L. Curtis & Son:—

Brown	£3,234 0 0
Elkington	2,890 0 0
Sharlington & Coles	2,793 0 0

For Tunbridge Sewerage Works. Mr. C. Jones, engineer:—

Crockett	£10,244 4 9 1
Ritson	9,638 11 1
Cole	9,429 6 0
Marshall	9,320 0 0
Neave	8,998 8 8
Pannett & Sons	8,781 3 0
Blackmore & Howard	7,211 11 0

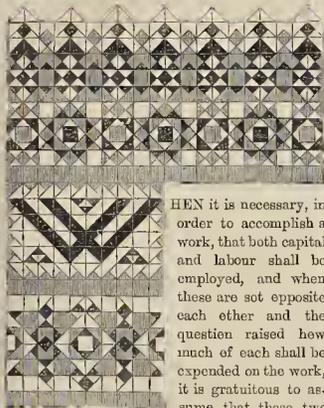
For restoration of Preston Bisset Church, Bucks, for the Rev. J. S. Holden. Messrs. E. Habershon & Brock, architects:—

Franklin	£1,065 0 0
Cooper	1,012 0 0
Nightingale	1,021 0 0
Munday	982 0 0
Tibbets	946 0 0
Hawkins	821 11 0

The Builder.

VOL. XXX.—No. 1535.

Wages.



WHEN it is necessary, in order to accomplish a work, that both capital and labour shall be employed, and when these are set opposite each other and the question raised how much of each shall be expended on the work, it is gratuitous to assume that these two sides of the question

form the whole of it; there is a third side, that of abstract justice, or, to express the same idea more practically, of mutual interest, without which the work is only a kind of slave-work, capital being converted into tyranny and labour into slavery. But the recognised theory is that no slave can set foot on English soil or touch an English tool or weapon, and it is mutual interest that makes this so. If this is not taken into account the theory is not true. Mutual interest, indeed, is but the lowest form of the great idea of freedom and equality. If a man in England wants something done that he cannot or will not do himself he does not say to another, as of right, "Do this thing and I will pay you for it," but, rather, "If you please to do this thing for me I shall be obliged to you," the feeling of obligation being mutual and equal. And thus we always hear a gentleman address a labourer in exactly the same manner as that in which he addresses every one else. How then does it come about that workmen strike? Clearly from the fault of both master and workman regarding a piece of work as having only two sides, and these opposed to each other,—capital and labour. That damnable doctrine that it is self-interest alone that governs all the actions of every man, and the assumption that there is no principle of justice applicable to any rate of wages, and no other permanent interest influencing the motives and actions of men than the merest self-interest, is as untrue as any proposition can be, and is made to fit the philosophy and to apologise for the actions of those who can see only two sides to the wages question. If it were true, indeed, it would be an excuse for any coercion that a combination of individuals could exercise for the purpose of increasing the weal of the whole.

Capital is employed in either of two ways,—by simply spending it, in which case it goes to pay for the labour of unknown persons, and is not productive of profit to the capitalist, or by doing some useful work with it by the employment of the labour of known persons, with whom agreements are made to exchange work for money; for it is not the labour but the work that constitutes the value given by the labourer for the money of the capitalist.

The workman says, "So far good, but the money is not sufficient, or, which is the same thing, the

master makes too much profit; we should be satisfied if by paying us 20s. he received for the work we do for him 22s. or 23s., but he receives 25s. for every 20s. he pays." Well, after all, it is but a question of investment and assurance against the stoppage of the need for labour. The master who pays 20s. with the hope of getting 25s. may not get even his 20s. back again, and if he does not do so he will not again pay 20s. on the same terms, but will rather hoard it, and so it cannot be employed in remuneration of other labour; whereas, if he succeeds in getting his 25s. he is ready to make other engagements with those who want his money and will give him its value in return.

Thus moderate wages are in truth better in the long run, for the difference between moderate and high wages is but an investment and an assurance of the continuation of the need for labour. We are inclined to look very fairly at this question, and not to take merely an optimist's view of it; and nothing would excite us to take a decided stand on the part of the workmen against the masters so soon as to think that the forbearance of workmen to ask for more than moderate wages should be misunderstood, or that advantage should be taken of that forbearance to misappropriate funds that belong not to any individuals, but to the people at large.

The voice of the people is a mighty power, and any one appealing to it on the side of justice need have no fear of inaction; but the one thing to be first determined before appealing to it is that the cause be just: and in proportion to the facility of commanding the voice of the people in a just cause is the opprobrium of exciting it in a wrong one.

Higher wages mean either reduced profits to the capitalist, or, if by a tacit understanding with other capitalists he increases the price of his productions, a reduction of the means of those persons who have to pay for them must take place, and in these are included other workmen,—brother workmen,—in which case the high wages paid to the workmen of one trade are taken from the earnings of those of another trade, and so the transaction is merely an exchange, and as it is not a voluntary exchange an ugly word might in strictness be applied to it.

Now, taking the case in either of these aspects, say the first, the question for consideration is whether the increased amount supposed to be received by the workman is as well spent, *i. e.*, for the good of the community, by him as it would have been by the capitalist. To answer that question it must first be inquired what the workman does or would do with the additional money he receives or may receive. Granting it to be well spent or appropriated, then there is a reason for his having it. If it remains in the hands of the master it will probably be used in increasing still further his profits, by undertaking further work; but that cannot be done without the employment of a greater number of men, and this is one of the aims of the trade-unions. But trade-unionists go further, and say, seeing no more than two sides of the question, let us have all we earn, to the last farthing, and we will find a use for it. Nobody has a right to inquire what we do with that we earn,—that is an impertinent inquiry, and interferes with our liberty. The framers and supporters of the trade-unions have taken a short and narrow view of the case; but it is in accordance with the doctrines they have been taught, and was certainly justified by the conduct of the masters in the first instance. The selfishness of the masters naturally begat selfishness in the workmen, until they have almost come to the conclusion that the two bodies are not only distinct classes, but of antagonistic interests.

The trade-union system of increasing wages is a very unscientific one, and fictitious, although in some cases it has been successful in its object, and is a practical measure. It may, indeed, be

called a rough form of justice. It is, however, founded on a wrong idea. Its advocates' views fall short of comprehending the whole position, and the only two sides of it they see appear to be antagonistic, and to admit of no amalgamation of interests; but the truth probably is that hereafter there will be but one interest, and that class distinctions will be done away with (and a good riddance that will be), and that there will be no such thing as wages paid for labour. If this is probable, as the natural result of civilised society, its progress towards accomplishment ought not to be hindered. It may not be accomplished in our day, and we cannot much hasten its approach, but we may at least refrain from trying to establish principles on fictitious bases, which will have to be overthrown before true principles can be established. In the meantime, we think that arbitration ought to be applied in disputes in the building-trade. It has often been tolerably successful, and may yet be entirely so. For each trade or class of trades, as the building trade, which is a class involving many individual occupations, as excavators, labourers, brick-makers, quarrymen, bricklayers, masons, carpenters, joiners, plumbers, glaziers, plasterers, paper-hangers, draughtsmen, clerks of works, master builders,—let there be a board or committee formed of a number of men proportionate to the number employed in building works, the number of each to be ascertained from the statistics of the country from time to time, for we must in such cases as this deal with average numbers.

SOME SPECULATIONS AFFECTING THE STRIKE.

We are very much afraid that at this moment neither party in the struggle that has commenced care to read much on the subject, or are likely to be much affected by anything that is written. Still there are thoughtful men amongst them who know very well that any violent and partial attempt to hurry or to modify the great movement of social progress may defeat its own ends. Artificial stimulus is not health. And when we see class, and craft, and calling banding itself together in a manner that implies hostility to every other class and calling, it is impossible to predicate any good result. The least harm that can happen, the greatest good that can be hoped, is for matters to remain much where they are. For any assertion, on the part of any single trade, of its own exclusive interest, will lead to a corresponding assertion, sooner or later, on the part of every other trade. And so we find that we are treading the path backwards to the old system of protection,—that old system that was so quaintly characterised by the expression, "All protection means robbing somebody else."

We suppose that no one will quarrel with us for saying that one main, if not the main, object of the present strike is the wider distribution of work among workmen. If a tenth of the time be cut off from the working day, one-tenth of the number of workmen, in addition to the actual number, will be required to do the same quantity of work. In itself we think the idea sound and even laudable. In one respect we have ourselves long urged that it ought to be made universal. In all those cases where employment is constant, and where its general or even its partial suspension on one day of the week is attended with great public inconvenience, the only proper remedy is to be found in the application of this principle. In the telegraph service, in the railway service, in the Post-office service, in many other cases that can be named, a certain amount of Sunday work cannot be neglected without serious inconvenience, loss, and danger. We may point to the water-supply of towns as a remarkable case in point. The water companies, to give a day's rest to their servants, inflict an amount of annoyance, toil, and danger to health on the holders of the smaller tenements which they supply that can ill be estimated. For the saving of the seventh part of the labour they employ, they make the public lose far more than a seventh of the whole benefit of a supply of one of the first necessities of life. In all these cases we should be glad to see it rendered imperative that the companies should employ seven men to do the work of six, so that

on each day of the week, one seventh part of their force should be at rest. It could then easily be so arranged that each man should have his fair share of rest on the Sunday. Nor can there be any real objection to the introduction of this salutary distribution of labour except the desire, expressed or understood, to make each servant of the company work seven days, or at all events six days and a bit, for six days' pay.

Again, in the case of a pressure of work, it would be far better to utilise the eighteen hours of daylight which we enjoy at this season of the year by the employment of two sets of workmen for nine hours each, than to keep the same men on for twelve or fourteen hours at a stretch. But the sound rule is, that the amount of work to be done should regulate the number of hands employed. When the object is to save time, or to avoid overworking the artificer without incurring delay, the proper remedy is to take on additional hands. But to divide the work of two men among three, and to shorten the hours of work in order to do this, is an artificial interference with the course of labour that can only produce an evil result. Labour, rightly directed, is capital. But also time is money. Anything that positively checks the producing power of the country, directly impoverishes it. And there can be little question that the limitation of the hours of labour directly checks this power. The money-earning value of each laborer is directly diminished. It is all very well to say that this is counterbalanced by acting a man who would otherwise be idle to do this omitted work. But the proper thing to do is, to let each man engaged have his fair and adequate amount of employment, and to turn elsewhere the attention of the spare hands.

For it cannot be too clearly borne in mind by the workmen that increase of their numbers will not produce increase of employment. When work is pressing, and hands few, no doubt additional workmen will expedite the quantity of work. But the very existence of the present contest denotes that the case just now is widely different. We have rather too many than too few laborers for the labour we have in hand. Otherwise, there would be no question of an enforced distribution of work among a larger number of workmen. The movement, then, cannot increase employment. On the contrary, it both can and will diminish it. There is no question that that work is rendered in every respect inferior, more cumbersome, and more costly, when it is carried on by too large a force. If, for instance, we only speak of the reduction of one hour out of ten in the day's work, this is an addition of ten per cent. to every charge incurred by the builder, with the single exception of the actual wage-sheet. Interest on capital, superintendence, horse-power, engine-power, correspondence, travelling, rent, taxes,—all these items will be increased one-tenth by the sole alteration of the time-table. And if we compare the actual cost of labour of a piece of work with the price which the purchaser of the work has to pay for it, we shall find that the latter ordinarily averages from one-half as much again to twice as much as the former.

Now the amount of money to be spent yearly in building is not unlimited. It cannot be enlarged by increasing the cost of building. On the contrary, it can, and no doubt will, be considerably diminished. That for a time it will be very seriously curtailed by any uneasiness among the men, any strike, or prospect of a strike, there can be no doubt at all. No great public or private work that is not urgently necessary will be taken in hand in the presence of such an uncertainty. But let us look beyond the present year. Let us suppose that a certain amount of building, if not executed in 1872, will be crammed into 1873-4-5, in addition to the natural work of those years. How much that might otherwise have been taken in hand will be deferred altogether? The positive building demands of the country are limited, after all, by the annual growth of the population. Increased luxury of accommodation, such as is now going on at the West-end of London, and elsewhere, is all very well, but it is not essential, nor will it be provided at more than a certain cost. It is probable that at this moment London is rather over-building than under-building itself. Now the annual increase of the population of England may be taken at 220,000 souls. (Between 1868 and 1869 it was 220,230.) The ratio of population in London is 8·4 persons per house. That would require the erection of 26,200 houses per annum in the whole of England, to provide for

the actual increase of the population, on the supposition that all our existing houses are fully occupied. As to the expenditure involved in the erection of those houses, different views may be taken. But if we are looking, not at luxury, but at what is necessary alone, we may take the approximate measure of 500 cubic feet per pair of lungs, which of course is much in excess of our actual cottage accommodation. A shilling a cube foot will not be considered too low a price for such building. That gives us a natural steady demand of 220,000 times 257, say 5,500,000 sterling per annum, required for housing the people. What is to be added for maintenance and repairs must also be borne in mind; but it is to new work that the workman has chiefly to look.

Now in London, by the occupation census of 1861, there were,—

Carpenters and joiners	27,598
Plumbers, painters, and glaziers ..	20,366
Bricklayers	16,335
Cabinetmakers	11,410
Wood-carvers	2,067
Masons	5,224
Plasterers	5,206
Gasfitters	2,160
Sawyers	3,627
	94,033

To this total of men employed almost exclusively in building and maintenance, must be added a proportion of 48,688 laborers (exclusive of dock labourers), of 3,221 brassfounders, and of 9,527 blacksmiths; so that we shall be on the underside of the truth in saying that 120,000 able-bodied men, many of them heads and supporters of families, were dependent on the building trade, within the metropolis, in 1861. The increase of the city, which doubles itself in forty years, will have increased this number, since that date, by one-fourth. That gives us 150,000 men directly supported by building, exclusive of all indirectly so occupied, for London alone, in the present year.

Now, the estimate by the Registrar-General, in his last annual report, of the population of London in the year 1869 was 3,170,751 souls, "within the domain of the Metropolitan Board of Works." The population of England, in the same year, according to the same authority, was 21,869,607,—that is to say, one-seventh of the population of England dwells in London. If the proportion of builders of all sorts to other inhabitants in the country, including all our great towns and cities, be the same as in the metropolis, we shall have 850,000 men in England alone who are engaged in building occupations. If the necessary repairs cost the half of what we have taken as the necessary outlay in building, we still do not find the sum amount to quite a pound a week for each member of this great army. These numbers are, of course, rough and tentative; but we give the data on which they are based, which are positive and exact. Let each of our readers work the sum for himself. We have given the figures rather with the intent that a definite idea should be formed than with any thought that they are more than approximate. But the fact comes out clearly that the one thing that is fixed, imperative, and annually increasing, is the number of mouths for which the occupation of the builder has to provide bread. The other side of the balance, the natural requirement for enlargement of abode, is already inferior to this demand, and is eminently liable to be checked by any increase in the cost at which that accommodation can be provided.

These matters are not opinion. They are hard, definite facts. They are facts against which, it seems to us, the authors and promoters of a strike run their heads. Especially it is incumbent on the workman to bear in mind the fact that his gain does not measure the public loss. The great sum which, in this country, we pay for the direction and distribution of labour has never yet been estimated. It cannot be far short of the sum which we pay for the actual labour of which we thus enjoy the results. All retail trade lives on this difference,—all capitalists' returns and masters' profits come out of it. Take, for instance, in that which ought, one would think, to be more directly and ungrudgingly rewarded than almost any species of labour, the sweat of the brain,—the exhausting toil of the literary man. Do our readers know what it costs to publish a book? We do not mean to print and to publish,—but to publish alone.—It costs 45 per cent.—more nearly 46 per cent.—on

the nominal selling price. For the mere handing over to the reader of the book, which has first to be written, printed, corrected, stitched, and bound, forty-five shillings out of every hundred are divided between the original publisher, at the regular trade profit, and the retail booksellers. It is thus we see so many of the latter able to take twopence in the shilling off the published price; it may be said that this is only a nominal price; but the effect on the original producer, the author, is most crushing. Take any other calling. In goldsmiths' work goods can readily be obtained from manufacturers at a reduction of one-third below the shopkeepers' price. Lace is made to order at half the price asked for it at the counter. We do not wish to pry into any trade secrets, but the fact of the enormous proportion which the cost of distribution bears to that of production is patent. We are of opinion that it exceeds the due limits. When we see the palpable signs of the immense fortunes that are made, often with very little toil, or skill, or desert, in consequence of the state of the produce-market, we are not surprised at such unbusiness being displayed by the actual producer. In this respect co-operative associations are indicative of the same conviction that is displayed in other cases by strikes. But there is this difference between them. The first are guided by reason. They are established by men who not only have a definite aim, but have an intelligent method of attaining that aim. That the co-operative system, by extinguishing the too great risks of trade, want of custom, and bad debts, brings the most wholesome check to bear upon that large proportion of profit which is absorbed by our present machinery of distribution, there can be no doubt. Thus, while the strike is certainly limited in its results, and almost certainly disastrous, in reducing that very amount of employment which its object is to increase,—the opposite route, that of hearty and intelligent co-operation, tends to increase at once individual welfare and public wealth.

The establishment of co-operative builders' associations must prove the downfall of the strike system, and may lead, with good fortune, to the establishment of a really co-operative interest between the employers and the producers of labour. To such an accordance alone can those look with hope who have at heart the welfare of old England.

THE PRINCE CONSORT NATIONAL MEMORIAL.

ON Monday morning last her Majesty the Queen, accompanied by Princess Beatrice and Prince Leopold, and afterwards met by the Princess Louise and the Duke of Edinburgh, visited the Prince Consort National Memorial, previous to its being opened to the public. The Right Hon. A. S. Ayrton, Chief Commissioner of Works, was also present. Mr. Gilbert Scott, the architect, Mr. John Kell, the contractor, and the following artists who had been engaged on various portions of the structure, were presented to her Majesty:—Mr. J. H. Foley, Mr. W. Theod. and Mr. J. Bell, the sculptors of the lower groups; Mr. H. Weeks, Mr. T. Thornycroft, Mr. J. Lawlor, and Mr. W. C. Marshall, the sculptors of the upper groups; Mr. H. H. Armistead and Mr. J. B. Philip, the sculptor of the pedium and of the bronze statues. Mr. F. A. Skidmore, who executed the metal-work; Messrs. Clayton & Bell, the designers of the mosaics; and Mr. Brindley, who executed the carving of the stone-work, were present.

Her Majesty was conducted round the memorial, and examined the sculptural work and other details, and expressed her entire approval of the manner in which this great work has been executed.

Since then the barriers have been removed, and the memorial thrown open to the public.

Just at the proper moment Mr. Murray issued a shilling Handbook, which enabled the morning papers to give very full and correct particulars of the structure and its remarkable adornments.* This little book includes an architectural account by Mr. G. G. Scott, and an account of all the statury. We have but one quarrel with it. The original committee, from whose labours the whole matter grew, are entirely ignored, beyond mention of the meeting, under the presidency of the Lord Mayor (William Cubitt), at which they were appointed, in January, 1862. The executive

* Handbook to the Prince Consort National Memorial. Published by authority of the Executive Committee. London: John Murray.

committee, which was a small one, worked sedulously, week by week, for many months; they discussed various proposed memorials, smoothed the way for a right selection, and ultimately handed over some 60,000*l.* if we remember rightly, to the committee afterwards appointed to assist her Majesty in selecting a suitable design. The present executive committee, who came into being later still, and under whose authority the book before us is issued, will scarcely be satisfied, we think, to have the names of the original executive committee left out of the record when the facts are brought to their memory.

ACCIDENT IN A SEWER AT LIVERPOOL

FIVE men working in a sewer at Liverpool, as we mentioned last week, were rendered insensible by foul air, and one of them died. This sewer was 6 ft. in height, and contained putrid matter, which the five men were employed to remove. Now, why should this death be termed an accident? There was no accident about it. The five men are said to have entered the sewer, and to have commenced to stir the putrid refuse, when the foul air (or gas) instantly rendered them insensible. They were removed, but in a few minutes one died. This was no accident, but the result of well-ascertained laws. Unventilated sewers of deposit, it has been proved over and over again, are liable to generate gases deadly to life; and here was a sewer, having these deadly conditions, into which five men are made to enter, to the peril of all and to the immediate death of one. Accident, indeed! This, we say again, was no accident, excepting we are to understand that the Liverpool corporation officials having charge of the sewers are utterly uneducated, as also utterly inexperienced. Educated men know that diluted, and therefore weakened, sewage-gases are injurious to health; but they also know that concentrated gases from putrid matters are deadly, and that to enter a sewer, a well, a brewer's vat, or other receptacle, filled with carbonic acid gas, is instant death. Men were formerly killed on entering the foul unventilated sewers of the metropolis, but since these sewers have been ventilated (very rudely ventilated, it is true), "accidents" from sewage-gases have ceased. The London sewers are as foul with deposit as the Liverpool sewers are, and were, in their unventilated state, as deadly; but abundant ventilation from the crown of the sewer to the surface of the street has permitted unceasing dilution and dispersion of sewage-gases in the open air, to the improvement of the health of the whole community. Stop these rude sewer ventilators, and the mortality of London might rise as high as that of Liverpool. The Liverpool sewers are not ventilated in the London manner, nor are they sufficiently ventilated in any manner: hence this "accident" to five men and the sudden death of one of them.

When will the Liverpool officials learn, and put the knowledge into practice, that town sewers may be under-ventilated, but cannot by any possibility be over-ventilated?

The sewers of Liverpool are not sufficiently ventilated, and along the steep gradients of the town, in their foul and unventilated form, they are answerable for very many deaths, and will continue to be so answerable, until they are fully and freely ventilated to the open air. These "accidental deaths" are not, however, so sudden and palpable as the one commented upon, hence do not cause so much alarm.

NOTES ON FOREIGN PICTURES IN THE INTERNATIONAL EXHIBITION.*

Among other works of interest in the French Gallery may be named Cormon's "The Niebelungen" (1,145), a fine specimen of drawing and painting of the female figure; Banvier's "Idyll" (1,235), in which a real modern interest is given to a classical subject by its spirited treatment and rich colouring; Mdme. Mamont's "Caught!" a splendid piece of still-life painting of fruit and flowers, on a large scale, the title indicating the predicament of two small children, who endeavour to hide under the table, having been found in the act of uncharitable deprecation. "Bibot's" "The Samaritan" (1,290), is a thing not to be passed over, equally powerful in conception and execution; the single figure of the man who has "fallen among thieves," lies on the ground, naked and pale

from loss of blood, amid a rocky landscape: the drawing of the figure, sharply foreshortened, is admirable; the Samaritan approaches in the distance. This is a remarkable and original work, which leaves its impression on the mind. Tissot has two remarkable works: "Before the Departure" (1,176) represents two girls, and a hard-featured seaman in some kind of uniform, watching with different degrees of interest the clearing of a ship out of dock; the picture is in the painter's usual hard white tone, and completely filled with details of masts and rigging crossing the composition; the scene and the personages are as completely English as the work, artistically, is completely French. "Portrait of Captain * * *" (1,282) is an admirably painted and characteristic specimen of realistic portraiture: the "captain" is shown seated in a railway-carriage at the moment of taking out his watch to note the time; every detail, the rug, the railway-guide, &c., finished minutely; the whole effect as natural and life-like as such a picture could well be made. One or two works of the late M. De Poitvin (1,237, 1,241), lent by the French Government, are delightful to look at, from the perfect grasp and mastery of the subject and materials on the part of the artist. A very charming picture also is Jundt's "Return from the Feast" (1,247), a young peasant girl returning by summer moonlight, laden with flowers and presents, pausing at a brook side; there is much sentiment, and a very good atmosphere effect in this. Landscapes are not numerous, but some are admirable: "The Village in Snow," by Chenu Fleury (1,171), is one of the finest; a flat landscape, a straight road leading to the village in the middle distance, the whole buried in snow, the main part of the canvas occupied by an expanse of sky of that peculiar dingy yellow tone which a foggy atmosphere in winter acquires by contrast with the dead white of the snow. This painting is almost sublime in its effect, yet how simple in its treatment and materials. The French landscape-painters shine in the treatment of snow, as shown again in Lavezzari's "The Wood of Monthuis" (1,155). They have acquired a broad and yet truthful treatment, analogous in its principles to that which our own artist, Mr. Hook, bestows upon sea and sand. Lapostolle's "View of the Canal St. Martin, Paris" (1,117), Gniaud's "Autumn Landscape" (1,154), and Lansvers's "Pond of Montefontaine" (1,271) should be looked at. Schmidt's "Hollow Way in Brittany" (1,300) is a little gem. Grisebille's "Verge in a Wood" (1,153) is another of those small, broadly-painted landscapes in which French painters delight, and is an admirable specimen of a method of treatment largely illustrated in French landscape-painting; laying on the colour in broad masses, with scarcely any attempt at texture or detail; the artist trusting to his truth of tone, light and shade, to secure the intended effect. This is particularly illustrated in the grass-lawn which forms the foreground of this little work. An English artist would almost certainly have stippled and broken up the mass of green, to give the idea of grass-blades. The French artist shows an unbroken, thick mass of colour, but so carefully studied as to tone and the effect of the varying lights from slight irregularities of the ground that, at the proper distance, the illusion is perfect. We suspect that more thought goes to the French method than the English. At all events, we should incline to regard it as a more intellectual and aesthetically correct way of using pigments in imitation of nature.

In Gallery XVIII, Bavaria and Baden show the usual number of mountainous landscapes of considerable similarity of style and composition; Winkler's "Mountain Scene" (1,375) and Parnmann's "Thunder-storm" (1,461) are among the best of these, though both somewhat sensational in effect. A "Sketch on the Simsee," by Poschinger (1,377), is a very good specimen of landscape of a less pretentious and more truly artistic style. There is scarcely a figure subject calling for remark. Italy, represented in the same gallery, is much better in this respect, though, perhaps, hardly equal to last year; Baccani, whose beautiful "Idyll" attracted admiration last year, has a picture in quite a different manner, "The Evening after the Massacre of St. Bartholomew" (1,500), which may be briefly characterised by saying that it strongly resembles, in character, motive, expression, even to a great extent in colour, Calderon's "Funeral of a Puritan." Rinaldi's "Rehearsal of the New Mass" (1,493) is a clever

and interesting work, a scene in the choristers' gallery of a convent; and in a totally opposite way, Bianchi's "Violoncello Amatore" (1,469), representing an old gentleman puzzling over his instrument in the middle of a large and richly-furnished room, is very good; in manner and treatment this picture bears some resemblance to Tissot. Ferroni's "Female Straw-plaiter" (1,519), a large painting of women at work as indicated by the title, is very characteristic in treatment and colour, especially in the figure of the old woman with the handkerchief over her head, intent upon her task; there is something of Northern feeling and tone of colour in this work. A very beautiful and feeling work is that of Sorbi, "The Evening Work—Environ of Florence" (1,515), two figures in earnest talk, in a kind of public garden apparently, with a distant peep of the city showing over the wall: the repose obtained by the level lines of the composition harmonises precisely with the sentiment of the figures; there is a nationality, too, in the subject and manner of the work which detracts in no way from its interest. In the main, however, there is not much of specially Italian interest among the collection, unless we except Ceccoli's "Aurora d'Italia" (1,486), a symbolical female figure floating in the air over the domes and towers of Florence, which gives, however, little indication of a dawn in art; it is a pretentious and very unsatisfactory affair. We do not know, indeed, when we have seen so many commonplace and utterly uninteresting nudities and classicisms got together as are to be found in Rooms XVIII. and XIX., among the Austrian and Italian productions.

It is a contrast, indeed, to come from some of these tame and meagre productions to the few pictures by which Russia is represented at one end of Room XVI. Russia is chronologically behind other European nations in all the arts—they are comparatively late achievements with her; yet in every branch of art to which she has seriously set her hand, her artists have shown a vigour and originality which promise great things from her in future. We come here upon what we should certainly call the finest landscape in the Exhibition: "The Bed of a River," by E. Ducker (1,535). The river is nearly dry, and its rocky bed, covered with loose whitish shingle, is exposed, over which loaves a tremendous and tempestuous sky, threatening a thunderstorm. In tone and powerful effect, this is a most unusual work. Equally admirable, in a totally different way, is Wasiloff's "A Thaw" (1,682); the sloppy brown luge of the half-melted ice on the road, succumbing to a feeble and struggling sun-light, has been most carefully studied and successfully represented. Makowski's "Carnival at St. Petersburg" (1,669), is a large and important work, crowded with figures, and with much variety of character and interest in the various faces. A large picture, illustrating a Russian tale, painted in wax by Wereshshagin (1,538), is interesting not only as a good composition, but as a specimen of a medium we are unaccustomed to on a large scale here. The tone and general effect is somewhat like fresco, flat and thin: it is painted on a very rough cordy canvas; so rough, indeed, as to render the details unintelligible on a near inspection, though the whole is clear enough at the proper point of sight. A small picture by the same artist, in a totally different manner, is "Opium-eaters at Tashkent" (1,690), a sad and fearful study of the wreck of human intellects, very powerfully portrayed; the tone is peculiar, cold and very grey.

Among the Belgian pictures there is not a single figure-subject of sufficient importance or individuality to demand a separate comment; of landscapes there are several of unusual merit: Rodiaen's "Lake of Briens" (1,600), Baron's "Autumn Snow, Environ of Brussels" (1,619); Asselberg's "Ravine near Mont Aigle" (1,568), a very bold and grand landscape composition; and "Early Autumn" (1,575), by Lamorinière, an artist who excels in painting some of the quieter aspects of nature in a truthful and natural manner peculiar to himself, and the result, notwithstanding its apparent simplicity, of a great deal of conscientious study. We noticed his picture last year in the same gallery as the only Belgian landscape worth looking at, and his contribution this year is decidedly the best of the set. Kindermans, J. Van Suppen, and Mdle. E. Beernaert, exhibit good landscapes; and there is a "View in Seville" by Bossuet (1,559), in which this well-known painter of architectural subjects is seen in his very best manner; the truthfulness of texture and colour in some parts

* See p. 461, ante.

of the building, particularly the brick quay on the right, deserves every praise. There is a splendid still-life piece by E. Vandenhosch, who like one or two other Belgian artists, can challenge all Europe in this particular class of work.

We reiterate, in conclusion, our conviction that the attempt to make an annual international picture exhibition will prove a mistake. If the picture-galleries were open, say, once in three years, and the years of opening duly advertised, the artists of different countries would work for the Exhibition, and send contributions which would not only represent their best powers, but would furnish a periodical index of the progress of art in their respective countries.

BATHS IN OLD LONDON.

The Turkish Bath, introduced into England as a novelty about the year 1856, is merely a revival of a bath which was very popular in the seventeenth century. This, however, fell into disrepute, on account of the circumstances and immoralities that were practised under the cover of its supposed object. The very names of the sweating-bath,—such as *Bagnio* and *Hothouse*,—obtained an unsavoury meaning; and, to a great extent, the bath went out of use when its name became disreputable.

The practice of sweating in hot-houses is often referred to in the works of Ben Jonson; and in "The Parian," one of the supposititious plays attributed to Shakespeare, a character exclaims, "Marry, it will take me much sweat; I were better go to sixteen hothouses."

One of the earliest and best-conducted of these baths was the celebrated hotel in Covent Garden known as the *Hummums*, from the Turkish word, *Hammam*, which is now used to designate the bath in Jermyn-street. The house was built about the year 1631, when the piazza was laid out by Inigo Jones for Francis Earl of Bedford, and the vaulted ceiling of the entrance-hall and corridor was designed by the great architect. It was very beautifully decorated with scrolls, wreaths, &c., and fortunately escaped injury from the fire which consumed the whole of the upper part of the front portion of the house about ninety years ago. The back part of the house also escaped, as well as the bathing establishment, which consisted at that time of the hot-room, &c., two bath-rooms, heated by means of flues from a large furnace, and also a large plunge-bath, with marble floor, and sides tiled like those of the bath-rooms. This bath has for many years been covered in, and used merely as a water-tank for the supply of the house. Many years ago, when some alterations were being made in the basement of the house, the original brickwork forming the foundations of the Covent of Covent Garden were laid bare. An ancient passage, or arched gallery, of considerable length, leading from one of the cellars in an easterly direction, was then discovered. It formed the means of communication between some of the subterranean cells, one of which still remains, and has at one end an arched way or recess, that has been bricked up either by the monks or their successors, at a very early period.

The south-east side of the piazza was originally built with an arcade like the north-east and north sides, and this is seen in Rooker's fine engraving of Paul Sandby's view of Covent Garden, which is dated 1777; but after the fire mentioned above the fronts of the houses were rebuilt as we now see them.

The Old *Hummums* was the scene of the notorious Parson Ford's ghost, which Dr. Johnson called the best accredited ghost story he had ever heard; and when the house ceased to be used as a bath, it attained a high character as an hotel, and was long the favourite resort of the military heroes of the Peninsular War. The Old and New *Hummums* remained side by side for some years; but lately the proprietors of the Old *Hummums* (Hewitts) have retired, and the proprietors of the New *Hummums* (Rockleys) have thrown the two houses into one and called the hotel the *Hummums*. The Old *Hummums* had been in the possession of Mrs. Hewitt's family for upwards of 100 years, and about the same length of time in that of their predecessor, Mr. John Rigg. Mr. Rigg, in his prospectus, lays great stress on the decorum of his establishment. The following is a copy from a handsome engraved plate, with ornamental border, by Woodfield, of Maiden-lane:—"John Rigg, Copper at the *Hummums*, in the Little

Piazza, Covent Garden, with a back door from Charles Street, where gentlemen only may be always accommodated (if not full) in the best and neatest manner with Lodging, Sweating, Bathing, or Cupping, and with the utmost decorum, as has always been kept and preserved for near a hundred years. Likewise Ladies are permitted only to Sweating, Bathing, and Cupping, with great care and proper attendance. N.B. Gentlemen or Ladies who desire to be Cupped at their own Homes, either in Town or Country, shall be waited on. There is likewise a good Cold Bath." In the *Postman* of Nov. 15, 1701, appeared the following advertisement:—"The *Hummums* in Covent Garden having for several years past been neglected and abused by those persons that had the care and management of them, whereby several Persons of Quality have been disgusted and have left off coming thither to sweat and bathe as formerly. This is to give notice, that the said *Hummums* are now in the possession of others, who have re-fitted the same, and rectified all those neglects and abuses that were formerly done there, where persons may sweat and bathe in the clearest and be Cupped after the newest manner. There is likewise provided good lodging for any persons who shall desire to lodge there all night, where who pleases may see the same. The price, as was always, for sweating and bathing is 5s. 6d. For two in a room, 8s.; but who lodges there all night, 10s." In Strype's edition of "Stow's Survey" (1720), the "*Hummum*" is said to be "much resorted unto by the Gentry."

The *Bagnio*, in *Bagnio-court* (now Bath-street), Newgate-street, was built by some Turkish merchants, and opened in December, 1679, for sweating, hot bathing, and cupping; but the most celebrated of these establishments was the Duke's *Bagnio*, on the south side of the west end of Long-acre, called after James, Duke of York. Samuel Haworth, M.D., published an account of this bath in 1683, which is interesting as giving us a good idea of what these old baths were like. He writes:—"In one of the rooms hangs a pair of scales, to weigh such as out of curiosity would know how much they lose in weight while they are in the *bagnio*. The *bagnio* itself is a stately oval edifice, with a cupola roof, in which are round glasses to let in the light. The cupola is supported by eight columns, between which and the sides is a sumptuous walk arched over with brick. The *bagnio* is paved with marble, and has a marble table; the sides are covered with white gully-tiles, and within the wall are ten seats, such as are in the baths at Bath. There are also fourteen niches in the walls, in which are placed so many fountains or basins, with cocks over them of hot or cold water. Adjoining to the *bagnio* are four little round rooms, about 8 ft. over, which are made for degrees of heat, some being hotter, others colder, as persons can best bear and are pleased to use. These rooms are also covered with cupolas, and their walls with gully-tiles." On the accession of the Duke of York to the Crown, the bath was called "the King's *Bagnio*," and in 1694 it was rebuilt. The following is from the description of the new house by the proprietor, Leonard Cundit, who does not forget to run down the rival *Hummums*:—"These are to give notice, that the late great *bagnio* in Long-acre, known by the name of the King's *Bagnio*, is now rebuilt, and divided into several rooms, and is far more convenient than before for the reception of all persons of both sexes that are pleased to reap the benefit thereof, every day in the week, all persons being private to themselves except they bring company with them; for it much exceeds the *Hummums* and other like sweating-houses for decency and convenience, and much more advantage may be reaped thereby, their fire being directly underneath, but ours at a distance."

The house, No. 73, St. James's-street, now occupied by Fenton's Hotel, was formerly Peyrant, Pierault, or Pero's *Bagnio*, which became a very fashionable place on its being set up about the year 1699. The prices charged were 2s. 6d. for a cold bath, and 5s. for a warm one. These *bagnios* were not the only baths in London, for besides them there were certain cold baths, such as St. Agnes-le-Clair Baths, Tahernaale-square, Finsbury; Peerless Pond, Baldwin-street, City-road; the Cold Bath, Clerkenwell; Queen Elizabeth's Bath, near the King's Mews, Charing-cross; Queen Anne's Bath, Endell-street, Long-acre; and the floating baths on the Thames. We thus see that plenty of bathing accommodation was supplied to the inhabitants of Old London. Some men nowa-

days seem to think that the virtue of cleanliness was left to be discovered by the present generation. In old times there was probably less "tubbing" at home than now, but there were more out-of-door baths in proportion to the size of London than at present.

THE IRON TRADE IN THE NORTH OF ENGLAND.

ERECTION OF EXTENSIVE NEW BUILDINGS.

BUILDINGS involving an immense outlay are now in course of erection at Stockton-upon-Tees, Middlesbrough, and other surrounding places in the north of England, in order to meet the requirements demanded by the extraordinary impetus which has been lately given to the iron trade in that district. The quantity of pig-iron produced in the neighbourhood is at the rate of about 2,000,000 tons per annum, or a value of 10,000,000l. at present prices. It will be admitted that this is something enormous both in quantity and value, and yet it is inadequate to the vast requirements of the trade, the demand being considerably in excess of what can possibly be produced. This being so, the various firms are endeavouring by every means to increase their productive powers by the erection of new blast furnaces. At the present time there are not less than thirteen new furnaces in course of erection at Stockton and the immediate neighbourhood, representing a value of 260,000l., in addition to which several of the leading ironmasters are about to erect new and distinct works. A Glasgow firm has just leased land at Redcar, near Stockton, on which to erect two new blast furnaces, whilst Messrs. Ross, Willis, and some other gentlemen have purchased a royalty of 500 acres of land at Kenningrove, near Redcar, on which they are about to erect blast furnaces, at an outlay of upwards of 150,000l. Messrs. Bolckow, Vaughan, & Co., of Middlesbrough, are also about to erect several blast furnaces at a place called Eston Junction, not far from Middlesbrough. Besides this immense outlay in the erection of new works and buildings, the Erimus Iron Company, with a capital of 50,000l., has been formed to erect iron-works on Dank's principle (a patent for puddling machines), near Stockton. This company has purchased 25 acres of land, and it is stated that the new works which they are about to erect will produce 500 tons of puddled iron per week. The several new schemes represent a total capital of 1,018,000l. about to be laid out in new works and buildings, in addition to other works now being carried out; and the total capital required for the completion of new works and the extension of established concerns within the next twelve months, as at present decided upon, is estimated at from 1,500,000l. to 2,000,000l.

SCHOOL BOARDS.

London.—The following architects have been invited to submit competitive designs, viz.:—For schools for 720 children, at West Ferry-road, Millwall,—Messrs. Arthur & C. Harston, Mr. J. Young, jun., Mr. P. Spiers, and Mr. John S. Quilter. For schools for 750 children, at Blundell-street, Finsbury,—Mr. Thomas Archer, Mr. Laey W. Ridge, Mr. T. Roger Smith, and Messrs. Arthur & C. Harston.

Ross.—Mr. G. Pearson, jun., has been unanimously appointed surveyor to this Board.

Rochester.—This Board, at its last meeting, proceeded to the opening of the designs for the new schools to be built by the Board. Mr. Hayward, before the plans were opened, said he understood that several members of the Board had been written to by one of the competing architects, who signed himself "Invicta," and he trusted the Board would mark its sense of the impropriety of his conduct by refusing to look at his plans. He had also been informed that another architect had addressed letters to some of the members of the Board; but as he (Mr. Hayward) had not been favoured with one he could not say under what name the writer went. He would propose that neither of the plans respecting which communications had been sent should be opened. The motion, however, was not seconded. The various competing plans, twenty-seven in number, were then opened and inspected, after which Mr. Aveling proposed that application be made to the Mayor to allow the use of the library at the Corn Exchange, in which the drawings and plans might be placed for inspection, and that the Board adjourn for a week. The Rev. C.

Bosanquet did not think that the Board would be able to go through the whole of the plans at their next meeting, and suggested the appointment of a committee to do so. Mr. Aveling hoped, after the expense and trouble the gentlemen had been at in preparing their designs, the Board would give them more than one evening's consideration. He trusted that there would be no unnecessary delay, as he wanted the new schools to be roofed in before the winter. Mr. Hayward seconded the appointment of a committee to go through the plans. Many of the plans, he said, could not be carried out under 1,000l. more than they intended spending, and it was of no use wasting valuable time over their consideration. The Chairman thought that most of the specifications would state the probable cost of the schools, as well as the name of a contractor who would carry out the work for the sum. After some further remarks the Board adjourned the meeting for one week.—The design of Mr. Walker, of Moorgate-street, has been selected. The design submitted by Mr. Banister Fletcher was considered next in merit.

Scarborough.—At a special meeting of this Board, the Clerk read a letter from the Education Department, with reference to the central school site, stating that the Education Department approves of the site for the erection of a school for 800 boys, girls, and infants (in Trafalgar-street West). The clerk read the minutes of a committee of the whole Board held on the 17th, which recommended that a competition amongst architects be invited for the plans of the school; that the school be named the "Central Board School;" that the Education Department be requested to give authority to the Board to borrow the money required to purchase the whole of the land near Trafalgar-street West, on the understanding that in the event of any portion being sold as surplus land, the money realised by such sale will be appropriated towards the payment of the loan; and that Mr. John Petch, architect, be instructed to prepare the necessary plan and levels of the site to be applied to the competing architects. The adoption of the minutes was carried.

THE COPENHAGEN EXHIBITION BUILDING.

The Scandinavian Exhibition has been opened, with some éclat. A Danish correspondent of the Times, in an account of the proceedings, gives some particulars of the structure, which we condense:—

The building erected for the purpose, but destined to be converted into a permanent institution, has found its place in the largest and most important of the four passages connecting the inner town with the suburbs. Until five years ago, Copenhagen was in name a fortress, a high wall with expanding bastions and deep ditches, drawing a broad belt between the old city and its modern enlargements. These traces of former fortifications are about to disappear in Copenhagen just as in Vienna, the State having sold to the municipality the whole ground of the ancient fortress, which is now to be converted into a semicircular boulevard and new streets. The Exhibition building is erected in the Western Passage, close to the renowned pleasure-ground, the Tivoli, partly on the even ground and partly in what was, until two years ago, a portion of the ditch. It reminds one, in this respect, of some Edinburgh houses, in which what may be third or fourth floor towards Prince's-street is ground floor on the Canongate side. The choice of place has been severely, and not undeservedly, criticised; but, after all, the irregularity of the terrain may have contributed not a little to the favourable impression now made by the palace and the adjacent grounds. The material employed is the red backstone characteristic of the period of King Christian IV., corresponding with your Elizabethan era, enlivened by greyish sandstone window-frames, numerous statues, large flower-pots, and waving banners. The four wings of the main building enclose a glass-covered court, upon which all the four stories of surrounding galleries open, and in this large space, where all the lions of the Exhibition have been collected in picturesque variety, the opening solemnity was performed. The inner court lying a good deal deeper than the principal entrance from the street, the hall or vestibule leads to a double flight of descending stairs, forming between them a broad platform with a balustrade, flanked by two of Thorwaldsen's masterpieces, — Mercury the Argus-killer and

Venus with the apple. From this platform, dominating the central court, and easily to be seen from all parts of the crowded house, the Royal family assisted at the opening. In the body of the court, placed between the china collections, the jewelry-cases, the terra-cotta groups, the trophies of armour, the bunches of singularly-twisted iron bars, and all the other incongruous items of the catalogue, the light and tasteful toilettes of the ladies enlivened the picture.

CHURCH WORK IN WORCESTER.

WE condense the following from an article on this subject in the Worcester Herald. Some of the churches in the article have already been noticed in our columns:—

Worcestershire for the last quarter of a century has been conspicuous for the prominent position it has taken in the restoration and rebuilding of parochial churches, as also for the establishment of new districts, provided with churches and chapels of ease.

"The time is conscious of her wants; through England's bounds In rival haste the wish'd-for temples rise."

The great exertions which have everywhere been made of late to atone for the neglect and to sweep away the barbarities of a previous century or two are still continued; and, as a proof of the zeal in this good work for which our own district is remarkable, we have put together a few notes respecting church-work at this present moment in hand:—

Malvern.—There is no part of the diocese where so much energy in church matters has been shown within the last quarter of a century as that around the Malvern Hills. The separation of a new district, to be called Christ Church, has just been legally effected. At present there is only an iron church to supply the wants of a district; but it is intended as soon as possible to build a church somewhere in the Mill-road. A successful effort has been made to raise an endowment fund. The chapel of Holy Trinity Church, North Malvern, has been richly decorated with gold and colours by Mr. Forsyth, of Worcester.

Hanley Castle.—St. Gabriel's Chapel of Ease, in this parish, which is being built at the cost of Mr. Samuel Martin, of Catterall, has so far advanced that the roof-timbers are being laid on, and it is hoped to complete the church by the end of the year.

Welland proposed new church has not yet been commenced. The parishioners are unable to raise the amount (2,000l.) which the architect, Mr. Huggill, of Oxford, has estimated as the cost of a church to hold 400 persons. A site in a central part of the parish has been given by Mr. A. Watkins, and plans have been prepared. Owing to the dilapidated condition of the parish church and the crowded state of the churchyard, something must be done speedily.

Eldersfield.—A school-church is about to be built on Corso Lawn.

Bengworth.—The old parish church here, it may be remembered, had fallen into hopeless decay, and to rebuild rather than restore was considered by far the wiser plan. Lord Northwick generously gave a site; while Miss Porter, of Birlingham, contributed 1,000l. The first stone was laid in October last by Lord Northwick, and the work has proceeded till the new church is now partly roofed in, and will probably be ready for consecration in August next. The cost of the erection, exclusive of the site and the value of the materials in the old church, is estimated at 4,000l., besides 550l. for extra works, walls, fences, and laying out the grounds. The church will be Early Decorated, and built of stone, faced and lined with blue lias and Bath stone; 700 sittings. Messrs. Barry & Sons, of Liverpool, are the architects; Mr. Yates, of Liverpool, is the builder. The old church is nearly pulled down, but a small portion of the tower will remain as an entrance to the churchyard.

Birlingham Church, which has been rebuilt at the expense of the late rector, Rev. R. E. Landon, and Miss Porter, of Birlingham House, is nearly completed, and when the churchyard is laid out and re-arranged, the consecration will take place. The building is in the Decorated style, and has a chancel, organ-chamber, vestry, nave, and aisles. Mr. B. Ferrey, of London, is the architect; and Mr. Estcourt, of Gloucester, is the builder.

Charlton.—This is a hamlet of the parish of Cropton. The handsome little ecclesiastical

structure now approaching completion was a short time ago an old barn. Mr. Workman called in the aid of Mr. Forsyth, of Worcester, and the transformation of the old building into an apparently new one was soon accomplished. It will be licensed and opened for divine service in a few weeks. The church is 72 ft. long by 21 ft. wide; has a chancel, vestry, nave, and porch, with bell-turret and clock at the west gable; open wooden roof, tastefully decorated; and Mr. Hughes, of Frith-street, London, has cleverly stained a three-light east window with the subjects of the Resurrection, the Good Shepherd, and Christ blessing little children. Other windows represent the Evangelists. The eight nave windows have stained-glass centres and borders. A neat gallery, with open front, contains a fine-toned organ. Stone pulpit, cleverly carved, and the floors laid with handsome tiles, of various patterns. No expense has been spared in the decoration of the structure. The church adjoins the village street, and is approached by stone steps.

Elmbridge.—Here a great restoration in the church has been going on, with some intervals of inaction, for the last two years. Mr. Forsyth, of this city, has superintended the entire work, with the assistance of Messrs. Bourne, of the Tything, builders. It is intended to complete the restoration this summer.

Kingsnorton Church restoration is so near completion that the reopening is expected to take place shortly. Mr. Hopkins, of this city, has been the architect; and Mr. Estcourt, of Gloucester, the builder. The church had been shored up with great unsightly buttresses in the year 1712, or it could not have stood so long. The estimated cost of the restoration is about 2,500l. The church and tower have been thoroughly restored, a new north aisle built, and new roofs to nave and south aisle. All defective masonry has been made good, pillars and arches set upright, and many unsightly excrescences removed.

Kidderminster.—A new organ-chamber is being erected at the parish church of Kidderminster, from designs by Mr. W. J. Hopkins, consulting architect to the Worcester Diocesan Society. The north gallery has been taken down; and a grand new organ, to cost 1,000l., is to be erected by Mr. Hill, of London.

DUBBIN'S PATENT.

Sir,—With reference to the new machinery for repairing houses, &c., engraved in the Builder, No. 1,533, p. 489, it deserves notice whether the invention might not include a plan for preserving the lives of workmen, by means of a movable chain fixed to the wall, on a wooden parapet or wooden rail, sufficiently high to prevent such a fatal accident as that which occurred to the late Mr. Basevi in Ely Cathedral, or that which threatened to close the career of Sir James Thornhill, when he was engaged in painting the ceiling of St. Paul's Cathedral. An attack of giddiness, as well as a false step, has ended the career of many promising workmen, in the absence of such a safeguard, which was suggested by the late Mr. George Combe, in one of his works, as a desirable improvement. Window-cleaners are liable, especially, to fatal accidents under the present system. CHAS. COOKE.

THE MOSAICS AND FRESCOES IN THE HOUSES OF PARLIAMENT.

In Committee of Supply, on a vote for lighting and warming the Houses, Mr. C. Bentinck referred to the mosaics and frescoes. He said he had always understood that mosaics were in future to take the place of frescoes in the decoration of the Houses of Parliament, and wanted some explanation, therefore, of the charge of 500l. for painting one panel in fresco for the central hall.

A desultory discussion on this and other subjects ensued, and Mr. Ayrton said in regard to the frescoes, it was determined by the Royal Commission that the four patron saints should be illustrated in the four compartments of the central hall. St. George had been exhibited in what was called glass or Venetian mosaic. It was generally considered, however, that glass mosaic was not a satisfactory mode of decoration for the walls of that building, and he asked all the artists concerned in fresco painting to give their opinion on the subject. They thought it

would be quite premature to abandon fresco painting; because an eminent chemist, who was associated with them in the inquiry, was of opinion that the failures of the frescoes could be traced to definite causes with the knowledge of which that class of painting might be revived in all its perfection. If the glass mosaics were to be gone on with, the cost would be 500*l.* apiece, instead of 650*l.* The question was an open one for the House to decide, and if they decided to grant the 500*l.*, further counsel would be taken with the artist, Mr. Poynter, who was a gentleman of great eminence. There was great difficulty in going on with the glass mosaic, because Mr. Poynter declined to proceed with the designs. Finally, the item of 500*l.* was struck out of the vote. Between two stools art came to the ground.

ARCHITECTURE AT UNIVERSITY COLLEGE.

The following is a list of the students who obtained prizes in Professor Lewis's classes:—*Architecture (Junior Class)*.—W. G. Field, First Certificate and Prize; P. Warne, Second ditto.

Senior Class.—F. E. Eales, Certificate and Medal.

Architectural Construction (Junior Class).—F. P. Johnson, First Certificate and Prize; W. H. Lloyd, Second ditto; C. C. Ogle, Third ditto.

Senior Class.—W. H. Lloyd, First Certificate and Medal; F. P. Johnson, Second ditto; F. A. Butler, Third ditto; P. Warne, Fourth ditto.

ARCHITECTURAL ASSOCIATION.

The final meeting of the session was held on Friday evening, the 28th of June. A paper was read by Mr. E. R. Robson, architect to the School Board for London, which will be found elsewhere in this number. The examination of the balloting papers for officers for the ensuing session gave the following result:—

President.—J. Douglas Mathews.
Vice-Presidents.—Edward J. Tarver and George H. Birch.
Committee.—T. Blashill, E. C. Lee, R. Plumble, J. S. Quilter, G. R. Redgrave, L. C. Riddett, L. W. Ridge, T. R. Smith, W. L. Spiers, and T. H. Watson.
Treasurer.—J. Douglas Mathews.
Secretary.—Francis Truett.
Auditors.—Stephen Salter and E. B. F. Anson.
Librarian.—H. C. Boyes.
Assistant Librarians.—Ernest Elliot and R. E. F. Pownall.
Secretaries.—Bones A. Faice and S. Flint Clarkson.
Registrar.—John S. Quilter.
Collector.—Edmund Marshall.

BEDFORD.

THE large mansion, from the designs of Mr. John Usher, of Bedford, now in course of erection at Clapham Park, near Bedford, for Mr. James Howard, M.P. for Bedford, and a partner in the well-known firm of agricultural implement makers of that town, stands upon slightly elevated ground in the midst of the park, and commands a fine prospect. It is built entirely of red brick, with dressings of Hare-hill stone, and is Early French Domesticated Gothic in general treatment. The house is carried well up, somewhat higher in proportion to its ground plan than are mansions of this class generally; and now that during the past fortnight the whole of the scaffolding has been cleared away, the general effect is seen to advantage, and the diversity of grouping and of sky-line afforded at every point of view cannot be deemed anything but satisfactory. The effect altogether, especially from the eastern elevation, is very picturesque. The principal entrance is on the north side, where there is a large groined porch. Fareham bricks are used throughout the building, the cut bricks being from Cossey, near Norwich; the cut-work of the chimneys and other parts of the building come out well and are successful. The tiles are Burslem ones, of varied shapes and hues: the roofs being steep in their pitch, these show out to advantage. The staircase is of oak, and is well lighted by a lantern, carried by an arched Bath stone, around which is a corridor communicating with the upper rooms. There are four bays on either side, the arches being supported by columns of red Mansfield stone, upon which are foliated capitals; the arch moulds are also enriched with running ornament. The encaustic tiles are by Mr. J. K. Cooper, tile and pottery works, Maidenhead. The arrangement in the basement, whereby the

chimneys of the principal rooms may at any time be swept and the soot carted away without the sweeps entering the building, thus saving a vast amount of dirt and muddle, is worthy of attention, and will gladly be shown and explained by Mr. Edward Dencon, the obliging clerk of works. The stables and coachman's house are well removed from the house, and are built in character with it, only that the bricks used are local ones, not quite so regular in colour as the Fareham brick. Mr. Samuel Foster, of Kempston, near Bedford, is the contractor; Mr. Dennis is his foreman on the works. The carving is in the hands of Mr. Harry Hems, of Exeter. The cost of the whole of the works will probably be about 17,000*l.*

THE TRADES MOVEMENT.

London.—A committee of the Social Science Association, with a view to bring about a settlement of the dispute in the building trade, passed a resolution suggesting that a court of arbitration should be at once constituted, consisting of an equal number of the representatives of employers and employed, who shall, at their first meeting, elect an umpire or referee, and that all matters in dispute shall be referred to such court, whose decision shall be final, it being agreed that, pending such award, both parties may maintain their present position. On Saturday, at a general meeting of the masons locked out, held in the Sun Concert Hall, Westminster-road, Mr. Broadhurst in the chair, about 600 men were present. The resolutions and recommendations for a settlement of the dispute emanating from the committee of the Social Science Association were discussed, and they were ordered to be upon the table, but not to be further entertained. The carpenters generally repudiate any sympathy with the recommendation. They refuse to entertain for a moment the idea of submitting the nine hours to arbitration. At a crowded meeting of the masons it was also resolved that it is advisable to allow those shops now working to continue to do so until further notice on the same terms as at present, but under protest. It was also resolved that no mason be allowed to resume work in any firm where the lock-out has been adopted until the present dispute is brought to a settlement.

The resolution passed by the London Trades' Council, suggesting that the question as to wages and working rules should be referred to arbitration, on the nine hours being agreed to, and which was identical with that submitted to the delegate meeting of carpenters, was rejected by acclamation, on the motion of Mr. Broadhurst. A second meeting of the Social Science (Labour and Capital) Committee was held on Saturday last: present, Mr. Frederick Hill, in the chair, Mr. Walter Morrison, M.P., Mr. Thos. Brassey, M.P., Mr. Godwin, Mr. Edwin Pears, and other members, when the position was further considered with a view of taking such further steps as might seem likely to promote a proper termination of the present disastrous state of things. It was ultimately determined, however, that it was desirable before moving further to ascertain in what spirit their first resolution had been received. Since then, the Master Builders' Association have expressed their willingness to adopt the suggestion made by the committee. It is stated, too, that some sections of the men hold an opinion favourable to it. Surely there are some men of position to whom both sides would listen, who could now usefully interfere. The question as to the formation of a company of co-operative builders seems to have so far attained the following shape:—The proposed company is to be called the London Company of Builders (Limited), with Mr. Thomas Hughes, M.P., and Mr. Walter Morrison, M.P., as trustees; to have a capital of 10,000*l.* in 10,000 shares of 1*l.* each; and to be based upon the co-operative principle, whereby a preference would be given to employes who were shareholders, and who would, by virtue thereof, be entitled to a share of half the surplus profits over 10 per cent. per annum, and other privileges. The company, which had already received promises of support from two eminent architects, would be registered for the purpose of carrying on all business incidental to building and contracting, and the purchase in fee or taking on lease of the requisite land for prosecuting the same. Mr. W. Morrison, M.P., had undertaken to subscribe for 1,000*l.*, and afterwards for 200*l.* for every 100*l.* subscribed by working men.

Lowestoft.—On Saturday evening a large

meeting of bricklayers was held at the Clapham Hotel, "to consider their present position with that of other towns." Resolutions were passed, "that an advance of a halfpenny per hour be asked for upon the present rate of wages, making 5*d.* per hour the lowest." The present wages are 4*d.* and 5*d.* Also "that a circular be sent to the masters immediately, requesting that the advance commence on the 1st of July."

Bristol.—The following is the decision of Mr. Lewis Fry relative to the dispute between the operative carpenters and joiners of this city and their employers:—

"Having given deliberate consideration to the facts and arguments laid before me by the employers and by the operative carpenters and joiners, I have arrived at the conclusion that it will be fair under the circumstances to fix the rate of wages at 6*d.* per hour, the hours of work to be fifty-four per week in summer (instead of fifty-six as at present) and fifty and a half in winter (as at present). I therefore make my award on these points accordingly. With regard to payment for overtime, I am of opinion that the evidence adduced would not justify me in altering the existing rate, viz., 25 per cent. for the first two hours and overtime (per day) for the remainder of the employment, and 50 per cent. after such two hours; the present rule will therefore stand good. Lewis Fry.

Bristol, June 24th."

Ponza.—A large number of the operative masons struck for an advance of 2*s.* per week, viz., from 20*s.* to 22*s.* They alleged that this increase of wages was promised in the spring of the year, to take effect at Midsummer, but that the promise was not fulfilled. Several important pieces of work were not in question, and the differences were arranged.

Glasgow.—At a meeting in the Trades' Hall, the following resolutions were passed:—

"That this meeting of the building trades of Glasgow cordially approves of the desire of the operative masons to introduce the system of the payment of wages weekly; deeply regrets that the deliberate refusal of the Master Masons' Association to entertain the proposal has forced the present course, viz., that of a strike,—upon them, and resolves to afford the operatives their best moral influence, and, if need be, financial aid, in maintaining their present struggle; and declares its thorough disapproval of the policy pursued by the Master Masons' Association in endeavouring to cause the employers in Edinburgh to lock out the operatives there, and its conviction that such action is contrary to the spirit of the Criminal Law Amendment Act, or otherwise a strong argument in favour of its repeal as a measure which interferes with the action of combined workmen only."

MR. G. G. SCOTT.

OUR readers will hear with great pleasure that her Majesty has been pleased to intimate her intention of conferring the honour of knighthood on Mr. G. Gilbert Scott, the eminent architect, on the occasion of the completion of the Prince Consort National Memorial in Hyde Park.

SEWAGE IRRIGATION AND THE GOVERNMENT BOARD.

Sir,—The article relative to proposed sewage irrigation at West Ham, by Mr. L. Angell, which appeared in the *Builder*, is most misleading. It is neither the whole truth nor half the truth. There is no alteration of opinion at the Local Government Board as to the advantages of sewage irrigation. There is no opposition to sewage irrigation. In West Ham proper Mr. Angell's letter needs no refutation. The Local Government Board must be assumed to accept honest reports from its inspectors; as, also, to decide from full knowledge of each question. The Local Governments' Board most certainly heard both sides at West Ham before giving any decision on their inspectors' reports.

SANTARIAN.

PREMIUMS OF THE INSTITUTION OF CIVIL ENGINEERS.

THE Council of the Institution of Civil Engineers have just awarded the following premiums for papers read at the meetings during the session 1871-2:—

1. A Telford Medal, and a Telford Premium, in Books, to Bradford Lewis, for his "Account of the Bridge over the Gaura River on the Goolundo Extension of the Eastern Bengal Railway."
2. A Telford Medal, and a Telford Premium, in Books, to Carl Siemens, for his Paper on "Pneumatic Dispatch Tubes."
3. A Telford Medal, and a Telford Premium, in Books, to William Bell, for his Paper "On the Stresses of Rigid Arches, &c."
4. A Telford Medal, and a Telford Premium, in Books, to John Herbert Latham, for his "Description of the Sookbaisa Canal."
5. A Telford Medal, and a Telford Premium, in Books, to George Gordon, for his Paper on "The Value of Water, and its Storage and Distribution in Southern India."

6. A Telford Premium, in Books, to Frederick Augustus Abel, F.R.S., for his Paper on "Explosive Agents applied to Industrial Purposes."

7. A Telford Premium, in Books, to Hensley Britton, for his Paper on "The Construction of Heavy Arches, with reference to Economy of the Mechanical Forces engaged."

8. The Manby Premium, in Books, to Charles Andrews, for his Paper on "The Best Mode of Making Mortar."

The Council have likewise awarded the following prizes to students of the Institution—

1. A Miller Prize to Oswald Brown, for his paper on "Sewage Utilization."

2. A Miller Prize to Arthur Tournon Atchison, B.A., for his paper on "Railway Bridges of Great Span."

3. A Miller Prize to John Atkin, for his paper on "The most suitable Materials for, and the Best Mode of Formation of, the Surfaces of the Streets of Large Towns."

4. A Miller Prize to Alfred Edward Preston, for his paper on "Wood-Working Machinery."

5. A Miller Prize to William Patterson Orchard, D.E., for his paper on "The Education of a Civil Engineer."

TILE PANELS, PICCADILLY.

Sir,—In your article on our buildings in Piccadilly (page 489), you wonder whether the pictured panels are actually designed by the architects.

I beg to state that these cartoons were drawn by Mr. Henry Gray, for Mr. G. G. Scott, a glass (opus secti) artist, and we have pleasure in expressing our satisfaction both with the drawing and the execution of the work.

GEORGE & VAUGHAN.

TENDERS IN MANCHESTER.

Most of your readers feel interested in the question of quantity-taking, and it is for this reason that your correspondent, "R. W. A.," would give some outline of the Lancashire system, of which he speaks so lightly.

R. W.

BRICK ARCHES.

Sir,—Permit me to ask through your paper a question which has long occupied my mind respecting the construction of brick vaulted arches. We have a reservoir in course of construction which we propose to cover with 9 in. brick segment arches of 8 ft. span. We wish to know which of the two following methods possesses the greatest amount of strength, viz. two separate rings of bricks, or the arch turned and bonded with headers and stretchers. We are inclined to think the best method is, as it were, to use the first method on one key. We wish to know if the above has ever been tested.

AVALON.

THE INSTITUTE CONVERSATION.

Sir,—In reference to the question which your correspondent "A," asked last week, allow me to say that every year members of the Institute are invited to contribute works of art for exhibition at our Conversations, and this year the council added a special note to their annual report with the same object in view. In addition to this, letters conveying a similar request were sent to a great number of artists who have kindly contributed on previous occasions. The result may not have been all that could be wished as far as pictorial art is concerned; but at this season of the year the works of painters are being exhibited elsewhere, and it is not easy to find private collectors who are good-natured enough to dismantle their own walls for the sake of decorating those of our meeting-rooms.

With respect to the rest of your correspondent's remarks, I am not aware that any "bad modern French works" were exhibited. We had many creditable examples of decorative manufacture, and the reproduction of medals and old Roman ware were, I believe, generally considered very interesting specimens of ceramic art. If in a few instances the price of any article was left upon it, it was through inadvertence. As a rule, particular care is taken to have such labels removed.

Whether contemporary architectural designs—of the grade usually applied on such occasions—would have been more interesting to the ladies and gentlemen assembled here on the 26th ult. is, I venture to think, doubtful. I can only assure your correspondent that no pains were spared to render the soirée an agreeable one, and though he seems to have found our walls "dreadfully dull," I hope that most of our visitors were of a different opinion.

CHARLES L. ESTLAKE, Sec. R.I.B.A.

A HINT TO MASTER BUILDERS.

A CORRESPONDENT, writing to the *Standard*, says:—

"It is not a great mistake to assume, as is too often the case, that a struggle is a struggle in any sense between Labour and Capital? Say I have capital and wish to build a mansion. I place the matter in the hands of a first-rate architect. He pleases me with his design and I agree to proceed. Having an idea that it is I who represent Capital, I wish to deal directly with my friend Labour. My professional adviser, the architect, however, tells me it will be a very costly method of proceeding, as I shall have to provide plans; that he cannot get Labour to give a contract, and that, without that, he does not like to bind himself to cost. Having great faith in his friend I follow it, and give up the notion of playing cardinals. The drawings prepared for me by my friend are thrown open to competition. Twelve gentlemen, desirous of representing me, send in prices at which they are willing to spend my money for me, and Mr. Chips carries the day. Mr. Chips calls on me in his brougham. I am proud, for I feel that I am well represented. My professional friend prepares an agreement, binding Mr. Chips to keep good faith both in the matter of cost and completion by a given date. There is a clause, however, exempting Mr. Chips from any responsibility in the event of that most unusual occurrence, a strike. I protest, but in vain. I am informed that all builders of position insist on that clause. My house is at all costs 20,000*l.*, and I hug myself with the belief that at all events I shall be turning over some portion of that

money while it is being erected! but I find that Mr. Chips is 'down upon' me with a certificate very speedily. In other words, he begins, as I have already said, to spend my money, not his own, almost from the commencement, while I remunerate him to the extent of 15 to 20 per cent. for the trouble. I may have a shrewd idea that even the first instalment goes to meet a 'little bill,' but the brougham undoes me. Of course there is a strike, and my building is brought to a stand-still. I cannot do anything—I cannot help myself. I am told that a struggle is going on between Labour and Capital. The proper place for Mr. Chips is the workshop from whence he came, not helping his fellow tradesmen at the bench, but aiding them with that strong head and clear brain of his. He is shrewd, intelligent, and pushing, and if only those shrewd, intelligent, and pushing men were to honestly represent their own trade for its amelioration instead of being, as is so often the case, mere impediments, fattening on Capital and on Labour too, and obstructing both, it would be well for the workmen and well for the capitalists of England, though fatal, perhaps, to that exquisite little brougham. What is my friend the architect about that he does not take his proper position as a professional adviser acting between those two old friends, Labour and Capital? He belongs to a powerful and learned body of professional men. In the old days, I take it, Mr. Chips was a stranger in the land, and it is not possible in these days of restoration for architects to assert their own position once again? With Labour and with Labour, the possessors of plant, are subject to a committee of shrewd, intelligent men, these subject again to a body of professional men, representatives of Capital, strikes would become impossible."

SCHOOL-BUILDING NEWS.

Gloucester.—The infants' and girls' department of St. Nicholas's schools has been opened. The buildings, designed by Mr. J. E. Jones, architect, and built by Mr. Fream, jun., are in two stories. The ground-floor contains the girls' school, 40 ft. by 20 ft., with class-room adjoining. The infants' school is at right angles to the girls' school, and measures 35 ft. by 20 ft. 6 in., and both schools are 14 ft. high. The upper floor contains the boys' school, 62 ft. by 20 ft., with class-room, 20 ft. by 14 ft. 6 in. The height of this story is 13 ft. to the wall-plates. The roof is ceiled to the underside of the rafters. Fresh air is admitted into the buildings by openings under the floors, and by the windows; and the warm air escapes through ventilators in the roofs and walls; and the boys and girls have separate entrances in Quay-street; the infants' entrance is in Upper Quay-lane. The hall hung over the galle in the Quay-street elevation. The inside of the walls are painted and lime-washed, and each room has wall-lining of wood, 4 ft. 6 in. high. The floor of the boys' school has been plugged to prevent the noise disturbing the occupants of the lower rooms. The buildings were recently visited by Mr. J. Bowstead, the Government Inspector, and on his estimate they have space sufficient for 380 children—200 girls and infants, and 180 boys. The elevations are plain, with no attempt at ornament, the walls being built of red brick, relieved with strings of black and white bricks; and the roofs are covered with Broseley tiles. The usual offices have been provided. The bare cost of the buildings is 860*l.* The total cost of site, buildings, and fittings, is 1,850*l.*

Halifax.—St. Joseph's Roman Catholic Schools for the north and east portion of the borough, are shortly to be commenced, the plans having been passed by the Southwam board. The site of the schools is on a portion of Bloody field near to Godley-bridge. The new building will be Gothic in style, built in the form of a quadrangle. Accommodation will be provided for several hundreds of children. Mr. Simpson, of Bradford, is the architect.

Brighouse.—The plans of the proposed new school in connexion with the Clifton Church, are now drawn by Mr. J. S. Barbor, of Halifax, architect. The schools will be used both as day and Sunday school, the present schools being too small. The new building will accommodate between 200 and 300 children, and will be built on a piece of ground adjoining the church, at the east end, given by Sir George Armatage, bart., who has also given the stone, and a donation of 50*l.* towards the erection. Several tenant farmers have likewise offered to lead the stone from the quarry, free of cost. The schools are to be erected for the purpose of doing away with the necessity of a School Board in the district, and with this object in view the Low Moor Company have given 300*l.*, there being now about 600*l.* towards the whole cost.

Sunmerstown.—The parish schools have been re-opened by the Bishop of Oxford. In order to meet the requirements of the New Education Act, they have been considerably enlarged. The cost of the work was about 300*l.*, the greater portion of which amount has already been raised by voluntary contribution. The alterations were

carried out from designs by Mr. Wilkinson, of Oxford, architect. Mr. Green, of Cassington, was the contractor.

Oxford.—The chief stone of St. Paul's parochial boys' school, which is being built to meet the requirements of the Education Act, has been laid by the Provost of Worcester College. The site selected for the building is in "Allum's Field," Upper Walton-street, and the school is intended to accommodate 200 children. The schoolroom will be 75 ft. long and 2½ ft. wide, and there will be two classrooms, 16 ft. square, besides two laboratories and an entrance porch. The cost of the work will be about 950*l.* Mr. Buckenidge is the architect, and Mr. Selby the builder.

Adelaide Bridge.—The new schoolroom just built at Adelaide Bridge has been opened. It was built to accommodate fifty persons. The architect was Mr. W. T. Pierce, of Southampton; and the builders were Messrs. Holl, of Cambridge. The total cost is about 300*l.*, towards which Government contributes 60*l.*; the remainder is raised by subscriptions of church people. The ground was given by Miss Brady.

Wolverhampton.—St. James's schools, Wolverhampton, have been enlarged. The alterations have doubled the original size of the schools, and in addition there are three class-rooms, whilst there were none in the old schools. Accommodation is now provided for about 550 children. The alterations have been carried out, according to the designs of Messrs. Weller & Proud, architects, by Mr. David Evans, builder. The alterations, together with additions which have recently been made at the Causeway Lake schools, will cost altogether about 1,600*l.*, and the greater portion of the money has already been subscribed.

Cheetham.—The foundation stone of a new school, in connexion with Rydal Mount Wesleyan Chapel, and situate close to Waterloo-road, Cheetham, has been laid. The site immediately adjoins the chapel, covers an area of about 70 ft. by 40 ft., and will accommodate 400 children. A plain brick building, in harmony with the chapel, the structure will be two stories high, the lower room the principal schoolroom, and the upper one will be used by infants. In addition to these rooms, on each floor provision will be made for class-rooms. It is estimated that the total cost of the building, including the purchase of the land, will be 3,500*l.*, and towards providing this sum 2,500*l.* have already been promised by members of the congregation and friends.

Chester.—The Blue Girls' new school, Vicar's-lane, has been opened. The Marquis of Westminster provided the site, which is ample for the purposes of a school and play-ground. The plans of Messrs. Kelly & Edwards, architects, of this city, were chosen, and the contract of Messrs. B. & O. Owens, builders, accepted. The building is of brick, with stone dressings, being a half-timbered one, presenting two gables, and a gablet in the centre, which overlook the park. The building will afford accommodation for twenty-six scholars, although there are only sixteen at present on the foundation. It contains on the ground-floor a vestibule, lobby, school-room, matron's sitting-room, board-room, kitchen and scullery, laundry, &c.; and on the first floor two large dormitories, bath-room, lavatory, bedrooms, and sick-room.

Thetford.—The new school-house recently erected by Sir R. J. Buxton, bart., M.P., in the village of Rushford, is nearly completed. The building has been erected under the superintendence of Mr. Myhill, of Shadwell, and is of ample dimensions to accommodate all the children in the villages of Rushford and Brettenham.

Barking.—The foundation-stone of new school-rooms for this parish has been laid. The building when completed will consist of a boys' and girls' school and a teacher's residence, the builder being Mr. Thomas Emuor, of Commercial-road; the architects are Mr. Wm. Slater and Mr. B. Carpenter; and the clerk of the works is Mr. J. E. Walker.

Bromley.—A new national school has just been erected at Mason's Hill. The building is in the Gothic style, and is erected on a large piece of ground presented by the Rev. Le Griz White, of Leeming, near Penrith. The architect was Mr. W. C. Banks, of London, and the builder, Mr. W. A. Grubb, of Bromley. The cost of the building is 1,150*l.* The number of boys and girls which the school will accommodate is 200. There is a covered playground, as well as an open one.

Barwell.—National schools have been opened here. They are to accommodate 220 children.

The building is in the Gothic style, and built of red bricks, and the front partly of stone. It contains three large rooms, a class-room, and two porches. The entrance to the boys' room is through a porch and cloak-room, 8 ft. 6 in. square. The boys' room is 40 ft. by 18 ft., and height of ceiling, 18 ft. It is lighted by one large tracery window, and three other windows. The girls' room is separated from the boys' by large folding-doors, and is 36 ft. long and 18 ft. wide. In the infants' room, which is 40 ft. by 18 ft., two galleries have been built. All the rooms have been laid with gas, and are heated with Penfold's patent warming and ventilating apparatus. The architect was Mr. Osborne, of Birmingham, and Mr. Simpson, of Leicester, was the contractor. The schools are supplied with desks, the invention of Mr. Simpson, useful, it is said, also for tables, seats with rest for back, or may be converted by a simple method into seats with hook-rest, for divine service. At the back of the school is a playground, walled round.

Stafford.—The memorial-stone for Wesleyan schools in Earl-street have been laid. The ground floor will be divided into class-rooms, large infant class-room, library, &c., and the general school-room above will accommodate a large number of children. The estimated outlay is 1,200l., towards which about 800l. have been subscribed, including the proceeds of the stone-laying, leaving a deficiency of 400l., nearly half of which is mainly attributable to the increased cost of labour and material. It will be a plain building, the outer walls faced with pressed bricks. The entrances are in Queen-street, and the ground floor, which is about 56 ft. by 40 ft. in the clear, is laid out for library, four lofty class-rooms, and a large infant class-room, which will also be suitable for Band of Hope and other meetings. The upper room will cover the extent of the whole building, and will be lofty and well ventilated, with ceiled roof, 24 ft. 6 in. in height from the centre. The whole will be heated with Redfern & Co.'s hot-air apparatus; and there will also be a yard and the requisite out-offices. Mr. Thos. Roberts, of Trentham, has given his services gratuitously as architect, and Mr. A. F. Whitton, of Stafford, is the builder.

Bayton.—The memorial-stone of the Bayton and Marnham school has been laid by Mrs. Charles Wicksted, of Ludlow.

London.—The corner-stone of the new schools, Kingsgate-street, has been laid by Lady Marian Alford.

Cheddar.—A new British school has been provided for Cheddar, on a piece of land a little to the west of the village. Mr. J. Bevan, architect, Bristol, prepared the plans. The building is Gothic in character, and built of conglomerate stone quarried at Dreycott (a few miles distant), with dressings of Bath stone. It has a bell-turret in front. The structure forms a conspicuous object from the Cheddar Valley line. The school buildings consist of two rooms, the principal one of which is large and lofty. On the right-hand side, and forming part of the building, is a residence intended for the master and mistress. There is school accommodation for about 120 children. The total cost of the building will be nearly 1,300l.

Sheriff Hutton.—The foundation-stone of the new Church schools at Sheriff Hutton has been laid. The schools will be built chiefly of stone, to contain 130 children. The principal school-room, 35 ft. 8 in. by 18 ft., will accommodate 80 children; and the smaller room, for girls (sewing) and infants, will hold 50, and measures 25 ft. by 16 ft. This will meet the Government requirement of 8 square feet to each child. The design is by Messrs. Perkin & Son, Leeds, and the contractor is Mr. John Tomlinson, also of Leeds. A master's house will afterwards be added.

STAINED GLASS.

St. Mark's, Lewisham.—The east window of this church has been filled with stained glass, representing the Crucifixion of our Lord and the scenes attending His Passion. A window (proposed to be one of a series) has also been placed in the south aisle, representing the Raising of the Widow's Son, subscribed by the members of the choir, in commemoration of the Prince of Wales's restoration to health. The whole has been executed by the firm of Messrs. Lavers, Barrard, & Westlake, with the general supervision of Mr. W. C. Banks, the architect of the building.

Glasgow.—In the premises of Messrs. Ballantine & Son, of Edinburgh, is a stained-glass window for a new Free Church just erected at

Sighthill, Glasgow. It is a memorial of the late Mr. William Collins, the founder, in 1834, of the Glasgow Church Building Society. The illustration of the centurion's faith in the power of Christ, occupies the three upright lights in the window. The dexter light contains Christ to see Hinu restore the sick servant to health; the centre lights represent Jesus met by two of the centurion's servants, and in the sinister light is seen the centurion tending his sick servant. The whole story is illustrated.

Bonsall Church.—Mr. William Henstock, of Manchester, and Mr. Francis Henstock, of Slaley Hall (near relatives of the late Miss Woodviss), having commissioned Mr. George Shaw, of Saddleworth, to design and prepare three stained-glass windows for the chancel of this church, that gentleman has now completed his task, and put the various subjects chosen for illustration in suitable order. On the south side of the chancel, as it is approached from the nave, there is the first window of three lights representing, by various groups, such as the Adoration of the Shepherds, and the Visit of the Magi, the Incarnation of the Redeemer. On the same side of the chancel, nearer to the eastern window, there is the second window of three lights, representing again by groups of figures the Transfiguration. In the east window is placed a representation of the Last Supper. Close upon 500l. have been laid out upon these windows.

Sutton Madlock Church, near Shiphal.—A stained glass memorial window has been fixed in this church. The window consists of two openings, one subject occupying each, the one on the left-hand opening being "The Baptism," and the other on the right "Suffer Little Children." Below the subjects are two angels surrounded with light grisailed work, and in the upper part of the window are light canopies with ruby backgrounds; also in a small tracery piece between the two openings is the Agnus Dei. A narrow border runs all round the window except the bottom, which has the inscription. The tone of colouring throughout the window is like that of old stained glass. The window was designed and painted by Messrs. Donn & Davies.

Berkhamstead Church.—A stained-glass window has just been placed in the chancel of this church, to the memory of the poet Cowper, who was born in Berkhamstead, and whose father and mother are buried in the chancel. The subject of the window is the Resurrection; beneath the central figure being the poet, with hands clasped on an open Bible. On one side is the Royal Psalmist, and on the other the Prophet Jeremiah. Cowper's name hares are also included in the representation. The inscription is as follows:—"William Cowper, the poet, son of John Cowper, D.D., rector of this parish, and Ann, his wife. Born at Berkhamstead, November 15, 1731; died April 25, 1800."

SCHOOL PLANNING.*

THE subject of school-planning is one which may appear to architects as so simple and even trivial as apparently to need little discussion, but in reality the problem of how to produce the best planned school (depending, as it does, upon the previous problem of how to teach in the most efficient manner) is one well worthy of their careful attention.

Various forms of schools have been adopted in different countries with various degrees of success, but it would still seem that none of these forms a perfect model for our country to adopt, although each may furnish a contribution on some point or other.

The Irish school consisted generally of large rooms, planned to give either a double arrangement of benches and desks along each side of the schoolroom, with classes intended to stand at certain points, or were arranged with desks down the middle of the room and standing-space for classes on both sides. The line of desks being generally broken at intervals of two, this plan had the advantage of enabling the teacher to pass easily to one side of any pupil at any moment by the intervening gangway; and the classrooms were few in number.

On the other hand, the "Prussian System," as it is called, has been much praised from the circumstance of its classes being all taught in separate rooms. It has not, as a rule, any general schoolroom, but the school consists

* By Mr. E. R. Robson, architect to the Central School Board. Read at a meeting of the Architectural Association on the 23rd ult.

entirely of classrooms, although in some instances a hall is provided for lectures and examinations.* The advocates of the Prussian system allege that it produces the greatest results when tested by public examinations, while others say that without a general school-room such a plan merely offers facilities for the greatest amount of "craming." I had expected to be able to lay before you a full description of a Prussian school, by a gentleman in Vienna, but, owing to the shortness of time, it has not reached me.

The Americans have followed the plan of the Irish schools to a considerable extent, and in their schools, as shown in the published reports and plans thereon, many of the main features of an Irish school are frequently to be found, although there are of course differences arising from the different opinions on education prevailing in America.† On one point American opinion differs widely from that prevalent on this side the Atlantic in the circumstance that the whole of the education is carried on by mixed schools, the sexes being taught together to the end of the course. A specimen of this system of mixed schools, throughout may be found in the Wesleyan Schools, near Tredegar-square, Boylston.

In England, hitherto, owing to the want of a general system of public education, funds have always been exceedingly scanty, the only moneys derivable from the State being "grants in aid." The result has been to necessitate the greatest economy in school buildings. As the funds have been generally raised with great difficulty, proper arrangements have been curtailed, and due regard to efficiency (especially in the article of class-rooms) frequently neglected. As before remarked, the advocates of the Prussian system show that it produces the greatest results when tested by public examinations; but the advocates of the English system, on the other hand, maintain that the latter promotes general intelligence in a much higher degree, in consequence of that attrition of mind arising from the assembling of a great number, and are commonly called "the sympathy of numbers." The English system seems to demand a general schoolroom as an indispensable necessity; and if this be provided, in addition to the number of separate classrooms required for the whole of the children; then there is a serious increase in the expense of the building, and, in fact, a superfluous and extravagant amount of accommodation. And it may fairly be laid down as a proposition, that in schools of the very largest size, where the cost of the additional school or hall can be distributed over a large area of children should such a system be adopted, and even then only for special reasons sufficient to outweigh motives of economy.

The accompanying plan sets forth a suggestion by the Rev. Canon Cromwell.

At the risk of being considered unnecessarily elementary, I must now proceed to indicate a few of the points which may be considered to govern, in most cases, the plan of a good school suitable for children in large English towns. I hesitate the less to do this, from perceiving many indications on the part of architects that the thoughtful planning of a school is a subject beneath their notice. As two instances, I may mention that I observed the other day published, in one of the professional journals, the plans of a new school, in which nearly all the internal uses,—the daily life, so to speak,—of the building, appeared to be overlooked or despised; and, again, I read with some astonishment a conspicuous article in another professional journal, criticizing plans, as though the only object in designing schools was to make them look pretty outside.

"Design prettily; usefully if thou canst, but prettily."

Still, I must crave the indulgence of the many architects who cannot be ranked in the same category, in stating many points so well known to them.

Infant Schools.—Under the Elementary Education Act, infants cannot be compelled to attend

* See accompanying plan of a German school. † Annexed will be found a plan of an American school. This plan may be found at page 72 of the fifth edition of "School Architecture; or, Contributions to the Improvement of School Houses in the United States," by Henry Barnard, Superintendent of the Common Schools in Connecticut, Hartford, 1854; 8vo. It was introduced there from another work, "The School and Schoolmaster," by George B. Emerson, first published in 1812. It is called there, "School for One Hundred and Twenty Pupils." The stairs lead up to recitation-rooms over the entry and wood-closet.

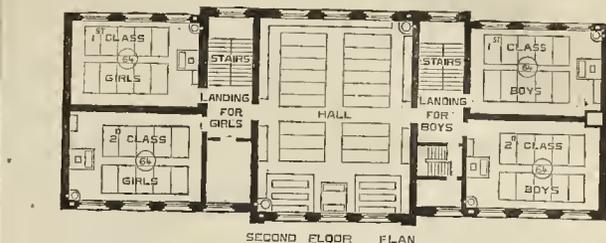
school before the age of five years, but, in point of fact, large numbers do attend before that age, and it is expected that they pass into the graded schools at the ages of six and a half to seven years. Architects cannot too clearly bear in mind the fact that in the infant school there are no standards or grades, but that these only commence after passing the infant stage. An infant school appears to divide itself naturally into three parts—1st. The youngest class of children who may be termed "babies," and who should have a room devoted to themselves, where they can be simply amused; 2nd. The main body of infants who are progressing through the usual stages of infant teaching, of which a large amount can be taught on a well-planned gallery, and to whom marching is a very important element, requiring clear floor space; and 3rd, an advanced class which is almost ready to be drafted into the graded schools, and who should be provided with benches and desks, and may be taught in a separate room. Sliding partitions are not, as a rule, desirable in infant schools, and the width and proportion are seldom those which are found to be most useful for a graded school. It is most important that the lighting to the large gallery should be from the side, and the class-rooms should enter from the side, and the panes of clear glass to enable the mistress to see what is going on. Circles in the floor for teaching classes, and lines for marching by, are also highly desirable. If the rooms are warmed by open fires, they should have guards to prevent accidents. Of all kinds of playground that for the infants must be considered the most important. The young children, depending so much upon sun and air, their playgrounds should be made to face the south, and have a portion roofed for protection from weather. Although it is not considered desirable to have the infant schools above the level of the ground-floor, still, recollecting that the proportion of the infant school is so different from that of a graded school, and looking to the value of land in the metropolis and other large towns, it seems desirable that in many cases where a large school is to be built, one infant school must be placed above another. Under such circumstances the staircases should be carefully planned so as to be easy and safe for such small children, and "winders" should be carefully omitted.

The general planning of a group of schools will be very much controlled by the site and its aspects in relation to school and playground; and, having secured the infant department in the best position for sun, the graded schools may be raised upon a low story of 8 ft. or 9 ft., so as to obtain their covered playgrounds, for some portion of the school, underneath.

Graded Schools.—In going into the question of graded schools, it is necessary to keep before us what is meant by the term "graded." According to the Education Act, the lessons are to be given in six separate "grades" or "standards," and although, when two standards are small in number, they may be taught in one class together, yet, as a general principle, there should be a separate class of from thirty to forty for each of the six standards. In the larger schools this arrangement will be doubled, so that each separate standard will have two class-rooms. And the school may then be planned in two portions as "junior" and "senior." Architects will do well to bear in mind that this question of grading the school in six standards,—in other words, of planning a class-room for every class,—is a vital point in all school-planning. Mixed schools are not at present in much favour in this country, because their adoption appears to narrow the field for the employment of school-mistresses to infant schools only.

Much has been said of the right kind of aspect for the main frontage of a school; and some have even gone so far as to say that none but a northern aspect was desirable; but it must be remembered that sun is to a child very much what it is to a flower; and that having due regard, by systems of blinds, to the inconvenience from heat in summer weather, it is difficult to make a school in this sunless climate of ours too sunny.

In planning a school-room and its class-rooms everything is, of course, subservient to convenience of teaching. Thus in the principal room the desks should be ranged along one wall and the principal amount of lighting should be from the back (as it cannot, as a rule, be supplied from the side). The lighting should be rather highly placed; but on the opposite side of the room it is necessary to have some other



Plan of One Storey of a German School. On other Storeys Class-rooms are formed in the space occupied on this Floor by the Hall. It will be noticed that the Class-rooms have light in each case at the Left of the Desks.

windows, so as to secure through ventilation in the hot summer weather. Each pair of class-rooms should be so arranged that two groups of from twenty-five to thirty-five, or even forty, each, may be taught together by the same teacher; and the same rule is applicable to the classes in the school-rooms, which, if arranged in couples, of twenty-five, thirty, thirty-five, or forty, will enable one master to teach the two; and in every case the wall opposite a group of benches or desks is of value for the display of diagrams, maps, and other objects used in teaching.

A girls' school should generally be grouped in relation to the infant school, and its entrances not far removed from those of the latter; while the entrance to the boys' school should be kept as far off as possible, and, in the case of a site having two frontages, be placed in the other street. It is necessary in the graded schools to have a lavatory, and also cap and bonnet rooms, compactly and economically planned, close to the school-room itself, with two doors, so that the children may be filed in and out by the teacher in an orderly manner.

The fittings of school-rooms have been much discussed, and much difference of opinion expressed as to the best methods; but in infant schools it is admitted that gallery teaching is mainly the best. When, however, we approach the graded schools there is much divergence, some insisting that benches and desks are the best, and others that there should be a gallery for occasional collective teaching. Both systems appear to be good; but the opponents of the gallery system allege that in a graded school the introduction of a gallery wastes space; and it would appear that a gallery is only likely to be well utilised for the two lowest standards. Another point appears to require consideration, namely, that in the senior standards the older children will require rather more space than in the lower standards, and that perhaps the best way of meeting the difficulty is to consider the class-rooms for these two senior standards as available only for a slightly-reduced number. This is supported by the circumstances that when Board schools have been in operation some time a per-centage of those who have commenced in the first standard will be lost by death before reaching the last. A pair of classes in the upper standards would hardly appear to require division, as in the lower standards, because of their better discipline.

Each class requires a separate cupboard, for its books and papers,—and, indeed, a separate room attached to each school, to be called an "apparatus-room," seems highly desirable; while in the case of large schools about to be erected in London, a general room, available as a committee-room for managers, and also for the use of the masters or mistresses, can hardly be dispensed with.

Much has been said and written upon the vexed question of ventilation, some advocating one system and some another. My own experience is that, for a large building, there is nothing like an artificial system constructed to supply warm fresh air, and extract foul. No doubt the open fire is the best of all; but in the face of the price of coals rising each successive winter, according to its hideous habit of late, it would appear that, as a matter of permanent economy, something else must be resorted to. It is not necessary merely to warm and rewarm the air which exists in any given room, and to

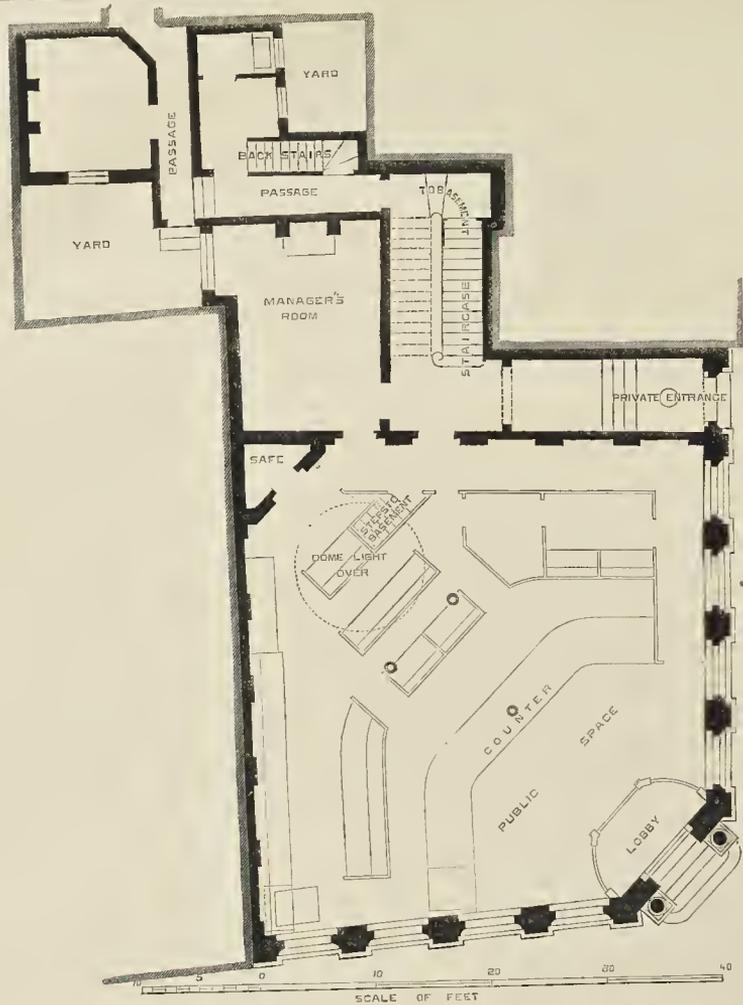
allow the children to breathe it again and again; but to take care that there is ample cubical supply per minute for each child, and that this is taken off in a regular and even manner, the great object of ventilation being to avoid stagnation of air. In the case of warming a church it may suffice to have the pipes above the floor, and to warm the cold air contained in the building for the purposes of a congregation present for an hour and a half at a time, and the same may be said of the practice of sending up volumes of air heated by means of hot iron plates, commonly known as "cookers," a system always liable more or less to vitiate and deteriorate the air, and not to be tolerated in connexion with an atmosphere which young children have to breathe throughout the day, and day after day. A chamber fitted with iron pipes, heated by hot water on the low pressure system, through which fresh air is passed and admitted to the various rooms at suitable points, while means of egress can easily be provided in connexion with some artificial extracting power, of which the furnace of the apparatus already mentioned can be easily made to supply the source, appears to me to be the safest and best. One reason why artificial warming and ventilation has not been hitherto more generally adopted is, that schools have hitherto been of a much smaller kind than they are now likely to be, and the cost of a caretaker continually on the premises, able to take charge of the apparatus as well as the repairs of the gas-piping, window-panes, warming apparatus, and various other matters about the building, was not to be thought of. And there is no doubt that the schoolmaster cannot himself properly manage the apparatus.

The cost of a school is a more serious point than architects seem at present disposed to consider; but it may be laid down that, irrespective of the price of land and of the cost of boundary-walls and playgrounds, the building *per se* should be admirably completed at 6*l.* to 7*l.* per head as a maximum.

On the subject of the external architecture of schools, I would venture to add that, as this Association has always laid down most strongly the principle that the design of a building should clearly express its purpose, its members will probably agree with me when I say that a school should appear like a school, and not like a monastery, a town-hall, or a set of almshouses. Large towers, prodigious roofs, exaggerated gables, wrought-iron ridge excrescences doomed to speedy decay, and wrought-iron "gable ornaments" are all better avoided. The really skilful architect will know how to make his school look like a school, without the use of unnecessary or absurd features, and will plan his building carefully, properly, and economically, giving due and thoughtful expression to the whole, so that his work may contribute, however humbly, to the world's wealth of architectural art, and even tend to produce, I will not say a new, but a better style of school architecture, arising out of the present great demand for school buildings.

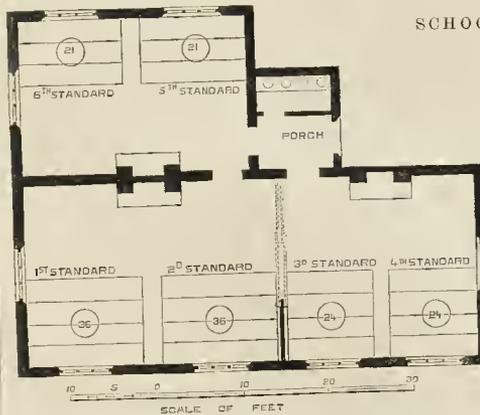
The student will find useful and interesting information in the following works:—

1. Hints on Infant Schools, published by the Home and Colonial Society.
2. Reports of the Commissioners of National Education in Ireland.
3. Description of the Schools of Berlin. By Adolf Gerstenberg, Government Architect.
4. Practical Illustrations of the Principles of School Architecture. By Henry Barnard, Superintendent of Common Schools in Connecticut.

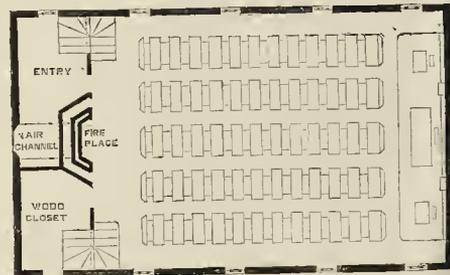


OFFICES OF THE HULL BANKING COMPANY, IN HULL.—Plan of Ground Floor.

SCHOOL PLANS.

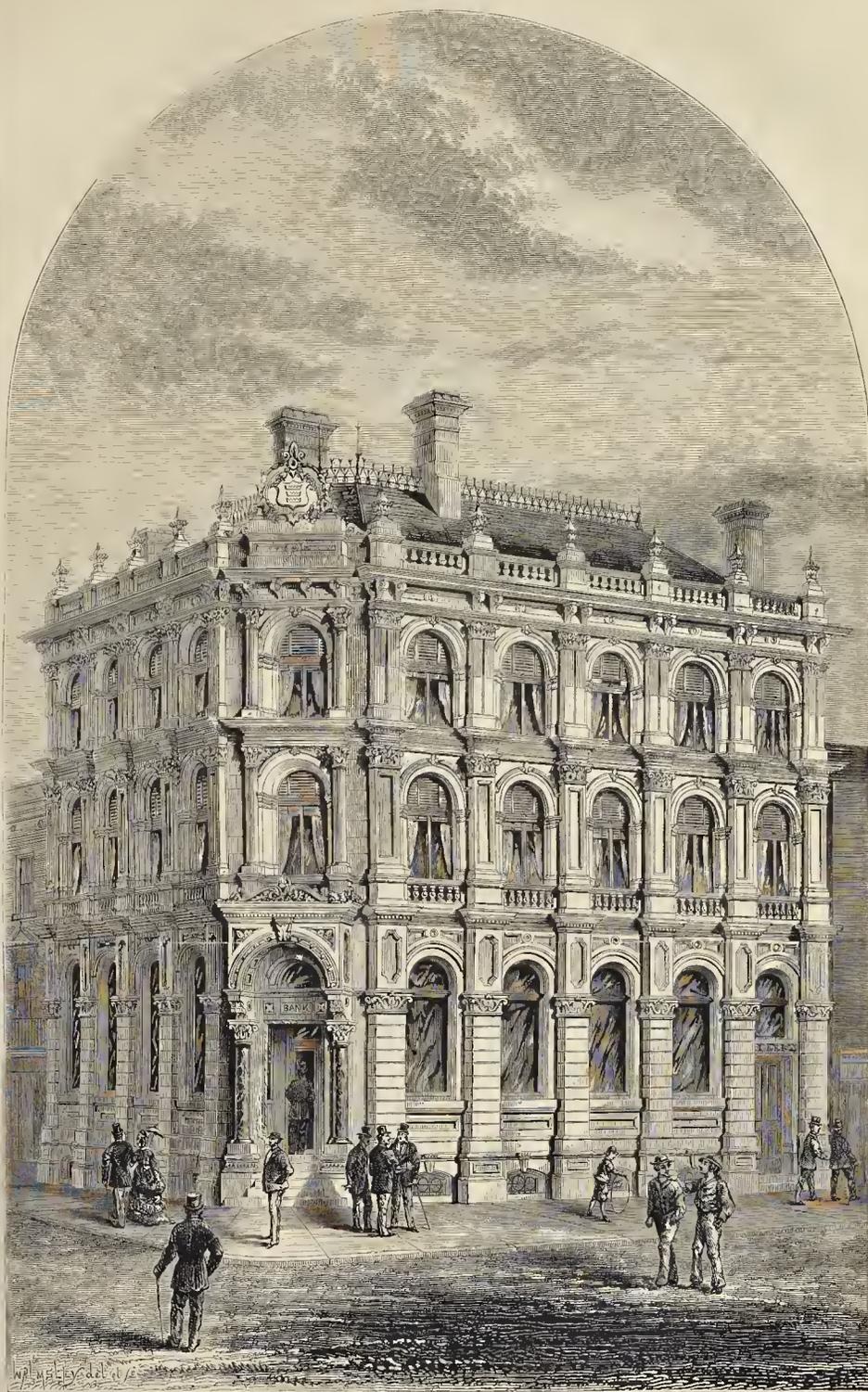


SCALE OF FEET

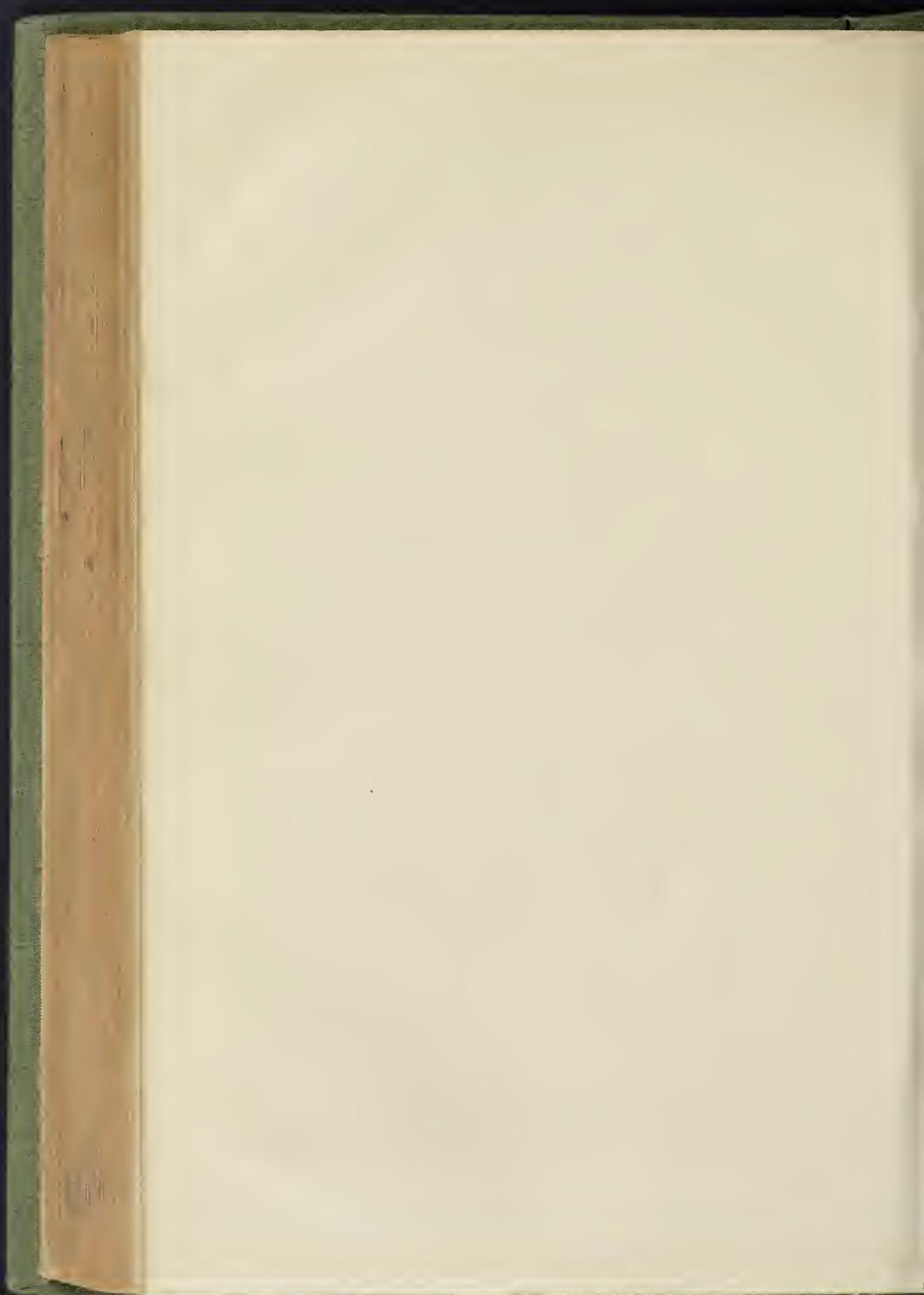


Plan of One Story of an American School.

General Sketch Plan by Canon Cromwell for an English Graded Elementary School; providing for each of the six Government Standards, with less numbers in the higher Standards to suit the average reduction by death and other causes, and giving a general Room for assemblage of the whole School when required.



OFFICES OF THE HULL BANKING COMPANY, IN HULL.—MR. W. BOTTERILL, ARCHITECT.



NEW OFFICES OF THE HULL BANKING COMPANY, AT HULL.

The structure of which illustrations are given in our present number has been erected by the Hull Banking Company at the corner of Silver-street and Lowgate, Hull, and recently opened as the chief offices of the company. The site is one of the most valuable within the borough, and comprises that of the former banking offices in Silver-street, with additional ground abutting on Lowgate, purchased by the company to meet the requirements of a largely-increasing business. On the clearing away of the old buildings from the site, advantage was taken by the Local Board of Health of the opportunity afforded for widening the above-named streets to the extent which could then be arranged. This was further aided by cutting off the angle in planning the new building, and thus the street-space has been increased at a point where it was much needed, and a considerable improvement in this respect effected. The length of the Silver-street frontage is 43 ft., and of that to Lowgate 50 ft.; and the height of the building from the street pavement to the capping of the half-straed on the main cornice is 52 ft. The bank-floor is 3 ft. 6 in. above the street-level, and the clear heights of the several stories are as follow:—Basement, 7 ft.; bank, 18 ft.; first floor, 12 ft., and second floor, 11 ft. The base of the building, to the height of the bank-floor, is executed in Calverley Wood stone, and the remainder of the façades in Ancaster stone. The principal entrance to the bank is in the splayed angle at the junction of the two streets, and has an arched stone canopy, panelled on the soffit, and supported on polished grey Aberdeen granite columns with carved capitals and trusses. The banking-office and manager's room, with the private entrance and staircase occupy nearly the whole of the ground-floor. The former is of somewhat irregular form, and measures internally about 40 ft. by 42 ft. Its wall-surfaces are recessed, and exhibit plasters and arcuation correspondent with the windows on the opposite sides, and are finished in Parian cement. The entrance-doors and internal lobby are of Spanish mahogany and embossed plate-glass. All the window-openings are fitted with oak sashes, those to the bank and also the entrance-doorway being protected by Bunnet & Co.'s bank-shutters. The counter and banking-fittings generally are executed in mahogany, arranged as shown on the ground-plan, and the floor of the public space is laid with Minton & Co.'s tiles. In addition to the plate-glass windows the banking-office has a domical skylight in a compartment of the ceiling, directly opposite the principal entrance, and rising into the area reserved for light to the back of the upper stories. The ventilation is secured by provision in connexion with the sky-light, and by a ventilating-shaft from the centre of the bank-ceiling, carried through the roof above the uppermost story, and under which a sun-burner is fixed. The basement-story extends over the entire area of the site, the greater portion of which is occupied with fireproof strong-rooms, having an aggregate area of about 800 superficial feet, provided with Chubb & Sons' doors, safes, and other fittings. The remainder is appropriated to lavatories and other necessary offices, a hoist communicating with the banking-office, and Perkins & Son's heating apparatus. There is a spacious hoard-room and waiting-room on the first floor; and the principal cashier's residence, with all convenient and suitable domestic arrangements, fills up the residue of the first and the entire of the second floor.

The building has been erected from the designs, and under the superintendance, of Mr. William Botterill, of Hull. Mr. Benjamin Musgrave was the contractor, and Mr. James Griffiths the clerk of works. The entire cost of the works is about 7,500l.

SCHOOL PLANNING DISCUSSED.

CANON CROMWELL (a member of the School Board for London), after the reading of Mr. Robson's paper, said that he had recently taken some pains in personally examining into the details of German and Swiss school buildings. Mr. Matthew Arnold, in his reports, spoke of the Zurich schools as better (in results) than any examined by him elsewhere. Being at Zurich, he (Canon Cromwell) therefore looked about him with a critical eye. He found there buildings of all sizes, and of almost all shapes; many mere adaptations of structures previously used for other purposes (one, for instance, was origi-

ally the town-hall). They practically agree, however, in possessing no large schoolrooms,—only series of class-rooms. These class-rooms are arranged pretty uniformly thus:—The teacher's desk is placed against one wall, the desks of the scholars facing towards it; gangways are left next the walls, and one down the centre; thus there are two blocks of desks, each desk containing sitting, &c., room for four children (in a few instances for five). The teacher by this arrangement reaches easily over or past the end child of any row, and is able to superintend the scholar's work to any necessary extent. This width of room allows each child to see thoroughly the teacher, and any blackboard diagrams made by him; also enables the teacher to see into the face of every child without effort, so as to observe whether he has succeeded in making himself understood; whether he may pass to a further stage of the subject, or should wisely go over again a part or the whole. At Zurich, however, he found a school-building (situated near to the minister) which has been recently erected, and is said to meet the views of the best teachers, and to be the outcome of their experience and careful thought. The school is for girls of the lower middle class. In general plan it resembles the colleges at Oxford, consisting of a set of buildings (two or three stories in height), surrounding a quadrangle on all the four sides; open corridors, not unlike those round the courtyards of the old London inns, surround the internal inclosure, and give access to a large number of separate class-rooms. These rooms are oblong on plan; the light always falls on one side of the ranges of desks placed longwise in the room. Between fifty and sixty children are taught in each such class-room by one teacher. When the number of children capable of being grouped together for similar instruction exceeds sixty, it is usual to place them under two teachers.

As to the American (United States) schools, he had studied the plans of the schools there as illustrated in the Reports of the Controllers of Public Schools in the important cities, and in other authorities. In schools recently erected in Cincinnati a wide entrance-hall gives access to separate square rooms, opening from it to right and left, showing an increased leaning towards the system of separate classes in distinct rooms, to which English experience has also been gradually leading. The example from Barnard's Hook on School Architecture (school for 129 pupils, with two small recitation-rooms over the end of the room; sitting, &c., room for all the children in one large room), he believed was now a little antiquated—certainly for the large schools of large towns. That, however, shows what is rarely deviated from in any school in the United States, viz., the arrangement of the desks, so as to facilitate a still closer approach of the master to the children than even in the German schools, a school-desk never being arranged for more than two children, and a gangway left at each end of it. In the more expensive schools, indeed, a separate desk is provided for each child. The external appearance of the American schools of which he had been speaking, he did not consider satisfactory examples of that harmony of look and purpose to which Mr. Robson had alluded in his paper, and that he hoped would mark the new schools of the London Board. The Ohio schools reminded him of nothing so strongly as of the blocks of offices erected of late years in the City of London.

As a typical instance of a large school building lately fitted up most completely, according to the instructions received from Berlin, Canon Cromwell mentioned the Lyceum at Strasburg, which he had recently carefully looked into, both as to the educational work and the arrangement of the building. Children of all ranks are educated here, and the instruction ranges from the teaching of the alphabet, to preparation for the university. The buildings inclose a quadrangle on the three sides, and are three, and, in parts, four stories in height; the staircases are placed at the two external angles; the whole consists of a number of separate class-rooms, entered on the sides next the quadrangle. No large rooms are provided. These class-rooms are oblong in form, the teacher placed in the middle of the longer side, with the desks opposite to him—five rows of desks on a platform slightly raised; the entrance is placed in the shorter side with a window also therein; and two windows in the opposite end wall. The stove is also placed against that wall, and a pipe frequently carried from it the whole length of the room towards the quadrangle.

As to the English schools, a considerable

change had come about in the ideas of those directing education and the erection of school buildings. The earlier public schools were erected to serve two purposes,—to be at the same time schoolrooms and places for public worship. In order to effect this, some of the arrangements desirable for the one function had to be given up and *vice versa*, so that in the result the buildings were thoroughly satisfactory for neither. Three-and-twenty years ago, when he left his University to engage in teaching, he found a pretty uniform type in vogue such as that of which in the course of his own education he had seen the unsuitableness,—a room 30 ft. by 55 ft. or 60 ft. he remembered,—and of course many other examples used for the systems of supervision by one master, of Lancaster and Bell. Gradually, however, the importance of reducing the distractions and keeping the minds of the scholars well bent on their work has been found out. The type of schoolroom shown by his diagram, some of the details of which he would describe, he thought gave this necessary separation (see plan). Four desks in depth,—placed as nearly as possible together so as to obviate the necessity of speaking very loudly in order to reach those seated at the back of the group, he thought the best number of rows. They would occupy less depth if the standard and back of a seat are made parts of the supports to the desk belonging to the next seat behind (he had adopted this with success). An additional seat should be formed in front of the first desk, without a desk in front of it; this will be required when several sections of the school are assembled for collective teaching. A group of benches and desks should not exceed 13 ft. (at a stretch 14 ft.) in length. A greater length than this for ordinary lessons makes the field of vision too wide for the teacher to range over easily and successfully. The desks should be raised on a slight platform; this is better in practice for the children than raising the teacher's desk. When possible a solid wall should be built between class-rooms, in order to avoid the reverberation from wooden and other partitions; and, for the same purpose, wooden hock flooring heddled solidly will be found to reduce the noise largely below that from a more or less elastic wooden floor. He had a few days ago been informed by a member of the School Board for Leeds that the system of building wide schools was being acted upon there; consequently the disadvantages of that method were evidently not so clear to others as they seemed to him. He could not for his part help considering double rooms an entire mistake, defeating all the objects had so specially in view in all recent changes. The distraction of the attention of the children by the noise, from the observation of opposite classes instead of their teacher, and the inconvenience to the teachers themselves in some instances, are immense hindrances to success.

On the sketch plan prepared to show some of his views, in deference to the suggestions of some of his brother members of the School Board, movable partitions were shown, so that a place for assembling for singing lessons, addresses, &c., was provided. From his previous observations it would be seen that, however much he recognised the value of this, his mind was much more fixed on the importance of the isolations of the sections of the school. Light should be admitted at the back of the children's desks; of course, in large quantities; it will be well aided and diffused by end windows in any room not exceeding about 50 ft. in length. For an extension of a school of this kind he would advise an L plan. This system of back and end lights he had recently adopted in some of his own school buildings with, in his judgment, satisfactory results. For warming, Galton's stoves seem suitable to clear away the heavy carbonic acid gas usually filling the lower portion of a school-room, and subjected to little movement in the absence of such an open fire. For the windows he recommended an opening of the main portion hopperwise. No cold draught descends from such windows on to the heads of the children. The cold air takes its course from the upper portion of the windows into the middle of the room, and is warmed as it descends. He had noticed that windows thus contrived could always be kept open with comfort nine months at least out of the twelve, only requiring to be shut when cold strong winds from some quarter have set in. When a number of hoys had occupied for three hours a room warmed and ventilated in this way, he had entered it from the external air, and found it perfectly sweet.

Mr. T. Roger Smith, in speaking of the German schools, noticed that the division was almost uniformly vertical, as in the plan shown by Mr. Robson,—the other portions of the girls' and boys' schools being placed on the other floors, similarly to those on that plan, and the space occupied by the hall divided into additional class-rooms, entered from one staircase landing or the other, according to the requirements of the school (as to proportions of sexes, special rooms for classes, &c.). The large hall is used for collecting some portions of the children, for addresses, the distribution of prizes, &c., and is arranged in size so as to hold the senior or selected sections of the children. In the class-rooms the usual plan is to provide seats for seventy, with the idea, however, that sixty will be very nearly the average requiring to be taught at one time. In his view, the end light or side light may be considered about equally good, so long as a strong light wholly from the right is avoided. For writing, arithmetic, and some reading, a light entirely from the left, no doubt, would be preferable; but if not obtainable, a good light behind and another from the left would be a good substitute. As to the sizes of the class-rooms, the Germans had considered the matter carefully, deciding that the child seated furthest from the window should have light enough on a dull day to see (say the letters of) a map or diagram without effort, and should not be placed so far from the teacher as to have any difficulty in catching all that he says. This distance has been settled at 26 ft. or 27 ft. at the longest; and consequently this dimension, by about 20 ft. or 21 ft. is the normal size of their class-rooms. The benches in no case touch the walls,—room being provided for the masters to go round on every side of a group of desks. The warming in the German schools is effected by stoves or heating apparatus placed in the basement (no open fireplaces). Vitiating air is often carried off by flues from the ceiling.

With reference to the English schools, Mr. Smith thought it impossible not to see what ground the system of separate class-rooms was gaining in the minds of most people who had to do with public education. The heavy curtains, that have been recommended and largely used for some years past, teachers pronounce a great improvement on the undivided school-room; but these are now frequently considered insufficient for securing the isolation wished for. At the same time the matter of supervision which dictated the large school-room only imperfectly divided, must neither be overlooked nor treated as chimerical. Teachers must be obtained for every standard who can go alone, trusting to their own judgment and authority, needing no moral support from the older and higher-placed teachers, before thorough separation can be safely ventured on; therefore some compromise has been generally deemed necessary in this particular. Before concluding, he should like to bring forward one or two points on which he found difference of opinion prevailing, and as to which some continued discussion on this occasion and thereafter (among those interested in such matters) might aid in bringing right conclusions; perhaps even some difference in practice might be permitted as experimental for the same reasons.

I. As to ventilation. Although opinions had been expressed in favour of school-rooms with windows on opposite sides, he personally failed yet to see that more would be secured by that plan than by (in a school-room of some moderate length) windows in one side-wall (at the back of the desks), and large windows giving a thorough current from end to end of the room. Great convenience, with reference to the general disposition of a school-building, is often to be gained, if, in designing, cross-lighting is not considered indispensable.

II. As to the conveniences (closets and urinals). In some of the recent competitions, it had been stipulated that these be kept away from the main building,—across a yard; and he thought it a wholesome kind of arrangement; neither could there be any inconvenience in it to children of the class by whom the public elementary schools would be attended. It had been, however, rather strongly argued that discipline would not be readily maintained, as these conveniences in the case of a school on the third floor, must necessarily be at some considerable distance from any superintendence; and it had been proposed that, on all the stories entering from half-landings of the staircases should be lobbies open to the air on both sides (a kind of covered way); and the conveniences situated

beyond,—cut off from the school-buildings, in fact, so effectually as to exclude any risk of effluvia reaching them. What opinion do the larger number of practical teachers hold as to this? And is uniformity of practice of importance?

III. As to the sliding-partitions to divide class-rooms, and in some cases the general school-rooms. They should be as sound-proof as possible, and thoroughly manageable without much exertion. Is it absolutely necessary that, in order to realise this, they shall be double? Has a partition of this kind (thoroughly effective) as yet been erected?

IV. As to the use of the general school-room for assembly of the greater proportion of the children in any school. Has any better plan been used or suggested than putting in front of each desk of the regular desks and benches an extra seat,—used only at the times of assembling,—and (at least) doubling the number of the seats in the school-room? It is true that this permanently increases the depth of the block of desks,—with the consequent disadvantages; but some method should be arranged by which the larger number of children may be seated at once, with as little labour as possible in altering the positions of their seats.*

Mr. Charles Clark (member of the School Board for London) said that he had lately examined some of the largest schools in Scotland. One large school (for 1,200 or 1,400 children) he found consisting of class-rooms arranged for fifty-four (fifty the ordinary number in constant attendance); these class-rooms being entered on each side of a large corridor of communication. Each class is taught by the same teacher every day; who is thus thoroughly acquainted with every child, and the progress made seems to be rapid and certain. The head-master in this school does not teach at all,—devoting himself to the management of the business,—to keeping all the machinery in motion. In another school for 1,400 girls,—taught by most capable masters, he found the system of separate class-rooms, with rooms capable of containing 120—for singing and similar lessons to grouped classes. In this building separate stairs are provided for ascent and descent; the rooms for clothes are placed below near the entrances, the clothes placed there under the direction of the teacher, the door locked till the end of the school session when the teacher superintends the exit of the children. It seems to be the custom in Scotland to raise the benches. As to the points named by Mr. Smith, he (Mr. C. Clark) thought some amount of ventilation across (the width of) a schoolroom must be provided in most instances; at the same time he remembered cases in which great compactness of plan had been combined with fair efficiency in ventilation as at the Birbeck Schools, Peckham, where are lofty rooms lighted by opening sky-lights; he considered, however, that the simplicity and certain efficiency of cross windows should make that system the rule in all except a very few exceptional instances. In the schools at Hamburg great attention is paid to the warming and ventilation; on examining them he had found an avoidance of open fireplaces, a large stove in the lower story warms air which is admitted by flues into the rooms, and a system of special shafts extracts the used air. As to the closets, &c., they should always be reached by a covered way when placed apart from the main building. If thought it would be worth considering whether rooms for dining the children as at the middle-class schools in Cowper-street should be provided; there it was found to save valuable time, and in bad weather the health of the children is not risked.

Mr. James Watson (member of the School Board for London) called attention to the value of the louvre system for ventilation (as used in the windows of the Middlesex Hospital and the new hospital in Soho-square). Being connected with these institutions he had witnessed experiments that convinced him as to the changing of the air and the absence of draught from these windows; the air ascends and comes down by the centre of the wards. As to general school systems, he would confess that he was not a convert to the German system,—he had had practical experience of the value of the sympathy of numbers, and of the possibility of sufficient

isolation and most efficient control in school-rooms for 120.

Mr. L. W. Ridge thought that no windows met the requirements of large schools so well as double-lung sashes up to a transom and upper portions hung hoppers-wise. The sliding partitions in the building of the Home and Colonial School Society in the Gray's-inn-road had been pointed out to him by Mr. Robson, and on careful study of them he (Mr. Ridge) considered them the most efficient contrivance of the kind he had seen.

Mr. J. D. Mathews suggested that the London School Board should start a competition for warming and ventilating a large school building of a plan supposed fairly typical; he thought some novelties of value would be elicited,—as ventilating engineers and similar specialists would give the matter much consideration.

Canon Cromwell, in responding, said that, in his view, schools were not on the same footing as hospital-wards; these latter are occupied night and day, and by patients suffering from wounds or disease, and the cross windows of the pavilion system are required in order to provide the utmost facility for constant movement of the air of the ward. In the intervals of school-work the open end-windows he had advocated should, however, entirely renew the air in the room. The closets, in his opinion, should be entirely detached from the other buildings. As to the raised desks much difference of practice prevails, though the value of bringing the head and chest of each scholar under the eye of the teacher is uniformly insisted on; if more than four desks deep they must be graduated. In the Zurich schools, however, the teacher is raised on a platform instead; at Strasburg the children are raised; in the American schools the children's desks are on the level. The general assembly-hall (of the German schools) he thought would prove more interesting than of much practical utility in our schools. In the case of the London School Board, such a provision coexisting with the limit of 10 superficial feet per child in general school-room and class-rooms together, will lead to a diminution of class-rooms in number or area which he thought undesirable. He advised architects to listen well to the views of practical teachers; but not to follow them implicitly in their definite suggestions as to buildings, rather to make provision as technical skill and knowledge will enable it, the simplest and completest way for the carrying out of the system of teaching to be pursued in all its details.

Mr. C. Clarke could say that there was no wish on the part of the London School Board to bind architects to a single form of building, or to uniformity in details; they only asked in each case for the most suitable building for the special school—the best fitted for the site, provided a the lowest proper cost.

Mr. Robson said that, in his individual opinion, we, in England, should have heard less of, and paid less heed to, the German system of school-teaching if the French had been victorious in the late war. The German system in its entirety at least at present, is impossible in England, where, for various reasons, it is stipulated by the Education Department that the head master of a school must not be allowed "to provide for carrying out the entire business of instruction without his own direct intervention in giving the lessons." He thought with more class-rooms than hitherto customary, the English system required little modification. Personally he looked on cross-ventilation of school-rooms as desideratum. The removal of air on any other system depends too much on the position of the axis of the schoolroom with reference to the prevailing winds. As to sliding partitions, he had derived the most valuable knowledge he possessed on the subject from those at the buildings of the Home and Colonial Society. It would be desirable, in all cases, that they should be prepared double, with a space of air between, being used single as a rule, double where required.

A Medal Commemorative of Thank-giving Day.—The Court of Common Council of the City of London have resolved to order a medal to be struck, at a cost not exceeding 500*l.* to commemorate the late national demonstration in the City of London on the day of thanksgiving for the recovery of the Prince of Wales. The medal will be distributed to such members of the Court, of the Royal Family, and of public institutions as may desire it.

* Could not this be effected by hanging each extra seat to the standards of the desk adjoining? The desks in front being on casters running on rails, the adjustment of them to marked lines in the floor, and the letting down of the seats, would be the work of about two minutes at most.

CHURCH-BUILDING NEWS.

Harleston.—A new church has recently been erected in the improving town of Harleston, and consecrated. The church, which is dedicated to St. John the Baptist, is built in the Decorated style. It consists of a nave, 68 ft. long by 20 ft. 6 in. wide, and 41 ft. high to the ridge of the roof, on each side of which are four arches and piers, the latter alternately circular and quatrefoil on plan, opening into aisles the same length as the nave, and 10 ft. wide. These aisles are lighted by three-light windows, and the nave has a cloistery of trefoils and quatrefoils enclosed in equilateral arches. There is a west entrance, the doorway being shafted and deeply moulded, and above it is a four-light window. The chancel is 30 ft. long and the same width as the nave, with an apsidal east end of five bays, and a single-light window in each bay. The roofs of the nave and aisles are of pitch pine, carved and moulded, and the chancel roof is formed of arched groining. The roofs are covered with green rag slates. The benching throughout and all the doors are of wainscot oak, carved and moulded, the latter having some curved ironwork, by Smith, of Weybread. The passages and chancel are laid with encaustic tiles. The five east windows are by O'Connor. The subjects are,—1st. The Birth of the Saviour; 2nd. The Baptism of our Lord; 3rd. The Crucifixion; 4th. The Entombment; 5th. The Ascension. The other windows are glazed with rough plate cathedral-glass and white margins, the tracery being filled with rough plate of two colours, worked in crosses and other devices. The outside walls are of flint and stone, the flint being in several places cut square, like bricks, and laid in regular courses. There are stone crosses to the nave and transepts, and a wrought-iron one at the top of the intersections of the roof of the apse. A stone hell-turret, with a bell by Warner, is fixed on the gable of the south transept. The church will hold about 400 persons. Mr. Phipson was the architect; the contractor, Mr. Grimwood, of Weybread. The carving has been done partly by Mr. Phipson, of London, partly by carvers in the employ of Mr. Grimwood, and partly by carvers from the atelier of Mr. Cornish, of North Walsham. The church is lighted by gas laid on by Mr. Chappell, of Harleston, and consists of simply a set of burners laid along the string under the cloistery windows, which lights the whole building completely. The heating apparatus was provided by Haysdon, of Trowbridge. The total cost has amounted to about 4,500*l.*, towards which Mr. Hazard, of Harleston, has contributed upwards of 2,000*l.*, besides giving the site.

Hatfield.—The Church of St. Etheldra, Bishop's Hatfield (the largest parish church in the county), having undergone a restoration by Mr. Brandon, the architect (of which almost the entire cost has been borne by the Marquis of Salisbury), is about to be reoccupied.

Sheerness.—The new church of St. Paul has been consecrated by the Archbishop of Canterbury. The edifice has been built on the Woll Marsh. It is in the Early English style, the plan consisting of nave, chancel, north aisle, chapel, and vestry. The arches of the south wall are temporarily filled with brickwork, so that, in the event of an extension of accommodation being required, a south aisle can readily be added to the present structure. The architect was Mr. R. Wheeler, of Tunbridge Wells. The ground was known to be very soft, and, on probing, it was found that the "softness" extended downwards for a depth of 10 ft. The problem to be solved was how to build without a foundation, and to save the enormous expense of driving piles. Mr. Wheeler built upon inverted arches, and the plan, which was at first doubted, has, it is said, succeeded, the settlement having been very slight, and, as Archdeacon Harrison said, there stands the church, literally without "a builder's foundation." The builder was Mr. Miller, of Sheerness, and the stone carving is the work of Mr. T. Darp, of Lambeth. Messrs. Hart, Son, Peard, & Co. supplied the gas-fittings; and Mr. L. Gathewald has acted as clerk of the works.

FROM SCOTLAND.

Edinburgh.—A new place of worship in connexion with the Free Church has been opened at Viewforth. The building was designed by Messrs. Pilkington & Bell, and occupies a site on the north side of West Gilmore-place. In order to suit the configuration of the ground, it was found necessary to adopt the form of a parallelogram. A result of the limitation of the site has been the introduction of galleries to a larger extent than might otherwise have been considered desirable, so as to provide the required number of sittings. The church will accommodate 1,000, of which number 546 are provided for in the area, and 454 in the galleries. The interior is fitted up in a simple style, such ornamentation as has been introduced being confined to the front of the galleries and the pulpit. The only available place for the vestry was in the sunk flat, and the access from thence to the pulpit involved the erection of a screen, which, as being the central object in the church, has been combined with the pulpit. The site being at the intersection of West Gilmore-place and Viewforth-place, the salient corner has been selected as a suitable spot for a tower. When finished, it will rise to a height of 113 ft. The church may be regarded as a specimen of the Geometrical Decorated style. The windows which light the area are square-headed, and there are more elaborate windows above. The elevation facing West Gilmore-place has, in addition to the tower, a large central gable occupied by a five-light window, the head of which is filled in with moulded bar tracery; also a smaller gable occupied by a two-light window, the tracery of which is treated more simply. The elevation facing Viewforth-place has to the north of the tower three gables, the centre one of which is, both as regards size and elaboration, the most conspicuous. The church, without the tower, has cost about 5,000*l.*

Books Received.

The Culture, Management, and Improvement of Landed Estates. By G. A. DEAN, Land Agent and Agricultural Engineer, &c. London: Longmans, Green, & Co. 1872.

THE author of this work is a man of experience, and the book is an elaborate and valuable one. Mr. Dean is well known; he is a referee to the Board of Trade, and author of various works on agriculture.

The work is divided into two parts, including a somewhat lengthened introduction. The first part also relates to climate and geological surface, soils and their properties, culture of all the various plants used and crops reared in agriculture; farming and high farming, stock cultivation, pasture land, manures, utilisation of sewage, insects and birds. The second relates to the tenure, transfer, and taxation of landed property, ownership and occupation of land, commons and waste lands, law of fixtures, dispendations, and waste; arbitrations and awards, leases and agreements, rents, valuations between tenants, tenant rights and obligations, farm labourers, choice and valuation, management, &c., of landed estates, farmhouses, and offices, construction of buildings, building materials, ventilation and dampness of buildings, sewerage, arificial and general land drainage, irrigation, varping, reclaiming of land, roads, timber and ornamental planting, underwood, &c. The work is illustrated by engravings of grasses and insects.

As an example of the author's manner, we quote what he says of stables under the heading "Arrangement of Farm Offices."

"The stables should be placed in such a position that workmen may have access to them, without passing through the yards and courts where cattle are kept. The horse, from being in a highly artificial state, is much predisposed to inflammatory action of the viscera, and requires to be treated with great care; consequently all stables should be cool, properly ventilated, well paved, and thoroughly drained.

Stables should be from 16 ft. to 18 ft. wide between the stalls; the walls about 8 ft. high, and the interior of the buildings open upwards to the roof. The doors should open outwards, and all the fastenings sunk in them, to prevent damage to the horses, by their running against them, when suddenly going in or out; or accident by the harness catching and getting entangled.

These buildings may be ventilated by means of louver-blinds, answering windows, but when glazed sashes are used, the louver-framing may be hung outside to act as shutters; the sashes should be made to slide past each other in grooves. The temperature should be about 45° or 50° in winter, and from 60° to 65° in summer. Excess of light is prejudicial, producing restlessness; therefore no more should be admitted than is sufficient to enable the workmen to cleanse the stables.

The best materials for the pavement are Dutch clinkers, or small square granite, which unquestionably are superior to any other descriptions for this purpose, and in the end the most economical. Asphaltum will not stand against the iron shoes of horses, and the common public paving, from its uneven surface, and its soon wearing into holes, leaves lodgments for the urine, which soon becomes putrescent, and gives off ammonia accompanied with a fetid odour. Powdered gypsum scattered over the paving two or three times per week will remedy much of this evil, by its combining permanently with the ammonia; and it will add much to the cleanliness of the stable. All paving should be kept dry and even on the surface; this will effect a great saving in the litter, and keep the atmosphere more wholesome.

Oak blocks, or blocks of any hard wood, which from its texture is not a great absorbent, form a good and warm pavement. A portion of each stable should be partitioned off for containing the harness, also the chaff and corn-bins; recesses may also be formed in the wall behind the horses, for placing in them the harness daily used, also curry-combs, brushes, and stable utensils. These recesses should have sliding doors, as the ammonia from the urine perishes leather, and acts strongly upon all brass-work.

Stalls, or divisions of a suitable description, should always be used, otherwise accidents will frequently occur by the horses kicking or biting each other. The stall divisions should be about 6 ft. apart, and may be framed as described for cattle sheds; but the posts should be oval in form, to prevent injury to the horses, should they run against them; the whole framing, if so constructed, will be removable, and in their places "horse-blocks" may be readily formed when required. The stalls for nag stables should be about 7 ft. high at the mangers, 6 ft. high at the other end, and 8 ft. long. The mangers may be either of wood or iron, and should be about 3 ft. long, 8 in. deep, and 16 in. wide, the back part being rather higher than the front. The preference should be given to cast-iron; racks are also best made of this material. Many persons think that the racks are best placed by the sides of the mangers, as the hay-seeds are apt to fall into the eyes of the horses, when they are placed above their heads; others, that horses who work at the bottom should have no rack-meat given, considering that they satisfy their hunger much quicker and better when fed from the manger, and consequently have more time for rest. This mode of manger feeding has come much into vogue, and is probably the most economical for draught horses.

The best means of securing horses in their stalls is with halters, having double ropes or chains, with stop-blocks at the ends, the ropes or chains working in separate rings fixed on the manger; each horse is thus confined to the centre of the stall, and cannot reach those next him. Cast-iron or wood brackets may be fixed in the harness-room and recesses, for hanging on the harness in frequent use. These brackets should be slightly inclined upwards, to prevent the harness slipping off, and have hooks at the bottom for head stalls, reins, &c. Wire-raze lanterns are the safest and best for stable use, and should be hung with weight's, lines, and pulleys."

VARIORUM.

Captain R. F. Burton, in *Cassell's Magazine*, gives some interesting particulars of the present state of Palmyra. Speaking of an excavation made by his party, the writer says,—

"During our absence the workmen came upon two oval slabs of soft limestone, each with its kit-cat in high relief. One was a man with straight features, short curly beard, and hair disposed, as appears to have been the fashion for both sexes, in three circular rolls. The other was a feminine bust with features of a type so exaggerated as to resemble the negro. A third and similar work of art was brought, but the head had been removed. It would be hard to explain to you the excitement caused by these wonderful discoveries. Report flew abroad that gold images of life-size had been dug up, and the least disposed to exaggeration declared that chests full of gold coins and ingots had fallen to our lot."

—A writer in the current number of the *Leisure Hour*, says as to cathedral libraries,—
"Cathedral chapters are usually spoken of as learned bodies, and are supposed to be zealously addicted to the study of grave and aged tomes; but the state of the libraries entrusted to their care is hardly very creditable to them. Book after book has been allowed to disappear even from cathedrals whose deans have acquired distinguished renown as men of letters. Only a few years ago, it was customary, by tipping the verger, to obtain permission to cut out the illuminations in the ancient manuscripts of one cathedral library; whilst in another, one of the most valuable works has been seriously injured by the rude handling of visitors, to whom it used to be shown as the largest and heaviest book in the collection. The dean and chapter of one of the cathedrals, not very many years ago, disposed of a number of Caxtons of priceless value, in order to purchase some current literature; and only the other year, an enthusiastic scholar, who had hunted in vain through the library for a magnificent copy of one of the rarest editions of the Bible, actually found it used by the ignorant verger as a convenient prop to keep the window open."

The Bermondsey Water Supply.—Energetic measures adopted by the Committee of Ratepayers in Bermondsey have resulted in a great improvement in the supply of water to the neighbourhood. The company, it is said, are actively pushing on their new works at Nunhead, which they hope to complete in ten months.

The Thames Embankment Surplus Land.
It is said that Government have refused to accept the alternative compromise proposed by the Metropolitan Board of Works for the settlement of the Thames Embankment surplus land question.

Miscellaneous.

Opening of the Madras Waterworks by Lord Napier.—The Madras Waterworks were formally opened by Lord Napier of Merchiston, ex-Governor of Madras and ex-Viceroy of India, on the 13th of May, about half-past six a.m., just before his departure from India. Notwithstanding the late hour at which notices were issued on Sunday evening, a pretty large number was present, and all classes of the community were represented. The crowd outside the railing was very great. The scheme for bringing water from Red Hill, prepared by Mr. Lee, executive engineer of the municipality, and to a loan of thirteen lacs of rupees to enable the Commissioners to carry it out, was given in 1869. In March of that year the delivery channel for conveying the water from the Red Hill tank to the town was commenced, and in March, 1870, a contract was concluded with Mr. Woolley for the supply and laying of the pipes. When the distribution works are complete there will be thirty-six miles of these, of which twenty have been already laid down, and it is expected that the entire length will be finished before the end of the year. The water will be made available for the use of the public by means of 127 fountains and 36 public wells and tanks. The number of inhabitants in the districts which it is proposed to supply with water is about 315,000 out of a total population of 397,000.

Opening of the New Town Hall, Wednesday.—This event has taken place in the presence of a large assemblage. The hall stands in the rear of the public offices, which front the Holyhead-road. The exterior of the building is devoid of all ornamentation. Internally, the walls are divided into panels, separated by Corinthian pilasters, supporting a full Corinthian cornice, with enriched modillions, from which spring a coffered and panelled ceiling, with moulded and panelled ribs, and enriched centre flowers, from which are suspended five star-light burners. By day, light is obtained from semicircular windows, groined into the coffering of the ceiling. The hall is supplied with a gallery, the front of which forms a continuous curvilinear line, and finishes in a curve at the end nearest the orchestra against each side wall of the building. The front, as also the front of the orchestra, is decorated with mountings, and fitted in with cast-iron panels of an ornamental pattern, and coloured. Means of ingress and egress are afforded by five doors. Mr. D. Moore, of Walsall, executed the work. The total cost of the building will be about 3,000l., including gasfittings, heating apparatus, and seats, which, like all the woodwork of the interior, are of pitched pine, stained and varnished. It will accommodate an audience of 780 persons, and the orchestra a hand and chorus of 120. The organ was given by Mr. Brogden, M.P.

Improvement of the Dwellings of the Working Classes.—The annual meeting of the Society for the Improvement of the Dwellings of the Working Classes has been held at Willis's Rooms, the Earl of Shaftesbury presiding. The secretary of the society (Mr. Payne) read the report of the committee, which stated that the houses owned by the society were well occupied. The mortality throughout the houses, with an average population of 1,588, has only been about 12.6 per 1,000, making the lowest death-rate the society has been enabled to record. The amount received by the society from all sources during the past year was 5,254l. 12s. 9d., which, with a balance in hand at the beginning of the year of 586l. 9s. 9d., made a total of 5,841l. 2s. 6d. The current expenses of all the lodging-houses, including repairs, amounted to 3,435l. 9s. repaid, and interest on loans, &c., 1,215l. 5s. 9d., salaries and agency, 563l. 17s. 3d.; publications and other printing, books and stationery, law charges, and advertisements, 82l. 16s. 2d.; rent of offices, postages, coals, cleaning, and all incidentals, 138l. 17s. 4d.; leaving a balance at bankers' and cash in hand, 404l. 16s. 11d. The real property, &c., belonging to the society is estimated as worth 35,412l. 17s., and the general liabilities of the society amount to 20,573l. 9s., leaving assets to the amount of 14,839l. 8s. It was resolved "that this meeting recognise in the success granted to the efforts of the society in past years, a call to continued operations in the time to come."

Report of Metropolitan Board of Works for 1871.—This report has been issued in a printed form. The metropolitan improvements of which it treats, include the Victoria, Albert, and Chelsea embankments; Queen Victoria-street, and the Whitechapel and Stimpson-lane improvements. Those projected, which are spoken of, include the new thoroughfare from New Oxford-street, through Old-street to Shore-ditch, and thence to Balnalgreen-road; and the widening of High-street; Shoreditch, of Wapping High-street, of Edgware and Harrow roads, and of Newington Butts. The superintending architect's annual report relates to the improvements. During the past year 105 applications had been made to the Board for their sanction to the formation of new streets, of which 70 were granted, and 35 refused. For the construction of porticoes, balconies, and verandahs, 78 applications were received, of which 65 were granted, and 13 refused. Since 1865 the Board have sanctioned loans to the amount of 1,657,497l. Of this sum 760,823l. were for sewerage works, 672,522l. for paving, and 224,102l. for street and other improvements.

Sale of Contractor's Plant, Sevenoaks and Orpington.—On Monday last Messrs. Fuller, Horsey, Son, & Co. concluded the sale of the first portion of the contractor's plant used in the construction of the Tunbridge direct line, lying at the depôts at Riverhead, Tunbs Hill, and Orpington. The importance of the sale attracted a large assemblage of buyers, among the principal of whom were Sir Morton Peto, Mr. Cowdy, Messrs. Homer, Mr. Deardon, the Landore Steel Company, Mr. Glassbrook, Mr. Tomlinson, C.E., Messrs. Colman, and Messrs. Walker. The rails, of which there were about 1,400 tons, realised from 7l. 5s. to 8l. 17s. 6d. per ton. Two locomotives, made in 1865, by G. England, 1,520l.; three by Brotherhood, made in 1863, 1,310l.; three by Hughes, 737l.; a mortar-mill, with 9-ft. pan, by Henry Clayton, 96l.; three Murray's pumps, 140l.; a 16-horse portable engine by Clayton & Shuttleworth, 186l. 350l.; four 14-horse power portable engines by same makers, 1863, 1,095l. The total amount was nearly 30,000l.

The Workmen at Redcliff Church, Bristol.—On Saturday last the workmen employed at Redcliff Church had a thorough day's enjoyment, through the liberality of the Mayor, the Rev. Canon Randall, and the Restoration Committee. Before starting each man was presented with a small packet of silver, containing three half-crowns, to enjoy himself with, independently of the cost of dinner, breaks, &c. so forth. They then proceeded to Porthead to luncheon, and thence to the Rock House Hotel, Clevedon, where they enjoyed a hearty dinner. After the usual loyal toasts, Mr. Williams proposed the health of Mr. Rice, clerk of the works, and read an address from himself and his fellow-workmen to him. Mr. Hammett, the shop foreman, then presented Mr. Rice with a silver cup, bearing the following inscription:—"Presented to Mr. W. Rice, clerk of works of St. Mary's Church, Redcliff, by the workmen, as a mark of respect, June 29th, 1872." Mr. Rice thanked them for their kindness, and said he would treasure the present as long as he lived.

Fall of Scaffolding in Nottingham.—A new chapel is being constructed on the plot of land at the corner of Shakespeare-street, Nottingham, for the "Christadelphians." The outer walls have been completed, and a good deal of interior brick, stone, and wood work had been done. Five men, bricklayers and their labourers, were engaged in carrying over an arch at the Shakespeare-street end of the building, and a scaffolding stretched across the chapel resting upon two stone corbels. Three of the men were engaged on the scaffolding when it suddenly gave way, and they were precipitated to the ground, a distance of 40 ft., a considerable quantity of bricks and wood falling with them. Two bricklayers were very seriously injured, and another less so. About 700 bricks fell. The stone corbels on which the scaffolding rested were not removed from their places, but the walls had bulged out, and it is said there was not sufficient strength in the abutments.

The International Exhibition and the Working Classes.—The Commissioners are to adopt measures for keeping the Exhibition open one evening in the week until ten p.m. On those occasions the charge for admission after six will be sixpence.

Improvements in Hyde Park.—In reply to questions as to these intended improvements, put to Mr. Ayrton, in Committee of Supply, he said that the sort of trees to be planted was settled by the chief gardener, who was a distinguished arboriculturist, and who decided to have evergreens and deciduous trees. With respect to bathing places, he held in his hands the sum of 50,000l., the legacy of a lady, for their erection, but until that lady's affairs had been finally settled he was not at liberty to dispose of the money. The fountain for Hamilton-place was in the hands of the sculptor, who was carrying on the work under contract. The sculptor was Mr. Thornycroft, the lady Mrs. Brown. The Park piling was going on, and there would be no cessation in the work until the whole had been completed. With respect to the water-borings had recently been made which would assure a certain supply. If more seats were required for the public, more would be added, but they did not interfere with the chairs, as those who used the chairs would not use the seats.

The New Wood-Pavement.—The wood-pavement laid in Bartholomew-lane, near the Bank, of which we have before spoken, is attracting attention. The new system consists, first, in the formation of a foundation of sand, of sufficient depth to make a good "grave." Upon this is laid a continuous flooring of 2-in. planks, with a similar one above it placed transversely. The pavement-blocks, which in form are rectangular, rest upon this double floor, and are studded by means of strips of wood nailed to the floor beneath. The whole structure is cemented together with a composition of hot pitch, tar, and gravel, and the surface receives a dressing of the same materials. The manufacturers maintain that, as each block cannot possibly sink below the level of the surrounding ones, and the wood itself is preserved from decay, the free surface of the pavement will always remain uniform, whatever be the traffic it may have to support.

A Memorial Mortuary Chapel at Chichester.—The family of the late John Ahol Smith, who for over thirty years represented Chichester in the Liberal interest, intend to erect a monument over the vault containing his remains at the cemetery. The town council, as a Burial Board, have inspected the plan, by Mr. Gilbert Scott, and the proposed site, and approved of them. The plans laid before the council were for a mortuary chapel, in Early English architecture, to stand in a triangle, formed by the meeting of the two main thoroughfares of the cemetery. The dimensions of the proposed chapel, so far as could be seen, would be 18 ft. high to the top of the gable, 20 ft. long outside and 15 ft. inside, and 7 ft. wide (inside). There is to be an open arcade round the building, and the entrance is to be by a metal gate of elaborate design on the east. The chapel is to be built of stone, and roofed with lead.

The Enlargement of the National Gallery.—On the vote of 37,250l. to complete the sum for the enlargement of the National Gallery, in Committee of Supply, Mr. Ayrton said the new buildings had been expressly designed in such a manner as that, whilst they might stand alone, they would also fit in well with an structure that might be raised round them. In the meantime, they would blend harmoniously with the existing National Gallery. The best pictures might be brought from Kensington, and there would be no difficulty in accommodating presents of pictures to the nation. The new buildings would be fire-proof, and every precaution had been taken with regard to existing buildings.

Royal Gallery of Illustration.—Mr. and Mrs. German Reed have been very successful of late. The proverb, "Charity begins at Home," sparkling with the melodious strains of Mr. Cellier, nightly retains large audiences in their seats till the fall of the curtain; and "My Aunt's Secret" eminently suits the peculiarities of the company. Mr. Corney Grain, in his last sketch, "A Five o'Clock Tea," displays a very great amount of humour, and admirably burlesques English, German, and Spanish songs.

The Building Societies Bill.—A deputation from 1,100 building societies have waited on the Home Secretary, to urge the Government to reconsider their amendments to the Building Societies Bill. Mr. Bruce, in his reply, said the Government were not in a position to legislate immediately and properly on the subject.

The Public Health Bill.—In Committee of Supply, Mr. Stanfield said it was unquestionably the intention of the Government to proceed with his Bill. The measure was committed *pro forma* the previous evening for the insertion of certain amendments and the withdrawal of certain clauses. He had unwillingly come to the conclusion, however, that, considering the advanced period of the session, and the pressure of other business, it was necessary in the interests of the Bill itself to do what was sometimes called "throwing part of the cargo overboard." It appeared to him the best course would be to stop that year with the creation and consolidation of the local authorities, and to withdraw all the clauses relating to nuisances, hospitals, river pollution, and other matters.

Drinking Fountains.—Some information as to the cost of these public conveniences was disclosed at the meeting of the Metropolitan Drinking Fountain and Cattle Trough Association, held on Tuesday, under the presidency of the Marquis of Westminster. There are more than 300 troughs and fountains under the care of the society, and all are visited, cleaned, supplied with cups, and reported at the office every week. The cost of the fountains for repair and water-supply averages nearly 10*l.* a year each, at the cost of the cattle-troughs varies with their size and locality. The small dog-troughs are supplied entirely with the waste water from the fountains, but for the larger troughs the water-rate alone is in some cases as much as 6*l.* per annum, more than 1,200 horses, besides other animals, frequently drinking at one trough in twenty-four hours.

New Institute for High Wycombe.—At a meeting in the Town-hall, High Wycombe, to promote a movement for the creation of new institute buildings at Wycombe, it has been resolved that the Literary and Scientific and Mechanics' Institutes of the town should be amalgamated, with a view to increase the advantages afforded by such institutes, and that to carry out the amalgamation a suitable building, with reading-rooms, library, class-rooms, and an assembly-room for lectures and other public gatherings, should be provided. Committees were then formed to carry out the objects proposed. Frogmore Gardens were proposed as a site.

The Beacon at Westminster.—Last week some alarm was occasioned by a rumour that a fire had broken out in the upper story of the clock-tower of the new Houses of Parliament. There was not, however, any cause for apprehension, as the damage done was confined to the destruction of a small deal box lined with iron, in which the new beacon had been displayed, which the new beacon had been displayed, which became over-heated, and broke into a blaze, the gas which supplied the illuminating power was turned off as soon as possible, and the fire was stamped out without the use of water. This beacon adds a pleasant feature to London at night, and we hold it to be valuable. It gives a hint to calculate for; steadies the thoughts, and leads to precision.

Decoration of Enderby Church, Leicester.—The internal decorations of this church have just been completed. The chancel has been decorated throughout, a choir of angels painted on the wall above the chancel arch, and quaint ribbands, bearing legends, carried round the nave arcade and over the aisle windows. The west end of the nave has also received ribband decorations. The works have been carried out by Powell, Roberts, of Leeds, from plans prepared by the architect, Mr. Edward Birchall, of the same town, at the cost of Mr. Charles Brook, of Enderby Hall.

Rochester Castle Gardens.—These gardens are opened to the public on Wednesday afternoon, by the Mayor, in the presence of a large company. The gardens have been taken on lease by the Corporation from Lord Jersey. A public subscription has been raised for laying out the gardens and other work, which has already cost more than 2,000*l.* We gave a view of the sign some time ago.

Fire-proofing Experiments.—With reference to our report of an experiment at Edmondson, in fire-proofing, at Mr. Brannon's cottage, Mr. Edward Marshall asks us to say that the roof and floors of stables, and coach-houses there, are covered with asphaltic made and laid by Mr.

New Enterprise in Scarborough.—Mr. W. A. Waddington, of York, is erecting a restaurant, an arcade, a theatre, and a gentleman's club all in one building. A spacious entrance serves the whole edifice, the restaurant being on the ground. On the second floor is the arcade. Round the sides are ranged stalls to be filled with articles of taste and convenience. On the third story is a theatre, to be ready for opening early in July. The theatre will seat 800 people in gallery, boxes, saloon, and private boxes. Above is the gentlemen's club, fitted up with news-room and billiard-tables.

A Novelty in the Building Trade.—Our Exeter correspondent writes:—"A twenty-roomed house, complete with grates, stoves, and fittings, has just been brought by ship to Exmouth, for transmission by rail to North Tawton (North Devon). The house was built in Norway for a gentleman at North Tawton named Vicary. It is mostly built of wood, and, it is said, can easily be taken to pieces and put up again in any locality desired. . . . Men have been brought from Norway to put it up, so that the owner will be altogether independent of home labour."—*Pall Mall Gazette.*

The "Cahman's Rest."—A curious little structure has just appeared in the streets of Birmingham. It is a "cahman's rest," and is neatly made of stained wood and glass. It contains sitting accommodation for several men, and has a locker for their food. There is also an apparatus for cooking. The current expenses of the "cahman's rest" are to be defrayed by subscriptions of the drivers who avail themselves of its advantages. Its cost has been about 70*l.*, and it is the gift of the town mission, who intend, it is stated, to supply it with literature of an "instructive and moral tendency."

Miss Glyn's Readings.—On Friday, the 28th ult., Miss Glyn brought out a series of her readings to a close with an admirable presentation of "Measure for Measure." Selections from the "Merchant of Venice" and "Romeo and Juliet" had preceded it. Miss Glyn is reading better than ever: the union of force and delicacy, of subtle appreciation and effective characterization, has probably never been so strikingly exhibited before as during this series. It is to be hoped that some of our rising actresses have not failed to profit by the opportunity thus afforded.

Northumberland House.—A direct approach from Charing-cross to the Thames Embankment being required for the public convenience, the Metropolitan Board of Works propose to apply to the Duke of Northumberland, with a view of ascertaining whether he would assent to the introduction of a Bill by the Board for the acquisition of Northumberland House and grounds, and such other portions of his property as may be necessary for the formation of the approach.

Schools for Girls.—The Board of the trust for errying on the North London Collegiate and Camden Schools for Girls, Camden Town, at a meeting held on June 24th, appointed Mr. E. C. Robins their architect. Miss Buss, who for twenty years has made a success of secondary education for girls, and has nobly resigned her interest into the hands of these trustees, to secure the permanency of the institution, deserves public sympathy.

Docks for Bristol.—The Bristol Town Council on Monday did an important day's work. The Council evidently felt, as was anticipated they would, that the time for talk had gone by, and acting upon this conviction they decided, by thirty-three to twenty-two, not to assist to purchase the Channel Docks at Avonmouth; and next, by thirty-six to nineteen, they resolved to contribute out of the city funds 100,000*l.* towards the construction of Docks at Portishead.

Grimston Park.—This domain, in the county of York, with its mansion and park, covering an area within a ring fence of nearly 2,500 acres, was recently submitted to competition by Messrs. Driver, auctioneers, of Whitehall. There was a keen competition, and the estate was ultimately knocked down to Mr. John Fielden, of Dobroyd Castle, Todmorden, for the sum of 265,000*l.*

The Loughborough Loop Line of the London, Chatham, and Dover Railway.—The three large wrought-iron bridges on this line were manufactured and erected by Messrs. Matt. T. Shaw & Co.

Fuseli.—"The Dream of Quoon Katherine," spoken of by Allan Cunningham, and engraved by Bartolozzi, which was counted as lost in a fire that consumed the property of Mr. Watts, the celebrated publisher, has recently been brought forward by a member of the family. It is a fair example of the peculiar style of the artist, and has good qualities. The picture may be seen in Mr. Robinson's shop, in Brownlow-street, Holborn.

Emigration to Brazil.—A small pamphlet on the possessions and products of the different provinces of the Empire of Brazil has been published by Joaquim M. de Almeida Portugal, F.R.G.S., at the Commercial Agency of Brazil in Leadenhall-street. It will be useful to many having an interest in Brazil.

Metal-work at the Institute Conversation.—It is right we should correct a little slip in our notice last week. The crosses, candlesticks, and vases designed by Mr. Lonsdale, for St. Andrew's, Wells-street, were executed and exhibited by Messrs. Barkentin & Co.

A Glazed Surface.—Several correspondents desire to hear more as to the practicability and expediency of using glass for the lining of walls. Perhaps Mr. James will go further into the subject.

Ground-rents in the City.—According to the *City Press*, 120,000 square feet of land on the Holborn Viaduct have been let upon a building lease for 15,000*l.* per annum.

TENDERS

For erection of six residences at Ramsgate, Kent, for Mr. N. B. Kennard, Mr. Charles Baily, architect. Quantities supplied by Mr. Poland:—

Wigmore	£8,008 10 0
Barwick	7,797 17 0
Wilson	7,447 18 0
Osborne	6,625 0 0
Hayward	5,838 0 0
Smith & Sons (accepted)	5,250 0 0
Harrison	4,915 0 0

For making roads at the West London District Schools, Ashford, Middlesex. Mr. H. H. Collins, architect:—

Jones	£87 14 6
Brooks	85 0 0
Heston	75 0 0
Kirk	71 0 0
King	70 0 0
Batch	69 10 0
Cole	61 3 0
Nicholson	57 5 0

For alteration of house at Stopham, Sussex, for Col. Bartlett. Messrs. Tendon & Cronk, architects:—

B. Inkpen (accepted)	£1,100 0 0
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For restoration of Woodmanote Church, Henfield. Mr. H. Woodyer, architect:—

B. Inkpen (accepted)	£1,100 0 0
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For house at Sudbury, Spalding & Knight, architects:—

Woolnough (too late)	£3,250 0 0
Cook & Groom	2,958 0 0
Green	2,720 0 0
Stephenson	2,553 0 0
Grimwood & Sons	2,497 0 0

For the extension of the Stock Exchange. Mr. J. J. Cole, architect. Quantities supplied by Mr. Barnett:—

Higgs	£13,141 0 0
Manly & Rogers	13,455 0 0
Henshaw & Co.	13,275 0 0
R. Ashby & Sons	13,150 0 0
Dave Brothers	12,885 0 0
Hill & Sons	12,720 0 0
Perry & Co. (accepted)	11,900 0 0

For the erection of vicarage house at New Maldon, Surrey. Mr. Ewan Christian, architect. Quantities by Messrs. Goodman & Vinal:—

Belham	£1,904 0 0
Todd & Saunders	1,883 0 0
Lathey Brothers	1,525 0 0
Gibson, Brothers	1,497 0 0
Pitler	1,479 0 0
Sturt	1,255 0 0
Hibbins & Co.	1,159 0 0
Wright, Brothers, & Goodchild	1,095 0 0
Spearing & Stewart	1,503 0 0

For new porter's lodge, &c., at Wandsworth Union Messrs. Beeston, Son, & Brereton, architects. Quantities by Mr. Barnett:—

Assis & Co.	£1,650 0 0
Parsons	1,638 0 0
Norris	1,550 0 0
Higgs	1,517 0 0
Faston	1,442 0 0
Atkinson	1,429 0 0
Gregory	1,355 0 0
Lathey Brothers	1,320 0 0
Bass	1,360 0 0
M. Lechlan	1,347 0 0
Myers & Sons	1,100 0 0

For house and shop, Portmadoc, for Mr. J. Owen. Messrs. Roberts & Morrow, architects:—

Humphreys	£80 0 0
Griffith	88 0 0
Roberts (accepted)	77 0 0
Lloyd	76 0 0
Hughes	71 0 0

For dwelling-house, Portmadoc, for Capt. Richards. Messrs. Roberts & Morrow, architects.—
 Griffith £40 0 0
 Humphrey 400 0 0
 Lloyd 384 0 0
 Roberts (accepted) 309 0 0
 Hughes (accepted) 324 0 0

For villa residences, Dolgelly, for Mr. Edward Jones. Messrs. Roberts & Morrow, architects.—
 H. Jones £755 0 0
 Hughes & Pritchard 765 0 0
 W. Jones 663 0 0
 J. Jones (accepted) 690 0 0

For finishing four houses at Teddington-road, near Hampton Wick station. Mr. C. Sewell, architect.—
 Beech £1,086 0 0
 Smith 860 4 0
 Threadkerell 800 0 0
 Jackson 830 0 0
 Stevens 730 0 0
 Cooke & Groom 670 0 0
 Tyrell 651 0 0
 House & Berriman 628 0 0
 Turner 724 0 0
 Thorpe & Co. 427 10 0

For Castle Goring, Sussex, for Sir Percy Burrell, bart. Wm. G. Halbershon & Pite, architects.—
 Tongue £2,933 0 0
 Boden 2,928 0 0
 Jarrett 2,835 0 0
 Morgan 2,708 0 0
 Grover 2,757 0 0
 Moore 2,717 0 0
 Forrest 2,718 0 0
 Blackmore & Morley 2,600 0 0

For restoration of Sandal Church, Wakefield. Messrs. Wm. G. Halbershon & Pite, architects.—
 Brumley £5,201 0 0
 Hampson 4,403 0 0
 Blackmore & Morley 2,830 0 0
 Beales & Co. 2,712 0 0
 Eley 2,593 0 0
 Weatherley & Bymer 2,531 0 0

For residence at Poulmire, for Mr. F. D. Johns. Mr. E. Nash, architect.—
 Bunting (accepted) £1,176 0 0

For residence at Orwell, for Mr. P. H. Meyer. Mr. E. Nash, architect.—
 Bunting (accepted) £2,315 0 0

For the erection of a detached villa residence at Narborough, near Leicester, for Mr. John Bevan. Messrs. Willoughby & Son, architects.—
 Glover & Son £1,251 8 0
 Mason 1,200 0 0
 Kellert 1,200 0 0
 Sackree 1,100 0 0
 Herbert 1,100 0 0
 Major 1,150 0 0
 Smith & Mowbray 1,125 0 0
 Lewis (accepted) 1,100 0 0
 Foister 1,050 0 0
 Brown 1,029 0 0

For painting and decorating the exterior and interior of the vestry-hall, City-road. Mr. J. Niblett, architect.—
 Mackintosh £271 18 0
 Jones 650 0 0
 Wyall & Co. 524 0 0
 Botling 497 0 0
 Griddle 410 0 0
 Starkey & Son 379 0 0
 Britain 375 15 0
 Jones & Wareham 375 0 0
 Cooper 360 0 0
 Allard 363 0 0
 Thomas 350 0 0
 Searle 310 0 0
 Bodman 310 0 0
 Beeton 297 0 0
 Lovell & Co. (accepted) 295 0 0

For cottage dwellings, Prince's Town, Dartmoor, for the White Works Tin Company. Wm. G. Halbershon & Pite, architects.—
 Angott & Luscombe £2,662 0 0
 Bischoff 2,325 0 0
 Waterson 2,300 0 0
 Blackmore 2,243 0 0
 Berry 2,069 0 0
 Loader 2,076 0 0
 Blacker 2,038 0 0
 Westway 1,963 0 0
 Candish 1,830 0 0

For erecting a manufactory and cottages at Haverhill, Suffolk. Messrs. Tarring & Son, architects.—
 Brown £2,660 0 0
 Shurmer 2,540 0 0
 Mason 2,453 0 0
 Bell & Son 2,340 0 0
 Hall 2,240 11 0
 Thoday 2,234 15 0
 Mason & Tall 2,070 0 0

For the erection and completion of factory at Barnsbury-road, for Mr. Bradsl. Mr. Wm. Smith, architect.—
 Crab £298 0 0
 Durnford & Langham 505 0 0
 Rooney Brothers 435 0 0
 Cook & Groom 395 0 0

For the erection of a villa residence at Sudbury, Suffolk, for Mr. H. C. Cunham. Messrs. Spalding & Knight, architects.—
 Cook & Groom £2,953 0 0
 Green 2,720 0 0
 Stephenson 2,553 0 0
 Grimwood & Sons 2,407 0 0

For Norfolk County Schools at Elmham, near East Dereham. Mr. John Giles, architect. Quantities supplied by Mr. C. H. Gode. Contract No. 1.—
 Skipper (accepted) £3,000 0 0

For building a warehouse at Hayne-street, Charterhouse-square, for Mr. Geo. Penson. Mr. N. S. Joseph, architect.—
 Langmead & Way (accepted) £3,775 0 0

For additional aisle, transept, and porch, to Holy Trinity Church, Wandsworth. Mr. J. M. K. Hahn, architect.—
 Awiss & Co, accepted.

TO CORRESPONDENTS.

Hydraulic (next week).—S. B. (we published a letter on "Lath and Plaster Buildings," some short time ago; but must leave our correspondent to look for it himself.—W. E.—J. W.—H. L.—H. R.—Mr. F.—B. & Sons.—Professor L.—T. & Co.—J. R. M.—B. F.—A. S. N.—Messrs. F. & Co.—Messrs. G.—H. A.—Dr. G.—T. E.—W. A. M.—J. B. W. R.—A.

We are compelled to decline pointing out books and giving addresses.

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A GENTLEMAN, of thoroughly practical experience, is open to an ENGAGEMENT, to TAKE THE SUPERINTENDING AND CHARGES in an Architect's Office.—Address, W. 88, Leppel-street, Kentish-town, N. W.

TO ENGINEERS AND SURVEYORS. A YOUNG GENTLEMAN, who has been three years in an Engineer's Office (part of the time on large works), an experienced Trencher, and able to Level and Survey, wishes an ENGAGEMENT. Terms moderate where plenty of practice may be had.—Address, S. W. 14, Brixton-street, Barnsbury, N.

TO ARCHITECTS. A THOROUGHLY efficient ASSISTANT desires an ENGAGEMENT.—Address, A. O. 19, Oakley-crescent, Chelsea, S. W.

A WELL-QUALIFIED GENERAL ASSISTANT will be DISENGAGED at the end of this week. Has been accustomed to prepare designs and details, specifications, estimates, surveys, schedules of disbursements, &c.—Address, 183, Office of 'The Builder.'

TO ARCHITECTS, SURVEYORS, ESTATE AGENTS, &c. A JUNIOR ASSISTANT, hitherto engaged in the two first-named offices, offers his SERVICES in any of the above. Would wish to enter an office where a most draughtsmanship and writer is required. He is desirous to make himself generally useful, therefore would be found an acquisition.—Address, D. G. Postoffice, South, Hackney.

A JUNIOR ASSISTANT, capable of taking in neatly and framing, is WANTED in an ARCHITECT'S OFFICE.—Apply on Saturday and Monday Mornings, with references, to Mr. FALMER, 37, Bedford-square, Bloomsbury.

TO ARCHITECTS, &c. A THOROUGHLY efficient ASSISTANT, of twenty years' practical experience, seeks an ENGAGEMENT. Good references. Terms moderate.—Address, 208, Office of 'The Builder.'

A THOROUGHLY practical CLERK of a WORKS desires a RE-ENGAGEMENT. Involvement in years' engagement with an eminent architect. References unexceptionable.—Address, R. F. Mr. Faulkner, 26, Villiers-street, Strand.

TO DECORATORS, &c. A SUPERIOR DECORATOR, WRITER, GILDER, CHAIN-Painter, and FAIRBANKS, wants a constant SITUATION. Country preferred. Used to having charge of good work.—Address, T. H. Postoffice, Sutton Coldfield.

TO BUILDERS, &c. A VERY Respectable Person wishes to PLACE her SON, aged 14, just left school, at a BUILDERS, where he can learn the Carpenter and Joinery. No premium. First-class recommendation.—Address, W. C. 8, Hayes-court-terrace, Turbham Green, W.

ADVERTISER, with practical knowledge of building and engineering works, levelling, surveying, abstracting quantities, making drawings, &c. desires EMPLOYMENT.—Address, F. 58, 'Mercury' Office, Liverpool.

CONTRACTS.—Continued from p. ii.

ST. MARTIN'S CHURCH RESTORATION.—Builder desires a TENDERER for TAKING DOWN and REBUILDING the BODY of ST. MARTIN'S CHURCH, Birmingham, are requested to apply for particulars to the Architect, Mr. J. H. CRAWFORD, 28, Tottenham-street, Birmingham, on or before the 7th JULY inst.

By order of the Committee, HENRY J. HARDING, Secretary.

TO BUILDERS.—Persons desirous of TENDERING for the BUILDING of a PARSONAGE HOUSE, OFFICES, STABLES, &c. situate at Moughton, in the County of Montgomery, may view the drawings and specifications on or after this date. Tenders to be sent in not later than the 16th day of JULY instant. The lowest or any Tender will not necessarily be accepted. Address, THOMAS STURKES, Architect, Newtown, 1st July, 1872.

TO BUILDERS.—Contract for building Walls at Hansell Cemetery, Middlesex.—The Burial Board for the Parish of Saint Mary Abchurch, Middlesex, are willing to CONTRACT for building a BRICK WALL to inclose the cemetery partly purchased by them, and immediately adjoining their cemetery at Hansell. Specifications, plans and particulars of the work may be seen at the Office of Mr. JAMES BROADBENT, Surveyor, Vestry-hall, Kensington, on and after MONDAY next. Sealed Tenders, addressed 'Tender for Wall,' are to be delivered at my Office, before FOUR O'CLOCK in the afternoon of MONDAY, the 29th JULY instant. The contractor will be required to execute a written contract and bond, and to provide two sureties in a penal sum of £200. The Board do not bind themselves to accept the lowest or any Tender. G. GREEN, Clerk.

Vestry-hall, Kensington, July 4, 1872.

BOROUGH OF WOLVERHAMPTON.—The ROAD CONTRACTORS.—The Streets Committee are desirous of receiving TENDERS for Works required to be done in SEWERING, DRAINING, FORMING, METALLING, PAVING, KERBSHING, and CHANNELLING about 3,000 lineal yards of Streets in the East Borough. Plans, sections, and specifications may be seen and forms of Tender obtained on application at the Borough Surveyor's Office, on and after the 9th day of JULY, 1872, and Tenders to be sent to the said Office at or before FOUR O'CLOCK on TUESDAY, the 30th day of JULY, 1872, addressed to the Chairman of the Streets Committee, and endorsed 'Tender for Works.' The Committee do not bind themselves to accept the lowest or any Tender.—By order, H. UNDERHILL, Town Clerk. Town-hall, Wolverhampton, 18th June, 1872.

BOROUGH OF SWANSEA.—TO CAPITALISTS, CONTRACTORS, and OTHERS.—The Swansea Local Board of Health are prepared to receive TENDERS for the SUPPLY of GAS for a term of not less than ten years. The contractor or lease to provide and lay down, at his own expense, the necessary mains, and connect the same with the lamp pillars and lamps of the Local Board. No new or additional mains are required, as the Local Board, or their contractor or lease, are already empowered, by Statute, to break up the streets and lay the pipes, and subject to the by-laws of the streets, or any of them, to supply private consumers, and recover the gas rents. The population of the borough is 22,000. For particulars and forms of Tender, apply to Mr. EDWARD COLSTONS, Surveyor, Guildhall, Swansea. Sealed Tenders, marked 'Gas Tender,' to be delivered by post, addressed to the Town Clerk, Swansea, not later than MONDAY, the 8th day of JULY, 1872.

RICHARD AUBREY ESKET, Town Clerk, &c. N.B.—The corporation have laid out contracts for the gas, and at the lowest level, which might be treated for by any new Gas Company. Guildhall, Swansea, May 13, 1872.

TO PAVIERS and OTHERS.—The Streets Committee of the Commissioners of Sewers of the City of London will meet in the Guildhall of the said City, on FRIDAY, the 13th JULY, 1872, at TWO O'CLOCK precisely, to receive TENDERS for a quantity of OIL PAVING-STONE, now lying at Phoenix Wharf, Whitehall, and which may be inspected by any person on or after the 10th day of JULY, 1872, in accordance with a specification which may be seen at the Office of the Engineer and Surveyor to the Commissioners. The Commissioners do not bind themselves to accept the highest or any Tender. Tenders must be sent, addressed to the undersigned, before TWELVE O'CLOCK on the day of TENDERS, to Mr. EDWARD DAW, Principal Clerk, Sewers Office, Guildhall, 4th July, 1872.

AUCTIONS.—See also p. xvi.

HAMPESTEAD.—First-class Building Plots in a favored locality, a short distance from the Finchley-road station on the Hampstead Branch of the Great Northern Railway, and near the residence of the villa residences, TO BE SOLD by AUCTION by MESSRS. JONES & RAGGETT, at the Rooms, 11, Abchurch-lane, London, on TUESDAY, JULY 16th, 1872, at TWO O'CLOCK, punctually, SIXTEEN FREELAND BUILDING SITES, in well-proportioned lots, and of various situate on the Hill-field estate, admirably placed, abutting on the Finchley-road and Fortune green, near the Great Northern Railway. The estates are ripe for immediate building operations, good roads are fully made, and 4 feet covers of the parish authorities at a great outlay. Four-fifths of the purchase-money may remain payable in four equal annual instalments—particulars and conditions of sale, with plans, of H. J. GODDEN, Esq. Solicitor, 188, Fenchurch-street; H. G. BARTON, Esq. Surveyor, 10, Old Jewry, Gunpowder-square; T. R. CRABB, Esq. Secretary, Land Company of London (Limited), 51, Abchurch-lane; or Messrs. JONES & RAGGETT, Auctioneers, Valuers, Surveyors, and Land Agents, 3, Adelaide-place, London-bridge.

Building Materials of a large Masson within five miles of the City. MR. PHILIP D. FUCKETT is offering for SALE by TENDER, in one lot, the whole of the valuable MATERIALS and costly FITTINGS of a large MANSION, very conveniently situated within five miles of the Bank, and close to one of the largest railway depots and manufacturing centers, where there is a constant demand for such materials, comprising about 100 tons of iron, including a mill, a boiler, and a steam engine, and fifty square of sound laths, some modern oak, and mahogany joinery, with a large stock of mahogany and other fine woods, and a large quantity of iron, including 40 feet of 20 feet, two smaller greenhouses, and the whole of the materials in the house, including the roof, &c. May be viewed at particular intervals at the Office of Mr. PHILIP D. FUCKETT, Surveyor, 10, Old Broad-street, E.C. where Tenders are to be delivered on MONDAY, JULY 15th, at TWO O'CLOCK.

CHELSEA.—FREELAND BUILDING LAND.—TO BE LET on Lease about 1/2 ac. of LAND, opposite the Hospital grounds, and fronting the Chelsea New Bridge-road, Commercial-road.—For particulars, apply to Messrs. FULTON, 9, Whitechapel.

DANIELCH-ROAD, PIMLICO.—To BUILDERS, CONTRACTORS, and OTHERS.—TO BE LET, important PREMISES, occupying an area of three-quarters of an acre of ground, with a large workshop, and a large water area, and a large office, &c. and extensive frontage to Belgrave Road, suitable for any business or manufacturing requiring space. Immediate possession can be had. For further particulars apply to Messrs. FAREBROTHER, LYE, & WHEELER, Surveyors, 8, Lancaster-street, Strand.

TO BUILDERS and OTHERS.—BUILDING LAND, at Shepherd's Bush, TO BE LET on Lease, a short distance from two railway stations. Omnibuses to the City. Roads and sewers made, and in all respects ready for building. The estate is well situated. Apply to Mr. HENDERSON, 30, Harwood-square, London, N. W.

TO BUILDERS.—Eligible GROUND, at Brighton, for workmen's cottages and small-class houses. TO BE LET, at low ground rent, and with the advantage of a water supply, as may be required. The land is within five minutes' walk of three railway stations, having trains to and from the city, and the sea, occupying fifteen minutes either way. When buildings are erected in, advances of 40 per cent. may be obtained. If required, by order of unexceptionable references, and on the most approved plan. For further particulars, apply to W. G. HABBESHON & PITE, Architects, 48, Bloomsbury-square.

TO BUILDERS.—A most desirable PLOT of GROUND TO BE LET, for Villas and Shops, with a fine view of the city, and a short distance from the Victoria-terminus, and in a most desirable locality. Advances supplied if required.—Address, Mr. N. DANDO, Torrington Park, North Finchley.

TO BUILDERS and OTHERS.—TO BE SOLD, in a finished neighbourhood, a piece of FREELAND LAND, suitable for three houses of two storeys each. Good soil. Omnibus to the City, &c.—For particulars apply to No. 6, Victoria-terminus, Russell-street, Victoria.

TO BUILDERS and OTHERS.—TO BE LET, on Leases, for 99 years, a direct frontage of 100 feet, in a most desirable locality, an excellent frontage of LAND, within a few minutes' walk of the new Railway Station at Stoke Newington. Respectable tenants, and the ground is in a most desirable locality. The above is a good business for a young man wishing to commence business.—Full particulars at the Auctioneers' Office, 20, Regent-street, Waterloo place. (Folio 317.)

GREAT NORTHERN BRICK COMPANY, LIMITED.—TO BE SOLD, by Private Contract, the PROPERTY of the above Company situated in a most desirable locality, and consisting of a large area of freehold and copyhold, more or less, containing an inextinguishable supply of sand, &c. of 200 acres, and a large quantity of building materials. Cards to view the property may be obtained at the Company's Office, No. 2, White, Great Northern Railway, King's Cross, June 27th, 1872.

WIGMORE-STREET, CAVENDISH-SQUARE.—MR. JAMES BEAL has FOR SALE the LEASE of excellent BUSINESS PREMISES, together with the appropriate furniture, and the good-will of a Flouring and Dressing Business. The above is a good chance for a young man wishing to commence business.—Full particulars at the Auctioneers' Office, 20, Regent-street, Waterloo place. (Folio 317.)

LAMB'S CONDUIT-PASSAGE, RED LION STREET, HOLBORN, and CHURCH ROW, ALDOSTRE.—TO BUILDERS and OTHERS.—TO BE LET by TENDER, from Michaelmas, 1872, on a Repairing Lease, for 14 years, EIGHT small but substantial HOUSES with SHOPS, on the southern side of Lamb's Conduit passage, and well adapted for trade. Also, TO BE LET, on a Repairing Lease for 21 years, from Michaelmas, 1872, NINE small HOUSES or TENEMENTS, with about No. 2, 10 on the western side of Church-row, leading from Aldgate to Houndsditch, and containing an excellent business, and well adapted for trade. The above being considerable.—Particulars of the repairs and conditions required in each case may be obtained at the Surveyor's Office of the Corporation, Newgate-street, City. Tenders, endorsed 'Tender for Lease,' are to be left, with references, at the Counting-house of the said Corporation, on or before the 10th day of JULY, 1872, at TWO O'CLOCK, precisely. M. S. DUNN, Clerk.

TO PLUMBERS, HOUSE DECORATORS, and OTHERS.—TO BE DISPOSED OF, a thorough genuine old-established BUSINESS, situated in a most commanding position in the City of London, Kensington.—Inquire on the Premises, a Newland-terrace, Kensington.

TO BUILDERS and OTHERS.—FOR DISPOSAL, an established Jobbing BUILDERS and UNDERTAKERS BUSINESS, well conducted, and profitable. An excellent chance for an energetic man. Terms very easy.—Address, Y. Z. Postoffice, Hallow.

TO BRICKMAKERS and OTHERS.—TO BE SOLD, with a royalty, NINE ACRES of FREELAND BRICK-CLAY, in a most desirable locality, about three miles from London, on the high road.—For particulars apply, by letter only, to Mr. A. B. BULLOCK, Brick-maker, Bullock's, Bullock, Bedfordshire.

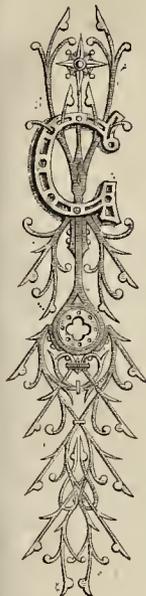
CLERKENWELL.—TO BE LET, on a building lease, a PLOT of BUILDING LAND, occupying an area of about 15,000 square feet, situate near the Farringdon-street, and on the high road, and in a most desirable locality. For particulars apply to Messrs. FULLER, HORSEY, SON, & CO. 11, Pall-mall-square.

HOUSES.—WANTED, the REPAIRING LEASES of a few substantial Houses in W. C. District, where a profit return is obtainable by letting in tenements. To obtain same, persons will be required to secure PROPOSALS for a lease. These will be allowed.—Address, G. H. 2, Buxton-street, W. C.

WANTED, FREELAND OR LEASEHOLD GROUNDS.—TO BE LET on Lease for 99 years, or for 21 years, or for 14 years, or for 7 years, or for 3 years, or for 1 year, or for 6 months, or for 3 months, or for 1 month, or for 6 weeks, or for 3 weeks, or for 1 week, or for 6 days, or for 3 days, or for 1 day, or for 6 hours, or for 3 hours, or for 1 hour, or for 6 minutes, or for 3 minutes, or for 1 minute, or for 6 seconds, or for 3 seconds, or for 1 second, or for 6 tenths, or for 3 tenths, or for 1 tenth, or for 6 hundredths, or for 3 hundredths, or for 1 hundredth, or for 6 thousandths, or for 3 thousandths, or for 1 thousandth, or for 6 ten-thousandths, or for 3 ten-thousandths, or for 1 ten-thousandth, or for 6 hundred-thousandths, or for 3 hundred-thousandths, or for 1 hundred-thousandth, or for 6 millionths, or for 3 millionths, or for 1 millionth, or for 6 billionths, or for 3 billionths, or for 1 billionth, or for 6 trillionths, or for 3 trillionths, or for 1 trillionth, or for 6 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The Builder.

VOL. XXX.—No. 1536.



The Risk of Buildings from Fire.

AAPTAIN SHAW, of the London Fire Brigade, has published a little book, under the title of "Fire Surveys," which, if well studied and acted on by those engaged in the construction and the guarding of buildings, will save life and property in time to come.* If it were desired that we should point out its main purpose, we should say it was to enforce the truth which has only recently dawned upon legislators and constructors, that iron and stone are not fireproof materials,—stone is absolutely inadmissible for stairs, or to support weights internally, and no structure can properly be called fireproof the ultimate strength of which depends on any metal.

We will give a general view of the writer's argument, but we advise our readers to obtain the book for themselves. In the whole range of building materials, he maintains, there is perhaps none so unsuited for resisting fire as that most commonly in use—stone. It is true that, if imbedded in cement or in thoroughly good mortar of lime and sand, it will resist for a considerable time heat gradually applied; but even in such a case it will become calcined, and will crumble to so great an extent as to be unable to carry a load afterwards. In the case of any sudden change of temperature, either from cold to heat or from heat to cold, it cracks instantly without notice, not only leaving a passage for smoke and flame, but in many instances causing the wall to fall. Stone may, however, be used with a certain amount of safety for external walls, but even for this purpose it is very much inferior to bricks.

Bad mortar is frequently a cause of heavy loss; it has no adhesive power, and consequently fails to bind the other materials in such a way as to prevent buckling. A great quantity of the mortar used in this country during the last fifty years is but little better than road mud, which, though in itself well suited to resist fire, is wanting in the most essential qualities for combining with other materials.

Walls should be constructed in such a manner as not to separate easily either from defects in the foundation, irregularity of the loads placed on them, vibration, shocks, or other causes. A wall built of hard bricks laid in sound mortar or cement, and properly bonded, is perhaps the soundest of all for general purposes; but even such a wall is likely to fall on an emergency, if not firmly bonded into a cross wall. Enormous losses have been occasioned by the absence of

this latter kind of bond; in fact, most firemen of experience can call to their recollection numerous instances of a front and side wall becoming disconnected at the corner, each falling out separately, and breaking only on contact with the ground; thus showing that, although each may have been a sound wall in itself, the two together were useless as sides of a building for want of a proper corner tie.

Bond timber in walls is dangerous, as we have long taught, and should not be allowed. When it rots or burns, there is a tendency in the walls to crack. Hoop iron forms a much better bond, and is free from the drawbacks attending the use of wood. Lean-to buildings are dangerous if there are windows in the wall above them. Weather boarding causes two dangers,—one of taking fire from without, the other of conveying fire through the windows. Wherever iron is used, it must be allowed sufficient play for its elasticity, and also for the expansion and contraction which it undergoes unceasingly in consequence of changes of temperature. In some places it is the custom to encase the ends of a bresssummer in cast-iron shoes, but this is a very bad practice, and should not be permitted, as the iron would convey fire rapidly from one side to the other. An external wall should be firmly tied to party and return walls by strong wrought-iron anchors, of sufficient strength and number to keep the whole outside of the building firmly fixed without the assistance of floors, roofs, or internal ties of any kind.

Captain Shaw has no faith, nor have we, as a rule, in that mysterious, unsatisfactory, and most expensive process known by the vague and unmeaning title "under-pinning," which in point of fact is nothing more or less than a device or trick to hide what is in every case at least a damage, and, as all firemen of experience have frequently and bitterly realised, in many instances an imminent and serious danger. This process, or device, or trick, or whatever it may be called, may possibly be adopted with some degree of safety in small, light, new, and isolated buildings, to obviate defects arising from the ignorance or carelessness of the constructor, but it is wholly inadmissible on a large scale in warehouses or in those long continuous blocks of buildings which form the streets of all great towns. Even when this mode of patching up and concealing a damage is successful, it may be productive of incalculable mischief; as, for instance, if a single building of a row or block is under-pinned and the rest allowed to go on in their natural process of sinking, the result almost invariably is a settlement of the walls of the adjoining houses, accompanied by danger in direct proportion to the fracture. Walls may be destroyed by buckling outwards from a thrust or inwards after the falling of the floors, by inherent weakness, absence of proper ties, and in a variety of other ways which will be afterwards explained; but the principal cause of their "tumbling about," to use a fireman's expression, is undoubtedly in almost all cases the want of a proper foundation. The weights carried by different parts of the same wall frequently vary very considerably, and if the ground underneath be all of the same consistency, as is generally the case, some intermediate structure beyond a common foundation is absolutely necessary for buildings liable to be heavily or irregularly loaded. The neglect of this precaution has frequently been the cause of heavy losses.

Coppings, balconies, cornices, or other projections should never be constructed of stone, as this material is certain to fall down at an early stage of a fire, and is likely to kill both persons endeavouring to escape and those coming to render aid. Wherever such projections are placed, and whatever material they may be composed of, they should invariably be well

supported from the inside, and should be of a weight in proper proportion to the strength and tenacity of the internal supports. Cornices and other projections of the same kind are very dangerous when the internal supports are burned away, and the bond stones by which they are generally fastened to the walls are of no use when flames are coming out of the windows underneath. This is a point very much neglected in many large buildings, but it is one of paramount importance in connexion with fires.

No fireman of large experience has ever seen a stone staircase escape when subjected to much heat; and, this being the case, it would seem to be most desirable that there should be introduced a prohibition of the use of stone as a material for lobbies, corridors, passages, landings, or stairs, except where it is supported throughout and not overhanging in any part. We repeat that the use of stone is most dangerous for this purpose, except when it is supported throughout.

Ordinary stone steps are very dangerous, as their strength entirely depends on their being kept at the common temperature of the atmosphere; in other words, they are dependent on the power of the iron doors to resist the fire; and, when these fail or are left open, and the flames hurst through, the whole of the stairs above that level are crumbled into fragments in a moment, and would of course kill every one whose duty it might be to be at work on or under them at the time.

The author summarises some facts of recent date which serve to enforce what is said above. In the autumn of one year, and again in the beginning of the next, there were serious fires in some large waterside premises, and on both occasions large stocks of inflammable materials were stored in warehouses constructed of brick, wood, iron, and stone. After each of these fires the following results were observed:—The bricks were uninjured; the wood was seriously damaged, but only partially consumed; the iron was fractured, and consequently rendered worthless; and the stone was shivered into fragments, and totally destroyed. At a fire which took place in the basement of a private house, a cupboard and some small articles of furniture were burned, and the fire was confined to the spot in which it originated. The stairs leading from the basement to the ground-floor were of stone, and were separated from the basement by a door and partition, both of wood, only 1/2 in. thick in the panels, and this door and partition, though very much charred on the inside and blistered by the heat on the outside, were not burned through. No fire whatever reached the stone stairs, and nothing but heat from either above or below; no water was thrown on them to cool them suddenly, and no draught of cold air from outside passed over them; and yet they were broken into fragments and totally destroyed up as far as the first landing, where they ended, and the wooden stairs commenced.

At a fire which took place in some large warehouses, all the stone stairs and the so-called fireproof flooring failed utterly at an early stage, and as it was consequently impossible for the firemen to do their work inside, a large destruction of property took place, which certainly would not have been the case had there been means of access to the several floors either by wrought-iron stairs, strong enough to bear the weight of the men, but not so heavy as to be in danger of coming down with their own weight, or even by sound and well-constructed wooden stairs with wooden landings over.

A fire occurred in a house at the corner of two streets supported altogether by iron columns, and at an early stage of the fire the supports softened, and the house, without a moment's warning, fell completely down, not leaving a vestige of any kind, except a small portion of a chimney-breast, to show where it had originally

* "Fire Surveys; or, a Summary of the Principles to be observed in estimating the Risk of Buildings." London: Eillingham Wilson, 1872.

stood; and yet there is at the present moment to be seen at the corner of two streets a new building recently erected, 90 ft. long, 24 ft. deep, and from 70 ft. to 80 ft. high, supported entirely on iron columns, without any wall, wood, or brick work reacting to the ground along the whole line of the front. There is no doubt that at the ordinary temperature of from 60° to 70° Fahrenheit the whole building must inevitably fall down, and such a temperature could easily be created by the combustion of a very small quantity of household furniture or any other inflammable articles.

It will not be denied that there is matter here calling for wide and earnest consideration, and that Captain Shaw has done a good and useful work in bringing it together.

FINE ART IN BETHNAL-GREEN.

The opening of the Branch Museum at Bethnal-green, to which we alluded in a recent number, is an event of unusual interest among the exhibitions and art-displays of the year. The South Kensington Museum, as erected in 1857, shared the disadvantage which the entire group of kindred buildings inherited from their progenitor, the original Crystal Palace of 1851, of being essentially temporary in its structure. For a fairly palace, destined to shelter for three or four short summer months such a collection of beautiful objects as the world had never before seen collected, and then to vanish as rapidly as it rose, the building projected by Paxton, and scientifically designed, as well as practically executed, by Sir Charles Fox, was, no doubt, admirably suited. Rapidity of construction, abundance of light, and such constant repetition of the same detail as to economise to the utmost both time and cost in the preparation of the iron-work, were the objects aimed at, and attained, in the Hyde Park building. Architectural grandeur was thought of. Shelter was the thing sought. The effect actually produced by the exterior was striking from its novelty, its magnitude, and the summer brilliancy of its material, when new. For the English winter such a building was never designed, and was manifestly unsuitable. So great, however, was the effect produced on the imagination of the people by the unprecedented success of the first Exhibition, that a strong effort was made to retain in perpetuity the great summer conservatory in Hyde Park. When that effort failed, the next idea was to preserve the building as far as possible unchanged; and the Crystal Palace at Sydenham was the first resurrection of the Exhibition. This was inaugurated a style of architecture, for indulging in which the shareholders have to pay a yearly mulct in the shape of repairs, maintenance, and depreciation of material, that must by this time have amounted to a sum too large to be pleasant to calculate. The building that was erected at South Kensington in 1855 to receive various miscellaneous collections acquired from the first Exhibition, together with the fine-art collections exhibited, since 1852, at Marlborough House, consisted chiefly of iron and wood, and was generally known to the public by the name we gave to it (when the design was only on paper), hoping to prevent the transformation of its ugly forms into iron and glass,—the Brompton Boilers. It soon became necessary to replace this ill-designed structure by something of a more permanent nature; and by 1865 the brick buildings at South Kensington had so far advanced as to allow of the removal of parts of the original iron.

Our readers know of the circumstances which resulted in the purchase of land and the erection of a portion of the Brompton building in Bethnal-green. We cannot avoid a fear that the good people of the East will one day regret that they had anything to do with the old iron-work at all; however, it has gained them help in other ways, and it will at any rate serve their purpose for a time. Our present business is with its contents. The food collection and animal product collection of the South Kensington Museum have been removed to this branch establishment, together with the magnified drawings of articulate animals. Of the beauty and value of these collections we have already spoken in high terms. They form an educational element of great value, and appear to attract even more attention at the East, than they did at the West, end of the town. It is to be regretted that the light in which they are bestowed does not give them a better illumination. The remaining contents of the building are the property of Sir

Richard Wallace. They have been most generously lent by him to the Museum, and placed there at his own expense, most of them having been expressly sent from Paris for the purpose.

This collection is of a beauty hard to characterise in appropriate words. It is, in one respect, unique. It bears the impress of the same presiding taste, we do not say of the absolute taste of one individual, but of selection on the same principle. Never has there been a nobler apology for the possession of an immense fortune. Wealth has been directed in a manner that it would have been impossible to effect had it not been the wealth of one man. A nation would have shrunk from the price paid for some of the objects. Only the other day, it was the same not afford, which the National Gallery could not afford, presented it freely to that institution. It is evident that no object in this great collection has passed through the meshes of economy. What the noble owner chose, and thought appropriate, he bought, whatever was its cost. What he did not choose, he let alone. It thus happens that we have no rubbish,—no picture that can be called inferior, if we speak of its actual merit. Nay, though of course some are rarer and more costly than others, there is a homogeneity about them which is one chief charm of the whole. We are well acquainted with a unity of this kind in many a collection and in many a shop,—but then it is for the most part a unity of want of merit. Just as in certain shops,—we could supply the names of a good many,—you are sure never to get anything that is thoroughly good, never that which is best of its kind; just as you see in certain collections that the collector could never make up his mind to give more than a certain limited price for anything, so do you see in this grand series of paintings, porcelain, bronzes, build, and other objects, nothing admitted that has not on the wedding-garment of beauty and of merit.

The chief value of the collection as a whole is its wide representation of French, Dutch, and Flemish art. The Italian and Spanish schools are, indeed, represented; but it is to an extent that rather serves as an illustration of their continental neighbours than on their own account. Thus many collections may be named, notably that of our own National Gallery, where there are finer Italian pictures. There is no Correggio. There is only one painting attributed modestly to the "School of Raffaele." There are two Titians; one Giorgione, which we should have called a Titian, and works by, in all, twenty Italian painters. Five Spanish painters are represented, notably Murillo and Velasquez.

The works of no less than twenty Englishmen are also there, and selected with such admirable taste as not to contrast, but to harmonise with the general tone of the collection. Thus, Mr. Sant's "Portrait of a Lady" holds its own amid such distinguished company. The number of artists represented in all is 198, besides four pictures from unknown hands. The number of oil-paintings is 598, and that of water-colour drawings is 123.

While the greatest artistic novelty to the English visitor is the full and admirable representation of the French school, both late and present, the first interest, especially bearing in mind the locality of the Exhibition, attaches to the English pictures. Among them, notably, we have an example of the attraction of a well-chosen subject, even if imperfectly represented to the eye. Thus Morton's picture of the Duke of Wellington and Colonel Gurwood, although it cannot be called a work of high art, is one of the centres of attraction. The great commander is seated in a semi-military dress, handing a folio of paper to his historian. The costume is sufficiently bygone to look strange and quaint, although it has not yet attained to the dignity of actual antiquity. The attitudes are constrained; the faces are but shadowy presentations of the men. And yet the picture, which is from Lord Northwick's collection, is one that lays hold upon the memory, and seems to bring one thoroughly into relation with one of the greatest men of modern times.

Another picture of extreme interest is a small view of Conway Castle, painted by Sir George Howland Beaumont. Those who remember the life of Sir David Wilkie, or are familiar with the literature of that day, will be aware of the very high position which this gentleman deservedly held as a connoisseur. He was one of the very

few persons who were trained and judicious art critics; and whose intelligent and luminous discourse contrasts so strikingly with the tone of much of the flippant criticism of to-day. His remarks are enforced by his practice. In "Conway Castle" we have a proof that Sir George had the very best basis for sound criticism; the power of illustrating his own precepts. The picture is the very opposite of pretensions. In the first great requisite of a real landscape, unity of idea, it is perfect. In the scarcely less important element of masterly arrangement on the canvas, it is no less so. It fills the mind, without filling the scene. It is a distinct subject, not a square bit of country cut out. Nor is the manipulation inferior to the imagination. The quiet subdued harmony of the browns and greys, the natural mode in which the ancient walls moulder on the canvas, the tints and treatment of the whole, render this a most instructive, as well as a charming painting.

There are two Gainsboroughs,—the portrait of Miss Boothby, and a full-length "Portrait of a Lady,"—the tantalising non-explanation ought to be peremptorily banished from our catalogues—of great beauty. She is a woman of an exquisite pink and white complexion, which time has respected,—on the canvas. The dress is white, relieved with blue, and a fine little white Pomeranian dog is not out of place; as it is not made, as in modern portraits that we can cite, the *motive* of the picture. Very noticeable is the extreme freedom,—to use the politest word,—of the background; a mere green indication that the painter, the fair human personality, does not suffer by this masterly negligence. On the contrary, the manner in which the woman interests you is a strong condemnation of the marble columns, and elaborated perspectives, and highly-polished boots, which find favour with the public of to-day.

Of Reynolds, the great rival of Gainsborough, there are no less than thirteen examples, including "The Strawberry Girl," so well known from the engraving, from the Rogers Collection; to which Mr. Black appends the rubric,—"The painter thought so highly of this work that he called it 'one of the half-dozen of original things' he had produced." We wish that the accomplished editor of the catalogue had given us more of this explanatory gossip. Few men now living could do it better, and the value of the collection, to ninety-nine visitors out of a hundred would have been thus materially enhanced. "The Strawberry Girl," like almost every work of Sir Joshua, has sadly faded. The eyes yet look out with almost a supernatural brilliancy. They recall the look of one of those exquisite and tiny monkeys,—the silky tamarins,—that come to our climate only to die of consumption. Then there is the portrait of the famous Perdita, Mrs. Robinson, as to whose illustrious scandals the catalogue is mute; then the characteristic form of William, Duke of Queensberry, known as "Old Q.;" Miss Bowles, engraved under the title of "Love me love my Dog;" and Nelly O'Brien, *paraded* as a celebrated beauty of the time, and frequent sitter to Reynolds. There is Mrs. Carnac, a portrait engraved by J. R. Smith; and the tender and charming group of Mrs. Hoare and Son, in which the loving maternal glance tells of a care and tenderness which is never without its own reward.

With regard to the condition of the pictures, we must remark that perhaps there are not half a dozen Reynoldses in the world in anything like their original lustre. If we do not find one of these in the present group, none the less must we speak with unstinted admiration of the admirable condition of the whole collection. Not only has all care been taken, but it has been intelligent and learned care, which is a very rare thing as to pictures. So charming is the condition, that the had illumination of the gallery is to a great extent disguised by it. It is only by the comparison of known pictures, as they look here, and as we remember their appearance elsewhere, that we are enabled to speak so positively on the subject.

With the fine group of paintings by Sir Joshua Reynolds, and happily selected so as to harmonise with the tone of such illustrious companionship, are two pictures by John Hopper. One of them is a very beautiful portrait of an unnamed lady; the other a portrait of the late King George IV, when Prince of Wales. Hopper has been fortunate in seizing the best side of a character in which that aspect was ordinarily veiled by that personal irresponsibility which is

encouraged by the fictions, no less than by the imposing of the constitution of the country. There is much in the portrait to remind the spectator of the genial qualities of the actual inheritor of the title. Sir Thomas Lawrence was rarely more successful in his graceful mannerism than in the well-remembered portrait of Lady Blessington, which is here, together with another female portrait by the same artist. Gilbert Stuart Newton and James Sant are each represented by a graceful female portrait. By Charles Grant there is a sketch, rough almost to unintelligibility, of Count d'Orsay on horseback. There is a classic group, by William Hilton, of Venus appearing to Diana and her nymphs. The incident appears to have arisen in the imagination of the painter, and the picture is open to much criticism, but there is great beauty in some of the faces. The bold, frank, modest countenance of Frank Stone's "Boulogne Fish-Girl," whose comely face looks out from under a red kerchief, is an idealisation of the subject, so far as our own experience of the race and of the locality goes, that does much honour to the artist. "After the Masquerade" is another striking picture by the same painter.

There is a very graceful picture by W. P. Frith, of a lady, dressed in white silk, bearing wine on a salver. Westall's "Waking of Aphrodite" is a good example of the special treatment of classical subjects by that elegant but rather antiquated painter. The miniature finish of the flesh is remarkably delicate, and the sly glance of the opening eyes is admirable. Sir David Wilkie is represented by two small but life-like pieces of Scottish genre painting, "Scotch Lassies Dressing," and "The Sportsman Refreshing." The style and labour of Sir David are brought out with unusual distinctness by comparison with the fine view of Conway Castle, by the accomplished friend, patron, and critic of the Scottish artist, Sir George Beaumont, to which we above referred. From Clarkson Stanfield we have the view, so well known by the engraving, of "Bacharach, on the Rhine"; a little faded, but still an admirable landscape. There are six landscapes by David Roberts; churches in Spain, a mosque in Cairo, a Moorish festival, Seville, Valladolid, and Baalbec. A group of cattle by Thomas Sydney Cooper bears inspection alongside of the works of the famous Flemish cattle-painters. We must not omit the well-known "Humble Friend," by Sir E. Landseer; by whom there are also a "Highland Group," and a female portrait. Among these works of English painters (by virtue, no doubt, of the subject), is a family piece, the Earl of Hertford, on panel, by François Clouet, called Janet, a French artist of the sixteenth century. Another family picture, the portrait of Lady Elizabeth Seymour Conway, daughter of the Marquis of Hertford, by Sir Joshua Reynolds, is marked by a rare degree of noble feminine beauty. Rather further on in the gallery, but naturally classed among those English portraits and scenes, is the very graceful picture of Her Majesty, when in her bright girlhood she was suddenly called to occupy the throne, towards which she is represented as stepping, by T. Sully, an American painter. This picture is also well known by the engraving.

The paintings of which we have spoken hang on the walls of the gallery. On Screen A, in the immediate vicinity, are eleven pictures, of minor size, by Richard Parker Bonington, whose life of only twenty-seven years gave promise of so much fertility. Among these is the well-known incident of the entrance of the Spanish ambassador into the presence of King Henri Quatre, when his Excellency found the gallant monarch on all fours, acting as a horse to one of his children. The look of the king, caught in this unwonted attitude, is admirable, both as to likeness and as to expression. There is, as a pendant, a reception of the English ambassador by Henry III., accompanied by his monkey and his parrot,—a peep at the manners of that crowned madman who gave to Europe the noblest of the orders of modern chivalry.

From the well-selected and brilliant illustration of English painters, we pass, by a natural and appropriate transition, to the works of the Dutch and Flemish artists that occupy the west and north galleries. Here again we recognise a selection characterised by admirable taste; and possible only to splendid wealth. Familiar as we are with most of the pictures, whether by former exhibition in London or elsewhere, or by engravings, we feel it a great privilege to be able to refresh the memory. There are six magi-

ficent Vandycks. The Jane-like young Flemish lady, whose beauty so impressed on the writer of the catalogue of the Exhibition of Old Masters last year at Burlington House, as to lead him to attribute to her royal rank—the wife of Philippe Le Roi—is here, together with the no less admirable portrait of her husband. There is a figure called by the name of Paris, which is unsuitable for that designation, as being entirely foreign from Greek physiognomy, but which, this difference being laid aside, is a most happy imagination of the fascinating beauty attributed to that royal shepherd. It must be an idealised portrait, and it is wonderfully fine. The Virgin and Child, without being a Vandyck of the first class, bears signs of its pedigree. A full-length male portrait, the subject of which is, unfortunately, unknown, is one of the noblest we have noticed in this or in any collection of paintings. The portrait of the wife of the painter Cornelius de Vos, is also a most noble example of the manner in which this prince of portrait-painters could throw upon canvas the very life of his subject.

Eleven Rembrandts are here, including the portrait of an old lady, as to whom Mr. Black has not followed the example of the Royal Academician catalogues in describing her as "Rembrandt's mother." Chief among these for its impressiveness, and almost unique in its character as a Scripture scene, is the group of "The merciful Servant." Lavater would have decried for pages on the marvellous physiognomic power with which this unamiable personage is drawn. You see at a glance a selfish, remorseless, shifty personage, low in intellect, almost to the verge of egotism, but giving more distinctly the idea of aptness to grasp at any sudden advantage than can well be described. A young man, in leathern jerkin and steel morion, is the very embodiment of watchful, alert obedience. An elder man, who guards the culprit on the other side, looks eager in his desire for justice, no less than in his duty to his lord. The latter, a fine dignified figure, almost more of a Persian than of a Jew, is giving sentence as matter of justice, not of revenge. Altogether it is a wonderful group, and one of which the study is calculated to throw more than doubt on the authority of the very vulgar picture in our National Gallery, "Christ Blessing little Children," as to which so lively a controversy arose at the time of its purchase. Most of the other Rembrandts are portraits, including one of the painter himself, intermediate in age between the two in the National Gallery. There is a "Youthful Negro," which, not only from its physiognomic power, but as a study of sombre tints, black and blackening green and brown, and an underglow of gold, reflected one cannot tell whence, is of prime value as an academic canon. The famous portraits of the Burgomaster Palekan and his wife, from the collection of the King of Holland, which were at Burlington House last year, are also in this exhibition.

The indications occasionally given of the sources from which the late marquis derived his *chefs d'œuvre* are so interesting, that we only wish they were more numerous. Thus in the pictures from the collection of Cardinal Fesch, the absence of real taste in the *bourgeois* churchman is at once to be remarked. We observe that the evident slip of the pen in the catalogue, which entitles No. 64, "The Departure of Jacob into Egypt," has been corrected in the label of the picture. It represents the division by that acquisitive patriarch of his family and possessions into distinct companies, when he was about to pass over the ford Jabbok, and to come into the presence of the brother he had wronged. It is a vulgar picture. The "Virgin and Child," from the same collection, is poor for a Vandyck, if it be one.

There are five pictures by Hobbema, one of unusual interest, being what Englishmen would call his *diploma* picture, painted on the occasion of the artist's reception into the Royal Academy of Amsterdam, signed and dated 1663. There are also the famous "Watermill," from the collection of the King of Holland, and three other landscapes, including "A Woody Lane," and "The Outskirts of a Wood." There are four Ruysdaels, one from Baron Denon's collection, in which the water foams with great beauty. There are eleven Cuypes, two of them on panel, the finest perhaps being the "Man of War and Fishing Craft off Dort." The birds, game, fruits, flowers, and still life, by both J. and J. B. Weenix, and J. Van Huysum, are as faithful transcripts of that department of nature as can be found among the works of these

well-known painters. Peter de Hooge, who ought to have constant prominence given to his works as specimens of exactly what a real artist should avoid,—*fastidius* representations of all the petty and sordid incidents of domestic circumstance, with ugly and ignoble figures clumsily inserted amid the gleaming tiles and photographed pots and pans,—is represented by two remarkably characteristic examples. There is one landscape by Aldert Van Everdingen, in which the special beauties of Hobbema and of Ruysdael appear to be blended.

There are eleven paintings by Rubens. The well-known rainbow landscape is one of them; a picture which has suffered much. Near hangs a very interesting portrait, that of Helena Forman, the second wife of the painter; the original of the charming picture in the Peel collection, known as the *Chapeau de Paille*. As a question of technical work, or, perhaps, of preservation, the Hertford portrait is considerably the best. But it represents the fair subject at an age palpably more advanced, and in spite of the solid excellence of its execution, has not the wonderful charm of the more rapidly wrought sketch. It may seem cynical to say one is the work of a lover, and the other that of a husband; but we fear that it is true. There is one of these pictures that we would reverently commit to the flames, "A Crucified Saviour," that points out the limits of the genius of Sir Peter Paul. The Holy Family, from the Boursault and Casimir Perier collection, is one of these works, not unfrequently, which bear rather more of the impress of the imagination of Vandyck than that of Rubens. Nos. 133, 174, and 178 are sketches for the series of historical pictures in the Louvre; and, as sketches, are instructive and valuable. A mark of the rich exuberance of the fancy of Rubens is to be found in the fact that his paintings are always far more subdued than his sketches.

There are half a dozen of the evening water-side scenes which Vandermeer loved to paint. The glow in the wintry sky, and its ruddy reflexion on the ice, in the "Winter Scene, with Skaters" (98), is wonderfully truthful; and the angry winter sky, and deep piled snow, which frame the "Skating Scene" (106), are equally fine. This painter transports the observer in an extraordinary manner to the landscape that so powerfully affected his own imagination. Dutch they may be, but it only shows that there may be poetry in Dutchman. There are eight seapieces of W. Vandouvelde, including the Dutch man-of-war, saluting, known by the name of the *Coup de Canon*. There are three Van Ostades, two Terburgs, two Van der Werffs, and five examples of Teniers. Among these most deserving note is the Dutch version of the delivery of Peter from prison. Through a cavernous passage a winged angel may he seen busily engaged in removing the fetters. But the motive of the picture is a group of soldiers, in full costume, sashes and all (Herod's soldiers in Dutch dresses), who are playing dice on a bench in the foreground. On screens are some of the exquisitely finished and unmeaning *genre* pieces of Gabriel Metz and William Van Mieris; and a St. Anthony in prayer, and a monk reading by candlelight, by Gerard Douw, which are simply exquisite.

Italy is represented by but few of her sons. The most numerous Italian paintings are the landscapes by Antonio Canaletto, and the far more beautiful and much less generally known views by Francesco Guardi. The difference between the work of these two artists is that between the architect's design and a painter's sketch. Venice floats in light before our eyes, as we look on some of Guardi's landscapes. Probably the most valuable Italian picture is that of a woman in Eastern costume, by Domenico, which very closely resembles that painter's "Cumean Sibyl," in the tribune at Florence. This picture is in a most extraordinary frame,—a miracle of Rococo in carving. There is a "Venus disarming Love," attributed to Giorgione, which we should have called a Titian. The goddess has the same grave and stately beauty that characterises the Madonna in several of the Holy Families by Titian. Then come a Virgin and Child, by Leonardo da Vinci, and a cabinet gem, exquisite in execution, although exceptional and unpleasing in motive, a "Tarquin and Lucretia," on copper, by Guido Cagnacci, called Cagnacci. There are two Madonnas by Sasso Ferrato; a "Reading Girl," by Carlo Dolce; a Madonna, by Bernardino Luini; a quaint Holbein-like female portrait by Bronzino; and a very fine *Salvator Rosa*, from

Lord Ashburnham's collection. There is also a fine study of the "Danais" of Titian.

The Spanish school is chiefly confined to two names, although a "Vision of St. John," by Alonso Cano, displays the inability, customary to most Spanish painters, to distinguish between a saint and a heggar. There are eight pictures by Velasquez, three of which are portraits of Don Balthazar, Infante of Spain, two of which we have seen at Burlington House. The most interesting picture of this group is a study of Gaspar de Guzman, Duke of Olivarez, minister to Philip IV., a life-size reproduction of which is in the Royal Gallery at Madrid. There is also a portrait of Philip IV. himself, in whom the heavy Austrian lip and jaw are unpleasantly conspicuous. Of the yet greater Spanish artist, Murillo, there are eleven examples. Among them is an "Adoration of the Shepherds," remarkable not only for the light beaming from the infant, but for the expression of wonder, delight, and love that kindles the rough features of a peasant who, with clasped hands, is looking at that glorious cradle. In the "Annunciation" and seven other pictures in which the Madonna is introduced, we see repetitions of the same model or ideal,—rising into real beauty in one, but marked in all by a full, heavy under-lip, which easily degenerates into snkiness,—a feature which leads to the opinion that the paintings were all executed from a real living model. It is the Spanish type, beautiful, but far from being a specimen of the richest Spanish beauty. Of the "Clarity of St. Thomas de Villa Nuova," we spoke on the occasion of its display at Burlington House.

The French Collection, displayed in the East and South Galleries, is probably the most complete and well-chosen illustration of a certain portion of the French school that has appeared in this country. Its value is very great, and so is its beauty. It shows the bias of the founder of the collection that the name of David does not occur in the catalogue. Of Greuze there are twenty-two works,—a number sufficient to allow one to arrive at the conclusion that Greuze painted only one girl,—or, at all events, a series so closely resembling one another that they could have been taken from the same model. They are pictures which we feel ought not to please as much as they do. Their mannerism is extreme, the suggested idea is often odious, and yet there is a certain charm peculiar to the artist. "Innocence" (417), would be charming, if it were alone. "Filial Piety" is, perhaps, the most curious instance of utterly perverted sentiment that we can name. There are thirty-four pictures by Horace Vernet, who died in 1863. They cover a wide range of subject and of treatment, and contain examples of extraordinary power. Perhaps the most perfect picture is one the subject of which is such as to exclude it from most galleries in this country. It is entitled "Judah and Tamar," and for truthful representation of costume, habit, and physiognomic expression, for power in telling the story, and for beauty in the modelling of the figure, and the glances of the half-veiled eyes, is a work of extraordinary power. On the other hand, No. 351, "Allan Mac Anlay," is a mere caricature,—a signal proof of the inability of a French artist to paint a Highlander or chief. The Vernets alone require a morning to study them. There are fifteen Meissonniers, including the famous group of Napoleon and his staff; historic and genre painting, of miniature size and finish, yet with almost the breadth of fresco. Meissonnier is the founder of a school—almost of an art—apart from anything that has preceded him. Escosura, the Spanish painter, now bids fair to envelope him; but his merit is all but unapproached in his peculiar walk. There are two pictures by Gerôme; one, "The Draught-Players," on panel. Thirteen pictures (a favourite number, in spite of its uncanny character, in this collection), are by Paul De la Roche, including the memorable pendants of the last hours of the two Cardinal ministers, Richelieu and Mazarin. By Decamps there are twenty-six, many of them Oriental subjects, among which the fierce Irish of the Patrol through the Streets of Smyrna is the most strikingly original.

Watteau, Boucher, Nattier, all breathe the same atmosphere; cloyed with luxuriant fragrance, and heavy with the indications of that fearful storm, which, in sweeping from France the corruption of a depraved civilisation, seems to have swept away, at the same time, nearly all the seeds of a yet more ancient nobility of character. There is a very interesting and well-painted picture by Nicolas de Largillière, giving the portraits of

Louis XIV.; of his son, the Dauphin; of his grandson, the Duke of Burgundy, the pupil of Fénelon and the hope of France; and of his great-grandson, who, on the rapidly-succeeding deaths of his three immediate ancestors, ascended the throne of St. Louis under the all-omened name of Louis XV. With this striking page of modern history should be compared another scene, in some respects the finest work of art in the museum,—the Emperor Napoleon Bonaparte divorcing Josephine, in the vain hope of founding a permanent dynasty by the sacrifice of the only woman who loved him on the one hand, and of the dignity of the House of Austria on the other. This very fine composition is by Heinrich Frederick Schopin, a living German painter. Napoleon is seated in state. In the attempt to preserve a look of impassive dignity, the painter has made the only approach to failure in the picture. No wonder. The figure and face of Josephine, who, dressed in white satin, stands by a table, and lays her hand on the fatal document, are exquisitely rendered. Hortense weeps on her shoulder. Cambronne, a figure superbly attired, leans forward, and forms one of the most striking features of the scene. Eugène Beauharnais, close to the throne, has the baseness to look on. Murat stands by. The picture is a lesson of no ordinary value. Some excuse for a page of history so mournful, yet so futile as to rouse the sense of the monarchical, is to be found in the sketch by Camille Roqueplan, after a picture by Reynolds, that perished in the fire at Carlton House, of the culmination of French baseness,—"Philippe Egalité."

We trust that we have said enough to induce many of our readers to visit this noble collection. How much is due to Sir Richard Wallace it is not easy to express. As to the bronzes, faience, marbles, huhl and ornola furniture, and as to the superb case of miniatures, we have no room to speak. Indeed, the catalogue of the minor objects is yet incomplete. But the most sanguine hopes of the promoters of the British-grove Museum must have been exceeded by the detail which the liberal aid of the proprietor of these costly treasures has thrown on the opening of the Institution.

SCULPTURE IN THE INTERNATIONAL EXHIBITION.

THE contributions in sculpture to this year's exhibition comprise more of individuality and interest, on being fairly studied, than would be supposed at first inspection, and in proportion to their number are perhaps of more interest than the paintings. Mr. Boehm's large statue of her Majesty the Queen occupies, in right of its subject, the central position in the conservatory, between the east and west quadrants. This is a sitting statue, in which the artist has aimed especially at the realisation of a dignified, and what may be termed regal, deportment, not unsuccessfully. The attitude is noble and unconstrained, without losing the effect aimed at, which has been further contributed to by the large and massed treatment of the silk robes, the texture and folds of which are carefully indicated. On the whole this is a work with somewhat more of power and breadth of treatment than is usually seen in Royal portraits, whether in painting or sculpture. Having discharged our debt to etiquette in giving first place to this representation of the sovereign, we may feel at liberty to look at the works which depend more entirely on their own merits for their interest. One of the first that we notice among the works of English sculptors is the group entitled "Il Giuocatori" (2,501), by J. Adams-Acton: a naked boy with cap and bells on his head, playing with a rough-haired terrier. The figure of the boy is capital, full of life and expression, but the dog looks, of course, a shapeless mass of jagged marble—why that modern sculptors should forget that their art is essentially concerned with beauty of form and line, without which it is nothing; any attempt to give such rugged minutiae of nature in so stuhhorn a material must fail, as this does. The same artist contributes a very pleasing specimen of portrait sculpture in the shape of a half-length bas-relief "Portrait of Miss Marion Hall" (2,503), the figure of a young girl with loose hair, defined in high relief, within a frame, picture-wise, in ordinary costume, and with no attempt at anything but the simplest and most nonintrusive result; nor, in this case, any detail not completely within the true limits of sculpture. Boehm's bust of Mr. Millais (terra-cotta, 2,524) has an interest of course, and is a successful

portrait, showing very refined and delicate modelling in the forehead and upper portion of the face. The "monumental relief" (2,557) in memory of that Bishop of St. David's who first translated the Testament into Welsh, by E. Davis, deserves a note as a good specimen of a life-size figure in relief, with considerable energy of expression in the upturned face; and a little further on we come to an important new group in plaster, by J. Durham, A.R.A., "Siren and the drowned Leander" (2,572). The siren who has caused the hero's destruction in the effort to lure him to herself, sits with his head reclined upon her knees, gazing on the dying features with a face admirably expressive of bewildered surprise and dismay at the result: the heaviness and helpless drag of the dead body, and the face with closed eyelids and drawn-up brows, have been carefully studied. We congratulate Mr. Durham on the production of this fine work. Next to this is a little figure very well executed, and thoroughly modern and domestic in its interest as the last-named group is antique and mythical. "The first Dip," by W. Earle (2,573), shows a little boy standing on the margin of the water, huddling his shirt round him with a decided shiver, though with a funny smile on his face which indicates no very serious alarm at the prospect. This is one of the best specimens we have lately seen of those illustrations of child-life which some of our sculptors, in search of new ground, have taken up a good deal of late. Foley's noble figure of the "Youth at a Stream" (2,580) cannot be passed, well known as it is, without one more word of recognition; it comes upon one like a strain of fine music. Affording, again, a strange contrast to Fontana's clever little statuette next to it, "The early Propensity," a little boy with palette and brushes, and a bright expressive face, which seems to promise power, as well as enjoyment in the use of them. One may group together near these three little statues of modern life, T. Powke's "Croquet Player" (2,585) and Count Gleichen's "Prince and Princess of Wales (2,590-1), all in plaster, all in complete modern costume, with every detail given, so far as possible, by the modeller, and all remarkable for elegance of pose and high finish, and a display of cleverness (*habileté*, to borrow a French expression) by no means suited to the material, though attractive no doubt to a certain class of critics. The Princess is represented in the act of gliding along on one foot in skating; a pretty idea, but one almost impossible to realise in sculpture. Here motion is attempted to be indicated by the flying out of the dress behind, but not with much success. One cannot realise breeze and motion in that solid bulge of plaster. "The Indian Sister," by F. M. Miller (2,650), is one of the things which attracts by its original and poetic feeling; it is a small bas-relief, representing an Indian woman reclined in a kind of hammock, with a canopy of palm-leaves drooping over her, a little child asleep in her arms. There is a great deal of grace and quiet sentiment in the conception. A series of four small bas-reliefs by Theod, entitled "Four Acts of Mercy" (2,688); perhaps suggested by Flaxman's "Acts of Mercy," deserve attention. They are suited for architectural decoration in niches, and probably so intended; the best is the one representing the accordance of hospitality to some weary travellers, who enter from the left and are received by a figure on the right; the simplicity of the composition, and the grace yet kindly feeling expressed in the figure who the host as he heads forward, give "Sunrise" (2,921), by F. J. Williamson, speaks notice for its pretty and original turn of thought, happily carried out. A little child, whose figure is shown in alto-relief, peers out through his curtains to find out if it is not day; another specimen, and a very pleasing one of the child-fancies of modern sculptors. Weekes's "Young Naturalist" (2,912), a girl in loose raiment, which blows about in the wind, stooping over something evidently on the seashore, is a charming thing when seen from one side (the "weather side," as we may say); the tube figure and the young bright face, with drapery and hair blown from them, are admirable; but at the other side the effect is sadly marred by the solid mass of marble drapery blown aside by the wind, and hanging to the figure; another instance of the danger of attempting this kind of naturalistic effects in sculpture. The subject would have been perfectly suitable for bas-relief, because there the blown-out drapery could have been thrown back and given something of pictorial lightness and

airiness; but in the solid mass such an attempt is all but hopeless, and will always be a most dangerous temptation for sculptors to yield to. It is, if they would think of it, the special glory of their art that it is restricted in its possibilities; that no adventitious aids of detail and finish can be allowed, in work of a high class, to distract our minds from the main idea. It is to pure thought, expressed in pure form, that sculpture must look for its triumphs; and such *tours de force* as we have several times alluded to serve only to captivate and amuse the less educated mass of spectators.

As last year, Italy is comparatively well represented in sculptures, so far as number and importance of subjects and ability of execution are concerned. As to this latter point, the sculptors of modern Italy seem inclined, indeed, to go further and further past the line which separates ideal sculpture from minute realism in detail and millinery. Our old friend the "Reading Girl" is here, but other reading-girls, or works of a similar nature, have unfortunately sprung up after her. The Italian sculptors seem inclined to make the workroom and the nursery the field for the exercise of their art, in a great measure. We have, for instance, Martinioli's "Girl Embroidering" (2,348), in which all the materials of her work, the fringe, the worsted, &c., are worked in marble with an attempt at *emulation* of texture. There is again a figure by Torioli of "Young Torquato Tasso" reading a book (2,901: in the West Gallery); the face certainly is a very beautifully-modelled specimen of a youthful face, but the attention of the spectator is at least as much taken up by the execution of the garments, in particular the texture of the striped trousers, which is most elaborately given from top to bottom; the whole of the book too is engraved on its two pages with printed matter, title, and all complete. Such waste of time and manipulation over trifles which do not in the least affect, unless injuriously, the artistic expression of the work, is simply absurd; and such an example ought to be decried and protested against by all who have the true interests of sculpture at heart. Then Tautardini sends "The Veiled Model" (2,682), another of those elaborate tricks of the carver's craft of which we have seen too many. This is more sculpture in style, however, than the "Reading Girl," the figure being prominent enough in the main; and the execution of the waist and thigh on one side, represented as seen through a transparent starred gauze clinging close to the body, is very fine in its way; this part of the trick not interfering with the form. Magui (author of the "Reading Girl") sends a bust of Shakespeare, an Italianised Shakespeare; the face, as given by the southern artist, being characteristically robbed of much of its force and vigour, and smoothed down into a commonplace. "The Sign of Love" (2,657) by Pagani, though somewhat sensational, is a remarkable work in its impassioned expression and voluptuous roundness and breadth of modelling. It represents a nearly nude female figure, whose head is chapleted with flowers, tying on a wedding-ring, with an expression and pose implying more *abandon* of feeling than is quite consistent with northern notions in connexion with such a subject. Still, this is a work of genuine sculpture without trickery or millinery, and as such to be commended. There is not much for special notice among sculpture of other foreign nations than Italy. M. Antokolsky (Russia) sends a powerfully conceived and executed bronze sitting statue, life size, of "Ivan the Terrible"; we notice here again the banking after too free a use of the material, in the long loose strip of drapery-fold banging to the ground, the detailed making out of the cushions of the chair and so on. Have sculptors come to the conclusion that there is no path left to distinction but by triumphs of manipulation? Or are they in a league to make the labour of hands stand us instead of the greater and more immortal labour of thought? Belgium sends an admirably executed figure of a "Roman Shepherd" (2,673) by L. Simain; another of the costume developments, with breeches, hose, pipe, and all complete, just the sort of figure that Carl Haag has once or twice put upon canvas, and which is infinitely better suited to his colours than to the Belgian sculptor's marble. France is represented in sculpture by a few small things, busts and statuettes; among the latter, the "Birth of Venus" at one end of the French picture gallery, a very delicately-modelled little figure; and near this a bust of Beethoven, considerably more than life-size, by Dantan, in which the grand expres-

sive head, with its furrowed features and masses of hair, so suitable for the sculptor's art, is very finely delineated. There are sundry also of those ideal busts in terra-cotta, treated with great dash and freedom, of which the French sculptors are so fond, but nothing calling for special comment.

THE CASTLE AND CAVERNS OF GUILDFORD.

THE ARCHÆOLOGICAL INSTITUTE.

ON Tuesday, 2nd July, a party of the members of this body visited Guildford. Usually their excursions have been of an official character, annual, and lasting a week; the present visit was extemporised to suit the convenience of those members who were in town, and could spare a day. The notion seems to us a good one, and we hope the complete success of the day at Guildford will lead to its repetition next year. There is no lack of notable antiquities within two hours of London.

Guildford being the town selected for this experiment, Mr. Parker undertook the Church of St. Mary, Abbot's Hospital, and the crypts; and Mr. Clark, the castle, and the celebrated caverns.

The party left London at 11-30, and returned in good time between five and seven o'clock.

The Church of St. Mary is a very curious edifice, and contains remains of every period of English ecclesiastical architecture. It is composed of a central tower, a nave, and chancel, and two aisles, which are prolonged as far as the chancel east end, so that the church presents three equal aisles, each ending with a semicircular apse, though that of the chancel has been cut off in the present century. The skeleton of the whole is Norman, though of different dates.

The original church seems to have been composed of a central tower, nave, and chancel. The tower in outline, pattern, material, and workmanship, might well be called Saxon, though probably a little later than the Conquest. It hatters slightly, and on each face are three very narrow pilaster strips of slight projection. In its north and south walls are original loops of trumpet section. Then, probably towards A.D. 1100, transepts were added. Two round-headed plain arches of early Norman style, were cut in the tower walls, slightly infringing on the older loops.

Later in the style, the original east and west arches of the tower were taken out, and replaced by larger arches, pointed. The nave was lengthened, the aisles added, so as to include the transepts, and the east ends made apsidal. Then followed various additions, Early English, Decorated, and a little Perpendicular. In the west end of the north aisle is a low leper-window, and in the exterior corresponding wall of the south aisle a cinque-foil headed niche for a saint, as though the service for lepers was carried on outside the west end. In the apse of the north aisle are some curious and early fresco paintings.

Mr. Parker had an excellent plan, on a large scale, showing in colours the dates of the various parts of the edifice.

Abbot's Hospital, next visited, is a collegiate establishment for aged persons, of the date of James I, having a common hall, library, chapel, and master. In the library, a quaint room over the gateway, panelled in oak, with a high carved mantelpiece, was exhibited a remarkable and partly local collection of flint implements. In the windows are Archbishop Abbot's coat, with the motto of the hospital, worthy of the British Solomon himself, "Clanarnus Abba pater."

In the chapel are two windows of excellent stained glass, of the period of James I., which Mr. Parker thought to be of English workmanship. The crypts, which remain beneath the Angel Inn and a house opposite, on either side of the High-street, are thought to be thirteenth-century work, in the Early Decorated style. They are each of six bays, vaulted and groined, and divided by two columns into two aisles. They were entered each at the end furthest from the street, and each had two high windows towards the street, the level of which must have been originally much as now. They were evidently the cellars of rival hostels, though probably never filled with more generous liquor than at this time.

This inspection, shared in by but few, was followed by an excellent though plain luncheon in the Angel Inn.

At three o'clock a large party assembled at the castle, on the summit of the mound, in front of

the keep. Here Mr. Clark employed an hour in an address, of which the following is a very brief abstract. He remarked that the vale of the Thames was guarded by five castles, at Oxford, Wallingford, Windsor, Berkhamstead, and Guildford, all of which were pre-Norman, and all were peculiar in the possession of a mound, as an essential part of their works. Farnham probably may be added to this list, and, it may be, Reading, long since destroyed. All had been the seats of eminent Saxons. Of these castles, Berkhamstead and Guildford were placed in notches of the chalk, one on the northern and the other on the southern margin of the London basin, and one on the Oth and one on the Wey, tributaries of the Thames.

Guildford was one of two remarkable passages cut through the steep ridge part of which forms the Hog'sback, the other being occupied by the River Mole. Ryegate Castle stood at the eastern end of the ridge, Farnham at the western. Guildford was thus the key to an important pass on the south-western approach to London, and yet, though a very obvious place for a town, the British remains in the neighbourhood are few or none. Even the names of the rivers are Saxon, and there are no certain camps or dwelling-pits known of the British period.

Nor are the traces of Roman occupation a whit more frequent. The two great roads from Dover and Chichester passed by Rochester and Mickleham, and but very few Roman remains have been found about Guildford. The earliest mention of Guildford is in King Alfred's will,—a very respectable commencement. The name shows that even before that time a *guild* or trading body was there established, and that the river was crossed by a *ford*. The next notice relates to a reputed massacre of a certain Norman escort of the elder brother of the Confessor, and his detention at Guildford, where, therefore, was probably a royal residence.

The path of the Conqueror did not lie through Guildford. He took the Roman way by Canterbury and Rochester to Southwark, and marched up the right bank of the Thames to Wallingford, thus turning the flank of the passes. Guildford, however, appears in Domesday as a royal mansion, and Flamhard, so celebrated for his rapacity and his magnificence, was one of the tenants. It was thus that a connexion was formed between Guildford and the Church of Sarum, of which there are traces even now. It is thought that in those days the town lay beyond the river, where the names of Burgh and Bury are still found.

One of the early Norman kings formed a park at Guildford. Capt. James, to whom the town is much indebted for its admirable survey, and for several valuable remarks upon its antiquities, has traced the borders of this park, which lay to the south of the Hog's Back, and was extensive. It was a favourite place of resort for the Norman kings, and, indeed, was not finally broken up till the reign of James.

The castle is first mentioned in the reign of John, when it was also a prison. Though a royal residence, it remained for centuries the prison for the combined counties of Sussex and Surrey, and the sheriff was usually its custodian. Henry III. was much here, and the records show that he was always repairing and decorating the royal dwellings in the castle. Each king was here more or less frequently, but the castle does not appear ever to have been besieged, nor did any important historical event occur here. Finally, the building and demesne, having been Crown property from the ninth century, if not earlier, were alienated by James I. The mound stood in the upper part of the Saxon fortress, and was protected on its exposed or eastern side by a deep ditch, which still remains. To the west the fall of the ground rendered the defence less necessary. The Normans placed the rectangular keep partly on the mound and partly on the original ground at its base. Usually the rectangular keep was not built where there was a mound, and in only one other instance,—Christchurch,—is the keep placed upon the mound. Here it is a rude structure, with the usual pilaster strips, and with much irregular herring-bone masonry, but with all this the groins and apertures are distinguished by excellent ashlar. The basement is on the ground level, and has two loops only, the door being an insertion. The entrance was in the west front, about 12 ft. from the ground, on the first floor, reached by a flight of exterior steps. The basement was a store, and reached only by a trap in the floor above. From this floor a well-stair commenced in the north-west angle, and led up

to the battlements. Here, also, in the thick walls, were three mural chambers; one a very remarkable one, an oratory, in plan an L, occupying the south-west angle. It has an eastern altar and a southern long loop, and all along its outer wall is an arcade of good Norman work. This oratory contains some curious original carvings in its chalk walls, evidently the work of common prisoners, perhaps in the reign of Edward I. This was the state floor, and has three good windows, of two couple-lights, separated by a Norman column. The upper floor had four windows, probably similar to those below, though shorter, and very thick walls, but only one mural chamber, a guardroom, in the south-east angle. The openings and ashlar work look Late Norman, the ordinary masonry much earlier, but the whole can scarcely be older than the commencement of the reign of Henry II.

The keep formed a part of the polygonal wall which crested the top of the mound. There was a gate-house at its junction with the keep on the north-east quarter, connected with a bridge, now a causeway, across the ditch, and probably a postern opposite, covered by a barbican, in Castle-square. This circle formed the inner ward. The middle ward lay to the north-west, and contained the royal hall and dwelling, of which much walling remains of Norman date. South-west of this lay the outer ward, the buildings at the south-west angle of which remain, and are Late Norman. The great gate lay between the two. It is the work of Henry III., inserted into a Norman wall.

The enclosure of the castle seems to have run along Quarry-street, then across the Bowling-green to Castle-square, and along Castle-street to the King's Head Inn, which probably occupies the site of a tower at the north-west angle. If there was a wall further out towards High-street, it probably was the fence of a paddock, and no part of the regular defence of the place.

Of the caverns, Mr. Clark observed that they were evidently quarries. There is a hard bed of chalk, about 8 ft. thick, which was quarried by open working till it dipped too deep for this method. Then a gallery was driven a little within the cliff along the line of strike, and from this parallel stalls struck out down the dip. The chalk between them was then removed, and the rubbish, much more than skilful workmen would have made,—thrown back. He supposed the whole to be Late Saxon or Early Norman work, and to have supplied the material for the castle, the interior of the churches, and the original town.

Mr. Parker subsequently led a party of volunteers to visit Loseley House, but was unable to visit the very curious Norman church of Compton.

The excursion, suggested, planned, and managed by Mr. Burt, reflected great credit upon that gentleman. Mr. O. Morgan was the principal member of the Institute present.

INDIVIDUALITY IN WORKMEN, AND THE STRIKE.

THE great "strike" now going on shows that the working man is a constant quantity, and irrepressible, and cannot be put out of the way and forgotten, or left to go on like a machine always consuming the same quantity of fuel and joint-oil. As he "improves," if that be the term, he demands more fuel, and even now says that he must have it, come what may. But without going into the whole of the complicated and difficult politico-economical question, as Colclough would have said, there are one or two things connected with the capacities and workings of the trained mechanics of the present day, as contrasted with those of past times, which would seem to be well worth a few words, and will be ought to have some novelty, if not interest, to skilful working men. We ask their attention to these few thoughts; they can do no harm, even if they do no good: they may serve a purpose.

In the first place, our present race of skilful workmen are the successors of those who brought into existence the great works of the Past,—of that Past which now forms the great volume in which the modern man finds, as from an oracle or book of fate, what he wants, and the *how* to do his work. They are not a new race, but their mode of work is most certainly different,—may, may it not be fairly and truly said, that it is the *reverse* of the old mode of work. Is it better, or is it worse? Is it "improvement?" and if so, where is it? and if not, what is it? The old workmen had but little or no machinery to help them. It is not a little

curious to look into some worm-eaten book, and get a glimpse of the quaint machinery of past days in the way of building; at the heavy and complicated scaffolding, curious-looking ladders, gigantic tread-wheels for hoisting purposes, and raising timber and the blocks of stone which formed the future structure. But all this was the mere mechanical help to aid human strength; for time was, in still more ancient days, when even those helps were not, and main human strength did the work of carrying and lifting. But passing by all this, though a subject of no small interest, we here refer especially to that wide extension of and use of machinery in aid of human labour, which the "improvements" of modern times are hourly making. The hands of the modern workmen are getting of less and less use to him. The machine is taking the place of the hand. Every day tells us of some new machine which does away with the necessity of human hand labour, from the printing of an apple to the printing of a gigantic newspaper, and the moving work-machinery of a great war-ship. It is this, indeed, that constitutes modern progress and improvement; and there can be no sort of doubt that all things have been increased so enormously under this system, and that the numbers of working men have increased, and in full proportion to it; and were there no other element in the world of humanity but this of useful material and human-consuming machines, there would be little or nothing to say but to wish it well. But there is something more in human nature than mere "utility" and "living." There is nature and there is art, and fine art, and the sense in humanity of what may be termed *enjoyment* of existence, quite apart from mere usefulness.

But there is yet another and a deeper source of difference between the old workmen and their modern successors; and it is this, and it has to do, we cannot but think, with "strikes and locks-out." The workman himself as an individual power, and does his allotted and divided work as does the lifeless machine. Indeed, it is the boast of the political economist that in proportion as you divide the labour in the production of any single article, and parcel it out among a succession of hands, you perfect its production. You get more and more of it for your money, and it even would seem to be a question whether or no a perfectly divided and apportioned set of human machines cannot be made more "productive" than the iron machinery of framework, spindles, wheels, and cogs, and driving-pulleys. We have heard even this boldly argued for, so completely has the machine taken possession of the minds of men in this mechanical age! Here there is an enormous amount of difference between the position of the old workman and the new, and the main and chief tendency of it is to make all men alike or nearly so, and their *pay* consequently alike too. Let us, by way of illustration, take a simple instance,—common *wall-building* and *stone-sawing*. No "carving," be it understood, is here talked of, no "enrichment" of any kind, no art-work, but the very simple and intelligible problem of wall-building as in old days, and in these modern times. Hand sawing and hand stone-dressing are not yet quite gone out; every man knows what saving by hand is, and has seen it, and though it looks at first sight a merely mechanical operation, it is something more, and we have known a man point with no small pride to the saw-marks on the stone surface as a proof of the goodness of the work, and the skill and dexterity of the workman. Some doubtless will feel inclined to smile at this; if so, let them go into any of our old cathedrals, and look to the stone-cutting and mere wall-surface and common wall-building, and observe the evidence in them of the skill of the workman even in such, as it would seem, work which anybody or a machine could accomplish as well. But it is not so. One more instance,—the famous Parthenon. Nothing in it is more remarkable than the mere masonry of this building, the working of the plain marble surfaces, and the putting together of the walls and columns. It is really artistic work of the highest order, and utterly beyond the power of production of any sort of machine-work, however perfect. It is the joint result of the mind and hand of the artist-workman, the said workman from a mere human machine heaving, through the use of hand and mind together, an *artist-workman*. Here, then, is a problem interesting to workmen, as we would hope. Is it nothing, may we ask, to a man bow his work

looks, and whether or no it has in it any artistic value, any impress in it of himself and his own individuality as a human being? If it has, then has he a value, a money value, of his own. Everybody cannot do as he does. The appreciative employer must value him as an individual, not as mere part of a vast machine, composed of himself and others just exactly like him. If he "strikes," he strikes on his own account, and asks to be valued as a *workman*, not as a mere moving apparatus, or part and parcel of a moving apparatus of bones and muscles. If he be "locked out," he is locked out as a somebody doing a certain kind of work, in a certain way, and does not stop work as a cogwheel ceases to move when the steam is shut off. No subject, we are convinced, can well be worthier of interest to our working men in the building trades than this. They will find that the deeper they look into it the more interesting it grows, and the more they will find it to their account to study it thoroughly. The old workmen who preceded them doubtless had not a few disadvantages to contend with, and our present race of workmen have not a few advantages which they had not; but of one thing we may feel quite sure, that the old work as it came from the hands of the old workmen in the building trades can never be equalled, or in any way rivalled, by the men in these days, as things are. The old system of work, defective as it might be, produced—as we may see in the buildings—a confraternity of individual men, with each one a special, though may be humble, faculty, but the present system produces only a vast human apparatus, smart and skilful enough may be, and doing its work, as we see, with truly wonderful speed and accuracy, all the various parts of the human machine working as one towards a certain end; but all is mere mechanism, and the more perfect it gets, the more mechanical it grows. The man is fairly *lost* in the associated human machine, and the resultant work is not art, but "manufacture" in the strictest sense of the word. We think our working men might well give a little attention to this important subject, for it goes to the bottom of that great subject of modern activity, their *education*. The nine-hours movement means more leisure, or time to do something for oneself. Mental improvement, we are told, is for; but what sort of improvement, and what for, and for what final result? The mere acquisition of knowledge for its own sake is, we are often told, its own great reward; and there can be no doubt that to acquire knowledge of any kind is a pleasure in itself, and a gain; but no small judgment is needed to make a selection. And then, after all said about it, it seems but poor work for a humble man to strive after, the mere filling of his brain-pan for the mere pleasure and sake of filling it. All knowledge should certainly have an *object*, and all "improvement" should tend to some certain result; and the question then comes, how can a workman, a stonemason to wit, improve himself more to the purpose, or in a more profitable way, than by the effort to know more of his trade by finding out all about it—looking into its history, studying the examples of it left to us from the past, and, in short, making himself a *better mason*; not to remain a mere mechanical working man, but to make of himself an artist-mason? This would not prevent "strikes," it may be, but it would alter their character entirely; and according to the work he valued as an artist, and according to the "rate of wages," when every man is alike, and you cannot tell one from another, or even discover who it is that did the work. If the men think a little of these things, then may the strike do some real good and lasting work.

WORKS AT BARROW.

We have already, on more than one occasion, in the columns of the *Builder*, drawn attention to the rapid and marvellous increase and development of the new town of Barrow-in-Furness, and a very striking illustration of it is afforded by the interesting proceedings which took place at the town council last week, when the mayor, Sir James Ramsden, who has just had the honour of knighthood conferred upon him, announced the distinction to the municipal body. "I shall ever bear in mind," he observed, "that the town, and not the man, is thus honoured. The Crown has recognised the spirit and enterprise of the people of Barrow, who by their exertions, have added another great centre

of industry to the nation's wealth. Gentlemen, we must not lose sight of the fact that the public recognition of the town and port of Barrow will demand increased watchfulness and care in the administration of its affairs. If, with all the advantages we possess, we fail to make provision in a large and liberal spirit for the health and well-being of the inhabitants, we shall be indeed to blame. Our numbers will be doubled within the next few years. [The population is now estimated at 76,000.] In fact, the various works now in progress will demand an additional population of from 40,000 to 50,000. The Bill enabling the council to raise 200,000l. will shortly receive the Royal assent, and it will be your duty to urge forward the sanitary and other works in order to keep pace with the growing requirements of the town.

In the discussion which followed it transpired that the erection of a new town-hall and exchange has been decided upon. Several other public works are also announced as being about to be commenced, in addition to the several manufacturing works in progress. Amongst these are the new cemetery and park for which 100 acres of land have been secured, at a cost of 8,500l., and the works are to be at once proceeded with. There is also a pressing demand for the enlargement of the gasworks in consequence of the constantly increasing population, and the sum of 10,000l. is about to be expended in their extension. In addition to these, a large new cattle-market and commodious public slaughter-houses are about to be constructed, whilst a comprehensive scheme of drainage is about to be carried out.

STEPNEY PARISH CHURCH.

The old church of St. Dunstan, Stepney (or Steinhiltho), was reopened on Tuesday, the 2nd inst., by the Bishop of London, after a restoration occupying a period of nearly twelve months. It is known that there was a church here during the time of the Saxons, dedicated to "All Saints," and that in the tenth century St. Dunstan, then Archbishop of Canterbury, restored or rebuilt the church, after which it was dedicated to him, and has been called after him to the present time. There is a supposed relic of this early church still to be seen over the entrance-door in the south porch,—a rood cross of stone, about 3 ft. by 2 ft., with the figure of our Lord crucified rudely sculptured in bas-relief, and the accompanying figures of Mary and St. John standing at each side of the cross. The sun and moon are also carved on the arms of the cross, and round the stone a well-defined foliated border, 3 in. wide. It is in a good state of preservation considering its antiquity, and has been pronounced to be a piece of Saxon workmanship.

For many years the present building has been in a most unightly and dilapidated condition, the last so-called restoration having been done in Roman cement instead of stone, the embattled work round the church removed, and its place supplied by terra-cotta 3-inch coping, and the faces of rag walls plastered over with mortar and flint clippings, forming a surface that was continually decaying and falling to pieces.

The rector and churchwardens having called a meeting of the parishioners, it was unanimously resolved that a thorough and complete restoration of the church, under the advice of their architects, Messrs. Newman & Billing, should at once be undertaken.

The works, commenced in August last year, and now brought to completion, consist of a restoration in Bath stone of all the windows, cornices, battlements, buttresses, &c., throughout the building. Also four new windows in the bell-chamber of the tower filled with open quatrefoil tracery, and a new three-light window immediately over the west doorway in the tower. (This as well as the clerestory windows has been filled with stained glass by Messrs. Clayton & Bell.)

The south and north porches destroyed some years ago have been rebuilt with stone dressings and groined ceilings. A new vestry has also been built for the use of the rector, as rural dean, and the clergy of the deanery. This room is hexagonal on plan, and capable of seating 100 persons, and as one of its sides is open to the old vestry, the whole forming one large room, 150 persons can well be accommodated. The walls are of black flint laid in coal-ash mortar, Bath stone dressings externally and internally, square-headed three-light tracery windows, one

in each external bay; the walls internally stuccoed; and an open-timbered roof, stained and varnished, the principals and curved ribs resting on caps, columns, and bases of stone, and the intermediate ribs on carved corbels springing from the hoods of window-openings. The roofs of aisles have been repaired and re-covered with lead, and the whole of the windows (except those of stained glass) filled with cathedral glass in diamond quarried lights.

The interior of the church has also undergone a transformation. The imitation Sienna marble paint has been scraped from the nave columns, showing them now as constructed, of stone. The circular gallery at the west end, projecting so far into the nave, and used for the organ and choir, has been swept away, thereby opening up to view the fine western arch as originally seen, and the new stained glass window presented by the Messrs. Charrington.

A new organ is being built by Messrs. Bryceson, Brothers; but in consequence of a dispute with their men, it could not be completed in time for the reopening. This will be placed at the east end of the north aisle in a chamber adapted to the purpose.

The whole of the decorative painting and gilding of the interior of the church has been executed by Messrs. Pitman & Cuthbertson, under the direction of the architects.

The chancel-floor has been paved with Maw & Co.'s tiles, in coloured patterns. And the church has been re-lighted throughout with gas, for which the main and services have been supplied and fixed free of cost by the Commercial Gas Company. The coronas, standards, and side-lights were supplied by Mr. Gawthorpe, of Long-acre. The whole of the carving, including the sculptured half-figures of the four evangelists to the new vestry, has been executed by Mr. J. W. Scale, of Walworth. And the general builders were Messrs. F. & F. J. Wood, of Cleveland-street, Mile-end-road.

The style of the present building is Perpendicular, with two exceptions,—viz., a two-light decorated window in the north chapel, and the sedilia in the south wall of the chancel, which are thirteenth-century work.

Mr. Richards has acted throughout as clerk of the works, to the satisfaction of the architects. The rector has been untiring in his endeavours to raise money for the restoration. The cost of the whole will amount to about 5,000l.

METROPOLITAN WATER SUPPLY.

WHETHER or not the Board of Trade or the water companies take action upon the monthly reports of Major Frank Bofton, C.E., water examiner for the metropolis, it is a healthy, and ought to prove a useful practice, for that functionary to deliver, as he does, a monthly report to the Board. It is satisfactory to know, however, that practical results of an important character have already resulted from these reports, although the series has only extended over a few months.

In May the examiner, after a special examination of the works of the Chelsea Water Company, reported to the effect that the filtering area and reservoir capacity were insufficient, and that the point of intake at Seething Wells was objectionable. The report was forwarded to the company by the Board of Trade, and a meeting of shareholders has passed resolutions that the principal recommendations in the report be adopted, and that the works suggested be carried into effect forthwith. These embrace an addition to the present filtering area to the extent of four acres, by the conversion of the present reservoirs into filter-heds; the removal of the intake from Seething Wells to a point higher up the river, by which the objectionable outflow of the rivers Mole and Rye will be avoided; the construction of a reservoir of large capacity, to enable the company, when the river is in good condition, to impound and store water sufficient for several days' consumption, and thereby avoid the impounding and storage of turbid flood water. The extension of the filtering-beds will be proceeded with at once, under the powers already possessed by the company, and application will be made to Parliament in next session for powers to carry out the remainder of the proposed works.

In relation to the Lambeth Waterworks also, the Examiner in some of his earlier reports pronounced the reservoir capacity of the company insufficient, and recommended that the existing reservoir at Streatham should be covered. In conformity with these recommendations, the

directors of the company have instructed their engineer to prepare drawings and specifications, and to obtain tenders for constructing a new reservoir at Streatham, and for covering the existing reservoir. The company has also nearly completed the construction of a conduit, four miles in length, to convey water from the proposed intake above Molesey Lock to the existing reservoirs and filter-heds at Ditton. This conduit will be capable of carrying 20,000,000 of gallons per day, and delivering this quantity, by gravitation, at the Ditton Works.

Now works of greater or less importance are being prosecuted for increased quantity or improved quality of the water-supply by almost the whole of the remaining water companies. The New River Company has a new service reservoir in course of construction at Highgate; for the East London Company, the auxiliary works are far advanced for the intake and supplemental supply from the Thames at Sunbury, and the company has also nearly completed a new reservoir of about 50 acres at Walthamstow; the Southwark and Vauxhall Company is constructing reservoirs at Nunhead for the storage of 18,000,000 gallons of filtered water. The West Middlesex Company has good reservoir capacity, and avoids taking in water during or after heavy rainfall, and consequent turbidity of the river; the company is providing additional power at Hammersmith in a 68-inch cylinder engine and 24-inch pump. The engine-power of this company is already ample, in anticipation of a constant supply system. The means of storage of the Grand Junction Company is about to be increased by the completion of a new covered reservoir at Kilburn, to contain 6,000,000 gallons. The Kent Waterworks Company dispenses altogether with filters. Although the supply taken from deep chalk wells is clear and bright, containing little or no organic matter, the consumers of the water have a decided opinion that its quality would be greatly improved by the elimination of much, or all, of the mineral matter, of which it contains so much; they would be more than willing to allow some of the "degrees of hardness" to go with the chalk.

THE NATURAL HISTORY MUSEUM.

ON the question of a vote in the Commons of 29,900l. in Supply, for the Natural History Museum, Lord Eloho moved that the vote be negatived. He had reason, he said, to believe that the contract for this building had not yet been taken; but, whether or not, there seemed to have been such an utter want of system in dealing with the plans of the Natural History Museum that he thought the committee ought to pause before they voted this money. There were other buildings, such as the Foreign Office and the National Gallery, which might be cited as examples of the same system,—of buildings which had been erected upon no system whatever. The right hon. gentleman (the Chancellor of the Exchequer) appeared, from his inarticulate grumbling and the shaking of his head, to think it was a waste of time to discuss a question of this sort; but there were other things which might be economised as well as time, and amongst these was the public money. The present Government had "Economy" emblazoned on its standard; but this system of contracts for public buildings did not tend to economy. The system had been condemned by the Prime Minister himself in 1860. The system was bad, and he moved the reduction of the vote as a protest against it.

Mr. Ayrton said the failure with regard to the selection of designs was to be attributed throughout to the same cause—to the fact that gentlemen had been selected for the purpose purely on the ground of architectural taste. Their selection did not embrace the consideration of the whole question with which the Government found itself bound to deal. The first consideration, after all, was as to the purposes for which a building was to be erected, and the manner in which it was to be used. He maintained that they had arrived at a better system than that which formerly prevailed. He had made considerable inquiries in Paris upon this subject, and had found the same grievance in all the great offices. The general complaint was, "We are the victims of the architects." His opinion was, that no architect should be employed by the Government to construct any building until they were perfectly satisfied of the nature, character, and purposes for which that building was to built. Mr. Waterhouse had entered very

fully into the details, which were very numerous. At present the building trade was in a state of stagnation, but he thought if the present strike or lock-out terminated soon, it would not be long ere they would get in their tenders. As to the designs which the noble lord wished to see, the right hon. gentleman said he did not know what use it would be to exhibit the contract plans and designs to the public, especially as one had not been exhibited. The public in general could not deal with this question. When Mr. Waterhouse was first employed by the late Government, it appeared to him (Mr. Ayrton) that Parliament determined to allow Mr. Waterhouse, as a professional architect, to undertake the construction of this work; and he did not see how it was possible for that gentleman to perform his duties with the assistance of the public in general. He therefore hoped that the noble lord would see that everything possible had been done to construct this museum in a way that would give satisfaction.

Lord Elcho asserted that the right hon. gentleman had given no reply at all to him. He should resist the vote in order to induce the Government to show them the designs.

The Chancellor of the Exchequer contended that since this Government came in they had most materially improved the architecture of our public buildings.

Mr. W. O. Gore said that the proposal to place 350,000*l.* at the disposal of Mr. Waterhouse was one of the most preposterous proposals ever heard of.

Captain Trench thought they should either adopt the motion of Lord Elcho or adhere to the original design and bring in a supplementary estimate.

On division, there appeared,—For Lord Elcho's motion, 45; against it, 85: majority, 40.

THE PROPOSED NEW PUBLIC HALL AT KENSINGTON.

THE Kensington Vestry have adopted the report of a committee appointed to consider whether any and what alterations can be made in the vestry-hall. This committee have reported that the vestry-hall can be adapted to meet the wants of the Vestry by converting the present hall into offices, and erecting a similar hall above, to be approached by two staircases, at a cost of 2,000*l.* The building stands on consecrated ground, and the vicar and churchwardens have given their consent to the proposed alterations, contingent upon no political or festive meetings being allowed to be held in it. The committee recommended the Vestry to approve the plans on the conditions imposed, and they have done so. The Vestry have also adopted the recommendation of another committee to purchase a quantity of land in High-street, near the railway station, for 5,500*l.*, on which to erect a public hall. The result is, that it has been decided to improve and enlarge the vestry-hall for strictly vestry purposes only, and also to erect a new public hall for public meetings and general purposes.

SURREY ARCHÆOLOGICAL SOCIETY.

THE annual excursion of this Society has passed off successfully in every way. The rendezvous was at Dorking, where vehicles were in attendance at the railway stations to convey the members and their friends to the places selected for a visit,—Newdigate and Charlwood Churches.

At Newdigate, Mr. J. Gough Nichols read a lengthened paper on the Newdigate family; and Mr. John Green Waller gave a description of a painting of St. Christopher, on the wall, founded on the well-known legend. Mr. Gilbert Scott spoke of the wood tower, which, he said, there was nothing unusual in, as he had restored several similar ones. Where wood was plentiful and stone scarce, it was not uncommon to build towers of wood.

At Charlwood, Mr. Scott described the architectural design of the edifice. Judging from the style of one of the arches of the chancel it was one of the very earliest specimens of Norman architecture that could be found. The earliest specimens of Norman were in Westminster Abbey, but he could see no difference in those works by Edward the Confessor there and that arch, which was as early a specimen as one could well find in the kingdom, the first probable addition to the church being the aisle in which he was then standing, the date probably being from 1290 to 1300. The window between the paint-

ings was also a beautiful specimen of the style, though simple. Mr. Scott proceeded to show other points of interest, especially the screen, which he should have thought would have been of an earlier period, but that it bore the date on it of 1580; the windows and doorway of the west end, of the style of the fourteenth century; the chancel which was coeval with Queen Mary; and the north aisle, which was probably of the beginning of the fourteenth century, but very much altered at a later date. The rest of the chapel had been so thoroughly spoilt, outside and in, by so-called "restoration" that it was needless to say anything about it.

On the lawn of the rectory a paper was read by Mr. G. W. Leveson-Gower, F.S.A., on the "History of Charlwood." The fatigue from the heat of the day was agreeably relieved by a supply of "claret cup" from the rectory. Then Mr. John Wickham Flower, F.S.A., gave a long paper on "Flint Instruments," some rare specimens of which were produced as illustrations.

It was not until five o'clock that the company adjourned to the schoolroom to partake of a cold collation. The Rev. T. Birmingham presided, and the guests numbered about 200 ladies and gentlemen. The chairman, in proposing the health of "the readers of papers," caused much cheering at the mention of Sir Gilbert Scott.

SCHOOL BOARDS.

London.—Mr. John W. Walton has been appointed architect for carrying out the schools to be erected on the site in Bolingbroke-road, Battersea. The works committee are drafting specifications to obtain tenders. A report from the Works Committee, recommending certain arrangements, has been agreed to, the result of which is that a tender of Mr. E. J. Sargeant, for the conversion of Ebenezer Chapel, Shadwell, to the purposes of a school, at a cost of 1,597*l.*, has been accepted; and the Board are prepared to enter into formal agreements with Mr. J. Caudwell, of Wandsworth, for the purchase, at 1,000*l.*, of about 10,363 square feet of freehold land in Winstanley-road and Livingstone-road, Lambeth; with Lord Winterton, for the purchase, at 3,000*l.*, of the freehold of about 20,000 square feet of land, lying between Lower Chapman, Ann, and Chapel Streets, St. George's-in-the-East; and for the purchase, at 6,000*l.*, of about 9,000 square feet of freehold land, with buildings thereon, in Broad-street, Ratcliff.

Middlesbrough.—Plans from Messrs. Alexander & Henman, Sunderland, for the erection of a school in Denmark-street, to accommodate about 1,000 children, have been accepted; but it was agreed that the tenders should be obtained before the plans are forwarded to the Privy Council.

Brighton.—The Board have considered an offer made by Messrs. Jeffcoat & Lewis, on behalf of the Misses Gouly, to sell certain property in Hanover-terrace for 1,300*l.* Mr. Stevens, in moving that the offer be accepted, explained that the property consisted of ten houses, and was 150 ft. in length by 50 ft. in depth. The houses (he said) could be converted at a small expense; the outer walls could be used, and the inner walls could be knocked away. One of the proposed rooms would accommodate 198, and the other 182 infants, making a total of 380 children. This would be allowing more space to each child than Government required. If converted upon plans affording the space required by Government, the buildings would give accommodation for about 400 infants. The offer was unanimously accepted.

Wolverhampton.—At last meeting of this Board a report was read from the Education Department, disapproving of the architect's plans for the proposed Board school, because they were designed to provide accommodation for 528 children, when a school for 300 or 350 would be large enough, as they were in the neighbourhood of several denominational schools, none of which were full. The clerk pointed out that none of the schools referred to were available. Mr. Bantock censured the Rev. J. Sandford, Government inspector of schools, for first approving the plan for the Dudley-road school and afterwards objecting to it to the Government. After Mr. Sandford had been defended by the Rev. H. Hampton, the chairman explained that they were called upon by the Education Department to provide accommodation for 1,500 children, and it was much better to provide that accommodation in large and efficient schools at once than by gradual stages. Eventually the clerk

was instructed to explain to the Education Department that all difficulty in the carrying out of the plans would be removed.

Leicester.—At last meeting several members of the Board complained of the delay in the architect's work, and protested against it, and it was eventually decided that the Board at its rising adjourn for a week, to receive a plan of the rising-plate site; and if, at the expiration of that time, the architect at present employed could not have the plan in readiness, the clerk instructed to employ some other. Mr. Burgess, on behalf of the Architects' Committee, reported that the committee had met that morning, and that they approved of the elevation prepared by Mr. Goddard, which met every requirement of the Board, and which was founded on the plans sanctioned by the Education Department in London. Mr. Goddard recommended, in consequence of the high price of building just now, that no stone, or as little as possible, be used, and that the style be as plain as possible. The architect had estimated the cost on the cubic principle, and reckoning 8*fl.* to each child, which would accommodate 970 children, he estimated that the whole expense would be about 5,000*l.* The Chairman moved that the elevation of the plans be adopted; that Mr. Goddard be requested to make further plans and specifications as required by the Educational Department; and that the committee be requested to superintend the execution of his work. After some conversation the resolution proposed by the chairman was adopted, with the additional words "That the Architects' Committee report again to the Board." The following letter from the Education Department was read, relative to the King Richard's-road site:—

"I am directed by the Committee of Council on Education to return to you the accompanying plans (two) which are satisfactory.

I have to request that when your Board have obtained tenders for the erection of the buildings, but before any contract has been signed, the plans and specification may be returned to this office, together with the enclosed form (No. 7) duly completed.

My Lords will then be able to inform you what sum they will be able to recommend the Public Works Loan Commissioners to lend to your Board under section 57 of the Elementary Education Act.

P. S. These plans are arranged in accordance with their lordships' rules. Fittings should be provided as sketched in pencil."

It was resolved that Mr. Baker proceed with the necessary drawings, specifications, &c., under the directions of the Architects' Committee. Mr. Hollingworth gave notice that at a future meeting he will move that a clerk of works be appointed to the Board, the question as to whether one, or a clerk of works to each school, should be elected, being left for consideration.

SEWAGE IRRIGATION AND THE LOCAL GOVERNMENT BOARD.

THE "Sanitarian" in last week's *Builder* ventures the assertion that my recent epitome of the Local Government Report on the West Ham case "is most misleading,—it is neither the whole truth nor half the truth."

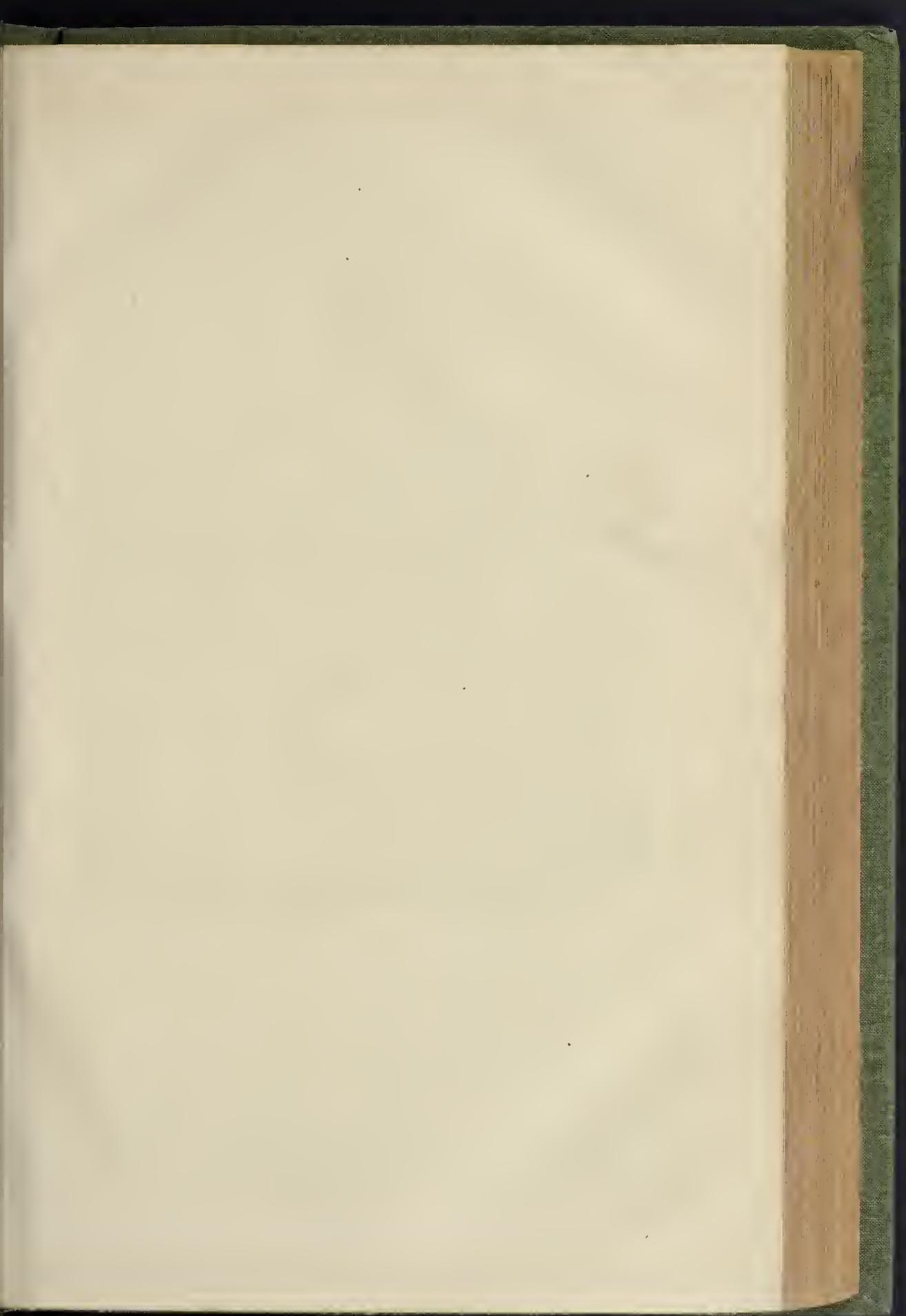
I challenge "Sanitarian" to proof, and I assert that the financial argument in the Report as to local rating, is utterly untenable; that the Report pronounces sewage irrigation elsewhere to have been unprofitable; and that the West Ham Board is not only told that tanks may be used without nuisance, but is directed to deal with the sewage of 70,000 persons, rapidly increasing, in tanks situated in a populous locality, notwithstanding that "disinfectants have previously reported that 'disinfectants do not disinfect, and filter-beds do not filter. Both attempts have been costly failures.'"

"Sanitarian" further states that, "In West Ham proper, Mr. Angell's letter needs no refutation." In reply to this, I will simply quote the following resolution of the Local Board "in West Ham proper," carried unanimously at a special meeting, July 4th:—

"That in the opinion of this Board, the report of Mr. Harrison is most unsatisfactory, and not supported by facts, and that the Local Government Board, by ignoring their previous recommendations and reports, and the facts gained by this Board at a considerable cost of time and money, has placed the parish of West Ham in a position of great difficulty, from which it does not seem to have any means of extricate itself."

I may add that I have received communications from all parts respecting this decision. One leading agricultural and sewage engineer writes spontaneously, after reading the full report, upon the necessity of counteracting "its pernicious effect."

LEWIS ANGELL.





FARM BUILDINGS, PADERBORN, GERMANY.—HERR GULDENPFENNIG, ARCHITECT.

FARM BUILDINGS AT PADERBORN.

The buildings represented in our illustration have been recently erected at a place called Werver, near Paderborn, in Westphalia, for the Baron von Brenkin. They are from the designs of Herr Guldenpfennig, diocesan architect to the Bishop of Paderborn, and one of the most recently-elected corresponding members of the Institute of British Architects.

These buildings consist of a gatehouse, two large stables, a large coach-house, harness-rooms, a cow-house, poultry-house, porter's room, outdoor servants' and coachmen's rooms; all these are in the lower or ground floor, which is constructed of stone, worked roughly, and partially covered with rough mortar. In the upper story, which is framed in oak, and filled in with patterns worked in red brick, are two large lofts, used as granaries, divided from one another by the upper portion of the gateway, which forms a large apartment with two projecting bay-windows. The roofs are covered with tiles made in the neighbourhood, the hips and ridges

being ornamented with finials and crestings of lead and iron. The entire cost of this very picturesque building, or rather range of buildings, was about 6,000 Prussian thalers (the thaler is about 3s. English money). This, however, does not include the timber, which was supplied from the very extensive woods belonging to the Baron von Brenkin, in the neighbourhood. As will be seen from our illustration, the buildings are of an elaborate description, all the timber being moulded and chamfered, and all the hickwork arranged in patterns. The general effect of the whole is singularly picturesque and pleasing.

EMANUEL CHURCH, CLIFTON.

This church has been several years in course of erection, under the direction of Mr. Norton, architect, on a site contiguous to the grounds of the new Clifton College, and near the Downs.

The first contract, embracing the nave and aisles, was carried out, by Messrs. Davis & Son; the second, embracing the transepts,

chancel, and chapels, by Mr. Diment; and the third, for the tower and spire, also by Mr. Diment. This latter has now been completed to the top of the tower and, if funds permit, it is intended to proceed with the spire, as shown in our view.

The church is spacious and lofty, measuring internally 122 ft. by 60 ft., and the roof carried through a uniform height of 60 ft. The chancel is apsidal, and measures 39 ft. by 28 ft. The nave is of five bays, with lofty arcade-arches springing from circular columns. Arcades of two bays divide north and south chapels from the chancel, designed for vestries and organ-chamber.

The church is built of the native stone, of a reddish tint, with bands of deep red sandstone. The dressings are of Bath stone; the chancel steps and dais of Limerick marbles and encaustic tiles. The reredos is carved with subjects in high relief, by Boulton, of Cheltenham. When completed, the spire will attain a height of 222 ft., the tower being 108 ft., and the spire 114 ft. high.



EMANUEL CHURCH, CLIFTON, BRISTOL.—MR. JOHN NORTON, ARCHITECT.

KENSINGTON GARDENS AND PALACE.

Sir,—After Windsor Castle, we have no position so beautiful and appropriate for a Royal residence as the now intramural palace of Kensington,—with a large scope of ground, say 250 acres, adjacent to Hyde Park, which, contains over 300 acres more. No Royal abode of Europe commands a finer site; but the state and condition of the palace, which might have been a suitable residence in the reign of William and Mary, is not commensurate with the requirements of our times; besides that, the stately forest-trees seem to have been wholly neglected for a century. There are, it is true, lovely forest glades and a profusion of stately trees; still, for want of the smallest care in thinning out and clearing away those in too close proximity, the great majority are grown up into bare poles, several interlacing each other, and thus obstructing free growth, and the natural development of forest scenery.

Is there no arborist empowered with authority to check this fearful waste of Nature's choicest products? It could not be expensive, for one full fourth part of the timber should be fallen: many trees are dead, many grown to bare poles; so that in case of a fall, the timber would pay several thousands of pounds.

When first erected, the palace might have commanded an extensive and pleasing western view; for then there were but few houses, and the prospect was open and unobscured; now suburban buildings extend for miles beyond it. Besides that, the site on the verge of the western boundary is 12 ft. lower than the ground near the Round Pond. In fact, the whole extent of the western extremity is bounded by an ancient wall, extending nearly from Notting-hill to the Kensington-road. At the Bayswater end there is a meadow of about eight acres, walled in as far as the palace. This may produce asparagus, sea-kale, and marrowfat for the establishment; but it is fearful out of place, and superior vegetables might be procured more economically from Covent-garden; and grounds in such positions are now risen to an enormous value, so that it would be absurd to convert them into kitchen gardens.

The Park railings have been cleared away along the whole *enceinte*, except at the north-west and south-west angles, and the recompense to the public by this improvement of open iron railings is beyond estimation; and perhaps the numerous allusions in the *Builder* long since published have had some influence in the removal of these *advertising* walls, and the erection of railings.

At the rear of the palace there is a green (about eight acres), bordering the fine Palace Garden-road; there is a small mean barrack on the south end, and a park-keeper's lodge of the ancient stamp at the angle of Kensington-road. Now, the opening out of these plots, and especially of the "*angulus iste*" at Kensington, would confer dignity and beauty upon the two most important of London suburbs—the Royal Kensington and the aristocratic Bayswater.

The proper site for a palace would be on the high ground, about 300 yards in advance of the old building, near the Round Pond, which might be somewhat withdrawn, in an oval or kidney form. At present the traverse broad walk runs between Bayswater and Kensington roads in a right line, and this would form a noble approach to a new palace, which might stand between that line and the Round Pond; and in exchange for this central position, the kitchen garden at the north-west, and the lodge at the south-west angles, together with the open green and hovel barrack, would, if properly embellished and laid out, afford the public a fourfold compensation. If a country mansion surrounded by park is more desirable than one on the roadside, how much preferable is the palace with trees and verdure all around?

It is only requisite to look at the iron railing, continuous along Park-lane and the Kensington and Bayswater roads, in order to appreciate the advantage of a similar railing encircling the whole scope of park and gardens, and giving extended freedom for a ramble round the whole as far as Palace Garden-road.

A Royal palace in this position would be more healthy for occupation than St. James's or Buckingham hollows; it would be sufficiently near to aristocratic quarters for levees and drawing-rooms; and if built in a style of architecture congenial to the improved taste of the time, must prove a lasting embellishment to the metropolis; the deficiency of accommodation in the shape of hospitality to Royal

visitors might be remedied by setting aside Buckingham Palace, or a portion of it, for that purpose; and lastly, the western margin, over 100 yards wide, which is now external to the gardens, might admit of a thoroughfare, so much needed for public use, between Notting-hill and Kensington; and this without marring the effect of fine trees standing near the boundary iron railing, which, by continuation, would give integrity to the whole park. QUONDAM.

THE TRADES MOVEMENT.

London.—The later incidents in the dispute show it to be in a different position now from what it was last week, but still not quite satisfactory. On Wednesday in last week the London Society of Operative Stone Masons, in a grand lodge meeting, composed of the "benefited" members of its twelve branches, resolved upon sending a deputation, with plenary powers, to treat for the termination of the strike and lock-out. In due course the masters were informed of this resolve, and having consented to receive the deputation, the interview, which extended over six hours, took place on Friday, when the following treaty of peace was agreed upon, viz. —

"2, Westminster Chambers, July 5. The Committee of the Central Association of Master Builders agree to settle the questions now pending between them and the masons (by their representatives in the following terms)—That the average working hours shall be fifty-one per week, as requested by the workmen, but that the shorter hours during which they cannot see to work in the winter shall be made up by additional hours in summer; and that the wages shall be 8s. 6d. instead of 8s., as at present. The hours to be as under:—Twelve weeks winter at forty-seven hours per week, the forty weeks remaining at fifty-two hours and a half. The hours of commencing to be six o'clock in the summer, seven o'clock in winter. In winter half an hour later on Monday morning. The hour of leaving off on Saturday to be five o'clock all the year round. The Committee of Masters will recommend the members of the Association to pay wages on Friday evening after work.

Signed for the masters,
B. HAYDEN, C. LUCAS, G. TROLOFF,
G. DINES, S. BIRD.
For the men,
H. BROADBENT, H. NISBET, W. BOWMAN,
M. KENNARD, F. WEIGHILL."

In accordance with a resolution adopted by the general committee of the Master Builders' Association, on Monday, the various shops, which had been deserted for the last few weeks, were on Tuesday morning, at six o'clock, reopened to the men of all branches who chose to resume work upon the terms accepted by the masons; but very few men availed themselves of the opportunity;—the masons, on the ground that their committee had received no official notice of the re-opening of the shops from the masters' committee; and the carpenters, and the men in the other branches, on the ground that they repudiate altogether the terms of arrangement made between the masters and the masons. The committee of carpenters had caused large bills to be posted outside the shops, cautioning all carpenters against resuming work upon the terms accepted by the masons, but this precaution was useless, as no men presented themselves. On Tuesday evening the masons' committee received the official notice from the employers, and they were to resume work as a body on Wednesday morning. The carpenters and joiners refuse to go in, and say they will carry on the struggle for the "nine hours and the ninepence." Surely it would be wiser for them to accept the compromise which the other trades have accepted. It has justice and common sense to recommend it.

Tamworth.—The joiners employed by the London and North-Western Railway Company have struck work for an increase of wages and a reduction in the hours of working. About eighteen weeks ago the men made application to the company for a rise in their wages of 6d. per day, —namely, from 4s. 6d. to 5s., and for the working hours to be reduced from 5½ to 5¼ per week. —Sunday work to be paid for as double time. An answer was received by the men from the railway company, refusing to grant the advance of 6d. per day, or to reduce the hours of working. In consequence of this, the majority of the men turned out, and are on strike; and the company, to meet the emergency, have collected men from various places and sent them to Tamworth.

Blackburn.—The joiners having applied for an increase of wages, the masters and men held a conference, and arranged to form a board of arbitration, to which all matters should be referred. Mr. Hulton, County Court Judge, is to be asked to act as umpire.

Glasgow.—We understand that there is some probability of the Glasgow masons' strike, which has now lasted for more than four weeks, coming to an end, two of the principal employers in the city having conceded the weekly payment of wages.

CENTRAL ASSOCIATION OF MASTER BUILDERS.

On Wednesday afternoon a conference was held at the Westminster Palace Hotel by the committee of the Central Association of Master Builders with representatives of provincial towns as under:—Mr. B. Briggs, president of the General Builders' Association; Mr. Urmon, president, of Liverpool; Mr. Neill, of Manchester; Mr. Johnson, of Manchester; Messrs. Bockett, of Northwich; Gibson, of Warrington; Hardwick, of Birmingham; Simpson, of Hull; Bennett, of Rugby; Marriott, of Coventry; Baker, of Bristol; Clutterhuck, of Gloucester; Fawcett, of Huddersfield; Bell, of Cambridge; and Mault. The following resolution was passed:—

"That it is desirable that the associations of master builders in the United Kingdom should enter into a close alliance with the view of ameliorating the position of the trade, and especially in regard to the labour question, to endeavour to settle matters without a resort to the system of strikes now so frequently occurring."

By a committee afterwards the following additional resolution was agreed to:—

"That in constituting a Central Association, it is desirable to make such arrangements as shall secure united action where united action is necessary, and, at the same time shall secure the various associations independence of local action in all local matters."

INAUGURATION OF THE WOOD MEMORIAL HALL OF THE MINING INSTITUTE, NEWCASTLE-UPON-TYNE.

The new building where professors and students will henceforth assemble in connexion with the North of England Institute of Mining and Mechanical Engineers has been inaugurated by the first meeting of the Institution of Engineers and Shipbuilders in Scotland, the South Lancashire and Cheshire Coal Association, and the Institute of Mining and Mechanical Engineers at Newcastle. The marble statue of the late Mr. Nicholas Wood was unveiled at the same time. The edifice forms a part of a block of buildings which attracts attention to the east of the Central Railway-station, and consists of a literary and philosophical institution, a museum, a medical college, a college of physical science, and the Mining Institute itself. The Wood Memorial Hall is rapidly approaching completion, and in its internal arrangements gives every evidence of comfort and convenience. It is 70 ft. in length by 20 ft. in width, the absolute height from floor to ceiling being 39 ft. 6 in. The style of decoration is mixed in character, being Franco-Gothic, with Gothic furniture to match. The cost of the Memorial Hall alone will be 20,000l. The Mayor and afterwards Professor Rankine presided at the inauguration meetings, and Sir W. Armstrong gave a banquet on the occasion.

THE ST. ALBAN'S ARCHÆOLOGICAL AND ARCHITECTURAL SOCIETY.

The annual meeting of this society was held at the Town-hall. Mr. J. Evans, F.S.A., occupied the chair, and there were also present the Revs. Canon Geo. Mackenzie Walcot, W. J. Lawrence, H. N. Dunning, F. Lipscomb, &c.; Messrs. G. Gilbert Scott, R. A. C. Longman, H. J. Toulmin, E. S. Wiles, T. W. Blagg, &c.; Rev. O. W. Davys and Mr. Ridgway Lloyd, secretaries.

A paper was read by Mr. Lloyd "On the Shrines and Altars in St. Alban's Abbey," not dealing with the architectural character of their remains, but tracing their history by means of extant documents (mainly the "*Gesta Aghatium Monasterii S. Albani*," edited by Mr. H. T. Riley), indicating also the evidence there existing as to the sites of the different altars. The Rev. M. Walcot, who has given much attention to this part of the subject, spoke *inter alia* as to the thoroughness with which Mr. Lloyd had done the work he had undertaken.

Mr. G. G. Scott made some remarks as to the works at the Abbey Church, —these among the rest:—"I believe that we can now say the [central] tower is perfectly safe. . . . One of the defects of the tower (in the south-east pier) extremely surprised me and all who saw it.

In digging away the foundations, there was a complete cave, of 5 ft. or 6 ft. in width, excavated underneath,—not fallen away, from weakness or disintegration, but actually cut away. This was, no doubt, excavated with a view to the destruction of the tower,—one of the modes of attacking fortifications in the old days was to undermine foundations. . . . In the event of sufficient funds being raised it is our intention to restore to a substantial state every portion which requires it; but while giving a perfect architectural restoration to those parts as to whose precise features we feel certain, we do not intend to introduce any conjectural embellishments. The abbey will thus be handed down by us as we have found it." As to the substructure of St. Alban's Shrine, discovered in a mass of fragments, Mr. Scott said,—“Through the extraordinary ingenuity of Mr. Chapple, the clerk of the works, and Mr. Jackson, the foreman, and the workmen, these innumerable pieces have been fitted together in a most admirable way, and the whole reconstructed. I will not take any credit to myself, as it was entirely their work. It was at first constructed in part, and then I suggested that it should be put up in its original place,—that is the only thing I can take credit for with reference to the shrine of St. Alban.” . . . Mr. Scott went on to state that Mr. Ruskin recently gave a subscription for its (the shrine's) restoration, and said that if the special subscriptions did not come in they might look to him for the whole amount. He hoped that Mr. Ruskin would not be allowed to do more than he had done, as the more he paid the more apathy might by some people be attributed to others. The audience (one of the largest ever brought together at a meeting of this society) then adjourned to the Abbey Church, and listened to Mr. Scott's explanation of the works of other days and of the present.

A prominent member of this society, Mr. Richard Grove Lowe, died on Friday, the 28th of June. At the time of his death (aged 71) he was the senior alderman of the borough, and had through life been settled therein,—for many years in practice as a solicitor. He had considerable acquaintance with the Roman and other antiquities of the neighbourhood; and the site of the Roman theatre, not far from St. Michael's Church, was first pointed out by him. His collection of coins, carefully brought together, is said to contain some specimens of unique interest.

THE NEW GLOBE BRIDGE AT PECKHAM: BURSTING OF THE DAM.

CONSIDERABLE expense has been incurred by the bursting of the dam at the works of the new Globe Bridge, over the Surrey Canal, at Peckham, now in course of construction. The contractor was put to considerable inconvenience by the accident, having to erect a second dam, and the progress of the work was much hindered. When the amount of the contractor's account for the expense incurred was last week submitted to the Camberwell Vestry for payment, several members took exception to it; but, the engineer having certified that the contractor was entitled to the money, the amount was ordered to be paid.

SMOKY WALLS.

Sir,—I wish to be informed by any of my fellow-readers, how smoke-stains can be removed from a new brick wall? J. W.

LIGNO-MINERAL PAVING.

Woop paving appears to be obtaining fresh attention. We mentioned lately the principle of one system; now another, Trenavay's mode, very strongly recommended, comes before us. The chief advantage claimed for this system is the fact that the wood blocks, being thoroughly impregnated with an impervious mineral substance, are impermeable to wet.

The foundation of the roadway is prepared in the usual way with concrete, and on this the prepared blocks are set, within interstitial joints solidly filled in with grout, penetrating to the grooves on either side of the blocks, and binding the whole together compactly. The blocks are bevelled or mitred at the ends to an angle of 60°; the inclined joints being set in opposite directions in adjacent rows, so as to break joint. The mineralisation is effected by a novel appliance of

mineral oils, of which the hydrocarburates render the wood impervious to damp, and proof against effects of variations of temperature.

This system has been tried in Paris, and vouched for by the official reports of the French Government engineer.

The City Commissioners of Sewers of London have allowed Messrs. A. McNeill & Co. (the English agents for the patent), to put down a piece of specimen paving in Gracechurch-street, immediately adjoining the asphalt previously laid down.

ERECTION OF NEW BUILDINGS AT ST. PANCRAS WORKHOUSE.

THE POOR-LAW BOARD AND THE GUARDIANS.

THE guardians of the St. Pancras Union and the Local Government Board are at issue as to the erection of a new laundry at the workhouse. The Local Government Board appear resolved on insisting upon the erection of the new laundry, and have called upon the guardians for an explanation why they do not proceed with the works and the alterations required. The guardians, in reply, have passed a resolution to the effect “That we inform the Local Government Board that we have no alterations to make.”

In the discussion which took place prior to this resolution being arrived at, several of the guardians protested against what they said would be a profligate and uncalled for expenditure of the money belonging to the ratepayers. The conduct of the Local Government Board towards the guardians was denounced as “nothing short of tyranny,” and “it was full time that they made a bold stand, and showed the Central Board that they would not be dictated to any longer.”

THE NEW LAW COURTS.

MR. C. BENTINCK asked her Majesty's Government whether it was their intention to authorise the expenditure of public money in the execution of the design for the Strand front of the New Law Courts, which was now exhibited by Mr. Street at the Royal Academy, and which was dated November, 1871.

Mr. Ayrton said the designs for the New Law Courts had not been approved of by him, but by the Lords of the Treasury. Since the sketch designs had been approved of, Mr. Street had intimated that he had made some small changes in the elevation of the Strand. What the nature and extent of those changes were could only be properly ascertained when Mr. Street had deposited the regular contract plan for the elevation of the building. The design which was exhibited at the Royal Academy was not really an elevation, but was merely a perspective drawing of the plan Mr. Street had in view at the time he drew it. At present it was impossible to judge what would be the nature and extent of the real elevation, but the matter would be taken into consideration when the regular contract plans were deposited.

UTILISING DRAINAGE.

CAN any of your readers inform me of a simple method of arranging the drainage of a detached house standing on about an acre of ground, by means of which the obnoxious large cess-pit may be avoided, and the liquid and solid manures may be so treated that they may be frequently distributed on a hungry soil without causing any unpleasantness, or running any risk of poisoning a good well of pure spring water? M. M.

* Employ a proper person to do the work.

HYDRAULIC.

Sir,—Allow me to suggest the probable cause of the peculiarity in the well alluded to in the letter of “Glaston.” First, premising that the rainwater collected from the roof is, doubtless, of less specific gravity than the brackish water the well obtains from the ground; and that during a continuance of dry weather, when there is no rainwater entering the well from the roof, the surface level of the brackish water within it will nearly coincide with the water-level in the ground outside it; the latter level being more or less the higher according to the draught upon the well, and the porosity of the ground the well is sunk in.

Now, supposing the level of this water to stand at 10 ft. from the bottom of the well, and to consist entirely of brackish water, undiluted with rainwater from the roof, then when a heavy fall of rain occurs, the rain-water from the roof pouring into the well will tend to fill it, and to raise the water surface within it; and if a heavy fall has occurred, the water may rise to the top of the well. Now, in such a case, it will follow consequently that there will be a greater weight or pressure of water within the well than on the outside of it, the water surface level within it being higher than outside it. The natural consequence will

therefore be, that the brackish water, which when the rain commenced filled the bottom of the well, will be driven back out of it into the ground around the bottom; and if the roof supplies a sufficient quantity of rainwater, not only will the brackish water be driven back out of the well, but also a greater or lesser amount of the rainwater will also follow it out of the well into the ground. The well will, therefore, after a moderate rain, contain nearly pure rainwater alone; and after a heavy rain the water-bearing stratum for some little distance around the well will also be filled by the rainwater from the roof.

The pump will, accordingly, after rain, draw pure or nearly pure rainwater; and will continue to do so, until the greater part of the rainwater poured into it from the roof is exhausted, when the brackish water will again find room for its return into the well, and thence again supply the pump.

J. R. M.

HAIRD AND SOFT WATER.

Sir,—Will you allow me, through the medium of your journal, to seek for information as to the best means of improving my supply of water? I want to soften hard water and catch rain-water. The spring water, which is excessively hard, is pumped into a large slate cistern, from which the house is supplied. How can I soften the water in the cistern? The tiles which cover my house are a shingle less than a foot continuous rain runs off. How can I make the tiles less porous at a moderate cost? F. M. K.

TREATMENT OF CONTRACTORS.

Sir,—A Building Committee to a large Institution invite tenders to erect same from some four or five builders in a radius of ten miles, to whom they forward the lithographic quantities, and fix twelve o'clock on a certain day to receive same. Only two tenders are received, both of which exceed the amount intended to be built. A builder present is asked for his price quantities, as the job must be cut down; one wing is suggested not to be built, and he states what he will deduct for that; several items are struck out of the quantities, and the amount allowed off; the site is selected, and position of building fixed. At half-past one o'clock he is told “they had expected to have received two more tenders; he need not stay longer, they would write him.” Now he hears that one or two more tenders have been sent in since by local men, and for less amounts, and one is likely to be accepted; but he has not heard from the committee.

Believing, as I do in this case, that honourable men may in ignorance of such rule and custom unwittingly encourage a most unprincipled proceeding by receiving tenders after the stated time, which enables others to bid out of the amount of the lowest tender, and send in accordingly, besides being most unbusinesslike, I hope you will insert this statement. A COMPETITOR.

NORTH CAMBRIDGESHIRE COTTAGE HOSPITAL, WISBECI.

THE plans of this hospital, which have been prepared by Messrs. Adams & Son, architects, King's Lynn and Wisbech, have been approved of by Miss Trafford Southwell, who has offered to erect the building, in a manner which shall make it a permanent benefit to the town, entirely at her own cost. Mr. William Peckover also has placed in the hands of the trustees the sum of 2,000*l.*, and Mr. Algernon Peckover a further sum of 500*l.*, to permanently endow the institution. The style of the building is Gothic, with a frontage of 62 ft. by 88 ft. in depth. The principal front will face the public pleasure-ground. The ground-floor will contain commodious sick-wards, another for special cases, dispensary, operating-rooms, nurses', committee, and domestic offices, bath-rooms. The chamber-floor will contain sick-wards, special ditto, convalescent-rooms, nurses' and bath-rooms, private bed-rooms, and other conveniences. A large cellar will be used as a hardy, stone, &c., under a portion of the building. The ventilation and drainage will be carried out on scientific principles. In addition to the hospital, there will be an entrance-lodge, with laundry and drying-rooms, and in the rear of the building will be placed the post-mortem and dead house, &c. The building, we understand, will be commenced forthwith.

THE HEREFORD FREE LIBRARY AND MUSEUM.

At the last monthly meeting of the Town Council of Hereford, a special report from the committee of the Free Library and Museum, was read. It stated that the premises in Broad-street, purchased by Mr. Rankin for the erection of the Free Library and Museum, have been conveyed to the Corporation. The plans for the new building were submitted to a selected number of builders, five of whom sent in tenders for the work. The lowest tender was that from Mr. James Bowers, of this city, and it amounted to 4,600*l.* It was at once evident that this amount, made thus high by the general rise of prices in building materials and labour during the last twelve months, amounting to about 25 per cent., was more than could be met by the funds at the disposal of the committee.

The plans had already been reduced as low as possible for the proper requirements of the institution, and the committee could not therefore have accepted the tender, or taken any further proceedings, but for the unolicited munificence of Mr. Rankin, who was present. He met the difficulty by adding another 1,000. to the 5,000. he had previously promised for this object. The tender of Mr. J. Bowers was then accepted, and arrangements were made to clear the site and commence the building. The plans, as finally agreed upon, will be presented to the Council for inspection. Meantime, the report was adopted with acclamation.

THE BRIDEWELL HOSPITAL ESTATE.

The land in New Bridge-street, Blackfriars, on which Radley's Hotel until recently stood, together with two houses facing New Bridge-street, having a frontage from the boundary of the hospital buildings to Bride-court, as well as a large quantity of land at the back of the premises, is being laid out by the construction of two new streets, one going from New Bridge-street westward to a junction with another new street, running north and south from Tudor-street to Bride-court, to complete which a number of houses at the north end and extending to Bride-court, are about to be taken down. The land on the north side of the new street from New Bridge-street, on which Radley's Hotel stood, will shortly, it is stated, be occupied by a large first-class hotel, whilst on that on the south side it is said offices and buildings of a commercial character will be erected, and that buildings of a similar character will in addition be erected on the land on the west side of the new street from Tudor-street to Bride-court.

CHURCH-BUILDING NEWS.

Folkestone.—A plan for restoring the church of Folkestone, now re-opened, and about half of which has been carried out, was made through the instrumentality of Lady Login and Lord Kimmsaid. The scheme consisted of re-building the chancel, raising the walls, and re-roofing the nave, adding north and south transepts, heightening the tower, and building a new porch. It was determined to begin at the east end, and the new chancel has been built, and the north transept with organ-chamber and vestry, the latter in the place of the box which, when the church was re-opened after the re-seating of the nave was completed, was economically papered, have been added, and there the restoration has abruptly stopped. The work has not been carried further because the funds have been expended. The lath and plaster ceiling of the nave is roughly broken off where the roof of the transept begins, and the intervening space is simply boarded up, whilst a strut, to support the roof at this point, comes down exactly in the centre of the passage in the nave. The new work belongs to the early period of the Decorated style. The chancel is apsidal, and is built of the bricks of which the Martello tower, formerly standing hard by, which has lately been pulled down, was composed, the grant of which by Government was obtained by Lady Login. In the original design the architects, Messrs. Edwards & Roberts, Dundee, contemplated that the bricks would be laid in courses, but, following a suggestion made by the contractor, Mr. R. S. Smith, of Ipswich, they have been laid irregularly, and it is said, with good effect; for, when looked at close, the appearance is much more in harmony with the style of the building than ordinary brickwork would have been, and at a little distance the walls would be taken for rubble. The plan might not, perhaps, have succeeded so well with new bricks. The same plan has been followed in the transept, and we presume will be carried out throughout, for there are about bricks enough to complete the restoration. The roof of the chancel is covered with the old plain tiles, and over the chancel-arch is what seems to be a bell-turret, the two sides of which are formed of the flues from the warming apparatus (supplied by Nichols, of Dundee). In each of the three easternmost walls of the chancel is a two-light window with a quatrefoil opening in the head, and there are similar windows in the west wall of the transept and the east wall of the organ-chamber which adjoins. The high-pitched roofs of the transept, &c., are slated. The quoins and dressings of the walls, buttresses, &c.,

are stone. Internally the chancel-roof is made of Memel fir darkly stained, and the principals which spring from stone corbels from the apsidal form of the building make it a groined roof. In the gable-wall are three plain, single-light windows, which, as well as the other windows in the new part of the church, are filled with cathedral glass, with a border of ruby. The stonemason's work was done by Mr. Frewer, of Ipswich. The plumbing and glazing was done by Mr. D. Thurman, Walton. At present the cost has been about 1,100., and a somewhat equal amount is required to complete the reconstruction.

Barley.—The church here has been reconsecrated. The whole of the new work (with the exception of the oak seating in the nave), has been carried out after the designs of Mr. Butterfield, by Mr. Gibbons, of Buntingford, builder, under the superintendence of Mr. Nash, clerk of the works. The stone-work, exclusive of flint-work, was undertaken by Mr. Bullen. A new aisle, 9 ft. 6 in. wide, has been built on the north side, also a porch, which forms the chief entrance to the church. The nave, with the exception of the old arcade, has been rebuilt and enlarged: it measures 50 ft. by 25 ft. The old arcade has been lengthened by the addition of a bay, made to correspond with the new arcade on the north side. The chancel is entirely new, as are also the small aisle and vestry, added to it on the south. The chancel is 37 ft. by 26 ft. The general walling is built with local flints, Box ground stone being used for all external dressings and for the windows, the tracery of the latter being of geometric design, and Corsham Down stone has been used for all inside masonry. Internally the walls are plastered and relieved by hands of coloured tiles. The roofs are of deal, the principal timbers being exposed to view, and the ceilings divided into compartments by chamfered ribs. The chancel roof has curved braces of English oak, and is filled in between the principals with ornamental tracery. The nave, chancel, and porch roofs are covered with red tiles, and the ridges finished with painted crosts. Encaustic tiles, mixed with some portions of stone paving, and laid to a pattern designed by the architect, are used for the chancel floor. The steps are of Portland stone, the risers being inlaid with figured tiles. All the other floors throughout the church, excepting where the seats are placed, are laid with 6-in. black and red quarries. New open seats of wainscot oak have been provided throughout the church, the floors upon which these seats are fixed being of yellow deal, with oak margins, and a level with the tile paving. For heating the church two Porritt's stoves have been provided. During the progress of the work the upper part of the tower was found to be in an unsafe condition; the walls were therefore taken down and rebuilt, new windows being inserted, new stone parapets provided, and all finished in a style corresponding with the previously existing work. A new spire, about 40 ft. in height, and octagonal in plan, has also been added to the tower. The upper part is covered with oak shingles, and terminates with an iron cross and weather vane. Improvements have been made in the appearance of the churchyard, and the church, which is a considerable height above the level of the road, is now approached by new steps from the entrance that has been formed on the north side. The style chosen by Mr. Butterfield for the new work is Geometrical Middle Pointed. Every original trace of Norman work has been left. A slightly new form has been given to the battlements, which were an addition of the fifteenth century. The stained glass of the east window, which is at present partially filled, is the work of Messrs. Hardman & Co., of Birmingham. In the central light is the Crucifixion, and below it the Virgin Mary bending over our Infant Lord in an attitude of devotion. The side lights will be filled (when money can be collected for the purpose) with the usual figures of the Virgin and St. John, and below with the Adoration of the Magi and the Shepherds.

Boston Spa.—St. Mary's Church, which is a very plain structure, built in 1814, is to be entirely reconstructed and much enlarged, as the want of more sittings is much felt. A few months ago plans were advertised for, and submitted by several architects in competition, and those of Mr. Walter H. Parkinson, of Leeds, were selected, and having been approved by the Archbishop of York, the first portion of the work will be commenced immediately. It consists of a new chancel, organ chapel, vestries,

south transept, and part of south aisle. Accommodation will be thus provided for 200 sittings, being 92 more than the church at present contains. The whole of the money is being raised by voluntary subscriptions.

FROM EDINBURGH.

The foundation-stone of a new church, in connexion with the United Presbyterian body, has been laid at the corner of Easter and London roads. The building has been designed by Mr. Starforth, architect, in the Early English style. The design shows, on the London-road side, an elevation consisting of a large central gable, flanked on the east by a tower and spire, and on the west by another tower of smaller dimensions. In the gable, which terminates above in a finial, combining the forms of cross and circle, the principal feature is a large window with five lights, the three in the centre being surmounted by quatrefoil perforations. On each side of the window is a niche, and underneath is the main entrance to the church, consisting of two flat-headed doorways enclosed within a pointed arch. The west tower, which only rises to the height of the side wall of the church, shows in front a two-light window, an enriched cornice along the wall-head, and a high-pitched roof with iron cresting. The east tower, rising close to that side of the central gable, is square in plan, and, in its lower stage, is supported by buttresses at the corners. Towards the front it shows a three-light window on the lower stage, and higher up a double window. The wall-head is finished with a blocked cornice, and supports a square spire, relieved with a pinnacled dormer on each side, and terminating at the height of 90 ft. from the ground, in an ornamental vane. The towers are pierced with doorways, which appear in the east and west elevations respectively; and each contains a staircase giving access to the gallery of the church. In the side elevation we have a range of wall divided by projecting buttresses into seven bays, and presenting in each bay two windows, the lower flat-headed, but the upper with two lancet-shaped lights, and head filled in with quatrefoil or circular perforation. From the wall-head rises a high-pitched roof, having its surface broken up by three pinnacled dormers. The north end of the church, so far as not hidden by certain subsidiary buildings, shows a large gable, pierced by a couple of three-light windows. Internally, the building will be fitted up to accommodate about 1,000 persons. A light gallery is to be carried round three sides, supported on ornamental iron brackets springing from the side walls. A series of wooden rafters, resting on carved corbels, will support a flat plastered ceiling, the rafters themselves being unvarnished. The pews will be open. In the erection of the church itself nothing has yet been done; but considerable progress has been made with a congregational hall and offices, which come in as a sort of annex on the north side of the main building. This is a stone structure, containing in the centre a hall, 44 ft. 4 in. by 32 ft. 2 in., which will be seated for 300 persons, and on either side apartments intended to be appropriated as session-room, vestry, ladies' waiting-room, and offices.

FROM AUSTRALASIA.

Melbourne.—The Ministry having decided upon at once commencing the building of a governor's house on the site in the botanical reserve, the plans were all prepared, and the following tenders for this and other works have been accepted by the Public Works Department:—Foundations and basements for Government House, Melbourne, Kilgower and Richardson, 7,576l. 6s. 10d.; additions and repairs to Public Works Office, Melbourne, Wm. J. Searlett, 647l. 10s.; additions to Court-house, Smythesdale, J. Milverton, 250l.; fencing Government Printing-office, Peter McCowan, 68l.; repairs, colouring, painting, &c., judge's ante-room and Crown presenter's-room, Supreme Court, Melbourne, F. S. Sterling, 20l. 15s.; supply of ladders for use at General Post-office, J. L. Kindon, 36l.; and works at Customs-house, Warrnambool, Kruger and others, 115l. 18s.—One of the most striking embellishments about to be added to Melbourne is a huestone fountain, to be erected on the open space in Spring-street, between the Parliament House and the Treasury, the Government having already determined on

the same. The material used has hitherto been considered utterly unfit for artistic purposes. This work has been designed and executed by Mr. William Stanford, who, for the last seventeen and a half years, having been an inmate of the penal establishment, has been therein immured from the early age of fifteen: so says the *Australian Illustrated News*, which gives a view of the fountain, and it is certainly an extraordinary production for such an artist. But how any crime committed at the age of fifteen could be punished by seventeen years' imprisonment we cannot imagine. It is unnecessary to add that the artist is not merely self-taught, in the usual acceptance of the term, but it is said to be an actual fact that he literally never saw a work of art worthy of the name previous to his recent liberation from his long captivity. The dimensions are:—Extreme height, 17 ft. 6 in.; extreme breadth, 40 ft. The whole is executed in what is colonially styled bluestone, but which, geologically, is trap-rock, save only the eight drinking fountains, which form the principal ornaments of the lower basin: these are zinc castings of a complex character, consisting of eagles standing on shells, in the act of seizing lizards, and, strange to say, this union of arts is in this instance found to be combined in the same individual, Mr. Stanford having executed them also. Extensive as this work is it has been completed in four years.—The new goods shed at the Spencer Street Station of the Victorian Railways has been opened. The building is nearly 900 ft. long, with platforms 42 ft. wide. The contractor was Mr. John Thomas, and the amount of contract 47,572l. 2s. 8d. About 80,000l. have been expended on improvements at Batman's-hill within the last eighteen months.

—Mr. Reilly has been chosen building surveyor by the City Council, to fill the office rendered vacant by the resignation of Mr. Everist. Mr. Reilly is the same gentleman who formerly held the position of city surveyor to the corporation, but retired about five years since upon a retiring allowance of 1,300l., and now comes in for 350l. per annum.

Sandhurst.—Sandhurst is to have the first theatre in the colony at a cost of 20,000l. Messrs. Heffernan & Crowley hold one-third of the shares and the rest are all taken up.

Fitzroy.—The Presbyterian Church at the corner of Napier and Gertrude streets, Fitzroy, having long been found unsuitable, owing to its position, it has been decided to purchase an allotment of land a short distance down the street, and the foundation-stone of the new building to be erected thereon has been laid. 400l. had been collected on account of the new building, but it was anticipated that the sale of the old building and land would realise a considerable amount of the balance required. The present contract is for 2,220l., but with extras it is expected the total cost will be fully 3,000l. The new building is to be of bluestone, faced with freestone, and in the Gothic style. It is 65 ft. by 40 ft. 6 in. (inside dimensions), and will seat about 450 persons. In the front to Napier-street there will be a large tracery window, with stained and ornamental glass. In the back gable will be a large wheel-light window, with ornamental glass, and the windows generally will be of cathedral embossed stained glass. At the back there will be a vestry, 25 ft. by 12 ft., which can be divided into two class-rooms by large folding-doors. The height of the walls inside the church will be 24 ft. 6 in. from the floor line. Above this are large ornamental open-urved principals, supported by corbels, with ornamental columns, &c., underneath; the rafters of open roof to the ridge, with diagonal panelled boarding, &c., are to be stained and varnished in imitation of cedar. The main entrance to the building is obtained by means of a porch, 9 ft. by 8 ft., from Napier-street, and will have a roof to match that of the church, with ornamental marble tile flooring. The design was chosen from those prepared by Mr. George Browne, of Melbourne, architect, and is now being carried out under his direction and general supervision by Mr. James Sumner, the contractor.

Queensland.—This colony is coming in to share with the Transvaal district at the Cape, the honours of its fields of precious stones. So at least it would appear from a story told, which runs thus:—When the *Governor Blackall*, conveying the Eclipse Expedition party, was anchored off one of the northern ports of Queensland, a gentleman came on board, saw Mr. Foord, and showed him some specimens of stone which Mr. Foord offered to bring to Melbourne to have them tested. The gentleman

assented, and requested that they might be set for him. When Mr. Foord arrived in Melbourne, he at once saw Mr. Spink, the lapidary, who pronounced the stones to be opals of great value. The smaller stone, which has been set as a ring, is estimated as worth between 300l. and 400l.; while on the larger, made into a gentleman's breast brooch, Mr. Spink says it is impossible to set a value, it being, he thinks, the largest opal ever found, within his knowledge.

Sydney.—In October, 1870, the Deaf and Dumb Institution invited architects to send competitive designs for the erection of a new building; a sufficient portion to be erected first to contain seventy beds, with all modern appliances and other necessary offices and accommodation, school and dining-rooms, hospital, &c., at a cost not exceeding 3,500l. Of ten designs sent in from most of the leading architects of Sydney, that of Mr. Backhouse, of Belmore Chambers, was adopted, and on the 30th of December, 1870, tenders were invited for the erection of the building according to the accepted design. The site on which the building is erected,—and granted to the committee by the Government,—is on the eastern side of the Newtown-road, opposite Victoria Park. It contains five acres, elevated above all surrounding land, a situation commanding views over the whole of Sydney. The front elevation, in the Italian style, shows a main cretion three stories in height, with extensions on each side of two stories high, and verandahs or arcades in front of each extension, in brick piers and arches, with stone paved floors. At each corner in the main cretion are a small tower with spire, and small dormers for ventilation. The roofs of these towers are of corrugated iron. At each end of the above described extensions are return wings fronting up to the same level as the main building, in front two stories in height, and the back portion, out-offices, &c., one story high. At the junction of the one and two story portions similar towers to those in front are placed, and at the further extremity of each wing will be a tower, rather lower than the front ones, but similar in all other respects. The front elevation of the wings shows a projecting or bay window, surmounted by a two-light window and a gabled roof over. Ample provision will be made for the drainage and water supply.

Utapu, New Zealand.—St. Joseph's Roman Catholic Church, Dunedin, is about to be rebuilt. A portion of the old building will form the eastern nave, 65 ft. by 30 ft.; the new north and south transepts, 85 ft. by 30 ft.; the chancel, entirely to the clergy, 35 ft. by 30 ft., which, further continued westward, incloses a sacristy, or priests' robing-room, 19 ft. by 12 ft. This is separated from the chancel by an isolated and perforated screen, forming a trefoil carved background to the principal altar. Over the sacristy will be a lofty open archway, reaching close to the roof, and which is constructed expressly for acoustic effect. Under this arch will be placed the first and successful specimen of colonial organ manufacture upon a large scale, by Fincham, of Melbourne. The choristers will be screened off from the congregation by a Gothic carved screen extending across the whole width of the chancel, affording, from a peculiarity of construction, an uninterrupted view of the congregation, without the choristers themselves being exposed to view. The church will be entered from the east, north, and south fronts, all the doors opening outwards. The north porch, fronting Dowling-street, will be pierced with dual arched openings, separated by a strictly primitive stone crucifix. The south porch is similar in character, but somewhat smaller. The church will be cruciform, the extreme length of the major axis being 150 ft., whilst the minor axis will be 100 ft. The extreme height from the ground-level to the apex of the roof will be 40 ft. The sides are flanked with massive buttresses and antique mullioned windows, the western one having octagonal turrets, inclosing stairs ascending to the organ-gallery, roof-loft, and choristers' gallery. The design is by Mr. John Millar, F.S.A., architect and civil engineer, whose works, engineering and architectural, are well known throughout the colonies.

The Price of Iron.—The extraordinary advances declared in the price of iron during the last twelve months have brought up quotations to a standard unsurpassed, and probably unequalled, in the experience of living ironmasters. Some one is making a deal of money.

VARIORUM.

Speaking of artists' descendants, Mr. Beavington Atkinson says, in the *People's Magazine*.—"In somewhat extended travels through Europe, I have failed to meet with living descendants of artists whose fame at least cannot die. The only exception I recall was in Florence; a descendant of Michelangelo I found making a poor copy of that weak product in the Corsini Palace, 'The Poesia' of Carlo Dolce. The family of Van Eyck is extinct; it lives only in immortal art."—**Mr. Llewellyn Jewitt's illustrated account of the Ashmolean Museum, Oxford, in the current number of the *Art Journal*, is interesting and valuable. The same must be said of Mr. Teniswood's paper on "Flaxman as a Designer."—"The *Essence of Fun*," selected and arranged by Mr. Tom Hood, is a capital shilling's worth, and will amuse a large public, to whom the periodical itself may be unknown. Every page is full of cuts.**

Miscellanea.

Memorial to Harvey, at Folkestone.—Harvey, the discoverer of the circulation of the blood, is at length to be honoured by the erection of a national memorial. The townsfolk of his native place, Folkestone, have resolved not to allow the tercentenary of his birth to pass unnoticed, and it has been decided that a bronze statue, if possible of a very superior class, shall be erected to his memory. A committee is in progress of formation in London to assist the Folkestone committee, and public scientific bodies and individuals are being asked for aid and co-operation. The Archbishop of Canterbury, Lord Granville, the Presidents of the Royal College of Physicians and Surgeons, Sir Thomas Watson, Sir Henry Holland, Sir William Fergusson, Sir William Gull, Sir James Paget, Baron M. de Rothschild, M.P., and others, have already promised support. As soon as sufficient funds are promised to assure the committee of success, the Prince of Wales will be asked to preside at a public meeting in the hall of the Royal College of Physicians of London. The treasurer of the fund is Dr. Bence Jones, F.R.S. Donations may be made payable to the "Harvey Tercentenary Memorial Fund" at the Western Branch of the Bank of England, or Burlington-gardens, London. A memorial window in the parish church of his native town is also contemplated. The large west window is to be filled with eight subjects from our Lord's miracles of healing.

Restoration of Tewkesbury Abbey.—A vestry meeting has been held, to consider the question of an application for a faculty to remove the galleries, and to substitute for the sittings, contained in them at least an equal number in other parts of the church. The meeting was called for the specific purpose of getting the authority of the Bishop's Court to remove the galleries. Mr. T. Collins generously made an offer to do the work, and to restore the stonework and pillars connected with it, without cost to the parish. It was unanimously resolved that the plans submitted by Mr. Collins be approved and adopted, and that the churchwardens be authorised to make the necessary application to the Bishop's Court for a faculty for the removal of the galleries and the alteration of the sittings, in accordance with Mr. Collins's plan, and for effecting such improvements as may be rendered necessary and as may be advised by Mr. Gilbert Scott. When the proposed work has been carried out the restoration committee will have funds at their disposal which will enable them to erect a suitable stone screen for the support of the organ, and a stone pulpit, which will be so placed as to be seen from all parts of the church.

Science and Art Department.—The examination of students' works submitted from night classes for drawing and from schools of art in competition for payments and prizes has just been concluded. From 397 night classes 56,016 works have been received. From 114 schools of art 73,226 works have been sent up, making a grand total of 129,242 drawings, models, or paintings, which have been executed in the classes during the year ending in April last. Ten gold, twenty-five silver, and sixty bronze medals have been awarded, together with a number of prizes of books. The prize works and some others will be found in the Western Gallery on the ground floor of the South Kensington Museum.

Blasting Operations in Dover Harbour.—The interesting blasting operations have taken place in Dover Harbour, in the presence of Mr. H. W. Shaw, C.E., Mr. Lee (of Messrs. Lee & Co.), and other gentlemen. Messrs. Lee have been engaged for several years in building the new Admiralty Pier, and have lately been improving and enlarging the Dover Harbour, according to Mr. H. W. Shaw's plans. For blasting purposes under water, Messrs. Lee were engaged to apply to Mr. France, who has extensively used what is known as Messrs. Krebs' explosive, the invention of a Cologne firm, and to come down to Dover to try the effect of the explosive on the hard chalk-beds. The operations were carried out under the direction of Mr. France and Mr. Bishop (of the Harbour Pier Works), and with success, large quantities of chalk being displaced. A characteristic of the explosive is that, when lighted by the ordinary match or vesuvian, it burns quietly away; but it is most powerful in its explosion when affected by the detonator, and gives a report like a large cannon. The safety of the explosive was satisfactorily demonstrated, as it was its value for submarine operations, owing to its not being affected by the water.

The Price of Coal.—The rapid rise in the price of coal appears to be starting the public. It is now 22s. per ton upon 22s.,—or 30s. per ton—looks like a fancy summer price; but next winter with its winter prices may astonish those who are not used to "out upon strike." Why should not the colliers strike as well as the building tradesmen? We may be able to do better than we have done for a few years, but we cannot well do without coals for a few winters. The extraordinary prosperity of the iron trade, however, has something to do with the rise in the price of coal. The next thing to be naturally expected, of course, is a strike among the ironworkers for more wages with less work, and so the problem of compound multiplication which brings all trades to a dead-lock is hastening its climax. Meantime, the colliers have not been striking the butchers for their high prices; but have not the butchers and the cattle-dealers and farmers just as much right to high prices as the colliers, the builders, or any others? The building workmen, we fear, however, will go the way before either the colliers or the butchers.

Dover Harbour.—The International Communication Bill, better known as Messrs. Fowler & Abernethy's scheme, now in the House of Commons after passing the Commons, is a project which embraces a harbour of refuge of about 200 acres as against Mr. H. W. Shaw's accommodation space for smaller mail packets. There are only three petitions against the Bill. The first is that of the Dover Harbour Board. They are going against the wishes of the town as expressed by the unanimous vote of the Corporation. The second petition is from the Corporation of Folkestone. The third petition is that of the South-Eastern Railway Company, who do not all they can for Folkestone. The Bill, as the *Dover Chronicle*, will go into committee in the House of Lords with stronger evidence in favour than was adduced in the Commons, and with a good understanding with the French Northern Railway; and, having passed the Peers, the co-operation of the French Government will easily be obtained.

Alarm on the Metropolitan District Railway.—On Wednesday morning last, some excitement was caused by the discovery that a section of the brick arch of the tunnel close to Clouster-road Station of the Metropolitan District Railway, was giving way, caused by the sight of a large mass of sand that had been piled on a vacant piece of land immediately over it. Numbers of men were put to work at once, to remove the great weight. Only one of the lines of rails was used for a time, the trains passing this portion of the line at the slowest possible speed. Some settlements in buildings near this line show that the vibration is very considerable. A correspondent wrote, a short time ago, to ask the reason why the trains moved so slowly between Praed-street and Bayswater stations of the Metropolitan Line.

Architecture at University College.—The prizes gained in the senior classes by Mr. G. H. Lloyd, as mentioned in our last, could have been stated severally as "Certificate of Donaldson-Medal." The recipients would be willing to lose the additional honour which the usual name connected with the medal gives.

The Great Landslip on the Midland Railway.—The obstruction caused by the great disaster at the mouth of the Peak Forest tunnel is likely to prove more serious than was at first anticipated. Five hundred men have been set to work to clear the line, but they look a mere handful, and make but slow progress at present, and the full extent of the damage to the short tunnel is not yet ascertained. The Midland Railway Company have connected their line by a junction with the London and North-Western Railway at Buxton, which has enabled them to run through with the London and North-Western engines, from Manchester to Derby and London *via* Buxton. The Midland continue running trains between Manchester and Chapel-en-le-Firth. The engineers, it is said, promise to restore the thoroughfare in a fortnight.

Sewer Grease.—A "grease" account has been opened in the ledger of the St. Olave's Board of Works for some time, says the *Clerkenwell News*. It shows a clear balance of 104*l.*, and what to do with this amount has been a moot question for a long time back. The origin of the account is somewhat singular. In Bermondsey, as is well known, there are numerous manufactories, at some of which fleshy matter forms an important element. Seven years ago the Board of Works appears to have permitted its sewermen to explore the underground channels in the neighbourhood of these factories, and the result was the collection of grease or fat, which, after paying liberally for expenses of collection, left a balance of the sum named. Mr. Strand moved that its obliteration should be effectual by its being applied to public improvements, and his proposition was agreed to.

St. Mary's Church, Saffron Walden, Struck by Lightning.—At Saffron Walden, on Monday week, the Church of St. Mary was struck by the electric current and considerably damaged. The storm, which lasted two hours with almost unabated fury, broke immediately over the town. The church was struck near the south-west window, which is chipped at several places, and the lightning would appear to have taken an oblique direction and then glanced upwards, as, in its course, a heavy piece of stone was forced out in the inside of the steeple, 125 ft. from the ground; it then shot across to the north-east, and effected a breach through the wall, about 1½ ft. square, hurling the stone a distance of 75 ft. Over a hundredweight of material is displaced. One or two of the flying buttresses on the turrets are also damaged.

Lessons from a Brick.—An Austrian savant has discovered, by means of a microscope, in a brick taken from the pyramid of Dashour, many interesting particulars connected with the life of the ancient Egyptians. The brick itself is made of mud of the Nile, chopped straw, and sand, thus confirming what the Bible and Herodotus had handed to us as to the Egyptian method of brick-making. Besides these materials, the microscope has brought other things to light,—the shells of river-shells, of fish, and of insects, seeds of wild and cultivated flowers, corn and barley, the field-pea, and the common flax, cultivated probably both for food and textile purposes, and the radish, with many others known to science. There were also manufactured products, such as fragments of tiles and pottery, and even small pieces of string made of flax and sheep's wool.

Society of Engineers.—On the 2nd inst. a party of members and associates of the Society of Engineers paid a visit of inspection to the Royal Arsenal, Woolwich, permission for which had been accorded by Colonel Campbell, R.A., the superintendent of the Gun Factories. They were received by Colonel Campbell, Captain Maitland, and Mr. Fraser, by whom they were conducted over the various departments of that establishment, the working details of which were fully explained. The visitors were finally conducted over the laboratory, and witnessed the series of highly interesting processes connected with the manufacture of the service cartridges. Altogether an instructive and pleasant afternoon was spent, and which was rendered more agreeable by the courtesy of those in charge of the various departments.

Value of Land in London.—The freehold site of the church of St. Mildred, Poultry, occupying an area of 2,293 square feet, was sold by tender, on the 10th inst., by Messrs. Fuller, Horsey, Son, & Co., for 46,105*l.*, or at the rate of 20*l.* 2s. per square foot. The purchasers are the Gresham Life Assurance Society.

The Little Bridge, Tunbridge.—At the last monthly meeting of the local Board, the chairman informed the Board that he had been in communication with Mr. Bohner, the county surveyor, who had informed him that tenders had been accepted for the works at the Little Bridge; that contracts were ordered to be prepared; and that they would begin the work in about ten days. He thought it would be desirable that the work of widening the approach to the bridge should be proceeded with at the same time, and he therefore moved that Mr. Dann should be appointed surveyor for this work. An amendment was moved that Mr. G. Richardson should be the surveyor, but the amendment was lost, and Mr. Dann was appointed.

The Institution of Civil Engineers.—Among the numerous signs of the return of confidence in engineering undertakings is the great increase of elections into this society. Since the last return, made three months ago, two hundred members (his Royal Highness Prince Arthur and Dr. Percy), 8 members, and 50 associates have been elected, and 21 students admitted by the council. Against this must be put the deaths or resignations of 23 members, leaving the actual net increase 58. The numbers of the different classes are now as follows:—Hon. members, 16; members, 756; associates, 1,127; and students, 214; making a gross total of 2,143, as against 2,009 at the same time last year.

Improvements in Mark-lane and Fenchurch-street.—Mark-lane and Fenchurch-street are both about to be widened at certain points. The Finance and Improvement Committee of the Commissioners of Sewers have arranged for a further improvement in Mark-lane, by setting back the frontage line at No. 10 several feet, the expense of obtaining the land being 1,148*l.* They have also arranged for a further improvement in Fenchurch-street, by setting back the line of frontage of one house in the street, the cost being 1,000*l.*, and also the setting back the line of frontage of two other houses in the street at a cost of 250*l.* The total cost of the land which has been acquired to carry out these several improvements, is 2,398*l.*

Ancient Monuments.—The report of the Sepulchral Monuments Committee of the Society of Antiquaries has been printed and issued as a Blue-book. This committee was formed in 1869, on the occasion of Mr. Layard, then First Commissioner of Works, requesting the society to draw up a list of such regal and other historical tombs or monuments existing in cathedrals, churches, and other public places and buildings, as in their opinion it would be desirable to place under the protection and supervision of the Government. The result of the labours of the committee, as now printed, forms a most valuable compilation, and will be found very useful for reference. To what extent the Government will act upon it remains to be seen.

Social Science Congress, 1872.—At the meeting of the Social Science Congress in September, in Plymouth and Devonport, the subjects for discussion will include, in the Health Department—1. "What are the principles on which a comprehensive measure for the improvement of sanitary laws should be based?" 2. "What steps should be taken to guard against sewage poisoning?" 3. "What means can be adopted to prevent the pollution of rivers?" The proposition to discuss the means by which a knowledge of sanitary science should be promulgated was not entertained. In the Economy and Trade Department it was resolved to initiate discussions on direct and indirect taxation, on local taxation and administration, on the condition of the agricultural labourer, and on outdoor relief to paupers.

Mr. James Howard's Mansion.—With reference to the recent notice in our columns of this building, we are asked to mention that as regards the encaustic tiles, Messrs. Maw's have been used; Mr. Cooper only provides the ridging and cresting of roofs. Messrs. Dennett's patent fire-proof arch system is adopted throughout the edifice, offices, and stabling. Messrs. Cranston & Luck, of Birmingham, have erected the spacious conservatories on their patent ventilating principle.

Sale of Land in Kent.—The Tunstall Estate, near Sittingbourne, containing nearly 1,000 acres of arable and wood lands, has been sold by auction, at the Mart, by Messrs. Foster, of Pall-mall, in twenty-two lots, for 72,250*l.*

Works at the Stock Exchange.—Messrs. Perry & Co. wish us to say that their tender was 11,600*l.*, not 11,000*l.*, as printed. If correct, respondents will write their thoughts as if they were sixes, and their sixes like noughts, they should be prepared to take the consequences. Another correspondent complains that we have commended his name with an L instead of an S, and in the very letter of complaint the S, if it be one, is written as an L. A fortnight ago a gentleman complained somewhat insolently of our having mistated his name. The signature at the end of his tirade was not decipherable. We hold very strong opinions concerning persons who commit such stupidities.

Kirby-le-Soken.—The commemoration-stone of a new school-house for Kirby-le-Soken, of which Mr. H. Stone, of London, is the architect (son of Mr. R. Stone, of Frinton), and Mr. C. Shephard, of Colchester, the builder, has been laid. It is estimated that the cost of the new school will be about 700*l.*, exclusive of site. The contract price accepted for the building is 497*l.*, exclusive of the cost of bricks and the cartage, which are found. Miss Barnard has provided a site for the school near to the church. The building is of red brick, with Bath stone dressings. It is capable of accommodating more than 150 children.

New Pier at Douglas.—The new low-water landing pier at Douglas, Isle of Man, has been opened by His Excellency Mr. Loch, the Lieutenant-Governor. The pier is 500 ft. in length, 52 ft. in height, 50 ft. in width, with 10 ft. of footway on each side. It has been built from plans prepared by Sir John Coode, at a cost of 46,000*l.* His Excellency named it the Queen's Pier. The company then crossed the hay in boats, and Mrs. Loch laid the foundation-hoek of the new Battery Pier Breakwater, which is intended to run out a distance of 650 ft., at a cost of 62,000*l.*, and which is intended as a pier, landing-place, and breakwater.

Decay of Stone, Lambeth Palace.—The Archbishop of Canterbury has addressed a letter to the Home Secretary calling his attention to the injurious effect upon Lambeth Palace and adjacent buildings, caused by the acid vapours emitted from the potteries in the neighbourhood. His Grace also drew attention to the fact that the decay of the stone of the Houses of Parliament was attributed to the same cause, the smoke containing large quantities of muriatic acid. A copy of the letter was read at the Lambeth Vestry, and the medical officer is about to make a report on the subject.

The Queen's Theatre, Long-acre.—The return of Mr. and Mrs. Bandmann to the London stage must be regarded as an advantage, we have so few actors at the present time devoting themselves to the poetic drama. Time and experience have much improved them, and we have no hesitation in pointing to "Narcissus" as a fine performance on their part. To Mr. George Reynolds also, and Miss Isabel Clifton, praise is justly due. The "Undergraduate," weak as it was in some respects, was worse treated by the press than it should have been. It was well put on the stage, and very well acted.

Burning of a Church.—A large portion of the fine church at Hartshill, near Stoke, Staffordshire, has been destroyed by fire. The large organ, which was about to have been opened, was literally reduced to ashes. The church was built at the cost of the late Mr. Herbert Minton, from designs by Mr. Gilbert Scott. The organ-builder's men were working until half-past eleven at night, and the fire was discovered an hour afterwards in the organ loft. The property was partly insured.

Monumental.—The city of Leyden (Holland) has just inaugurated a statue of Boerhaave, the great naturalist and physician, in presence of a vast multitude. The monument is 11 ft. 8 in. high, and stands on a pedestal of 10 ft. from the ground. The deceased is represented in his professional robe, with a book in his hand, and seems to be either beginning or terminating a lecture. The work was executed by M. Strackée, a sculptor to the king.

The Violence of Recent Storms.—Some evidence of the extreme violence of the recent storms has presented itself at the Chester Quarter Sessions, in a demand upon the county for nearly 11,000*l.*, being the estimated cost of repairs which will be necessary to eight bridges which have been extensively damaged by the rains.

Treat to Workmen.—The workmen, about eighty in number, who had been employed by Mr. Simpson, builder, of Egham, in erecting Heath Lodge, the new residence of Mr. Leeds Paine, were entertained by that gentleman, in the King's Head Inn, on Saturday. The building was designed by Mr. G. A. Dunninge, and is of red brick, with stone dressing.

Fall of a Building at Ashton.—In Park-street, Ashton, a new shaft had been put up less than a fortnight since in a blacksmith's shop, and whilst the men were busily pursuing their work, the shaft gave way, and, knocking out the sides of the building into the street, fell with the debris into the roadway. The roof of the building fell in at the same moment.

South Kensington Museum.—The report reaches us from a well-informed quarter that Mr. Henry Cole, C.B., is about to resign his appointment here, giving probably occasional assistance in the way of advice. If we say we are glad to hear it, it is only for Mr. Cole's own sake, who has nobly earned any leisure he may now desire.

Excavations for a new Building at Westminster Bridge.—The vacant piece of land on the Thames Embankment contiguous to the Metropolitan District Railway Station at Westminster Bridge, has been acquired by the trustees of the St. Stephen's Club as the site of their new club-house, the foundations for which are now being excavated. Much dissatisfaction is expressed.

Prizes for Athletic Sports.—The employees of Messrs. Morant, Boyd, & Blanford, of Bond-street, on the occasion of their annual day out, competed in racing, jumping, and so forth, for plated tea-pots, cruet-stands, knives and forks, and other tasteful and useful articles. About eighty of them afterwards sat down to dinner, and much good feeling was exhibited.

Proposed Monument to Burns at Kilmarnock.—The Kilmarnock Burns's Club have inaugurated a movement for the erection of a monument to the national poet in that town, from whence the first edition of his poems was issued.

The Roman Pavement at Bramden.—In the manor of Woodcote, Hampshire, having been threatened with entire destruction, will be placed in the new museum at Winchester as soon as the building is ready to receive it.

Great Fire at Scutari.—An extensive fire has broken out in a district of Scutari principally inhabited by poor persons, and up to the despatch of the news, 1,000 houses had been burnt down.

Bethnal-green Museum.—The visitors during the week ending July 6th, 1872, numbered 68,661.

TENDERS

For a detached house at Kenley, Surrey. Mr. R. Martin, architect:—

	House.	Felting Roof.
Walke	£1,650	227
Wright, Bros. & Goodchild	1,150	65
Jarrett	1,150	50
Simons	1,118	37
Smethurst	1,050	46
Ward (accepted)	989	48

For a detached house, Kenley, Surrey:—

Ward (accepted)	£800	0
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For mixed Juvenile and Infants' School, with teacher's residence, for the village of Farningham, Kent. Mr. T. Renton, architect:—

Sharp & Son	£1,161	0
Arsaud	1,054	0
Naylor	907	0
Gambrell (accepted)	906	0

For erection of two villa residences at Cambridge (exclusive of sand, lime, and bricks). Mr. E. Days, architect:—

Wilson & Son	£1,080	0
Bell & Sons	970	0
Clarke	907	0
Triplady	845	0
Thoday	790	0
Sharp (too late)		

For building gardener's cottage, at Holmberg, for Right Hon. E. F. Leveson-Gower, M.P. (brick supplied). Mr. R. A. Cane, architect:—

Shearburn	£282	0
Inkpen (accepted)	233	0

For offices and stables for the executors of the late Mr. J. M. Threlfall, Brewery, Liverpool. Mr. G. Schmitt, architect. Quantities by Messrs. Curtis & Son:—

	Stables.	Offices.
Holmes & Nicholl	£2,935	£3,901

For residence, stabling, and lodge, near Leamington for Mr. H. Ellis, Messrs. Payne & Talbot, architect. Quantities by Mr. T. Mansell:—

Jellery & Fritchard	£6,820	0
Smith	6,732	0
Horley, Brothers	6,587	0
Mason & Mills	6,382	0
W. & J. Webb	6,215	0
Farnell & Son	6,079	0

For new schools and master's residence, at Stam-in-the-Vale, Berks. Mr. W. Penstone, architect:—

Wheeler	£1,254	0
Newcombe	1,228	0
Honor & Castle	934	0
Williams (accepted)	932	0

For building carcass of house and screen wall on the Kent House Estate, Kensington, for Mr. Sang. Quantities by Mr. Ridley:—

	House.	Wall.
King	£925	£133
Stimpson & Co.	848	106
Richards	800	100
Thorn	735	100

For stables and cottage at Barking, Essex, for Mr. J. Smith, Mr. J. F. Walker, architect. Quantities Messrs. Curtis & Son:—

Henshaw	£1,093	0
Ennor	1,068	0
Brett (accepted)	985	0

For Welsh Congregational Chapel and three houses, the Southwark Bridge-road. Mr. T. Thomas, architect. Quantities supplied by Mr. Sarabole and Mr. J. Green:—

Gough (accepted)	£2,750	0
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For alterations and repairs to two houses in Lambeth. Mr. L. Solomon, architect:—

Bridgman & Nuthall	£378	0
James	317	0
Turrell	476	0
James (accepted)	393	0

For new front and alterations to No. 71, Queen-street City. Mr. F. Chancellor, architect. Quantities Messrs. Curtis & Son:—

Anley	£2,540	0
Sharprington & Cole	2,477	0
Tanner & Sons	2,460	0
Henshaw	2,415	0
Brown	2,337	0
Crabb	2,280	0
Merritt & Ashby	2,275	0

For new vagrant wards, Chelmsford Union, exclusive of engineer's work. Mr. F. Whitmore, architect:—

Thorn	£533	0
Brown	500	0
Last	431	0
Byatt (accepted)	408	0

For additions to Small-pox Hospital, Chelmsford:—

Brown (accepted)	£220	0
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For alterations and repairs at The Lodge, E Acton:—

Hill	£629	0
Cook & Green	518	0
Harris & Wardrop (accepted)	319	0
Purkiss	310	0

For house for Mr. T. Uborna, at Godden-green, near Sevenoaks. Mr. J. Fogarty, architect:—

Trollope & Son	£5,876	0
Brown & Robinson	5,490	0
Zoster	5,377	0
Ansonbe	5,376	0
Dove	5,300	0
Byass & Langmead	5,222	0
Gull & Son	5,118	0
Perry & Co.	4,775	0
Punnett & Son (accepted)	4,382	0
Loyal	4,330	0

For stables, groom's residence, and outbuildings, Godden-green:—

Punnett & Son (accepted)	£1,272	0
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For alterations and additions to Carlton-ball, Yorkshire (Contract No. 2), for the Lord Beaumont. Mr. W. Pugin, architect. Quantities supplied by Mr. O. Harris:—

Peto, Brothers	£14,540	0
Lucas, Brothers	13,230	0
Haigh & Co (accepted)	13,690	0

For the restoration of Cholesbury Church, Bucks. Mr. M. M. Glover, architect:—

Honour	£899	0
Senior	673	0
Chappell	669	0
Cooper	615	10
Mayer	585	0
Smith & Fincher	558	19
Snell	479	19

For house at Caterham, Surrey. Quantities supplied by Mr. F. Sparrow:—

Williams & Son	£1,851	0
Taylor & Son	1,750	0
Bridgman, Nuthall, & West	1,605	0
Jarrett	1,601	0
Jarrett	1,639	0
Snethurst (accepted)	1,635	0

For villa at Pinner, for Mr. J. Todd. Messrs. Habshon & Pite, architects:—

	House and Offices.	Stables.
Brass & Son	£4,730	433
Patman & Fotheringham	4,283	410
Haynes	3,987	379
Moores	3,680	314
Jarrett	3,640	340
Boden	3,623	330
Tongue	3,469	320
Forrest	3,397	327

or the erection of buildings for the Dublin Whisky
 illery Company (Limited), at Cloniffo, Dublin. Mr.
 Morgan, architect. Quantities supplied:—
 Hammond £36,890 0 0
 Mayers 33,326 0 4
 Collen, Brothers 38,155 16 10
 Bolon 32,821 0 0
 Wardrop & Sims (accepted) 29,268 7 0

or new girls' school, and alteration to boys' and
 residence, Standou, Herts. Mr. G. E. Fritchett,
 itect:—
 Whitaker & Sons (accepted) £728 0 0
 Thurgood 605 0 0

or alterations and additions to 410, Edgware-road, for
 O. Smith, Mr. C. White, architect:—
 Smith & Thompson £432 0 0
 Ebbis & Sons 429 0 0
 Boral 304 10 0
 Harris, Brothers (accepted) 255 0 0
 Bowles (to late).

TO CORRESPONDENTS.

K. M. - M. T. - J. H. - F. G. - J. T. - Professor L. - J. B. - M. S.
 - G. H. - M. T. - W. - F. S. - B. A. L. - M. M. G. - J. G.
 - F. J. A. - C. P. - One in doubt (J. G. - D. B. (next week) -
 - F. V. (next week).
 - "St. Paul's Church, Shrewsbury."—In place of Mr. H.
 - surveyor, clerk of works, read Mr. John Gathardgood.
 - are compelled to decline pointing out books and giving
 - references.
 - Statements of facts, lists of tenders, &c., must be accompanied
 - by the name and address of the sender, not necessarily for
 - publication.
 - -The responsibility of signed articles, and papers read at
 - the meetings, rests of course with the author.

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 and every description of Slate Goods, Marble
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 ings. A. & G.'s special Red Tiles prepared to
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 tion. Offices and Show-rooms, 14 and 15, Bury-street,
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DUPIL.—A CIVIL ENGINEER, having
 - works of considerable magnitude in operation, has a VACANCY
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 ing place, having an extensive high-class practice, and holding a
 - first-class appointment, has VACANCIES in his office for TWO or
 - THREE PUPILS, who will be carefully instructed in the artistic
 - as well as the practical branches of the profession. The highest refer-
 - ences given and required.—Address, NOEL ARNOLD, 10, Abchurch-lane,
 - the Diocesan Surveyor, Architect, Whitby.**

**NO ARCHITECTS.—THE PLANT with
 - Use of London and Provincial Offices and Practice, can BE
 - TRAINED (or share of the same) very modestly, from an Architect
 - of the highest standing. This would be especially so, at small expenses,
 - first instance, to H. G. H. 57, Blandford Crescent, Kensington,
 - and W.P.**

THE STAMFORD TERRA COTTA COMPANY,
(BLASHFIELD'S) LIMITED.

Incorporated under the Companies Acts 1862 and 1867, by which the Liability of each Shareholder is limited to the amount of his share.
CAPITAL, 30,000*l.* in 3,000 Shares of 10*l.* each.
 Of which it is proposed to call up only 15,000*l.* at present. Of this amount a very considerable sum has been privately subscribed.
 Pursuance of the above notice, of this sum 2,000*l.* would be taken in paid-up shares.
 The terms of payment to be as follow:—
 Upon application, 1*l.* per share; upon allotment, 7*l.* per share.
 A further call will not be made without giving two calendar months' previous notice. In the event of no allotment being made, the deposit will be returned.

DIRECTORS.
 Michael Parmenter Currie, Esq., Leadenby-road, Boyswater.
 Henry William Hoare, esq., Chorges-street, Heddly.
 Fortescue John Morgan, esq., Stamford.
 P. Stewart, esq., St. Francis-buildings, Middle Temple.
 With power to increase.

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 Northamptonshire Banking Company, Stamford.
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 Strand-street, London, E.C.
 James K. Atter, esq., Barn-hill, Stamford.

BROKERS.
 Messrs. Mello & Son, 80, Old Broad-street, London.
 Mr. F. Hewitt, 84, Martin's-bazaar.
MANAGER.
 John Marriott Blashfield, St. George's-square, Stamford.
SECRETARY (pro tem.)—Mr. Joseph Joiner.

AUDITORS.
 Messrs. Croysdill, Saffery, & Co. Old Jewry-chambers, London, E.C.

TEMPORARY OFFICES.
 28, Berners-street, Oxford-street, London, W.

PROSPECTUS.

The object of this Company is to take over and purchase of Mr. Blashfield, the well-known Terra-Cotta Manufacturer, of Stamford, his business, together with the Plant, Models, Moulds, Machinery, Stock, and other effects; and, by an increase of capital, fully to employ and develop the present works. For a long period past, public and private business of importance has been given up or returned from insolvency of capital.
 Large Beds of Clay are in close proximity to these works, especially suited for making red and buff Tiles and Ornamental Bricks. There are Fire Clay Beds also in the vicinity of Stamford, from which Bricks and Tiles have been made at these works, exceeding in durability at high temperatures, the best Article and made of Bluebridge Clay.
 The employment of these workshouses had therefore depended especially upon a trade for Ornamental and Artistic productions; but even at all times he fully occupied by works of common utility and every-day demand.
 The whole of the Buildings, Machinery, Plant, Models, Moulds, &c., have been recently valued in detail by an Architect who has had great experience in Terra-Cotta Work.
 The price to be paid for the whole of the Business, including the

Plant, Models, Moulds, Patterns, Designs, Manufactured Stock, &c., is 15,000*l.* Of this sum, 12,000*l.* is to be paid in cash and 3,000*l.* in paid-up shares. It is proposed to retain Mr. Blashfield's services as Manager. It is also proposed that Mr. Blashfield should join the Board of Directors as soon as the purchase from him is completed. It is estimated that 2,000*l.* as additional working capital will be sufficient for the present to conduct the business, beyond the 14,000*l.* purchase money. The Capital, therefore, to be called up at the present time, exclusive of the 2,000*l.* in paid-up shares, will be 15,000*l.*
 The Books of Accounts have been balanced yearly by well-known public Accountants, and the average profits of five years have been upwards of 10 per cent. per annum, notwithstanding all the drawbacks from insufficiency of capital to fully develop the works, and the great outlay that has been made to diversify and make the trade.
 An Agreement dated the 8th day of July, 1872, has been made between the said John Marriott Blashfield, of the one part, and Michael Parmenter Currie, on behalf of the Company, of the other part. Copies of the Memorandum and Articles of Association can be seen at the Office of the Solicitors, of whom Prospectuses can be obtained; also of the Brokers, and at the Office of the Company.

GRAINING.—WOODS, 6d. per square
 1 year; MARBLE, 2*l.* per square foot. Good references.—
 Address, GRAINER, 314, Vanwall-bridge-road, S.W.

LOCAL GOVERNMENT BOARD,
 - Bildeston. The Local Board for the Borough of Bildeston are
 - prepared to receive APPLICANTS from qualified persons for the
 - performance of the various duties of a BOROUGH SURVEYOR, at a
 - salary of not exceeding 100*l.* per annum. Applications for the office,
 - with Testimonials, to be sent to the undersigned, on or before the
 - 21st JULY instant, from which date the duties required to be
 - performed by the person appointed may be defined.
 - A. B. - The person selected will be required to enter on his duties
 - forthwith by order.

CHARLES WM. HOLZ, Clerk.
 Local Government Board Office, Bildeston, July 6th, 1872.

**WANTED, immediately, in a Surveyor's
 Office, competent ASSISTANCE in BILLING and AB-
 - STRACTING bills in this country, or for a few days per week.—
 - Address, with terms and reference, No. 27, Office of "The Builder."**

**WANTED, permanently, a well-qualified
 OFFICE ASSISTANT.—Apply, stating terms, references,
 and age, to C. G. ARCHIBOLD, 80, Pembroke-road, Dublin.**

WANTED, in a Builder's Office, a CLERK.
 - Must be well up in taking men's time, making up time-
 - sheets, and booking time and material. Must be quick and accurate
 - in figures, and accustomed to the routine of a builder's office.
 - Apply, with references, and name in confidence of last em-
 - ployer, to 24th, Office of "The Builder."

TO ASSISTANT SURVEYORS.
**WANTED, in the Estate and Rates and
 - Rates Office of a large Railway Company, an ASSISTANT
 - SURVEYOR, accustomed to deal with all questions of Parcelled
 - Rates and Taxes, and practically acquainted with the law of Land-
 - -lord and Tenant, all particulars of experience and testimonials
 - required, to be sent by letter, addressed to X, Institution of Sur-
 - veyors, 13, Great George-street, Westminster.**

TO STAINED GLASS FIGURE PAINTERS.
**WANTED, a FOREMAN, who must be a
 - first-class man, thoroughly capable of taking the manage-
 - ment. None need apply unless of good ability and can give refer-
 - ences. Good wages will be given, and a permanent situation to a
 - thoroughly efficient man.—Apply by letter only, stating full particu-
 - -lars, to Messrs. SAUNDERS & CO. Stained Glass Works, 20, Budge-
 - -ditch-lane, London, W.C.**

**WANTED, a TRAVELLER, to represent
 - a Provincial House in the IRISH and SLATE TRADES.
 - One with a connection in the eastern and northern counties preferred.
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**WANTED, for a permanency, in the
 - Country, a good PLUMBER, who can turn his hand.—Apply,
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TO MASONS AND JOINERS.
**WANTED, TWO competent MASONS, as
 - SETTLERS, and one to Dress and Lay Flax. Also Two JOINERS
 - accustomed to Church work.—Apply to Mr. WAKEFIELD, Parish
 - -Church, Knaresborough.**

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Canal and River Engineering.



IDEAL RIVERS, and all rivers as far as they are navigable in their natural condition, have always been, and must always be, in every country, most important means of communication for the transport of merchandise and produce. Besides these, in many countries, artificial canals have

been constructed to a great extent for the same purpose. These are laid out in level reaches, communicating with each other by means of locks, where the rising or falling ground makes a change of level necessary. These canals are fed with water at their summit levels, for the most part from the upper sources of the rivers. In addition to these artificial navigations, the natural river streams have been made navigable by constructing across them dams, which consist of a lock and a weir, the lock to permit the passage of vessels, and the weir to take over the surplus waters that come down the river, the head of water being thus kept up in the several reaches to a height which gives a sufficient depth for navigation. There have been so-called improvements of rivers, that have been done for the benefit of a particular interest, and to the detriment of more general interests. It has been not difficult, in time back, to pass through Parliament Bills authorising locks to be made here and there, for the so-called improvement of the navigation of a river, and other river courses have been blocked up by dams for mill purposes; but these things have been done in the way that is too common with us,—legislation for special and class interests, without considering its bearing on other interests. If you cannot prove to the satisfaction of the lawyers that you have a *locus standi*, you are not allowed to bring forward your arguments against a Bill for a proposed river navigation improvement; and to entitle you to this *locus standi* you must show that you are personally aggrieved, whereas the grievance in this case is a general one; and, unfortunately, that which is everybody's business is nobody's. The harm done to the general interests by damming up rivers for the purpose of navigation, which feeds the pockets of a few, is that the flood waters of rivers so dealt with overflow their banks, and create the miasma that always arises from damp ground. But, worse than this, it prevents the natural drainage of the land into the river-course, and keeps it in a condition which is perennially miasmatic. After the mischief has been done we hear complaints of loss of crops, illness, and other evils, and these are the general interests that nobody looks after at the proper time. It is, of course, from want of knowledge, and not from ill intention, that our legislators permit these things to be done. To those interested in river navigation, we do not know that we can point out a better source of information than the second edition of Mr. David Stevenson's treatise on "Canal and River Engineering." *

* The Principles and Practice of Canal and River Engineering, by David Stevenson, F.R.S.E. A. & C. Black Edinburgh, 1872.

As to inland and ordinary canal engineering, the book is meagre and poor in instruction, but upon the more important question to us at the present day of river improvements it is rich in information, derived, apparently, from personal experience, and given tentatively and modestly. In treating of such common things as everybody has or may have experience in, it may be sufficient to make assertion of one's own belief, and leave it to others to satisfy themselves whether it accords with their own experience; but in scientific questions we must always proceed from those things we know to those unknown things we wish to inquire into.

Mr. Stevenson proposes to divide rivers into three compartments:—1, (going upwards from the sea) there is the *sea proper* compartment; 2, the *tidal compartment*; and 3, the *river proper*. "These three compartments possess very different physical characteristics. The presence of unimpaired tidal phenomena in the lowest; the modified flow of the tide (produced by the inclination of the river's bed) in the intermediate; and the absence of all tidal influence in the highest compartment." These three divisions of a river require to be considered separately, if we would take any large view of the engineering requirements of them.

It is remarkable that in the "sea proper" reach of the river the level of low water is the same from end to end, however long the distance may be: thus, by observations made by Mr. Stevenson at Dornoch Firth, it was found that the level of low water at Portmahomac harbour, and at Meikleferry, 11 miles upwards, was identical; and, moreover, at a station called Bonar Quarry, 8 miles above Meikleferry, the level of low water was the same. From this circumstance Mr. Stevenson is led to the conclusion that the "sea proper" compartment of this river extends from the ocean to, or at least as far as, Bonar Quarry, 19 miles upwards from Portmahomac. But at this point begins a remarkable change in the phenomena. The fourth place of observation upwards was at Bonar Bridge, only 1,700 yards, or a little less than a mile, above Bonar Quarry, and in this short distance the level of low water rises as much as 6 ft. 6 in.

"It was, therefore, concluded that, in the Dornoch Firth, the point at which the low-water level of spring tides met the descending current of fresh water lay somewhere between the Quarry and Bonar Bridge." It was ascertained by intermediate observations that the exact point at which this junction takes place,—that is, where the sea-water meets the descending current,—was about 60 yards above the gauge at Bonar Quarry. We make a point of stating this to show how exactly observations ought to be made on rivers, for it is only by exact observations that the true regimen of a river can be ascertained. But although the level of low water is the same throughout this sea reach of the river, it is important to observe that the times of low water are different at the different places; thus, the time of low water at Meikleferry, 11 miles above Portmahomac Harbour, was found to be 50 minutes later than at the latter place, and at Bonar Quarry, 8 miles further up, it was found to be 50 minutes later than at Meikleferry, so that when the water had attained its lowest level at Bonar Quarry, it had been rising for 1 hour and 40 minutes at Portmahomac. Truly, the action of the tides is wonderful, and in an island like ours is of almost more interest than anything else. If a diagram be made of the action of a tidal wave, setting off the successive heights to which the water attains vertically, and spacing the horizontal distance to accord with the times, it will be found that in the reach that Mr. Stevenson calls the "sea proper," the curved line will be symmetrical, but, proceeding further up the river, a diagram of the same tide will show an irregular curve, the symmetrical flow and ebb of the tide being disturbed by the current of

fresh water coming down the river. Proceeding still further up a river, we get out of the influence of the tides altogether. Thus it will be seen how useful it is, in considering how to improve river channels, to divide them into the compartments suggested by Mr. Stevenson, for the engineering works required for each vary with the conditions which affect them.

Apparently, Mr. Stevenson's practice has lain chiefly in the estuaries of rivers; and, accordingly, we find the chief value of his book to consist of his experience in the outfalls of rivers, the shifting sand-banks, and other things affecting the free navigation. At the mouth of almost every river there is a "bar;" but the real bar, according to Mr. Stevenson, is not the sand-banks we see bared at low water, but submerged sand-banks, often far below, or to seawards of, the apparent bar of exposed sand-banks. At this part of a river's mouth the navigable channel is found to shift its position laterally; but it is a curious circumstance that the water upon a bar maintains nearly a uniform depth over long periods of time. Thus, at the mouth of the Mersey the mean height of high water of about 700 observations in each of the years 1768, 1769, and 1770, was 15.459 ft. above the datum of the old dock sill, and the mean height above the same datum in the years 1854, 1855, and 1856 was 15.454 ft. Further, the mean height of the highest spring tides throughout the year was, in the years 1768, 1769, and 1770, 18.993 ft., and in the years 1854, 1855, and 1856, 19.016 ft. above the same datum.

This nearly constant height of water at the bar above a dock-sill would, of course, indicate nothing of value unless we take into account the level to which the sand-bank attains at the bar. This, from one cause, is constantly increasing, and is as constantly diminished by another, viz., the outflow of backwater. This backwater is that which is spread out by every in-coming tide over the sand-banks, and is the more effective in scouring a channel through the bar the lower it is in level. In the formation and improvement of harbours, and of the mouths of rivers, this is an important point to be kept in view, and especially so in all questions of reclamation of land from the sea; and Mr. Stevenson lays down this axiom, that "by enlarging the tidal capacity of a river at a low level, where the acquired volume is filled at every tide, compensation may be given for a much larger amount of water excluded at a higher level;" thus pointing to the way in which land may be successfully reclaimed, and warning against attempts to reclaim it in improper situations.

The bar of the Mersey has a depth of from 9 to 10 ft. at low water; the Tyne, 6 to 7 ft.; the Wear, 3 to 4 ft.; the Ribbles, 7 to 8 ft.; the Tay, 16 to 18 ft.; and the Dee, 10 to 12 ft.

That famous old Professor, Dr. John Robison, who contributed to the *Encyclopædia Britannica* the article, "Theory of Rivers," and afterwards wrote his "Mechanical Philosophy," says, in the latter-named work, vol. iii., p. 353, Brewster's edition, "When a wave of a certain magnitude enters a channel, it has a certain quantity of motion, measured by the quantity of water and its velocity. If the channel, keeping the same depth, contract its width, the water, keeping for a while its momentum, must increase its velocity or its depth, or both, and thus it may happen that . . ." as we know, the range of tide is but 4 or 5 ft. in the open Atlantic Ocean, while it is ten times as much in some narrow rivers (e.g., the Wye at Choptow).

In considering the action of a tidal wave entering a river, it is important to distinguish between its rate of propagation and its velocity of current. Thus, in the Dornoch Firth, the distance of 11 miles from Portmahomac to Meikleferry is traversed by the tide wave in thirty minutes, being the interval between the first appearance of the tide, at the two stations,

giving a velocity of 22 miles per hour; but this is not that current which carries vessels over the bar, and onward to their destination; that current, at that place, Mr. Stevenson, never found to exceed 4 miles per hour.

A current of more than 6 miles an hour is hardly navigable. In almost every case which Mr. Stevenson had to investigate, he found that the rate of the tide current was, in common parlance, greatly exaggerated. Even in the Dee, where the rise of tide is great, and the current very rapid, he does not think that the current much exceeds 5 miles an hour; and in other rivers, where the rise of tide is not so great, he limits the probable rate of flow to 4 miles an hour. Every engineer accustomed to observations of the flow of tidal rivers will agree with this, as a general statement, although in the Severn the current is 9 miles per hour, and in the Mersey 7 miles. Mr. Stevenson quotes Capt. Otter's statement, that the current off the Pentland Skerries, is 10.6 nautical miles per hour, which he believes to be the highest tide current ever observed.

In connexion with the lower department of a river, to which we have, as yet, confined our remarks, there is in some rivers the phenomenon of the bore. This peculiarity of the tidal flow occurs wherever the obstructions offered by the river channel are such as to cause a heaving-up of the water at the mouth of the river, and so propagating itself with violence, instead of, as in ordinary cases, flowing quietly up the river. Quoting from the late Admiral Beechey's "Remarks on the Tidal Phenomena of the River Severn," the author says that the bore in that river is not dangerous to boats if afloat in the middle of the river, but that if they are allowed to remain near the shore they are liable to be swamped or stove in, for the wave breaks with great violence along the banks as it proceeds.

Now, having regard to the distinction to be made between the rate of propagation of a tide-wave and the velocity of the current of water, it is of importance to understand that by removing obstructions to the flow of water up a river from the sea, the rate of propagation is increased, and the velocity diminished; or, in other words, the quantity of tidal water that is driven up the river is increased, while from the removal of obstructions, its velocity is necessarily lessened, and thus the river is rendered more easy of navigation.

In the "tidal compartment" of a river various means are taken to preserve the channel for navigation. Mr. Stevenson objects to the system of jetties from the shore, as being likely to cause eddies between them, and so to deposit the sand and mud held in suspension in the water and form shoals, which may project into the stream beyond the line drawn from the head of one jetty to that of the next. To prevent this the heads of jetties are sometimes connected together by a wall, thus giving a clear run to the water; but when this has been done the character of the work is changed from the jetty system to that of walling. The latest example on a large scale of this latter system is the Thames Embankment, and interesting information on the same subject is given with respect to the Dee and the Ribble.

In the "river proper" compartment of a river the primitive method of navigating the shallow parts was by "stanches." These consisted of two substantial posts fixed in the bed of the river at a sufficient width apart to allow a boat to pass easily between them, and connected at the bottom by a cross sill. Upon one of these posts was a beam turning upon a hinge or joint, and long enough to span the opening. When the stanch was used the boatman turned the beam across the opening, and placed a number of planks vertically in the stream, resting against the sill at the bottom and the beam at the top, thus forming a weir, which raised the water about 5 ft. high. The boards were then rapidly withdrawn, the swinging-beam turned back, and all the hoast which had been collected above were carried by the flow of water over the shallow below. By repeating this operation at given intervals the boats were enabled to proceed a distance of twenty-three miles in two or three days, on the river Stour, in Essex, as reported by Sir William Cubitt.

This primitive system has been superseded by throwing permanent dams across the river, upon which Mr. Stevenson remarks that "the operation of damming up the river is important, and cannot be passed over without special notice. A river dam is a work in all cases demanding careful consideration, not only as regards its safe

construction, so as to resist the force of the stream, but also with reference to its effect in opposing the free discharge of the water, and causing the land above it to be flooded during heavy rains."

The dams constructed by Sir William Cubitt, on the Severn, consist of two rows of sheet piling driven across the river at a distance apart of about 30 ft., the heads of the upper row being cut off, and capped with a sill, at a height of 11 ft., and the lower row at 3 ft., above the bottom. The heads of the upper row of piles mark the height to which the water is to be raised in the upper reach, and those of the lower row the height in the lower reach, the difference of level between the two being 8 ft. Between the rows of piling the space is filled in with rubble stone, sloping off at the rate of 1 in 3.7. The upper row of piles is backed up also with rubble stone, sloped off at the rate of about 1 to 1.

In order to reduce the depth of any given quantity of water passing over a weir, the weir is made as long as possible, and for this purpose is not placed square across the river, but obliquely, its length being about three times the breadth of the river. The height at which the weir should be fixed may be determined on the following considerations. Having determined the height to which floods are to be permitted to rise in the reach above the weir, the top of the weir is to be at such a level that the rectangle formed by its length and the depth of water upon it in a flood shall be equal to the cross sectional area of the river above the weir, within the same flood limits.

Of ship canals there are three classes:—1. Those which on their route from sea to sea traverse high districts, surmounting the elevation by locks supplied by natural lakes or artificial reservoirs, such as the Languedoc Canal in France, and the Caledonian Canal. 2. Those in low-lying districts, which are carried on a uniform water-level from end to end, and are defended against the inroad of the sea at high-water by double-acting locks, which also retain the canal-water at low tide, such as the canals of Holland and other low-lying countries.

3. Canals of which the Suez is the only example yet made, without locks at either end, and communicating freely with the sea, from which it derives its water-supply.

The Caledonian Canal, constructed by Telford, was made 120 ft. wide at the top water-level, 50 ft. at the bottom, and 20 ft. deep; but from a survey Mr. Stevenson made in 1849, he was led to the conclusion that the standard depth of the canal cannot be regarded as more than 18 ft., giving access to vessels of 160 ft. in length, 38 ft. beam, and 17 ft. draught of water.

The North Holland Canal, designed by M. Blanken, and extending from Amsterdam to the IJelder, is fifty miles in length, 123½ ft. wide at the top water-level, 31 ft. wide at the bottom, and 18½ ft. deep. But this canal will soon be superseded by the New Amsterdam Canal, now being constructed under the directions of Mr. Hawkshaw. It is to be 197 ft. wide at top water-level, 89 ft. at the bottom, and 23 ft. deep.

The Suez Canal, designed and carried out by M. Ferdinand Lesseps, is eighty-eight miles in length, of which sixty-six miles are actual canal, formed by cuttings, fourteen miles by dredging through the lakes, and eight miles required no works, the natural depth being equal to that of the canal. The bottom width is 72 ft., and the top width varies according to the character of the cuttings, being, in the deep cuttings, 197 ft. The depth at which it was intended that the canal should be maintained is 26 ft.

THE RELATION OF PHOTOGRAPHY TO ART.

The range of photography as a practical craft has never yet, to our knowledge, been seriously discussed. It is, however, of no small importance to have a definite idea of the limit of that range. The question is, in fact, how far may art be, now or hereafter, superseded by a mechanical process. It is unnecessary to say how deeply this problem affects the future of all branches of art. Nor is the subject one that relates to the fine arts alone. It comes home to the practical craft of the builder. In the education of the architect much weight is laid, and properly laid, upon the actual admeasurement of every detail by the student. He is to jump at nothing. Now, the great triumph achieved by the applica-

tion of science to geodesic operations consists in the facility given to the surveyor by the substitution of angular for linear measurement. The practicability of producing, at any feasible cost, such a map of a country as that provided by our Ordnance Survey, depends implicitly upon the adoption of a trigonometric process. Any invention, therefore, that by optic means could supersede the toilsome procedure of architectural measurements, would be likely to effect a revolution in the practice of the draughtsman, if it proved to be as accurate as the hex sextant and the prismatic compass. We propose to inquire how far photography is to be relied on, as a substitute either for the fancy of the artist, or the toil of the architectural draughtsman.

The phenomena of microscopic enlargement are well known. The process is perfectly intelligible. The rays of light which proceed from the surface of the object regarded through the lens are so refracted by passing through that medium as to enter the eye at distorted angles; and the result is the apparent extension of the surface viewed. With this visual enlargement is necessarily connected a corresponding diminution of light. So indelibly is this the case, that it is necessary to throw, by means of a separate lens, or concave mirror, a large quantity of additional light on any object that it is wished highly to magnify. It would otherwise be so dark as to be invisible under the microscope.

In the use of the camera in photography occurs the converse of the operation of the microscope. The rays of light from the entire surface of the object focussed by the lens are made to converge on a much smaller area. The illumination thus obtained is intense, although some light is lost in the passage. But the chemical, or photographic, energy of the refracted light is not possessed by the entire pencil of rays. It resides in the blue portion of the spectrum alone; or rather in those invisible lines that accompany and overlap that blue portion. A compensation is thus provided, to a certain extent, for the extraordinary brilliancy of the concentrated light. All the light is brought to a focus, but only a certain portion of it—considerably less, we may say, than a third part,—produces any permanent effect on the chemical condition of the preparation that is to form the negative picture. Without this accidental compensation it would be impossible for photographs to be produced bearing less distinct marks of artificial optica action than in the case of objects magnified by the microscope.

The image which the converging actinic rays produce upon the negative plate in the camera is thus altogether different from that which would be formed on the retina, if it were placed in a corresponding position. The rays to which the retina and optic nerve are sensible, are inert on the chemically sensitised film. The rays which chemically affect the latter are insensible to the eye; yet so closely analogous, or rather so intimately connected, are the visible and the chemical lines of force, that a permanent, visible, approximately truthful picture is produced by this invisible light.

We learn, for the present, the further consideration of the optical or geometrical question of the refraction and subsequent action of the actinic rays, in order to pursue the analysis of their pictorial result.

We must, however, remember those causes of disturbance and distortion which are dependent on the size and refractive power of the lens employed. Such distortion varies according to laws not difficult to understand. The difference between the true perspective incidence of the rays of light on the eye and the convergent incidence of the artificially refracted rays is a constant source of trouble to the photographer. In some of the finest photographs yet produced such as those taken by Herr Braun of the marble sculpture of the Vatican, or those of Grecian temples and ruins taken by M. de Granges, the optical distortion is painfully apparent. A heroic figure which, in the positions which occupy the plane of proper distance is represented with a truth that mocks the ver gleam of the marble, stretches towards the spectator a hand that only resembles the monstrous foot, under the shadow of which the fabled Arimaspan sheltered his slumbers from the vertical sun. Lofty columns, on either side of the centre of the picture, curve and bow towards the perpendicular so as to emulate the arc of the rainbow. But this is not the difficult with which we are at present concerned. B the use of a lens of large diameter and moderate refractive power, combined with a diaphragm

that cuts off the rays at a certain distance from the centre, and by judicious choice of standpoint, the extreme of distortion may be, to a great extent, avoided. There will, of course, always be a mathematical distortion when the object photographed presents any but a plane surface, and accurate measurements from an image taken in the camera must not in consequence be expected; but by skill and costly apparatus the distortion of which we speak may almost be reduced within the limits of imperceptible error.

But even if we assume that these causes of error may be eliminated or compensated, and that we have a camera of size and power adequate to deal with the living form almost as if it was a picture or an object lying in a plane, we yet shall find that certain serious defects are inseparable from any process of optically magnifying or diminishing an object by the use of a lens.

The image which the actinic rays produce on the negative plate exhibits three very distinct qualities. We may regard it with reference to its outline or contour; with reference to its *chiaroscuro*, or masses of light and shade (which have to represent both natural light and shade and the concurrent effect of colour); and with reference to its surface or apparent texture. In each of these elements, where the size of the object is altered in the photograph, there is a material and irreconcilable difference between the image produced mechanically by the lens, and either the aspect of the natural object, on the one hand, or the satisfactory representation of that object, on the other hand, by competent art.

Let us first examine the third quality to which we referred, that of surface, or apparent texture. This is a matter of the highest pictorial importance. We must recollect the remarks which we made on this subject in a recent number (p. 498, *ante*) to the attention of our readers, as showing that it is not so much the tint, or proportion of light and shade, as the pattern, or apparent texture of the surface, that gives to the mind the idea of the nature of the material of which it is composed. We cannot think of a more familiar, and at the same time a more lucid, instance than that before suggested, of the mixture of given quantities of black and white fibre in threads, or twills, or checks. Varying from the microscopic finish of enamel, from the delicacy of the petals of a flower, or of the most exquisite human skin in early youth, to the roughness of canvas, of bark, or of hammer-dressed stone, or weather-worn rock, the surface texture has as much influence in determining the idea which the mind forms of the nature of an object as form itself—often more so. A face, however beautiful in form, loses all power to charm if the complexion be cadaverous, jaundiced, or spotted. Every sculptor knows what is the effect of the appearance of the blue stains in marble if they occur on the surface of his work. Roubiliac made a practice of destroying any statue on which he was engaged, however far advanced, if a stain appeared in an important place. Our readers may remember a French female statue, in the International Exhibition at South Kensington, from which the eye is instinctively averted as from a plague-stricken object, from the fact that the face is absolutely riddled with blue stains. In the mechanical reduction, by means of the lens, of the shaded and coloured surface of the objects represented, we have in some cases a change effected in their apparent texture which it is the especial study of the engraver to avoid. That artist, indeed, represents blending and modulated shades by a delicate diaper of black and white; but he does so of purpose, and under the guidance, in cases of excellence, of a sure and subtle instinct. He does not represent a satin or a velvet by a process at all akin to that of photography. Neither does the painter. The artist—

we speak of the thoroughly accomplished artist—gives to his work the effect of the texture which he wishes to represent. He does so by methods which he could not fully describe, but the secret of which is, that he reproduces, in his work, the general effect produced on his own eye by the material he copies. He is not concerned with the optical process. He does not give hair for hair and line for line. He grasps the idea of texture, and, by something akin to creative power, impresses that idea on canvas or on marble. It is only in his earliest stages, or in the very rudiments of art, that man seeks to reflect as does a mirror.

Now, when the artist who produced the origi-

nal object has been Nature herself, when she has clothed her work with an appropriate surface texture, a mere mechanical reduction of the scale must altogether alter the pictorial effect. We can see this most distinctly in the hair and in the eye-brows, eye-lashes, and beard. The physiognomic effect of their mammalian attributes is highly characteristic. At a distance exceeding three times the height of a human figure, the individuality of distinct hairs is lost. The eye-lash is visible only as a shadow. The hair is seen as a mass; whether of crisp or of hyacinthine curls, of tangled and dishevelled locks, or of harsh and stiff wiry fur. These distinct effects are, or have been, adequately represented by art, but it has not been done, except in certain rare cases of Japanese art, by any attempt to reproduce the individual hairs. The result of such an attempt is to destroy pictorial effect. But the camera can only delineate hair by hair, however reduced be the scale. Thus, the effect is often that of a blur. Sometimes the hair may lend itself to the reflexion of not unpicturesque masses; but almost always there is an unnatural rigidity, if carefully examined. The shadow thrown by well-arranged masses, may be such as to compensate to some degree for the poverty induced by minute accuracy of detail. But the shade which nature gives to the upper eyelid, which is always exaggerated by the artist, and on which the vivacity of the graphic or plastic representation of a face chiefly depends, is frittered away by the faithful detail presented by the camera on a reduced scale. When we consider that to this defect in delineation are added a partial flattening of the globe of the eye, due to the reflexive glaze of its surface, as well as to the blue contained in the white, and the exaggerated shade on the under eyelid, due to reduction in size, we can no longer be at a loss for the reasons which render the photographic representation of the eye almost always more or less of a failure.

We have been led to this analysis in speaking of the apparent surface, or texture, but it is evident that the question of contour and that of *chiaroscuro* are so intimately connected with the former quality, that it is difficult to treat of either alone. Again, the actinic effect of a surface is a very different matter from its optical, or pictorial effect. Certain glazed surfaces altogether refuse to lend themselves to clear reproduction by the camera. Something of this may be seen, as we have said, in the eye. The most striking example we can quote is that of the lustrated majolica of Gubbio. The photograph of a plate adorned with highly-prized enamel, which may have cost a hundred guineas, is only a hopeless snudge. The actinic condition of a surface is by no means identical with its physical condition. Thus equally polished surfaces of marble, of ivory, and of china, give thoroughly different images under the camera. But we repeat that, even apart from this chemical difficulty, the difference in apparent texture produced by reduction by a lens is often such as to alter altogether one of the most characteristic qualities of the object represented.

In what we may call, rather by way of illustration than of definition, the foreshortening of *chiaroscuro*, which is effected by the camera, the effect is often remarkably fine. It is to this power, and to the clearing tones produced by the metallic salts employed, that the chief admiration excited by photography is due. Striking contrasts of light and shade are produced, within distances far less than can often be obtained in nature. But the change from brilliancy to gloom in however brief a space, is always delicately graded. It is difficult for human art to effect anything so subtle as these gradations of the camera. Here lies what we may call the artistic merit of photography. It exaggerates light and shade; but it does so with an entire freedom from abrupt contrast, and thus from either harshness or poverty. No human touch can, in this respect, vie with the artistic power of the solar pencil.

In representation of texture, then, photography must often be at fault, excepting when it reproduces an object of its natural size. In the effects of *chiaroscuro*, on the contrary, the power obtained by the camera far exceeds that which the artist can hope to produce. But this power is far from being readily manageable. The camera has no taste; no imagination. It produces its brilliant contrasts of light and shade in total disregard of their artistic effect. Thus, in representing the human face, it may either flatter or the reverse, in a manner with which it is extremely difficult to deal. The intensified

shadow generally gives precision, energy, and often dignity, to the nose. The sharp precision of outline, in which slight irregularities are lost, the deep shadow thrown by the nostril, the clear definition of the alæ, are such as often to make this feature in a photograph far more beautiful than is the case in life. But the same cause that gives this artistic shadow to the nose converts the upper lip into a black stain, and usually obliterated the most tell-tale line in the whole countenance, that of the meeting of the lips. Again, the under lip and the under eyelid are distorted by a condensed shadow, and the most fugitive, most delicate, and most expressive trait of the entire countenance, the almost imperceptible modelling of the trait between the nostril and the angle of the mouth, is almost always utterly intractable by the lens. Good effects have been produced by such an incidence of light as to show the upper lip, and the line which parts the lips. But, in these cases, an ugly compensation is afforded by the deep and ghastly shadow thrown by the trait at the corner of the mouth.

There remains for investigation the subject of outline or contour, or what is technically spoken of as drawing. On this subject photography has thrown a new and most important light. It is obvious that the considerations above mentioned as affecting texture and shade do not apply to pure contour. We may refer to the drawings of Moritz Retach, or to the original rough sketches of John Leech, as instances of the most perfect delineation of outline, undisturbed by any attempt at colour or *chiaroscuro*. The question has arisen, and it was by no means one easy to solve, whether the laws of beautiful contour vary according to scale. Would a perfectly proportioned human figure, if drawn in outline of the natural size, be properly represented by the mechanical reduction of that outline to, let us say, an inch in height? The question is one of subtle delicacy, and of no slight importance. It is tolerably evident, in the first place, what is the fact in the converse case. If we wish to increase the size of a figure from the natural to the gigantic, the proportions must be varied. This results from the laws of perspective. It is intimated, although not distinctly expressed, in the *Traité de Peinture* of Leonardo da Vinci. It is very closely connected with another consideration, namely, that of the point of view from which a statue or a picture can be seen to most advantage. The more careful is our study of the antique, the more evident is the fact, that the greatest artists contemplated the position to be occupied by their works as an essential element in their design. In modern sculpture, at least in this country, the primary element of illumination is altogether disregarded. The result is often total confusion. But it is clear, both from Classic literature and from the peculiarities of all undoubted antique work, that the artists not only wrought under the illumination by which their work was to be viewed, but further so wrought as to render their statues most perfect in their effect when regarded from a definite and limited standpoint. It is difficult to cite any fine antique, except the Venus de' Medici, in which the two sides of the face are accurately alike, and there are peculiarities in the Venus which tend to the idea that the statue was intended for a piece of chamber sculpture,—for an object, not of worship, but of luxury.

We think it must be evident from the above observations that photography, while capable of rendering good service to the artist, can never displace the intelligent toil of the hand of man. It is not alone that great cost and great labour are requisite to produce really excellent photographs; it is not alone that a good and a bad photograph differ as much as a good and a bad painting; but there are inherent difficulties, and defects, in the action of the camera, which the true artist instinctively avoids. For memoranda of a known object, under a special aspect, the use of the camera is of the greatest value. But it is as furnishing the note and hint for the artist. We are speaking here of portraiture chiefly, not as in itself a work of art. Again, exquisite glimpses of nature may be at times petrified into durable beauty in the camera. Even the flitting clouds and the breaking spray have been seized by an instantaneous magic; and trees limned without even a shiver to slurr the outline of their foliage. But it must be remembered that these photographs, however pictorial, are not—or but very rarely—pictures. They may be bits cut out of the landscape, it is true, but in this very fact lies concealed not

only a defect, but a danger. We have seen something, and fear we shall see much more, of the reflex effect of photography on art. When the artist sees how nature is reflected in the mirror or in the camera, and when he hears on all sides, from those uncultured in art, how beautiful such a reflexion is, there is a great danger lest he should strive to copy it. Not infrequently he has done so. In the periodical literature of the day, when illustrated by portraits, the evil effect of the *carte de visite* is often too apparent. We see woodcuts of,—we need not recognise the subjects, but we do see that they are taken from photographs. Most of the defects, and none of the beauty, of the sun pictures are thus magnified and perpetuated, and a new chamber of horrors is added to the gallery of cheap illustration.

It will be very evident from what we have said that the rules of architectural draughtsmanship are not to be modified by the introduction of the camera. The proper use of photography by the portrait-painter and by the architectural draughtsman varies in this respect. In the former case a precise delineation, within certain limits of error, is attained, which may be of great service to the artist, if he avoids the above-described causes of pictorial bad effect. In the latter, evidence of the general effect of a building, and even of the exact character and state of the building material employed, is obtained and put on record, while for accuracy of plan and of detail the draughtsman must have recourse to the time-honoured method of absolute measurement. In either case photography is at once reliable to a certain extent, and capricious in an extraordinary degree. It is the most valuable servant of which the artist can avail himself, but becomes the most dangerous and destructive of masters.

THE PROPOSED PUBLIC HEALTH BILL.

The three features which distinguish the measure of legislation now under discussion in the House of Commons, viz., that the State shall pay half the salaries of the medical officers of health and of the sanitary inspectors, and shall, before the appointment or dismissal of any officer, inquire into his merits or demerits, and that the State shall advance money to local authorities for the construction of those works required by the necessities of the public health at a low rate of interest, are all sound in principle, and the measure, taken as a whole, has but this defect, that it proposes to pay only half the salaries of these officers. To begin with, the effect of their work is not local, but national. It is their office to prevent disease, and chiefly so in the poorer districts. Disease prevented amongst the labouring population means an increase of national wealth, independently of the benefits accruing to the individual by the absence of sickness. When such works and regulations are devised to rid the atmosphere in which a labouring population live of those foul emanations which induce low fevers and other forms of illness, the people go merrily to their work; they live more contentedly at home; there is less crime and less pauperism. To reduce the amount of crime and pauperism is a national work. The sanitary inspector and the medical officer, taking them together, are the prime movers in accomplishing this desirable end. Render them independent of local influence, and you take the first step towards a real improvement of the public health. Now, a long acquaintance with local boards, town councils, and other local sanitary authorities has made us aware that the question of salary of a public officer, whether it be much or little, is made the ground of factions contention, quite irrespective of either the merits of the officer or the amount of his salary. It is not the amount that troubles them, but the payment of any salary at all; and once the appointment made and a salary fixed upon, it remains a standing bone of contention over which factions try to get the better of each other, out of pure resentment and personal opposition which arise from causes wholly independent of the incident which gives them the opportunity to quarrel. That this contention should be obliged to be made of the actions of local boards as at present constituted is grievous, but it is only too true. And what are the public interests over which they contend? These, probably: whether the rate required shall be laid in the pound or whether it shall be 2d., for the supervision of the conditions upon which the health and welfare of the population chiefly

depend. Or, to put the calculation in another form, whether the charge for that supervision shall be 1s. 6d. per house per annum or whether it shall be 2s.

The salaries of the sanitary inspector and the medical officer, taken together form no real burden upon the local rates at all commensurate with the benefits received, but they do afford opportunities to the local authorities to wrangle amongst themselves, and keep up perpetual ill-will. Therefore, we say, let the local authorities be relieved altogether of this disagreeable situation, and let these officers be wholly officers of the State. This, of course, would lead to the appointment of those officers solely by the Local Government Board. So much the better. The sanitary inspector is the right-hand of the medical officer. He is the forerunner of the actions of the other. Together they perform a national work. They should have no local interests whatever. They should not depend, even partially, for their appointment, and for their continuance in office, upon the favour of the inhabitants amongst whom they administer the sanitary law; for they bring wealth into the national exchequer just as well as revenue officers do; and surely the health of a people is as much worthy of the protection of the State by the payment of persons to do that duty as is the payment of an army and navy to protect their lives and property. Indeed, without the one the other is of but little value.

Might it be said that this would be an interference by the Government with local interests? Well, it is admitted that it would be an interference, but not with strictly local interests. And it is a necessary interference. The favour with which even this proposed half-measure of the Government is received by both sides of the House of the people's representatives, and the popularity of the measure in the country generally, show how much such interference is desired; and we feel well convinced that the measure would be of greater popularity if it were made complete by the appointment and pay of the two sanitary officers in question being left solely in the hands of Government. If the inhabitants of any locality, in council assembled, should have any real ground of complaint of the actions of these officers, nothing can be easier than to appeal to the Local Government Board to cause an inquiry to be made into the merits of their complaint, and nothing easier for that officer and replace him. The Department must feel it to be a part of its public duty to take the responsibility of these details, in order to make the interference of the State in this great national affair of any real use and benefit to the people. These things which affect the health of the people have been managed solely by local authorities now long enough to have proved the weakness of men, and their ignorance of the true interests of even their own locality; and the time has come when an improvement in this respect must be made. Then let that improvement be made in accordance with the knowledge we have gained, and thoroughly, as with confidence in ourselves. To do this much cannot, surely, be temerity. After an accumulation of facts which afford a sure basis upon which to act, a bold stroke saves a deal of confusion thereafter, and saves the wound from which we suffer.

There are reasons why this Bill should be passed this session, notwithstanding that it cannot be said to be a complete Public Health Bill, and confessedly so by its promoters. Nevertheless, it is one step on the line of policy that we must quickly pursue, if we would avert alarming dangers to the State. We, therefore, confine our remarks at present to the few enactments of the proposed measure.

It will tend to preserve the true line that we must pursue if we begin with a true appreciation of the qualities which the two officers named should possess. In the medical officer (which, by the bye, is a misnomer, for he should be called the chief health officer) we want not a physician, but a physician and a chymist. To cure persons of disease they may have contracted is not his office,—that is the business of physicians; his sole work is to prevent disease. If he is well acquainted with the conditions produced in men, women, and children, by living upon a damp soil; if he knows by examination whether a soil is too damp or not to satisfy the conditions of health; if he knows what is the smallest space of a sleeping apartment that satisfies the same conditions; if he can analyse the atmosphere, and ascertain with tolerable

certainty what is in it, and knowing what is in it, whether and to what extent it is injurious to health; if, on finding a deleterious atmosphere, he can point to the cause of it; if he has given his attention to the study of these things rather than to the cure of disease—he shows the first signs of qualification for the office of chief health officer.

Then what do we want in the sanitary inspector? We want less scientific knowledge and more industry. This man must have a conviction that the work he is doing is no ordinary work, and he has almost to create in the public mind an appreciation of what his work consists of; for it is certain that a great many of the people he meets with do not see at present what his work really consists of; yet the last thing he must do is to do nothing because he is not appreciated. His faith in the importance and usefulness of the unpleasant work he has to do must spring from conviction. He is to take one straight course, and that is, to carry out the instructions of the chief health officer without fear or favour of the inhabitants amongst whom he works, and yet, of course, civilly. He sees whether the houses are properly supplied with water, and takes doubtful samples to the chief officer for analysis. He gives notices to whom it may concern to remove nuisances. He disinfects whatever the chief officer orders to be disinfected. The scavengers are under his charge. He reports the want of drainage where there may be none, and the defects of existing drains. If a house-drain is not properly ventilated according to rules laid down by his guidance, he reports that, and he will probably find this to be the state of things in nearly every house-drain.

He is to lead people in his intercourse with them on their own premises, to get out of dirty habits into cleanly ones. He is to be no tyrant or jack-in-office, but a counsellor of the ignorant.

The whole result of his work may never be known, but if it is faithfully performed, one outward sign will be that the people will look upon his inspections, not as meddling with their rights or liberty, but as work that is tangibly useful and beneficial to themselves.

The condition of the labouring population must be raised, by no violent means whatever, but by their own efforts. As long as their homes are dirty, from whatever cause, and they are sick and overcrowded, they will make no effort. They do not know what to do even when they are willing. But the sanitary inspector may do many things to direct them to study whatever common things of interest may be about them, and there is always something or other of interest everywhere. The more general knowledge he has then, providing it be sound, the better will he fulfil his office. The sanitary inspectors of the country may be looked to to make a practical beginning of that which must be done,—the elevation of the condition of the labouring population. They, therefore, deserve the utmost consideration and encouragement that the State can give them.

"RECOLLECTIONS AND REFLECTIONS."

UNDER this title, Mr. J. R. Planché, dramatic author and antiquary, has produced two very charming volumes, calculated to do something more than amuse.* The writer calls his work a Professional Autobiography: it bristles with amusing anecdotes and witty sayings; brings before the reader all sorts of well-known persons, and carries him along with delightful vivacity. When we read at the commencement, "To my dear grandchildren I dedicate these recollections of a life, the decline of which has been cheered by their smiles and blessed by their affection," we feel sure that we shall not find a thought or a word to offend the purest mind; and when we reach the end we rejoice in the justice of our impression. Beyond the pleasant relation of pleasant things, Mr. Planché discusses many matters of serious interest to all lovers of art: we have "Reflections" as well as "Recollections;" and as his anecdotes will doubtless be quoted in many pages, we shall confine ourselves in what we have to say to the more serious parts of the book. Many will hear for the first time that dramatic authors owe to him their first protective Act. His drama, "Charles XII.," proved a great success, as every one knows. The piece not being printed and published, which at that period would have entitled any manager to perform it without the

* London: Tinsley, Brothers, Catherine-street Strand, 1872.

author's permission, Mr. Murray, of the Theatre Royal, Edinburgh, wrote to inquire upon what terms he might produce it. The author named the very moderate sum of ten pounds, which Mr. Murray admitted he was perfectly justified in asking, but declined paying, on the plea that since the introduction of half-price into the provinces, the expenses attendant on the production of afterpieces was barely covered by the receipt they brought. This was all very well; but Mr. Murray had the dishonesty to obtain surreptitiously a MS. copy of the piece, and the effrontery, in the face of the above excuse, to produce the piece, without permission, at *whole price*, leaving the author to his comedy. He did not bring an action against him, but asked Poole, Kenny, Lunn, Peake, and some others of the working dramatists of the day, to dine and talk the matter over; and it was agreed that steps should be immediately taken to obtain the protection of an Act of Parliament. The Hon. George Lamb, at Melhourne House, was called on, and he kindly consented to bring in a Bill for that purpose. He did so, but was unable to get it through the third reading. Mr. Lytton Bulwer, now Lord Lytton, then took it in hand, and succeeded in carrying the measure through both Houses. It received the Royal assent June 10, 1833 (3rd of William IV.), and though, from the difficulties of enforcing it against managers who are unprincipled enough to resort to any means by which they can evade payment, it does not enable the author to—

"sit at ease,
Under the shade of his own laurel trees,"

as was more poetically than truthfully stated in the prologue to his lordship's play, "The Duchess de La Vallière," it must be thankfully acknowledged that it has greatly improved the dramatic writer's position, by giving him an indisputable control over his own property; and managers have to thank the unworthy conduct of one who was considered the most respectable of their fraternity, for the existence of the first Dramatic Authors' Act.

On the introduction of the Bill, an outcry was raised by the country managers of their inability, in the depressed state of theatrical affairs, to bear any, the smallest, additional burden. Upon the same ground it might have been argued that a man who could not afford to purchase goods to retail was entitled to steal them. Mr. Planché says "the great champion of these dissentients, Mr. Wilkins, an architect [could it be Wilkins of the National Gallery?], and proprietor of several provincial theatres, declared before the committee of the House of Commons that, in his opinion, no modern dramatist, Mr. Knowles perhaps excepted, deserved to be paid; while, in the same breath, he admitted that nothing but the melodramas and other pieces successfully produced in London by the writers he was insulting would draw money in the country."

The position of the dramatic author in England is much improved since then, but is still far inferior to that of the dramatic authors in France, and calls for consideration.

In connexion with endeavours made to improve the costume of the stage, Mr. Planché gives various anecdotes to show that some of our greatest painters, poets, and novelists were, as far as regarded a correct idea of the civil and military costume of our ancestors, involved in Cimmerian darkness. To Sir Walter Scott the honour is due of having first attracted public attention to the advantages derivable from the study of such subjects, as a new source of effect as well as of historical illustration; and though his descriptions of the dress, armour, and architecture of the Anglo-Norman and Medieval periods are far from correct, those in the romances and poems, the scenes of which are laid in his own country or elsewhere during the sixteenth and seventeenth centuries, are admirable for their truth and graphic delineation; but though writers of fiction, inspired by his example, took more pains to acquire information on these points, painters continued to perpetrate the grossest absurdities and anachronisms, often knowingly, under the mistaken idea that they were rendering their productions more picturesque. Did West, the President of the Royal Academy, render his composition more picturesque by representing Paris in the Roman instead of the Phrygian costume? Did Etty gain anything by placing a helmet of the reign of James or Charles I. by the bedside of Holofernes? As our author remarks:—

"Is it pardonable in a man of genius and information to perpetuate errors upon the ground that they may pass

undiscovered by the million? Does not the historical painter voluntarily offer himself to the public as the instructor of habits and manners, and is he wantonly to abuse the faith accorded to him?"

As an example of the extraordinary hallucinations which occasionally possess artists of first-rate ability, my old friend John Liston called on me one day and flattered me by expressing the request of Sir David Wilkie, who was a connexion of his, that I would pay him a visit at Kensington and see his great picture (now so well known) of 'Knox preaching to his Congregation,' before it was sent to the Royal Academy for exhibition, in order that I might point out to him any real inaccuracies in the time of the figures he had introduced. I accompanied Liston with great pleasure, and on being shown the picture, immediately pointed out to Sir David that the armed men in the gallery were depicted in helmets of the time of Charles I. or Cromwell, instead of those of the period of his subject. His answer was that he intended to represent persons who were curious to hear the discourse of the preacher, but did not wish to be recognized, and therefore came in armour. I could not help smiling at this explanation, and asked him wherefore, as such was his intention, he had not given them the helmet of the sixteenth century, which when the vizor was closed, effectually concealed every feature, in preference to that of the seventeenth, with its simple nose-guard or slender triple bars, which allowed the face clearly to be seen? He mused a little, and then half-promptly to make the alteration; but he didn't, and there is the picture and the engravings from it handed down to posterity with a wild anachronism which diminishes the effect, whilst it utterly defeats the object of the painter!

At the close of the first volume a remarkable correspondence with Mendelssohn is printed, and should interest the admirers of the composer. It seems to show that he feared to commit himself to the production of an opera; and gave bad reasons, rather than none at all, for not fulfilling an engagement to that effect.

The value, or otherwise, of the part played by the Lord Chamberlain in connexion with the stage is discussed by Mr. Planché at some length. Under present arrangements, a copy of a new piece is duly sent to the licenser, and not performed till the official permission is received. But are the alterations and additions, however important, ever submitted to him? Are his directions as to the omissions which are to be made invariably attended to? Does he ever ascertain personally or by deputy that his request has not been complied with, or that some new matter which he would have objected to, has been introduced? And if he do ascertain, are any steps taken to compel the manager's obedience to the official mandate? It is notorious that such is not the case. Then what is the use of law? asks our author. What is the value of the regulation to the morality of the drama, or the preservation of the peace of our sovereign lady the Queen? Any profane expression or indecent situation, any coarse allusion or personal insult to those in authority over us, may be, and has been, foisted into a burlesque or a pantomime after its performance has been sanctioned by the licenser; and, in the recent instance of the Christmas harlequinades, it is well known that the examiner's directions to omit the common-place jokes upon certain members of the Cabinet, while they gave rise to considerable acrimonious correspondence in the daily journals, and some mild expostulations from the honorable and amiable gentleman who is the present occupant of that responsible and important office, the examiners of plays, were never paid the slightest attention to, but continued to be uttered and to excite the roars and plaudits of the galleries to the last night of the representation. Is such a state of things creditable to our legislation in the nineteenth century? There can be no escape from the horns of dilemma; either the regulations are just and reasonable, and compliance with them should be strictly and invariably enforced, or they should be rescinded, as either no longer necessary, or incapable of being carried into effect.

Our author nevertheless arrives at the conclusion that the censorship of the drama is necessary, and that we had better leave things as they are—in a sort of indeterminate condition.

We have before now drawn attention to the very unsatisfactory manner in which the national armoury is managed, and Mr. Planché has in our pages set forth his views on the subject. He returns to it in these volumes, and shows indisputably the necessity for improvement:—

"The Tower armoury is self-supporting. The money received for its exhibition renders it unnecessary to go to the House of Commons for assistance. The purchasing power already exists; it is the misapplication of the calls for remedy. More than enough is taken annually for the payment of the requisite officers and attendants and the purchase of antiquities. The surplus is now transmitted to the Paymaster-General. I believe, I respectfully submit that every penny received from the public for admission to the armoury should be expended in its improvement and preservation. In calling attention to these circumstances, I feel I am performing a duty to the public generally, as well as to that literary and antiquarian portion of which I have been for upwards of forty years a humble but hardworking member."

It is annoying to hear of the losses that have

been suffered under the present arrangements. Amongst others, they include:—

The complete suit in which Sir Philip Sidney was killed at the battle of Zutphen, the embossed figures on which were of solid gold. This national and magnificent relic was at Strawberry Hill, and is now at St. Petersburg.

A hearse of the time of King John, now at Warwick Castle.

The gambutes of a fine suit, made for King Henry VIII., now in the Tower, imperfect from their absence. They had found their way out of the Tower, and on being brought back to it were ignored and refused by the authorities, and are now at Grimston.

A most singular ancient helmet, probably as early as the time of Stephen, if not actually the helmet of that monarch, or his son, now in the Musée d'Artillerie, at Paris.

Two other helmets, one temp. Henry III., the other of the fifteenth century, with part of the crest remaining.

At the time these curious relics were rejected, a helmet, newly made at Vienna for theatrical purposes, was purchased at the price of 50*l.*, and is now in one of the glass cases at the Tower.

The only armour at Alton Towers that could possibly have belonged to the great Talbot was suffered by some gentleman sent down by the Tower to pass into the hands of dealers.

The hack plate, a most elegant specimen, sold for 10*l.*, and is now in the collection of Lord Londesborough, at Grimston.

A chapel de fer of the twelfth century (unique), now at Geneva.

Mr. Planché concludes his work with his letter on the want of a national theatre, elicited by some observations to that effect made by the conductor of this journal, and which we printed at the time. Mr. Tom Taylor also wrote on the subject, and several meetings were afterwards held to discuss the steps that could be taken in furtherance of the movement. Nothing, however, has yet been done; "but there are unmistakable signs," says our author, "of the awakening of a better spirit, and I have not abandoned the hope that the metropolis will, ere long, be enabled to boast a theatre in which the rising generation will enjoy, not spasmodically, but regularly, the best plays, acted with intelligence, and placed on the stage reverentially and artistically. How is it, I ask again, that Government has never appeared to comprehend that such a theatre would afford the greatest assistance to the cause of education, which it professes to have so deeply at heart?"

Here, however, we must stop, and have not space to do more than commend to our readers this very interesting and valuable budget of "Recollections and Reflections."

ARCHÆOLOGICAL EXCURSIONS.

Suffolk Institute of Archaeology.—The scene chosen by the members of this institute for their annual summer excursion was the sparsely populated tract of country surrounded on three sides by the Ald, the Ore, and the Butley rivers, which, however, contains several buildings of unusual interest. The rendezvous was at Woodbridge Railway Station, where a party of about thirty—hardly so numerous as usual—assembled under the presidency of Lord John Hervey. They visited Butley Priory, Chillesford Church, Sudbourne Church, and Orford Castle and Church. At Butley, a paper on the Priory was read by Mr. R. J. Day. At Sudbourne, Mr. Plipson was their *cicerone*. Under the lee of Orford Castle, the president, Lord John Hervey, read a paper on the Castle, after which luncheon was partaken of in the Castle. The party, after visiting Orford Church, returned to Woodbridge. There was a little rain during the excursion, but never heavy enough to be unpleasant.

Cumberland and Westmoreland Archaeological Society.—This society had their second expedition for the season on Friday week. The party started from the Citadel Station at Carlisle in the morning for Burgh, and there visited the church; afterwards to Newton Aycliffe Church; and thence to the Abbey at Holme Cultram. Notwithstanding that the weather was beautifully warm and fine, and the programme laid down very attractive, the attendance was exceedingly small. Only three gentlemen—Mr. Browne, Dr. Lonsdale, and Mr. Charles Ferguson—started from Carlisle, and they were accompanied by two ladies. On arriving at Burgh they were joined by a few others. At Burgh, Mr. Charles Ferguson read a paper on the Church formerly prepared by Mr. Cory, and

published and entered on the records of the society. On reaching Newton Arlos, the members at once repaired to the church, where the Rev. W. M. Shepherd pointed out the prominent features. On the top of the tower the Rev. T. Lees read an extract from Lysons's "History of Cumberland," describing the church as it was, and also exhibited a sketch of the ruin as it stood in 1816, before its restoration. Major Ferguson, of Morton, joined the party at Abbey Town. Mr. Charles Ferguson read a paper on the old edifice. Mr. Ferguson then took the party round the church, and pointed out the extent it formerly occupied. After a conversation in the yard of the Abbey concerning its former grandeur, the party, wended their way to the station, and thence by train to Carlisle. Several of the members dined together at the Comity Hotel in the evening.

THE WIMBLETON PARK ESTATE.

WIMBLETON is a charming suburb, and has many attractions. It has a history and associations, as well as natural beauties, and Mr. S. C. Hall, F.S.A., has written an interesting little book about it (now before us), including a number of illustrations.* The real object of the publication, as is properly set forth, is to assist in making known the fact that the Wimbleton Park Estate, late the residence of Mr. John A. Beaumont, is about to be divided for building on; and in pointing out its beauties. The little book, however, does much more than this, and affords some pleasant information. The Roman earthwork, known popularly as Caesar's Camp (the destruction of which, by the way, is just now threatened) shows how early Wimbleton was occupied, and to the next great era, that of the Anglo-Saxon period, it owes its present name, which is stated to be derived from its possessor,—*Wibba, Wimbold, or Wymbald, and dure or dun, a hill or fortress.* † "Wibbandune, now called Wimbleton," says Camden, stands on the other bank of the Wandie, where, when long prosperity had produced civil wars among the Saxons after their contests with the Britons were ended, Ethelbert, king of Kent, first sounded the alarm against his countrymen; but Canlin, king of the East Saxons, fortunately defeated him here, with great slaughter, having slain his generals Oslac and Cnochen, from which last, probably, the fortification to be seen here was called Bensbury, for Chensbury.‡ Subsequently Wimbleton passed into Danish hands.‡

At the time of taking Domesday survey, Wimbleton appears to have been included in the manor of Mortlake, and belonged to the see of Canterbury, and was seized by Bishop Odo, Earl of Kent. In 1320, during the time of Archbishop Reynolds, that prelate was called upon to pay 20s. for half a knight's fee in Wimbleton on the marriage of the king's oldest daughter, and in 1327 it is described as a grange belonging to Mortlake.

In 1398 the estates of Archbishop Arundel were seized and confiscated, and at this time there appear to have been two capital mansions, one with a park at Mortlake, and the other at Wimbleton,—the former an ornamental residence of the archbishop and of the king, and the latter a grange with part of the demesne lands attached. These were afterwards restored to the archbishop. The Manor of Wimbleton ceased to belong to the Archbishops of Canterbury, in right of their office, during the reign of Henry VIII., having been exchanged, by compulsion or otherwise, by Archbishop Crammer with Henry VIII., for other lands; but by special grant of Queen Mary it was afterwards assigned to Cardinal Pole.

Wimbleton, continues Mr. Hall, "having in this manner become the property of the Crown, was, about 1533, given to the royal favourite, Thomas Cromwell, Earl of Essex, who thus became owner of the place, where he, the son of a Wimbleton blacksmith, first drew breath. The father of Cromwell appears to have lived in what, in 1617, was described as 'an ancient cottage,

called the blacksmith's shop, lying west of the highway leading from Putney to the Upper Gate, and on the south side of the highway from Richmond to Wandsworth, being the sign of the Anchor,' and it was here that this strange child of fortune was born."

It came back to the Crown when Cromwell's estates were confiscated, and after various vicissitudes was sold to Sir Theodore Jansen, one of the South Sea directors, in 1717.

After the failure of Jansen, Wimbleton was purchased by Sarah, Duchess of Marlborough,* for 15,000*l.*, and became one of the favourite retreats of that beautiful woman (so well known, first as Sarah Jennings, and next as "Mrs. Freeman," before her marriage with the duke). She died here in 1744. By the duchess, the Wimbleton and other estates were devised to her favourite grandson, John Spencer (youngest son of Charles, Earl of Sunderland), whose son was created Baron, Viscount, and Earl Spencer and Viscount Althorpe. In this family the manor has remained ever since, the Manor House and surrounding park and estates having been sold by the Spencers in 1846 to their present owner, Mr. Beaumont.

William Benson, the "Bold Benson" of Pope, architect to the Crown; Charles James Fox, Sir Francis Burdett, John Horne Took, William Wilberforce, and scores of other well-known men have resided here.

Concerning the present church, Mr. Hall says it was erected about 1543, from the designs of Messrs. Scott & Moffatt, in reality from those of Mr. G. G. Scott, R.A., and is understood to be "his maiden effort." It took the place of a very ugly affair, erected, with the exception of the chancel, from the designs of Mr. Holland, in 1786, on the site of the ancient church.

Some of our readers may thank us for directing their attention to this Wimbleton Estate. We speak from our own knowledge when we say it is a very charming place, and ought to be looked after.

RESTORATION OF HATFIELD CHURCH.

THE parish church of St. Etheldreda, Bishop's Hatfield, which, through the munificence of the Marquis of Salisbury, has undergone an extensive and thorough restoration, was re-opened by the bishop of the diocese on St. Peter's Day. The church, said to be the largest in the county with the exception of St. Alban's Abbey, was before the restoration disfigured by high pews and unsightly galleries, and the building had fallen into a state of extreme dilapidation and decay, when Lord Salisbury generously determined to take in hand the work of reparation at his own cost. Large portions of the edifice had to be taken down and entirely rebuilt.

The plan of the church comprises a nave, 102 ft. long by 30 ft. wide, with north and south porches, and an embattled tower at the west end; a chancel, 41 ft. long by 20 ft. wide, with chapels on the north and south sides; and north and south transepts with aisles. The nave was of the Decorated period of Gothic, the tracery of the windows being of the kind known as reticulated. A soft kind of stone (Chunnel) had been used for the mullions, tracery, and other portions of these windows, which were in such a state of decay that nothing short of entire reproduction in new stone was found practicable; the old mouldings and tracery have, however, in all cases been strictly adhered to. The open porches are also new, made of oak taken from the old roof. The external walls are faced with flint.

The tower has not been affected to any material extent. The ringing-floor of the belfry has been done away with, so that the bells are now rung from the floor of the church; and the memorial tablets, which were formerly placed in various parts of the church, are now to be found all collected together on the walls under the tower.

In the north and south transepts, windows of a debased style have been replaced by two fine four-light windows; and in the east wall of the south transept a curious discovery has during the progress of the work been made of what was apparently the east end of an early church or chapel; fragments of other interesting objects

* Mr. Beaumont has a picture of Sarah, Duchess of Marlborough, by Sir Godfrey Kneller. It represents her as very beautiful; certainly she was so when the fascinating Sarah Jennings of the Court of Charles II. On the back of the picture, in an old handwriting, is the following:—"Sarah Jennings, Duchess of Marlborough; Sir Godfrey Kneller, painter. This portrait was declared by the Duchess herself to be the best ever painted of her."

have also been brought to light, among which are two piscine, a very handsome one in the south wall of the chancel, and another in the east wall of the nave, which have been restored.

The south transept, which is the most ancient portion of the church, contains a circular arch (late Norman or Transitional), and the piers supporting it furnish an excellent specimen of the same period.

The chancel roof timbers were found to be sound, but of a very rude description; the ceiling has been decorated at the cost of two of the parishioners, Dr. Drage and the Rev. C. J. Robinson, and the decoration of this and the other ceilings has been executed by Messrs. Bell & Almond. The chancel arch has red Mansfield shafts and foliated capitals.

The east window has been restored, and filled with stained glass, the latter being the gift of several members of the Salisbury family, in memory of the late Marquis and Marchioness of Salisbury, and of the late Viscount Cranbourne. The subject, "The Ascension," has been ably treated by the artists, Messrs. Clayton & Bell.

The window in the north transept aisle was given by the youthful family of the Marquis of Salisbury, and the servants of the household.

The window in the south chancel wall was given by Mr. T. G. Barclay, who was also the donor of the Communion pavement.

The west window in the south transept is the gift of Mr. Webb, of Hatfield, and members of his family, in memory of their father and mother.

The new reredos, constructed by Mr. Earp, of alabaster, Caen stone, and marble, is the gift of the Rev. C. J. Robinson and Dr. Drage; the carved group in the centre compartment represents the three Marys at the Cross, and the figures on either side are those of St. Etheldreda (the patron saint of the church) and St. Alban. The sculpture is relieved by a background of mosaics, executed by Salvati.

The chapel on the south side of the chancel is the property of Mr. Wynn Ellis, and has been restored at his expense. The roof timbers which were concealed by an unsightly plaster ceiling, have been exposed and decorated with colour; and the windows restored with tracery of appropriate character. The chapel contains several monuments of the Brocketts and Reads, of Brocket Hall.

On the north of the chancel stands the Salisbury Chapel, erected by the first earl, in the reign of James I. His own monument stands at the east end of the chapel, and, it is reported, was ordered by himself when travelling in Italy. The sculpture is certainly unlike the work produced by English sculptors at that period.

The chancel is fitted throughout with oak seats (all exactly alike, whether for rich or poor), and will accommodate between 700 and 800 persons, including children.

The font, which is of carved Tisbury stone, is circular, supported by clustered shafts of various coloured marbles, and is the gift of the Marchioness of Salisbury. The pulpit, given by Mr. Wynn Ellis, is of Caen stone and marble; the figures in the niches are those of the four evangelists, St. Peter, and St. Paul. Both this and the font have been carried out by Mr. Earp, from the designs of the architect. The figures and foliage have been skillfully treated.

The design of the lectern consists of a stately eagle, with four lions at the base. It was made by Messrs. Cox, of Southampton-street, the cost being defrayed by the rector, the Hon. and Rev. W. C. Talbot.

The general works have been carried out by Messrs. J. & C. P. Anson, from the designs of Mr. David Brandon, F.S.A.; Mr. A. King being clerk of works.

THE BRADFORD NEW COVERED MARKET.

THE new Market building approaches its completion. The exterior, as seen from Kirkgate, is ornamental. The style of architecture adopted is Italian. In the centre of the facade is the principal entrance, which consists of an archway enclosed by a sliding gate, provided by the Colebrook Dale Company. The sculpture of the brackets above the gates has been executed by Mr. Keyworth, of London. The design represents Pomona and Flora. Round the exterior: belt of the Market-hall are thirty shops, all of which, so far as completed, have been let. The portion of the building immediately over the gateway displays some elaborate carved work.

* "Wimbleton: Illustrated Details concerning the Parish: its History; Notes of Residents there; with Descriptions of the Wimbleton Park Estate." By S. C. Hall, Esq., F.S.A., &c. London: Virtue & Co., 26, Ivy-lane, Paternoster-row, 1872.

† "Like most places, its name has been variously spelt at different times: we accordingly find Wibbandune, Wipandune, Wymbaldon, Wymbelton, Wymbylton, Wincendon, Wibleton, Wymbleton, Wimbleton."—BARLETT.

‡ "Several tumuli have been opened at different times on Wimbleton Common, but scarcely any vestige of them remains."

A zinc turret has been erected on the top by Messrs. Tylor & Co., of London, and a market-hall has been hung there. A clock, made by Mr. Potts, of Leeds, will be put up in the central compartment of the building. The rooms over the gateway are intended to be used as offices for the superintendent of the market, Mr. Bradbury. Above the shops on the Kirkgate front stretch two stories of offices. The entire frontage to Kirkgate is 150 ft. long, and 50 ft. high.

The market will when finished occupy the centre of the space inclosed by Kirkgate, Darley-street, Godwin-street, and Chapel Court. The portion now nearly completed will form the half of the entire scheme. There are three entrances to the building, each of which is of a distinctive design. The Kirkgate entrance, already described, is ascended by thirty steps of 6 in. each in depth; the entrance from Darley-street is on a level with the street; and the entrance towards Godwin-street will have a descent of thirty steps. The entrance from Kirkgate opens into an octagonal pavilion, 50 ft. in diameter, and gives access to six avenues. A similar dome will also be erected in the upper half of the building yet to be undertaken. The height of the dome is 60 ft. It is supported by ornamented cast-iron pillars, and ventilated by glass louvres. The interior of the hall is chiefly constructed of ornamental ironwork and glass, and decorated in green and gold bronze, relieved by gold colour. The roof, which is 50 ft. in height, is divided into sections and glazed with ground glass, allowing louvres for ventilation.

The interior accommodation comprises thirty-six covered stalls and fifty-two open stalls, with ample circulating space for the public through conveniently arranged avenues.

The lighting of the building is so arranged as to hinder the penetration of the direct rays of the sun. The south side of each roof is covered with slate and lined with felt, and the northern side glazed with obscured ground glass, admitting light abundantly while excluding heat. Round the entire building a series of semi-circular apertures, filled in with ornamental castings, is arranged, by means whereof a considerable amount of light and ventilation is obtained. The illumination of the hall by night will be by means of gaseliers, thirty-six in number, made by the Midland Architectural Metal Company, Coventry. In addition to this, each stall will be provided with gas-fittings.

The floor of the hall is laid with 3-inch flags. The interior shops, to the height of 7 ft., are lined with white glazed bricks.

The northern end of the portion of the market now finished is closed in by a temporary wooden screen, which will be removed when the entire project comes to be carried out.

The mason is Mr. Squire Hildsworth; the joiner, Mr. W. Ilingworth; plumbers, Messrs. Sutcliffe & Wilkinson; plasterer, Mr. J. Tatter-sall; slaters, Messrs. Hill & Nelson; painter, Mr. Pullan; and decorator, Mr. H. Briggs; all of Bradford. The interior fittings of the market, and also of the Kirkgate and Darley-street shops, have been erected by Messrs. J. Ives & Son, Shipley; the general carving of the building has been done by Mr. C. Maw, of Leeds; and all the ornamental ironwork has been modelled by Mr. Benjamin Dixon, of Bradford, from the full-size drawings of the architects. Mr. Wilson is clerk of the works. The architects are Messrs. Lockwood & Mawson, of Bradford and London.

SCHOOL-BOARDS.

Bradford.—The Board have accepted Messrs. J. & W. Beauland's tender for the erection of the school in Whetley-lane, at 7,900l., exclusive of the heating apparatus. In addition to the 7,900l. there will be 300l. for heating, and over 400l. for the architect's commission, making a total of 8,675l. The school is to accommodate 600 children; the site has been selected; and the plans are passed by the Board. The tender of Mr. Beauland was not the smallest, but was considered the most practical one. It is less than the original estimate, which was accounted for by the price of material. It was also resolved to ask the permission of the Education Department to borrow 8,670l. for the erection of the school, and also that the Department should recommend the Public Works Loan Commissioners to lend the money.

Heckmondwike.—The plans of a proposed school and school-master's house in Batye-street were

presented by Messrs. Holton & Cannon, architects, of Dewsbury, and were unanimously passed, and when completed will be sent to the Education Department for approval.

Caterham.—The plans and specifications, prepared by Mr. Richard Martin, of Caterham, for schools for 125 boys, 125 girls, 100 infants, with teachers' residences, for this place, have been approved of by the Education Department, and the work is to be proceeded with at once. These schools are to be erected on the old site, on the hill. Other schools are proposed to be built for the children in the valley.

COVERED CAB STANDS.

The Kensington Vestry have received a report from their Works Committee, respecting the application of the Police Commissioners for permission to erect a covering for a cab-stand in the Cromwell-road, opposite the entrance to the South Kensington Museum. A letter was read from Mr. H. Cole, C.E., stating that in his opinion the covering would be a benefit to the drivers. Letters were read from various inhabitants in the neighbourhood, protesting against the proposed covering, while Messrs. Whyte, Collison, & Pritchard, solicitors, of Bedford-row, attended before the committee on behalf of Major general Sir Vincent Eyre, in opposition to the covering. The committee decided to apply to the Police Commissioners for a sketch of the elevation, pending the receipt of which the question stands adjourned. The Vestry adopted the report.

THE PRICES OF IRON AND COAL.

It is announced from Wolverhampton that the prices of all kinds of iron are advanced 20s. to 50s. per ton, and we hear that no positive orders will be taken even at these prices or for less than 40s. more per ton. This time last year British bar iron was quoted at 7l. per ton, and a week or two ago the price was 12l. per ton. As regards coal, the unwelcome tidings come from the Midland Counties that the miners are following the example of their fellow toilers in Middlesex; and as to the rise in colliers' wages already, a coal-owner says that the moral injury that is being done to the miners themselves is lamentable in the extreme. Their present high rate of wages is beyond the humble necessities of their families; and the obligation seems to have sprung up to squander the surplus of their earnings in the numberless pot-houses which stud the coal districts. By the roadside and in the fields the men lie wallowing in drunkenness. If such a dissolute picture can be painted of the labourers in the coal-mine, a condition not less revolting forms the chief recreation of the labourers in the iron-mine on the day after the receipt of their pay. Hence the scarcity and rise in prices. Maintaining other things the advantages which the mad folly of our own is nationally casting away.

FRENCH VIEWS OF SOUTH KENSINGTON.

In the course of a report to the French Minister of Agriculture and Commerce on certain divisions of the London International Exhibition of 1871, M. Adolphe Viollet-le-Duc is led to make some remarks on the Museums of South Kensington. He visited England in 1862, and, like M. Mérimée, the reporter in the fine-art portion of that Exhibition, he expressed in print some fears of the effect on France of the active and intelligent concurrence of that establishment. Now, after a second visit, his opinion is altered, and he declares that France has nothing to fear from the kind of teaching produced at South Kensington and in the schools connected with the Department. The general tenor of the criticism will be evident from the following passages:—"It is in our opinion an utterly false idea, that of creating an 'industrial art.' There is no such thing as industrial art. Industry borrows the genius of art, dresses itself up in it, and ennobles itself, but it does not control or direct it; or, if it does, it denaturalises and corrupts it." Speaking of the magnificence and liberality of the South Kensington establishment, the reporter says,—"They compose from the collections a series of rare and precious models, but these treasures are wasted by interpretations which exhibit inability and want of discernment." He denounces the misapplication of productions of the old artists to uses to which they are totally unfit, and adds, "If this is what is called industrial art, it consists in a determined absence of method and forgetfulness of proportions and harmony."

M. A. Cruyer, the reporter on the Applications of Art to Industry, takes a somewhat similar view. "The Exhibition itself," he says, "gives

evidence of the inherent faults which reside in the Kensington system. He considers the admixture of picture-galleries and museums of sculpture with collections of decorated workmanship, however excellent in themselves, a great mistake, and as having prevented the Kensington Museum from producing all the results expected from it; and he blames his own countrymen for being inclined to follow much the same road. Art is held under the yoke which we all submit to, that of money. We talk more of the market-price of works of art than of aesthetic value." Applying the reasoning to France, he adds,— "Let us keep art pure in our museums, like a treasure which must be kept aloof from all profane contact. Let us bring back the dignity of art, and our decorative arts will recover their importance of themselves. Let us have our Kensington, but let us keep our Louvre; let us have our decorative arts, but let us preserve art independent and disinterested; let us perfect our professional education in drawing, but touch not our school of fine arts except to raise it and give it back its prerogatives." The essential thing is art itself,—art regarded, I repeat, without any consideration of application or speculation. Make art grand and pure, and you will have in addition, and consequently, good and charming industrial arts. Have not all the great epochs of art left us admirable technologies?"

THE TRADES MOVEMENT.

London.—The settlement with the masons has not been attended by the results that were expected, and while the large outside jobs are pretty well supplied with masons, the yards and shops have but few men at work, the employers being either unable or unwilling to take on masons under the circumstances. The masters' committee, having refused to entertain a memorial sent in from the bricklayers claiming a working day of nine hours at 9d. per hour, with a code of working rules for the regulation and payment of overtime, the bricklayers' committee issued a notice on Saturday striking against three of the largest employers of bricklayers in London, viz.—Messrs. Rider & Son, Union-street, Borough; C. & W. Aldin, South Kensington; and Jackson & Shaw, Westminster. Since then, three others have been struck against. The house painters and decorators received on Saturday morning a reply to a memorial sent in to the associated master painters, a different organisation from that of the master builders' association. The memorial claimed nine hours per day, or fifty-one per week at 8½d. per hour, and a code of working rules. The masters' offer is 8d. per hour, which has been declined.—A number of joiners who have all through the contest, been at work on one of Messrs. Cubitt's jobs in the City, "came out" on Saturday rather than continue on under the new arrangement, which, for the next four months, would have required them to work 5½ hours per week instead of 56½, receiving 1l. 17s. 2½d. per week in lieu of 1l. 17s. 8d. The United Trades' Conference have passed five resolutions, viz.—

1. That this meeting of United Trades Delegates do hereby constitute ourselves into a Central Trades Committee.
2. That Mr. Sinclair be chairman, Mr. Shipton, secretary, and Mr. Westaby, treasurer.
3. That we instruct our secretary, Mr. Shipton, to communicate with Mr. Stanley Bird, the secretary of the Master Builders' Association, requesting that a day may be arranged to receive a joint deputation of this committee to confer with the masters on the terms of our memorials, with a view to a settlement of the present dispute in the building trade.
4. That the secretary be requested to draw up a circular setting forth the position of the committee, and appealing to the entire country for support.
5. That no branch of the building trade connected with the joint-committee shall enter into any negotiation with the master builders relative to our present dispute other than through the duly appointed officers of this committee.

The Central Committee of the Plasterers having been out three weeks, forwarded a letter to the Master Builders' Association in these terms:—

"We, the committee, acting on behalf of the plasterers of London, beg to inform you that we are instructed to make the following demands, viz., that nine hours do constitute a day's work for the first five days of the week, and six hours on Saturday, making fifty-one hours per week, and that the rate of wages be 8d. per hour; also that we have a working code of rules."

This memorial, together with the anticipated request to be made in accordance with the third resolution of the United Trades Conference, formed the subject of some of the discussions at the weekly meeting of the General Committee of the Central Association of Master Builders, at which Mr. Hannen presided, and Mr. Piper, the

secretary of the old association, was present. The committee came to this resolution:—

"That the employers having agreed to terms of compromise respecting the hours of labour at an increased rate of wages, and the shops having been opened accordingly, the committee of the Central Association of Master Builders will feel it their duty to decline receiving any deputation having for its object the disturbance of this arrangement."

We are forced to express our regret at this step. The memorial of the labourers was also dealt with at this meeting, and it was resolved:—

"That the labourers be informed in reply to their memorial, that the master builders have agreed to raise the wages of ordinary labourers 4d. per hour."

Birkenhead.—A meeting of the operative house-painters has been held. There was a large attendance. Mr. McCarthy occupied the chair, and it was resolved that an advance of wages, one penny an hour, be asked for.

Tredegar.—The iron-workers and colliers seen determined to bring down the price of mutton and beef, and have given notice that they will abstain altogether until they can have it at 6d. per lb. Tradesmen have been earnestly requested to join in the "meat strike," and more than one publican has been threatened with the loss of a host of hard drinkers if they do not resist the present exorbitant demand.

The Eight Hours Movement in America.—In the *New York Commercial Chronicle* of June 29 we have the following information as to the latest phases of the eight hours movement:—

"One of the most sensible movements which have been made by the labour agitators took place on Thursday evening at Baltimore. The Bricklayers' Union of that city resolved by a unanimous vote that, as their masters were fulfilling contracts which, if interfered with by strikes, would involve heavy ruinous losses, they would take no action on the question of an eight-hour change in the hours of labour during the present year. It had been well for the strikers in this city if they had shown like appreciation of their own true interests. Here, from the strikes and the eight-hour agitation, with the consequent rise in prices, work has fallen off so much in several departments of industry that some of our mechanics and artisans may soon have some difficulty to find employment at all in New York. It is clear that the movement is rapidly dying out. After two months of privation and suffering the men are as far from the final goal as when they started. Several thousands of them have, it is true, got work at the rate of eight hours a day with the old ten hours' scale of wages. But the statistics on the subject are doubtful, and we have no trustworthy means of finding out either how many men have struck, what number are still out, or what proportion of those at work labour eight or ten hours respectively."

THE HOSPITAL FOR SICK CHILDREN.

The foundation stone of the new building, which is intended to replace the existing hospital for sick children in Great Ormond-street, Bloomsbury, has been laid by the Princess of Wales, in the presence of a large and fashionable assemblage of the friends of the institution. The scene of the ceremony was in the space immediately behind the present hospital in the street which runs between it and the Homeopathic Hospital. The new building is to accommodate two hundred children, and is to be built in sections as the funds come in. The building, of which we gave a view in our issue for 27th of January last, will consist of a central block and two wings. The central block will be built first, and the wings added afterwards. This central block will accommodate about ninety patients, and will contain kitchens and all other essential offices for the accommodation of a large number of out-patients. The site is convenient for the purpose. It is in the centre of London, yet close to one of its most open districts. To the south and east lie some of the most densely populated parts of London, to the north and west lie the gardens of the Foundling, and the series of squares on the Bedford and Foundling estates, which occupy the whole area between Euston and Holborn.

PUBLIC HEALTH (RECOMMENDED) BILL.

BEFORE putting the question to the House to go into committee on this Bill, the Speaker called upon Mr. M'C. Torrens to propose the instruction which he had placed upon the paper, and which was as follows:—

"That it be an instruction to the committee that they have power to provide for the rebuilding of workmen's dwellings in cases where the same shall have been extensively pulled down under or by the authority of any Acts of Parliament."

The hon. gentleman complained that the useful clauses in the Bill of 1868 had been struck out by the House of Lords, and described the shocking condition of many of the poorer neighbourhoods in the metropolis, and the misery which was caused by the pulling down of houses by

speculative companies and railway companies. All he asked was that the House would agree to what they had unanimously assented to in the year 1868.

Mr. Stansfeld sympathised with the object of the hon. and learned member, but said that, as he had himself unwillingly discarded a great many clauses in the hope of passing the Bill this session, he hoped the hon. and learned member would not press his instruction, but would leave this and other important questions bearing on the same subject to be dealt with next session.

Mr. J. Goldsmid thought that some check should be placed upon the promoters of railways and other projects which had the effect of destroying the homes of thousands of the humbler classes. In consequence of the improvements connected with the Holborn Viaduct a vast number of houses inhabited by those classes had been removed, the result being an increase in rents of from 30 to 50 per cent., and the crowding of families in one or two close rooms. He, however, did not think that the instruction proposed should be adopted on the present occasion, as this was merely a consolidated measure, and hoped the hon. and learned member would accede to the appeal which had been made to him for its withdrawal.

After some further discussion, Mr. M'Culloch Torrens withdrew his motion.

The House has since gone into Committee on the Bill.

THE MAURICE MEMORIAL FUND AND THE WORKING MEN'S COLLEGE.

THE first object of this fund will be to provide a bust of Mr. Maurice, to be placed in Westminster Abbey; and II. from each contribution will be applied to this object. The remainder of the fund will be invested in the name of trustees, for the benefit of the Working Men's College, in Great Ormond-street, founded by Mr. Maurice, and aided by him up to the last. As our readers know, the freehold of an adjoining house has lately been acquired. Upon this ground there have been lately erected, mainly out of funds (about 2,000*l.*) and for the purpose by friends of the college and the public, and in part by a loan from a few members of the council, a large additional building, comprising class-rooms, art schools, and museum, so arranged as to admit of other buildings being added when needed. The whole property is valued at 5,000*l.*, subject to a mortgage debt of 2,000*l.*, a charge which is being gradually extinguished by the appropriation to this purpose of the surplus rent of the adjoining house above mentioned, which is let on lease.

The college is thus amply provided with buildings, repairs, rates, and taxes is, of course, considerable, and a sustentation fund is much needed. Such a provision would secure the permanent appropriation of the buildings to the purposes of the foundation, and free future managers from the danger of allowing its work to be governed by merely commercial principles.

Subscriptions may be paid to Messrs. Coutts & Co., in the Strand, and we hope many will be.

BUILDING OPERATIONS IN CAMBRIDGE UNIVERSITY.

THE extensive works at Pembroke College are approaching completion, according to the local *Chronicle*. The block of buildings in Trumpington-street, containing seventeen sets of undergraduates' rooms, besides suites for fellows and lecturers' rooms, will be ready for use in the October Term. The Master's Lodge is in a forward state, and is expected to be finished this year, the upper floor being finished and the plasterers being now engaged on the ground and first floors making elaborate ceilings. It is considered that this lodge will surpass most, if not all, other college lodges in Cambridge. These extensive works, which will cost 25,000*l.*, are being carried out according to plans by Mr. A. Waterhouse, architect, under the supervision of Mr. Tiff, clerk of the works; the contractor being Mr. Horsman, of Wolverhampton.

At Trinity Hall, there are to be extensive alterations, the contract for which has just been signed. The old part where stood the Porter's Lodge has been cleared, and is to be replaced by twelve sets of students' rooms, all the external work of which is to be of stone. Here the same

architect, contractor, and clerk of the works have been engaged as at Pembroke; and the work will be commenced at once.

In connexion with contemplated improvements at Magdalen College, a large space has been cleared next the river; but as far as we can at present learn, nothing definite is decided upon.

At King's College, Mr. Thoday is progressing satisfactorily with the addition to the south end of the college, from plans by Mr. G. G. Scott.

Improvements are contemplated at Emmanuel College.

At Jesus College, a work of restoration is being carried on under Mr. Waterhouse, the main feature of which is the re-arrangement of the whole of the chimneys throughout the older portion of the college; and it is anticipated that improvements will be effected in the dining-hall.

Mr. Loveday, of Kibworth, Leicestershire, has been entrusted with the erection of a building for the department of experimental physics for the University, according to plans by Mr. W. M. Fawcett, architect, Cambridge, the contract being 8,450*l.* This building, the magnificent gift of the Chancellor of the University, will be situated in Free School-lane. It has already been commenced.

It may also be mentioned that a Ladies' College is to be erected on the Huntingdon-road, just beyond the Girton-gate, about two miles from the town, upon which about 10,000*l.* are to be spent. The buildings are to be of plain red brick, with terra-cotta dressings; and the arrangements of the rooms will be similar to those of the students' rooms in the University, with gym-rooms, &c. The architect here, again, is Mr. Waterhouse, and the contractor Mr. Loveday. The work is to be commenced forthwith.

TILE ROOFS.

Sir,—On Friday evening, the 12th inst., a fire occurred at No. 39, Finborough-road, West Brompton, being one of the houses on the Redcliffs Estate, and belonging to Messrs. Corbett & McClymont.

The roof, which was a flat cement and tile one, as usually constructed in terrace houses on this estate (and described and recommended in some of the back numbers of your paper), was found to give every satisfaction as far as its fireproof qualities were concerned, while at the same time it was the means of effectually preventing the spreading of the flames to the adjoining premises, and also of saving a considerable portion of the building.

FRANK WRIGHT KEMP.

POROUS TILES.

Sir,—Having seen "F. M. K.'s" inquiry in the *Builder*, let me say that if he will cause his tiles to be coated with either the petrifying liquid of the Silicate Paint Company, of Liverpool, or the patent improved composition manufactured by Mr. Thomas Griffiths, of the Laurels, Oxton, near Birkenhead, he will, in a very satisfactory and inexpensive manner, do away with the porosity of which he there complains. I have proved the utility of both methods.

CHARLES BENNETT, SURVEYOR.

WASTE POWER AND UNDEVELOPED FACILITIES.

Few give any serious thought to the waste power and undeveloped facilities to be noted in relation to the labours of the artist and craftsman, not to speak of others. The education of the eye has been lectured upon by more than one person from an artistic standpoint; but we have not met with any writer or artist who has endeavoured to increase our information, or enlighten us on the empire of the hand, or the utilisation of the waste power of the limbs.

For sake of illustration, we might pick out a craftsman belonging to any branch of trade, but as it is more kindred to our present treatment of the subject, we will confine our remarks to the building or other cognate branches of it. The part that the eyes and the hands, or limbs in general, play in the province of the building operative is a most important one. From the hour that the carpenter, joiner, mason, bricklayer, or plasterer, as an apprentice, begins first to really learn his business, his eyes as well as his hands undergo a system of training. The discriminating faculty of sight is exerted practically for the first time in the workshop. Objects and appearances that would not have attracted the schoolboy's attention, as a matter of necessity, and as a consequence of mechanical training and employment, henceforth attract the young workman's attention. He learns by practice little and little, and by the advice of his elders in the workshop or building, to detect what is technically called "out of square," "out of perpendicular," "in winding," "out of level." He can discover in time by the look whether a

line is exactly straight, or a curve regular. This embraces the education of the eye, and in the case of the mason, bricklayer, or plasterer, and others, it is equally applicable. The workman's hand possesses many faculties, too, allied to the senses, by which it can detect errors or act as a guide to their prevention, even though the powers of the eye were held in abeyance. Even in the holding of his tools and the using of them, the workman may lighten his labour, or materially increase it to his own discomfort. In the performing of certain work many artisans, and artists too, throw a considerable amount of labour on their arms, and other parts of their body, which they might avoid did they but know how to relieve these parts by proper training.

It is an old saying that the bad workman throws the fault of the bad finish of his work upon his tools. Too often, indeed, it has been the case, but it more often resulted from the workman's dislike or laziness to sharpen his tools, trusting to his power of arm to push him through a half-hour's labour which five minutes' time, judiciously spent upon his tools, would have shortened to a quarter of an hour, with the further satisfaction of finding that his labour was well executed instead of faulty. The workman is too prone to keep in the old grooves of manipulation that he has inherited from those who preceded him. Short methods of performing work do not necessarily mean bad methods. By whatever process the manual labour of the workman is lightened and his workmanship rendered as perfect, or more perfect, that mode is an improvement and a profit. Our workmen are little more, in many branches, than a race with single hands, the other seldom performing the functions which it was designed to perform. There exists no reason why the left hand should not be trained to perform more useful labour in art or handicraft than it does. Why it does not is simply the result of false and deficient training. What are called "left-handed" men will be found, as a general rule, awkward in many forms of labour. They appear unskilful in handling the instruments of their craft to some; but in reality they are not so. The mechanic who can handle a saw, a plane, or even a hammer, in driving home a nail with his left hand, and can use his left as well as his right, is an operative not to be despised, but to be encouraged. Some men are naturally left-handed from their earliest years, and but very few are so from custom or practice. Now we boldly assert that the left hand, and the left eye, and the left leg and foot can be taught to perform the same ordinary functions as the right; and with artists, mechanics, and even with literary men, the utilisation of the waste powers of these members of the body and head ought to be a matter of grave importance, inasmuch as we are all creatures of circumstances, and all liable to accidents during our lives, which may deprive us of our most cultivated and generally used members or faculties. The man who can draw and write, and perform other labour with his left hand as well as his right, possesses great advantages over his fellows; and to the surveyor, engineer, navigator, or mere sportsman, the cultivation of the power of "sighting" with the left eye is a matter worthy of his attention. Men mechanically employed generally sight an object by closing one eye, but if asked, they would experience a difficulty in closing the opposite eye to the one generally used, and sighting with the other. They would not experience any such difficulty if they subjected themselves to a course of training in their younger years. There are numerous instances before our mind, as we write, of blind authors, travellers, professional men, and craftsmen who have performed marvellous labour, when wholly deprived, not only of their sight, but some of their most useful limbs—hands or feet.

We have known men who were absent from their country from their early years, and in middle life lost their power of sight, yet these men learned a trade, and such was their power of mind (some may term it intuitive perception) that they could pass through a crowded city, and several miles into the country, north, south, east, and west, and back to their workshop in the city again, without any guide or direction whatever. Not only could they perform this labour, but they could make several distinct calls upon different individuals for whom they were commissioned to do work. This is mental sight. If these persons had been born blind, men might say that they were "gifted by nature." Having become blind late in years, they were

thrown on their own resources, and when given facilities for learning how to do some mechanical employment, they industriously set to work and overcame what the world calls "impossibilities." We therefore contend that loss of sight is not darkness, save in the common acceptance of the term, nor is the loss of limb or arm consequent incapacity. We know of the case of a certain German of the name of Matthew Buchiner, who was once exhibited in these kingdoms as a sort of an anomaly or abnormal being. This man had neither hands nor feet. Where his hands ought to be his arm or wrists terminated in a bunch or knob, and something in the form of a dwarfed thumb protruded. His legs terminated in a similar lump, and rounded themselves off at or above the knees. Despite of all these deficiencies and obstacles, this half-formed creature taught himself to play on several instruments, invented one or two, and even showed his proficiency in writing and drawing. Some of his art work in the shape of letterings and drawings may be seen in the Dublin Museum.

Returning, we consider that the faculties and powers of mechanical action, as well as mental thought, in connexion with the human body, have been greatly overlooked; and that the members which are only partially used should be trained henceforth, and used with advantage to ourselves and the human race. The lady who can stitch and embroider with her left hand as well as her right may also learn to write and draw with her left hand. The left foot should relieve the right at the treadle, at the lathe, or spinning or sewing machine, and so should the left hand at the winch, crane, grinding-mill, or other similar machine.

The turner works with his hands and his feet at the same time, and his left foot takes the place of his right when tired. Why should not his left hand also relieve his right in holding the tools he uses? We might cite operations belonging to various trades and professions where the left hand could be used with advantage, and where the physical leverage of the body might be changed from right to left, thus calling on one side of the system while the other was regaining its lost strength, or recovering power for prolonged labour. Not only in employments belonging to mechanical branches, but in agricultural labour the workman who can dig, plant, trench, stack, pitch, thatch, and do other species of work from left to right, as well as from right to left, will be found to be a most serviceable labourer.

The cultivation of the powers of sight, and the training of the eye to approximate distance, or rather to compute it without any actual measurement, is a process of some value, and there are some men who can do this from practice and experience. This is further illustrated by the power possessed by others, who can tell by almost a look or a walk round how many tons of sandstone, clay, manure, or other material are in a certain heap or given space. An experienced builder or bricklayer could tell in a few moments how many thousands of bricks are in a house front; and an intelligent stonemason or quarryman could approximate pretty closely to the number of cubic inches in a certain hewn stone by sight alone, suggesting the stone to be beside him, or within a few yards' distance. The uneducated, particularly country people and the peasantry, make greater use of the feet, hands, legs, and arms as standards of measurement, and for obtaining other ends than the educated townfolk. A labourer in the habit of taking piece or task work will "step" the area of the ground before he makes his price for doing the job; and on measurement afterwards he will be found not to be far out in his reckoning. Country housewives will go into a market town and buy a variety of yards, half-yards, and other lengths of cloth and ribbons, their standard of measurement being so many lengths of their middle finger, although the shopman may run over the purchase with his rod or yard measure. It may be remarked here also that the exercise of the powers of memory among the uneducated is more marked in many ways than among the educated. We have known many countrywomen who could neither read nor write, yet possessed of such retentive powers of memory that they would bring home to a dozen or more of their neighbours from the market town a series of articles required, ranging in quantities from half an ounce to several pounds, comprising in the aggregate perhaps about fifty articles of every conceivable household want, yet in the diversity of their orders of small and large quantities, they would not make a single mistake either in

weight, measure, or the money outlay, or change brought home. How few there are among town-bred folk could task their memories to perform this labour.

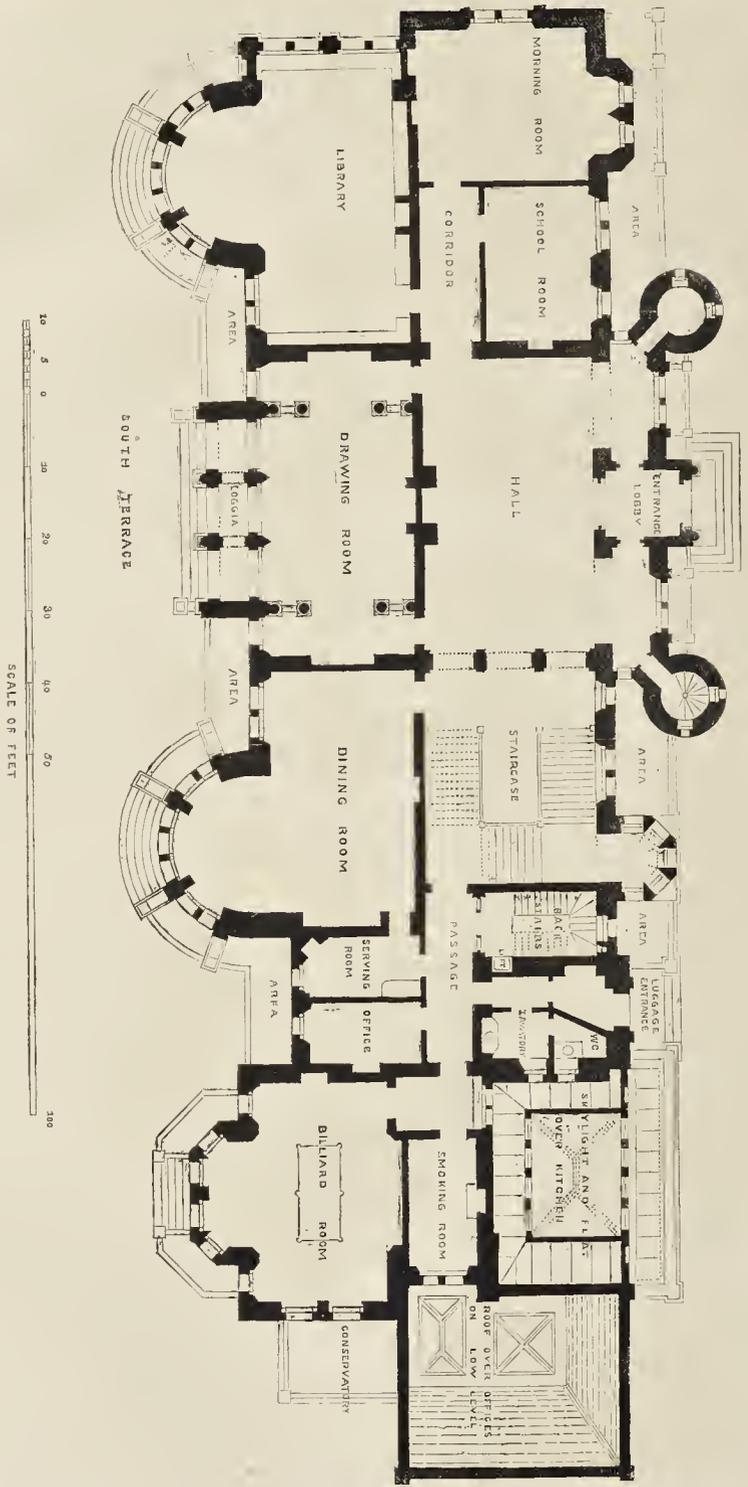
One great fault among our modern race of young men and women is, that they are utterly careless of cultivating the power of memory. Almost everything good they hear or read goes in at one ear and out of the other. Let them listen to a lecture, a sermon, or any public discussion, and not one out of every fifty could give you, in a few hours after, a connected summary of the subject. If people will not give themselves trouble to think and reflect, as well as read and listen, all the artificial aid to memory ever invented, or that may be, will avail them little. The remembering of dates and events may be useful to school folk, but there is no process by which a man or woman can remember, to know how to do that which they never learned to do. Truly, there is no royal road to learning, or to the acquisition of a science, a profession, or a trade, without study and practice.

To sum up, our object has been to show how much could be done in the science of man by the cultivation of many qualities inherent to his organisation by the development of faculties which he neglects to use. Some of these powers are mental, others are physical, but one and all capable of acting in unison. The memory can be made more retentive, the eyes to see and discriminate more effectually, the hands and limbs to perform further profitable service, and the human machine rendered more fit and durable, to stand the wear and tear of life in its too reckless struggle for independence.

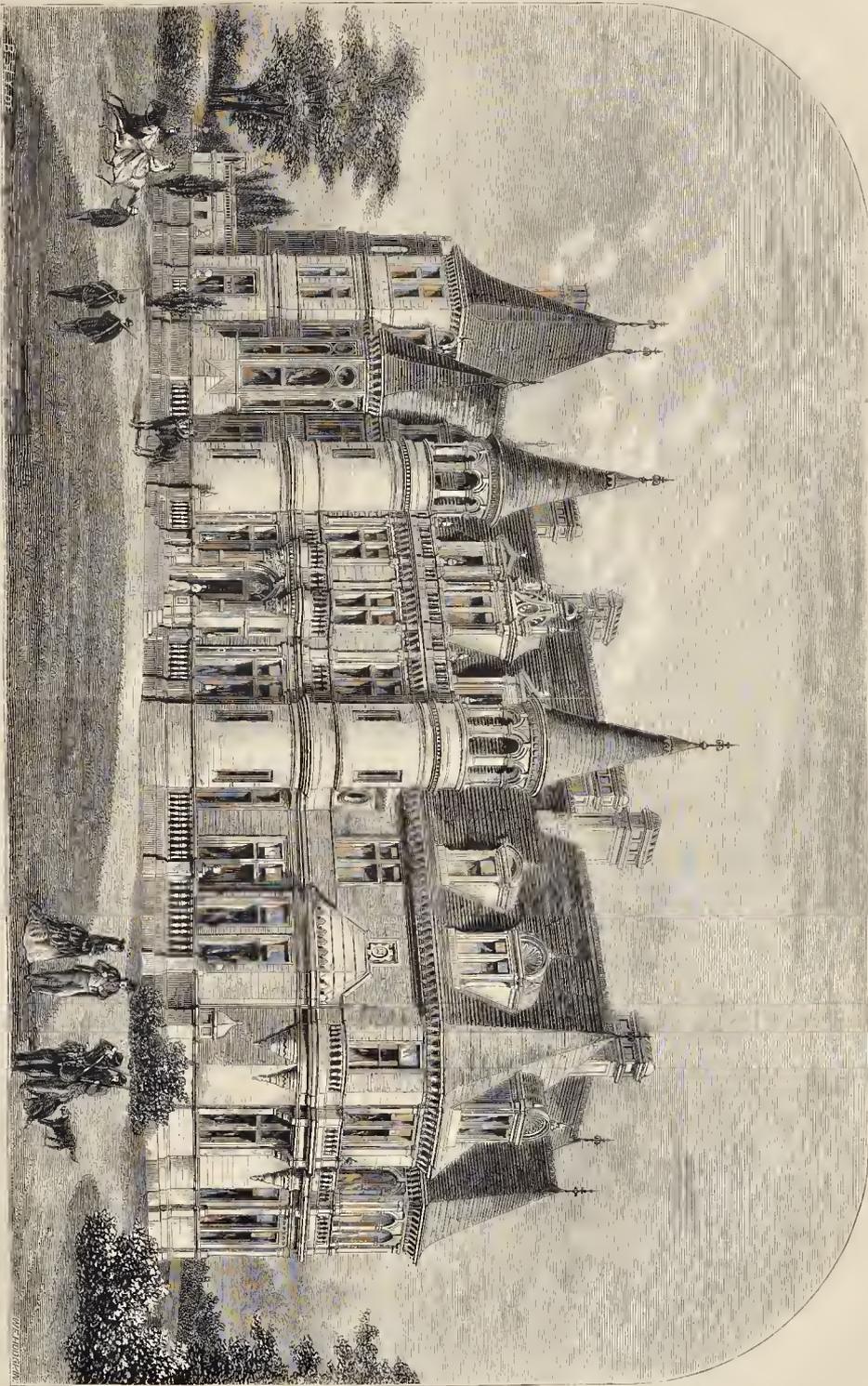
WYKEHURST.

This house is in course of erection, from the designs of Mr. Edward M. Barry, R.A., in Sussex, among varied scenery, and in a commanding position. The style of the architecture is based on that of the French *châteaux* on the Loire. The house is built of stone, and the roofs are of tile and lead. The hall and entrance are faced internally with stone. From the hall a triple archway of stone gives access to the principal staircase, which is of oak, with steps 7 ft. in width. The back stairs are of stone. From the nature of the site, a basement-story was considered advisable, and on this floor are placed the servants' offices. The floor over these offices is of fireproof construction, being composed of concrete, with wrought-iron joists. The kitchen and scullery are placed outside the main house, and have nothing over them. They are situated near to the back or luggage entrance and stairs. There is a warming apparatus under the hall, and from it flues convey warm air to all parts of the house. The various water-pipes are placed in a vertical shaft, and one of the warm-air flues communicates with this shaft, to avoid risk of frost. It is also made readily accessible, in case of accidents. There is a lift for luggage and coals, in the back staircase. All the external walls are built double, with an air-space between the two walls. The floors are double-framed, with main beams of wrought iron. Hot water is laid on to the various floors, and to the bath-rooms, from the kitchen-range, the flue from which passes up the outside of the tower, which forms the back entrance.

The first floor contains the best bed-rooms, with private sitting-rooms and drawing-rooms arranged in *suites*, having separate bath-rooms and private closets. There are other family bed-rooms, and also servants' rooms, on the second floor, the partitions and the framing of the roof being made double, with special precautions against cold and noise. All the best bed-rooms and sitting-rooms have balconies commanding a fine view; and each window towards the south and west is fitted with wooden "jalousies" or shutter-blinds, which, when not in use, fold back into the thickness of the walls, thus avoiding disfigurement to the architecture. The windows are glazed with plate-glass, in large sheets, hung as sashes, except where there are balconies, in which positions French casements are used. The turret staircase near the entrance is for the use of the servants, who can thus attend to the front-door without passing through the house. All the principal rooms have air-flues for ventilation, in addition to the ordinary smoke-flues. The whole of the works are being carried out by Messrs. W. Cubitt & Co., of Gray's Inn-road, London. Mr. Buckle is the clerk of works. The cost of the house will be about 35,000l.



WYKEHURST, SUSSEX.—Plan of Ground Floor.



WYKEHURST, SUSSEX: A COUNTRY MANSION.—MR. E. M. BARRY, ARCHITECT.

SCULPTURES IN THE ROOF OF NORWICH CATHEDRAL.

The roof of the nave of Norwich Cathedral is ornamented, at the intersection of the arches, by a very curious series of sculptured bosses, which represent (with the exception of an interval from Solomon to Christ) the whole course of Scripture history, from the creation down to the final judgment. These sculptures are a work of the fifteenth century, the present stone roof of the nave having been erected by Walter Lyhart, Bishop of Norwich (A.D. 1446-1472), in place of the original timber roof. The sculptures were painted (as they are executed) rudely, both sculpture and painting, being intended to be viewed from the floor of the church, at a great distance from the eye. At the beginning of the present century, when the colours were found to want renewing and the roof cleaning, it was determined, and of course greatly marred the effect of the old sculptures. The roof has been already cleared of the colour-wash and the stonework exhibited; and it is found that quite enough of the original colour remains to guide a faithful and skilful restorer. But meanwhile it is thought that these sculptures should be represented by means of photography, as a monument of Mediæval art. Dean Goulburn will edit them.

WAGES.

SIR.—Perhaps you will admit a few words from one of those believers in the potency of self-interest in governing the actions of average mankind, on whom some of us think you were a little hard in your recent article on wages. You justly denounce the "doctrine that it is self-interest alone that governs all the actions of every man." Yet self-interest is a very real force, and I venture to think may be a beneficial one. The whole question turns on the point whether it is blind or enlightened. Self-interest impels a thief to steal my purse. If he were better instructed, the same feeling would teach him to leave it alone. Similarly, if the workmen had been better taught they would often refrain from making demands which are simply suicidal. In fact, nothing could be more dissimilar than the effects of this same feeling in different instances; they may be wholly good or wholly bad. Our wisdom surely consists, not in ignoring or decrying the impulse, but in doing our utmost to insure that it shall be wisely directed. It is, doubtless, an evil that capital and labour should take up a hostile attitude. Both are necessary to the production of wealth, and if they are to co-operate efficiently, they must be in harmony. Still, so long as the labourer has no share in the capital employed, it is idle to ignore the fact that the labourer and the capitalist must be, to some extent, in opposition. The wealth produced by their joint efforts is to be divided between them in some proportion. What that proportion shall be is necessarily matter for discussion from opposite points of view. And I venture to think that any supposed settlement under which one party is conscious of sustaining a loss for the advantage of the other, is essentially a non-permanent and hollow affair. Substantial agreement must rest on the basis of mutual satisfaction. The old relations between master and servants, where a distinct tie was recognised on both sides, and into which a good deal of sentiment entered—what may be called the feudal theory,—these relations, with all their advantages and disadvantages, and there were many of both, are now practically extinct. The railways and the press have done that for us, and it would be vain to regret them or to look for their revival. The true solution of the difficulty lies in the near future, and it will be found, I think with you, in some kind of co-operation, or co-partnership, different perhaps from any we have hitherto seen, but such that the labourer shall have a share in the capital employed and the wealth produced in the process, and that all parties concerned shall have an *obvious* identity of interest.

In your aspiration for some such state of things this a good many of us will share, and he happy to do what we can towards bringing it about. "It no good will be done by ignoring the fact that under the present system we must be, whether we will or no, either side denouncing the other as selfish or ungrateful. Still less will

outsiders improve matters by preaching sickening sermons on universal benevolence.

If I have made my meaning clear, you will see why I must dissent from your opinion that in the present dispute in the building trade "the question for consideration is whether the increased amount supposed to be received by the workman is as well spent,—i.e., for the good of the community,—by him as it would have been by the capitalist." Surely a workman should receive the *value* of his work; and this value is not affected by consideration of what he does with his wages. Practically, however, it is enough that it would be impossible to obtain a correct answer to such a question. The questions which, I submit, should be asked and answered are such as these:—Has the value of money declined, and the real reward of the labourer thus decreased? Has the efficiency of labour increased? What is the proportion between the wages-fund and the labouring population? Are the profits on capital, exclusive of compensation for risk and wages of superintendance, above the current rate of interest? The result of a comparison of the answers to these questions should dictate the conduct of both parties. At present, unfortunately, the only questions asked would seem to be, "Can we enforce this demand?" on the one hand; and on the other, "Can we successfully resist it?" Ultimately, both will feel the result of flying in the face of laws which are as sure in their operation as the recurrence of the seasons.

I do not profess to decide on the merits of the present dispute,—that I leave to wiser or bolder spirits, who are not afraid to form an opinion on slender data; but if it be true, as I have seen it stated, that the object of the workmen is to reduce the hours of labour, in order to give employment to brother-workmen who at present seek it in vain, their conduct is founded on an economic fallacy. It amounts to this: that because the supply of labour is in excess of the demand they wish to raise the price; in other words, that since misery results from the present undue strain on the wages-fund, they propose to mend matters by increasing the strain. One thing, I fear, is only too certain. Whatever agreement may now be come to can be of no value towards a real settlement. It will but put off the difficulty for the present, to confront us anew at no distant day.

Meanwhile, some of the energies of the working man's instructors would be well employed in teaching him to regard his social relations from a scientific point of view. He should be shown that economic forces are forces in actual operation, and not empty phrases; that it is his interest and his duty to study them, and that to ignore or ridicule them is simple imbecility. A little knowledge of the elements of political economy would suffice to teach him some home truths,—that, for example, waste and destruction are not "good for trade;" that the wisdom of a demand for increased wages does not depend merely on the probability of its success; above all, that the rate of wages depends greatly on the proportion between the wages-fund and the labouring population; that, in fact, "no material improvement in the condition of the working classes can be permanent unless it is accompanied by circumstances which will prevent a counterbalancing increase of population." The men who will undertake the task I have indicated will not gain an immediate popularity, but they will act a patriotic part, and will prove themselves the true friends of the working classes. H.

RISK OF BUILDINGS FROM FIRE.

SIR,—I have read with great interest your remarks on the risk of buildings from fire, and I believe that the profession will benefit from perusing Captain Shaw's recent work on "Fire Stairs."

It has not been generally thought that stone staircases and iron columns are dangerous; and although they cannot be burnt, it does not appear that they resist fire equally well as brick or timber in large scancellings. I do not know whether I am advocating anything new in calling attention to the use which might be made of Portland cement for stairs. Bricks made of fine sand to one of cement will bear a pressure equal to the best stocks, and made with neat Portland cement they are as strong at six months as Staffordshire lime bricks or York landings. Such being the case, would it not be possible to cast Portland cement steps in moulds, with rounded and re-

turned nosings, &c., complete? They might, if desired, have sinkings on the top of each tread, for the insertion of ornamental tiles; and if manufactured in large quantities the expense would not be great.

It is well known that Portland cement, for furnace-work, will stand fire better than Roman cement.

Perhaps the insertion of this letter in your next number may be the means of bringing forth some better suggestion than the above.

T. A. BRITTON.

KENSINGTON GARDENS AND PALACE.

SIR,—I have read with much interest (as I do everything in the *Builder*) the remarks of your correspondent signed "Quoniam" on Kensington Gardens and Palace. There is another reason why his recommendation might be turned to advantage,—namely, should the palace be brought down to the round piece of water, room might be found for the Knightsbridge Barracks, as, I believe, might be found at present, between it and the Palace-garden houses. A. C.

House of Lords.

METROPOLITAN BOARD OF WORKS.

Ventilation of Sewers.—Last week the committee on the ventilation of sewers presented a report upon the resolution of the Board of the 26th of June, 1868, referring to them the question of the ventilation of the sewers belonging to the Board, especially to advise the Board as to the expediency of effecting a premium (by public advertisement) for the best practicable plan of effecting such ventilation; and stating that they have arrived at the opinion that it is undesirable to offer a premium for a plan of ventilation, as it appears that no one plan would be applicable to the whole of the metropolis, and recommending that the committee be further authorised to pursue their investigations, and to deal with each case that arises according to the particular circumstances of the same, reporting from time to time the results to the Board. Mr. Saunders, in moving the adoption of the report, said no one system was applicable to the whole of the metropolis, but each case must be treated upon its peculiar exigencies. They used charcoal-boxes, and in every possible instance the up-cast shaft of factories. Next to draining the land, there was nothing of such importance as keeping the noxious gases arising from sewage from reaching the population. The report was then adopted.

The York Water-Gate.—The works committee have considered the letter from the Science and Art Department, South Kensington Museum, requesting that the art-pupils might be permitted to sketch and measure the York Water-Gate in the grounds adjoining the Victoria Embankment, and to remove a portion of the earth for that purpose, and recommending that the Department be referred to the proprietor of the gate, with a view to inducing him to remove the gateway, so that it may form a finish to the street and be on the same level. On the motion of Mr. Runtz, the report was adopted.

ARCHITECTS' ACTIONS.

OSWALD V. THE GUARDIANS OF NEWCASTLE-UPON-TYNE UNION.

THIS action, tried on the 15th inst. in Newcastle, before Mr. Justice Willes, was for professional services rendered by the plaintiff, who is an architect in Newcastle, to the Guardians of the Newcastle-upon-Tyne Poor Law Union in the erection of an infirmary, and alterations of the workhouse buildings. The amount claimed was 538*l.* 18*s.* 1*d.*; 150*l.* had been paid into court; and the action was to recover the balance, 388*l.* 18*s.* 1*d.* The action was based on the following letters:—

"North Elwick Hall, 23rd November, 1867. Sept. Oswald, esq., Newcastle.

Sir,—The Guardians of the Poor of this union are about to build hospitals, &c., near the present workhouse. The plans are about ready, but the intention of the guardians is to engage a professional man to do the following work: 1st. To examine, and, if necessary, to alter or add to these plans, all of which are to be gone over with Mr. Brown, and our medical officer. 2nd. To revise and alter the plans as required by the Guardians and the Poor-Law Board. 3rd. To prepare estimates to submit to the Guardians on Friday next, if possible, but at the latest on Friday week, the 6th December, 1867, when the plans are to be laid before the Guardians. 4th. To superintend and carry out the whole of the works to completion; and 5th.

To do all and everything necessary to be done to commence, carry on, and finish the work. Great attention to be paid to warmth, light, and ventilation. If I succeed in inducing the Guardians to confer the appointment on you, you will undertake to work on the plan, and understand that your remuneration is to be 2½ per cent. commission on the gross actual cost of the works, and no more? If I do not succeed in securing the appointment for you, then in that case I undertake to pay you £100 (on guesses) for doing the work Nos. 1, 2, and 3, on the other side. But, if the Guardians do confer on you the appointment, then in that case the ten guineas are to be considered as part of the commission of 2½ per cent., and is to be deducted from the gross amount of the said commission. Please to say if you will undertake the work on the terms I have named.—Dear Sir, yours truly,

To the letter Mr. Oswald replied that he accepted the conditions stated. Mr. Herschel opened the case, and called the following evidence for the plaintiff:—

Mr. Septimus Oswald, the plaintiff, examined by Mr. Bruce.—I am an architect in Newcastle, and have been since 1855. On 23rd November, 1867, I had an interview with Mr. Milvain, vice-chairman of the Newcastle Board of Guardians. In consequence of that interview, I received a letter from Mr. Milvain, and replied on the same day. On the 25th November I first saw the plans; they were not at all mature; it was not possible to make an estimate from them. The committee saw the deficiency of the plans for themselves. I received no written instructions from the Board as to how the plans were to be drawn. I received all my instructions from the Workhouse committee, and they were all verbal. (The minutes of the committee were put in.) The plans shown to me made the building run north and south, mine made them run east and west; that change involved an entirely new plan. The plans I received were of no use whatever in the preparation of the plans I made. My plans were sent to the Poor-law Board, who returned them with certain requisitions, one of which was that the quadrangle should be open to the south instead of to the north. The ground falls from the south to the north to the extent of 14 ft. The alterations required by the Poor-law Board necessitated a new set of plans. I went to London with a deputation from the Guardians to wait upon the Poor-law Board, to see what alterations were required; and on the 24th April the Board approved of a small pencil plan [produced] showing the buildings turned round. A few days made a new set of plans in accordance with the change—that is to say, working plans. I also prepared specifications and took out quantities for tenders. On the 8th of August, 1868, I received from the clerk to the Board of Guardians the following letter:—“I beg to inform you that at the meeting of the Board of Guardians of this Union, held yesterday, you were appointed the architect to superintend and carry out the whole of the works of the above erection at 2½ per cent. commission on the gross actual cost of the works, and no more, in conformity with the agreement made with the vice-chairman of the Board.” The buildings were erected from my second set of plans, and I superintended. The usual charge for the preparation of plans and superintendence is 5 per cent. Assuming that there was no contract, the charge for the second set of plans, and an approximate estimate, would be 14 per cent. I charge 1½ for the first set of plans. The preparation of the plans down to the commencement of the works is 2½ per cent.; the plans for the latter were complete with specifications.

Cross-examined by Mr. Holker: The basement story at first was of necessity built by the Guardians did not rough, and have very few windows and no plastering, and the 5 per cent. was commission on 771l. 1s. 2d. for completing the basement, while the 2½ per cent. on 12,024l. was for superintending the works. A number of plans prepared by Mr. Brown were produced to me. One was a block plan.

By the Judge: This is a totally different plan from mine. This is for an enclosed yard; mine was for a quadrangle.

Cross-examination resumed: Mr. Brown's plan was for one long building. I had no plan laid before me from Mr. Brown for a quadrangle. Brown's plans were rejected by the Guardians. I suggested a variety of alterations.

Evidence having been given on both sides, the Judge said, in summing up, that he was glad the case would go to a jury of men of business, who would decide according to honesty and fairness. There would be no honesty, fairness, or equity in giving the plaintiff one farthing more than he was entitled to under the contract; at the same time, common justice suggested that that bargain was made with reference to what the parties were dealing with at the time, and could not bind the plaintiff or defendants in respect of a different thing which was afterwards substituted. Was the work which the plaintiff was called upon to do different from the contract? Was it known to the Guardians that it was different? Did the Guardians employ the plaintiff to make new plans? And did they do so, knowing that he would have to expend more labour and time upon them? Again, did Brown's plans become totally useless? If they did, Mr. Oswald must be paid as an architect introduced in the first instance. If the jury came to the conclusion that the 2½ per cent. on the cost of the Guardians, assuming there was work done under circumstances universally known to involve an extra charge, then the jury must find for the plaintiff, and then the question would be as to the amount to be paid.

The jury retired at ten minutes past five to consider their verdict, and in ten minutes returned with a verdict for the plaintiff, both as to the plans and the specifications. Amount, 200l., out of the 246l. claimed.

A TESTIMONIAL.

On Friday evening, the 12th inst., a dinner was given at the Sunnery Arms, Fulham-road, West Bromwich, by the foremen, pieceworkers, sub-contractors, and others employed on the Redcliffe Estate, to Mr. Henry Smith, on his retiring from the position of clerk of the works to Messrs. Corlett & McLymont. They at the same time presented him with a handsome marble timepiece, as a memorial of the regard they had always entertained for him. Mr. F. N. Kemp presided; Mr. Rattebury, foreman of carpenters, acting as vice-chairman. In presenting the testimonial the chairman said they had always considered Mr. Smith one of the corner-stones to the estate, and the good name the estate had obtained was in great measure due to his energy and exertion. It need not be added that Mr. Smith expressed himself very gratefully.

DRAINAGE AT TOOTING JUNCTION.

Sir,—I request to call the attention, through you, of the powers that be to the state of drainage at Tooting Junction. The sewage from Arnold-road, and the road adjoining, is carried by a pipe drain to an open ditch in the centre of the middle platform at the railway station. The stench has been so bad at times as to make the railway officials ill; and on the station-master complaining of the nuisance to the engineer of the railway company, he was directed to have the drain stopped up at once, which he did, and it now stands in this state; it is therefore only a question of a few days at the most to make the houses unfit for habitation. One of the landlords had his attention drawn to the state of affairs about twelve months since by the railway company, and requesting him to make some other provision for his sewage, and not to drain it into the open ditch. He took no notice of the request, and unless he can be compelled to make some improvement in the outlet of sewage, it will pollute the neighbourhood.

If a formal complaint were made to the Metropolitan Board of Works, would they step in and rectify the matter? L.

BEECH.

Sir,—Will one of your correspondents inform me of a receipt for preventing beech from cracking, as I make a large number of beech mallets, and as soon as I cut them they crack at the ends, which is a great loss? W.

DONEGAL GRANITE.

Mr. HARTE, the county surveyor of Donegal, has sent to the Dublin Exhibition some specimens of polished Irish granite, in the shape of slabs and columns, which are attracting attention. Plain white granite, in hammered blocks, ready to be set, can be supplied in Dublin at 83d. a foot, and the red polished granite, dressed, at 9s. a foot. The exhibitor says, a horse with 28 ft. of frontage and 43 ft. high, after deducting openings, will cost, polished, 321l.; add for mouldings, &c., 60l.; freight to London, 21l. 15s.; total cost for an entire granite polished front, 405l. 15s. By a combination of, say one-third polished red (at 9s. per foot superficial, and two-thirds white, plain, at 4d. per foot superficial), the costs, he says, would be reduced to about 167l., while the effect would be increased.

SEWAGE IN TOWNS.

On Wednesday last a meeting of municipal authorities and others, interested in remedying the nuisance of sewage in towns, was held in Stafford House, by the kind permission of the owner, the Duke of Sutherland. The meeting was very well attended, and the chair was occupied by his Grace. The immediate purpose for which the meeting was called was to discuss the plan of Major-General II. Y. D. Scott, for getting rid of such nuisances by fire, and to devise measures for applying the principle to the removal of the present difficulties. As our readers know, Gen. Scott's process is in actual operation at Ealing, and the subject has been discussed by the Society of Arts and the Architectural Association, Conduit-street. His plan of precipitating with lime or lime and clay, and the conversion of the deposit into lime or cement by calcination, has been strongly recommended, and the cement thus produced is valuable; General Scott says that he is at present getting 3l. 10s. a ton for it. A great variety of remarks and questions on these several points, proceeding from Mr. Morgan (Barking), Mr. Hawkesley, C.E., Mr. Rawson, C.E., Mr. Webster, Colonel Jones, M.P., Mr. Bennett, Mr. W. Hope, Mr. Hoegs (Ealing), Mr. Bramwell, C.E., Dr. Frankland, and others followed, which were answered by General Scott. Mr. Graves, M.P., moved, and Mr. Cole, C.E., seconded, a vote of thanks to the Duke, who responded.

BASILICAS AND CHURCH REVIVAL.

On Sunday morning last, the Rev. E. Salisbury Foulkes, B.D., preached to a numerous congregation in St. Bridget's Church, Waverley, Liverpool, on the subject of basilicas in connexion with church revival. The text was taken from St. Luke, xii. 2: “For there is nothing covered that shall not be revealed; neither hid that shall not be revealed.” The preacher said there was a striking harmony between those words and the character of the building in which they were assembled, and between the character of that building and the character of the age in which they lived. The words of the text were precisely what the walls of that church said to them. The walls were so constructed as to let in most light. There was no corner of the building where anything could go on long without being seen—there was no room in it for concealment or mystery; it was a

cheerful, transparent edifice, without gloom or obscurity. Nothing that could be lavished on the walls by way of decoration was thrown away, and as for the behaviour of the worshippers, and the manner of conducting the services, all was as patent as day. That church was by no means of the character of the Gothic or Mediaeval style, the style most prevalent in England formerly, and which had been so largely revived among us of late years. It was not his intention either to criticise or disparage that style; but looking to our existing habits and cast of mind, looking at what the services of the Church had ceased to be, and were likely to become again, he could not but think that Gothic would be the favourite style much longer in this country, where a new church had to be built and not an old one restored. The type of architecture presented to them in that church was not merely more suited to modern requirements than Gothic, but it carried them back to times far holier and purer than the middle ages, and reminded them of triumphs which ceased just as the middle ages commenced. The middle ages won lands to the Church, not souls; the ages to which that architecture carried them back won not merely souls but nations to the truth of the Gospel. The Christianity of the middle ages had its impressive, its attractions, its merits, if they would; but it was not the Christianity which the Apostles preached, or it would have produced similar effects in the world to what they did. Instead of that it never advanced; it mystified the faith itself. Beliefs, not only laymen, but slaves, women, and children not only laymen, but slaves, women, and children preached the Gospel by giving their lives and by shedding their blood for it. When Christianity was first preached it was arraigned in buildings such as those for contempt of the law. Buildings such as those were then called basilicas—i.e., royal edifices, or the king's courts. Their arrangement was substantially what they saw in that church. Having described the construction of the basilicas of which Christianity became possessed when the Roman empire became Christian, he said the central part was called the nave (the Latin word for ship), because Christianity had been early symbolised in a ship, and the lateral parts aisles, as though they were the wings to bear it heavenwards. Coming to the more practical part of his subject, including church revival in general, and with special reference to the character of the age in which they lived, he said that if the character of the present age was not absolutely straightforward and upright, it was the next thing to it, in that there was nothing it detested so cordially as underhandness and hair-splitting, moves in the dark and intrigues. The Church movement had never been distrusted in this country when it had been outspoken; it had gained the confidence of the public in proportion as its objects had been avowed, its reasons for them shown to be solid, and not the result of a halting between two opinions. Referring to galleries in churches, he said that nine-tenths of our church revivalists looked upon galleries in churches as an abomination for which there was not a word to be said. Why so? Simply because, without being conscious of it in all cases, they were mediocrities at heart; they judged things by the standard and rule of the Middle Ages, church architecture included. They professed to have done with the Middle Ages, and they were never more committed to them in practice than at the present time. Church revivalists seemed to think that, because galleries were not suitable to a Gothic church, therefore they could never be suitable to any church. Yet it so happened that in the style which preceded Gothic by so many centuries galleries found their natural place. Another vulgar error into which they had fallen by looking at church architecture through Mediaeval spectacles related to the ceremonial—the position of the celebrant at the administration of the Lord's Supper, a subject which was now, perhaps, the uppermost in the minds of all. In all basilicas the place assigned to the clergy was what had been occupied by the tribunal of the judge, and that stood on a raised platform at the further extremity of the central part, and was usually semicircular or apsidal in shape, and in front of the clergy was placed the altar.

St. Ann's Heath Lunatic Asylum.—We understand that the design submitted by Mr. Alfred Smith has been selected.

CHURCH-BUILDING NEWS.

Loughton (Essex).—The new church dedicated to the honour of St. Mary the Virgin was consecrated by the Lord Bishop of Rochester on the 5th inst. It consists of nave, apsidal chancel, chancel aisles, transepts, and south aisle (the completion of the north aisle has been deferred for want of funds). It is faced externally with Godalming or Bargate stone, from the pits of Messrs. Sisley, in random work brought up occasionally to single courses of squared stones with red tile bands to relieve the colour. The Bath stone dressings to doors and windows are carried through the whole thickness of the walls. Corsham Down stone is used for the interior finishings of nave arcade, &c. All the stones are put together with a wide joint, which is ironed back to form a V joint. The walling stone is used on the outside for all quoins which are formed by a chisel draft, 1 in. on each side. The roofs are covered with red tiles, with ridge tiles final, and on the chancel, crockets, of the same, made by Mr. Cooper, of Maidenhead, from the designs of the architect. All the timber construction remains as left by the carpenters, the seats only are stained to a low tone, and varnished. Various gifts of carving and other ornaments and fittings have been made; notably, the carving of the south porch, by the Rev. John Gott, of Beaulieu; the font, which is the gift of Mrs. Matland; a stained-glass window, given by Mr. P. Gethely. Mr. Bentley, of Waltham Abbey, is the builder; Messrs. Allen & Burge have done the carving. The architect is Mr. Thomas Henry Watson, of London.

Kilburn.—The new church of St. Augustine, Kilburn, has been opened for Divine Service. It is not yet consecrated, as the structure is not completed. The edifice has been built under the direction of Mr. Pearson, of Harley-street. All the seats are free. The plan of the church consists of a nave and chancel, together internally 155 ft. long and 28 ft. wide, and 56 ft. high up to the ridge of the groining. The outside facing is of red brick, and the inside of stock brick. Bath stone is used throughout for dressings. The style is an adaptation of Early Thirteenth-century. The church will accommodate, when completed, about 1,200 persons on the ground-floor, while the triforium can be made available for 250 more. A small portion of the area is intended to be seated with movable benches, the remainder of the church with pews. Part only, however, of the church is as yet built, and this includes the transepts, and two bays of the nave and all east of them. Four bays of the nave, with the additional aisles, porch, and tower, remain to be built; also the *arche*. Messrs. Colls & Son, of Moorgate-street, are the builders.

Podmore (Somerset).—The church here has been reopened, after restoration through the liberality of Mr. G. D. W. Digby, of Sherborne Castle; but the chancel is as yet left in a dilapidated state. The church has an octagonal First Pointed tower, with a belfry stage of later date. The great features of the church are the relics of the paintings with which the whole was covered. Many of the old oak benches have been repaired and re-used, as well as the fifteenth-century pulpit. The roofs are wagon-headed, of the usual local type, strengthened by oak tie-beams. Messrs. Slater & Carpenter are the architects; Mr. Creed, the clerk of works. The contractors were local tradesmen.

Aslington (Sussex).—The parish church of Aslington has been reopened. The consecration of an additional piece of ground lately taken into the churchyard was combined with the opening ceremony by the Bishop of Chichester. The enlargement nearly trebles the area of the old building, and consists of an extension of the nave to the west, about 15 ft., and a new south aisle, porch, and vestry. The new portions are generally built with local stone and Bath stone dressings, in the style of the old church, which was erected during the first half of the fifteenth century. Ancient work has been preserved, and used in again. The new aisle roof is open-timbered, and plastered between the rafters. In the porch the old roof has been reproduced, and some of the old timbers used in again. The old porch doorway is also refixed in the new aisle-wall. The chancel seats, pulpit, sedilia, altar, and table are all of wainscot. The nave seats are of English oak, cut from the estate of the Rev. John Goring, of Wiston Park. The floors are laid with encaustic tiles from Mr. Minton Taylor's works. The work has been

designed and superintended by Mr. R. Wheeler, of Tunbridge Wells, assisted in the latter part by Mr. G. Hanby. Mr. Dalby, of Steyning, was the contractor.

Bruton (Somerset).—The nave of Bruton Church was reopened on the 20th ult., being the first portion completed of the restoration of the whole under Messrs. Slater & Carpenter. The roofs of the nave and aisles are of the richest possible type, moulded and carved over the whole surface. Unfortunately, owing to the original bad construction of the gutters, these roofs were become dangerous, through the rotting off of the ends of all the timbers and wall-plates. Iron rods and struts had been introduced; but in the mean time the north walls of the nave and aisles had been pushed out of the upright; it was necessary, therefore, to rebuild entirely the north arcade and clearstory, and to take down and reconstruct the old roof, which, with the exception of three new tie-beams, wall-plates, and some few ribs, has been put up again. The missing angels, bosses, panels, &c., have been renewed and carved by Pepper & Son, of Brighton. The same treatment will now be adopted with the aisle roof. The nave has been re-seated with open seats, re-using the old Jacobean bench-ends. On removing the modern wood-and-plaster chancel arch, the original arch was found springing from corbels; but it was so much cut about that it has had to be rebuilt. The original rood-loft stairs remain; but the rood-screen has been for many years in a neighbouring church. Portions of a screen remain in the tower, but these probably were for St. Catherine's chapel, where a stone staircase yet remains, indicating the position of the screen. A very interesting crypt was discovered, partly under the nave and partly under the chancel. It is of six bays, vaulted with two detached columns. It formed at one time the substructure of an earlier chancel. It is now used as a burial-vault of the Berkeley family, and has been preserved, the level of the floor rising (as formerly) from west to east, so as to get over the crown of the vault. Its original doors and windows are, of course, now blocked up. The works have been carried out under the architects by Messrs. Clarke & Son, of Bruton, with Mr. Court as clerk of works. The warming is by Haden, of Trowbridge.

Southampton.—St. Michael's Church, Southampton, has been reopened after restoration. The whole of the galleries have been removed; the walls have been stripped of the plaster with which they were covered some forty years ago, when a new roof was provided; the pews and pulpits are gone, and the floor taken up, leaving the base of the area at its original level, which is a foot and a half or so lower than the street. New rafters and supports have been introduced under each of the aisle roofs; the vestry in the north-east corner has been thrown into the church, and forms a "chapel" for private communion, there standing within the rope railing, which only now separates it from the north aisle, a small altar, on which stand an ornamental brass cross, a couple of candlesticks bearing long tapers and vases filled with flowers. The old-fashioned staircase which occupied the opposite corner of the church leading to the belfry has been removed, giving thereby room for a spiral chapel, and in its place there has been a spiral staircase of somewhat temporary construction in appearance, which runs up close by the south-eastern support of the tower and spire. Within the chancel considerable alterations have been made, mainly in accordance with High Church ideas. The high altar is separated from the smaller chapel already alluded to by a dwarf wall of Bath stone, surmounted with a light iron railing painted blue. The chancel-space under the tower is occupied by the choir stalls, of oak plainly carved; the seats for the congregation are of modern pattern and comfortable construction, and are made of pine, the work being of the plainest possible character. All the sittings are unappropriated. The centre aisle is paved with red and black square encaustic tiles, and others of a more ornamental character are laid down in the chancel. The chancel ceiling has been painted and decorated, and the approaches are also coloured. This portion of the work was carried out by Mr. G. Vaughan. The general appearance of the church is at present one of incompleteness, the stone walls being for the most part left as they were found after the removal of the plaster. The work of restoration has been carried out by Mr. H. I. Sanders, of the Strand, builder, under the supervision of a committee. The work so far done has been at a

cost of about 1,000., of which there is a deficiency of about 200.; and 1,000. as well are required to complete the restoration.

DISSENTING CHURCH BUILDING NEWS.

Swansea.—The foundation-stone of a Wesleyan Chapel in the locality of Sandfields, has been laid. Quite a new town has shot up in the Sandfields within the past few years, and open spaces there are still being built upon with a rapidity bespeaking the material progress of the borough. There is now a large aggregation of the working classes in that district. The site obtained is in St. Helen's-road, opposite the Hospital. The architects are Messrs. Habershon, Peto, & Faulkner, of London, Cardiff, and Newport. The style of the building is "Victorian," and it will accord with the architecture of the buildings opposite. There will be a schoolroom underneath, 12 ft. in height, and 72 ft. long by 45 ft. broad. The chapel will seat about 350 persons, but provision will be made for galleries to be put up hereafter, which will seat 300 more. The contractor is Mr. David Morgan, and the amount of the contract 1,926l. 7s. 5d. The extra cost, including capitalised value of the ground-rent, will be about 2,300l.

Stockport.—The foundation-stone of a place of worship at Stockport Little Moor, called the "New Union Chapel," has been laid by Sir James Watts, bart., of Abney Hall, the term "Union" having been selected "to denote the fusion of all sects of Christians, in the erection of a tabernacle in a locality where the want of such a place has been long felt; and where all classes may worship from one common platform, gentlemen of all denominations having contributed to the work." The designs for the chapel are by Mr. T. H. Allen, architect, and the contractor is Mr. Henry Barlow. The site selected for the purpose is a fork of land where the Maple-road and that leading to Hazle-grove meet. The building will be in the Gothic style of architecture, faced all round with stock bricks, and relieved by stone bands and other dressings, with a circular rose-light window in the front gable. A tower at one corner forms a feature, with a porch on the opposite corner. It will have two entrances in the front; one in the tower has a staircase leading to the orchestra above the vestry. The chapel will be 47 ft. long and 31 ft. wide in the clear, and 25 ft. high to the ceiling, and is arranged to accommodate 250 people. The pews and roof-timbers will be of pitch pine, stained and varnished. The cost will be about 1,000l.

Bristol.—Pill Wesleyan Chapel, Bristol, has been opened for divine service. The contract, which includes a school, has been carried out by Mr. J. W. King, builder, Bristol, from drawings and under the supervision of Mr. E. A. Lansdowne, architect, Newport, Monmouthshire.

Leicester.—The memorial-stone of a Nonconformist church has been laid on a site in New Parks-street, Leicester. The building, when completed, will seat nearly 1,000 persons. Mr. Shenton is the architect. The church is cruciform in plan, but the intersection of the four arms of the cross is converted into an octagon, in which part the bulk of the congregation will assemble. The site being surrounded by streets partially dictated this form, as it was thought desirable to have a separate entrance from three of them, in order to give increased facilities of ingress and egress from the church. The principal or nave entrance, in New Parks-street, will be approached through an arched colonnade, leading to an open porch, from which access will be obtained to the gallery-staircase, as well as to the body of the church. The end of the apse is made semicircular on plan, and is appropriated to the organ and to the use of the choir. A gallery, five seats deep, will be erected at the end of the nave, above the open porch. The extreme internal length of the church, from the nave to the apse, is 120 ft., and the clear breadth across the transepts is 113 ft., the width of the central octagon being nearly 50 ft. The style chosen for the building is an adaptation of the Early Gothic; but as the church will be mainly a brick structure, no attempt has been made to give it a high decorative character, and the effect of the building will rely upon its variety of outline, rather than upon minute detail in its several parts. No endeavour has been made to construct decoration for the mere sake of ornament, but construction has been decorated where possible without great expenditure of money. The walls of the interior will be faced with red

bricks to a height of 7 ft. from the floor, above which they will be finished with white bricks, bounded with red courses, in order to break up its otherwise monotonous surface. The chief architectural features of the building will be the octagon, whose internal height is 55 ft., and whose elevation in the interior is 85 ft. from the ground to the top of the lantern. Around its upper part will be a range of lancet-headed clear-story windows, twenty-eight in number, which, it is hoped, may some day be filled with stained glass. From each angle of the octagon are projected stone shafts, with curved caps and bases, from which will spring the curved ribs of the roof-trusses. The ceiling will be partially domed, the timbers being visible, which, together with the boarding, will be stained and varnished. The height of the nave and transepts will be 32 ft. from the floor to the ceiling, and these roofs will be treated similar to that of the octagon. The seat accommodation, allowing a full width in each sitting for adults, will be as follows:—Ground floor, 700; gallery floor, 70; total, 770. The church will be warmed by means of hot water on the low-pressure system, for which two furnaces will be fixed in the basement. A vestry will be erected on the eastern side of the apse, and it was intended to have had a similar building on the western side; but this, together with the gallery which it was proposed to have in each of the transepts, has for the present been abandoned, although the foundations for them have been built. There will be accommodation in all provided for upwards of 900 people.

SCHOOL-BUILDING NEWS.

Stamford.—A draft scheme for the management of the Stamford Endowed Schools has been brought under the notice of the Corporation. A clause in reference to Radcliffe's High School, says:—"So soon as conveniently may be after the date of this scheme, the governors shall provide on some site convenient of access for the inhabitants of Stamford, school accommodation sufficient and suitable for a high school for at least 150 boys, and a residence for the head master, with boarding accommodation for thirty boys; they shall also provide a place for cricket and other games for the use of the scholars. For this purpose they may expend a capital sum not exceeding 6,000*l.*, unless with the consent of the Charity Commissioners."

Bradford.—The chief stone of St. Michael's and All Angels Church Schools, which are building in the rear of the church, in Brick-lane, Bradford, has been laid. The schools, which are being erected entirely by voluntary subscriptions, have been designed by Messrs. T. H. & Healey, architects, Bradford, in plain Gothic style. Accommodation will be found for 250 boys and girls in a mixed school, and there will be an infants' school for 222 children, with playgrounds attached. The total cost will be about 2,100*l.*, including furnishing and fittings, and towards this sum about 1,500*l.* has been either promised or received.

Haughton-le-Skerne.—The new schools at Drinkfield, in the township of Whessoe, in the parish of Haughton-le-Skerne, have been opened. These schools have been built by the Rev. E. Cheese, rector of Haughton-le-Skerne, and Mrs. E. Cheese, in memory of the late Hon. and Right Rev. Henry Montagu Villiers, D.D., Lord Bishop of Durham, for the benefit of the ironworkers who have lately been drawn together by the new ironworks at Drinkfield, in the parish of Haughton-le-Skerne, as well as for the use of the other inhabitants of the district. The site was given by Mr. John Henry Garbutt, on an open space between the ironworks and the new village. The schools are called St. Peter's Schools, in consequence of the parish church and schools of Haughton-le-Skerne being dedicated to St. Andrew, the brother of St. Peter. The plans, by the Rev. E. Cheese himself, have been brought to their completion by Mr. G. B. Scotson, of Haughton-le-Skerne, as contractor for the masons' work, and Mr. Robert Unthank as contractor for the joiners' work. They consist of two large rooms built in the form of two sides of a quadrangle. The principal school-room is 66 ft. long, 19 ft. wide, and 15 ft. high. There is a large mullioned window at each end, and three mullioned windows on either side. As it is to be a mixed school, there are separate entrances for the boys and girls, each having a separate lobby and separate yards, with conveniences attached. The second school-room is 28 ft. long, 16 ft. wide, and 12 ft. high. This

room is fitted up with a gallery for infants, and, as well as the large room, has parallel desks, which can be used either as tables or desks, and forms which can be easily moved as occasion may require. There is a kitchen attached to the schools. The buildings stand upon a quarter of an acre of ground, which has been walled in and drained. They are built of red bricks, slightly relieved with white fire-bricks. They are roofed with slate, and approached through large gates, and a convenient carriage drive.

Kingston.—The promoters of the scheme for building new church schools in Kingston, in two departments, for the reception of 262 boys and 263 girls, are now ready to commence operations. The site has been purchased and legally conveyed to the vicar and churchwardens for the time being, as trustees. Plans have been prepared by Mr. C. L. Luck, of Surbiton, and tenders are adopted by the committee; and tenders are adopted by the preliminary arrangements are now being made by a committee of management for laying the foundation stone by her Royal Highness the Princess Mary, Duchess of Teck, on the 14th August.

Books Received.

The Village Churches of Denbighshire. By Messrs. LLOYD WILLIAMS & UNDERWOOD, Denbigh, 1872.

A CONSIDERABLE number of plates have been published since we noticed the commencement of this work, and include subjects of greater interest,—for example, the fine old screens of Llanwrth, Gresford, and Derwen, which are well worthy of notice; the wall-painting at Ruhnog; the wooden font and the wrought-iron knocker on the door of Enechidd Church (plate 30). The wrought-brass candelabra at Llanunaw Church is a good specimen of old work. Messrs. Lloyd Williams & Underwood have made drawings of Denbigh Castle, Valle Crucis Abbey,—which contains some very exquisite detail,—and Wrexham and Ruthin Churches (the tower of the former is as fine as anything of the date), and when these are issued they will have illustrated nearly everything of architectural interest in the county, as regards Gothic buildings.

In the Burgesses' Tower and the grand gateway of the castle they have been careful in giving the masonry,—putting in every stone. The mixture of free and lime stone,—the latter often being so small as to look like tessera, is very interesting.

VARIORUM.

THE Fourteenth Annual Report of the Ladies' Sanitary Association (Office, 22, Berners-street, Oxford-street) has been issued. The committee state that they have good reason to hope that the work of the Association is progressing. In many localities much good solid work has been done during the past year among the poor and ignorant. The tracts have been widely circulated; in all 32,000, making a total of 777,810 since 1857. The park parties have been most useful and numerously attended; a total of 32,364 children went out in these park parties, at an expense of 53*l.* 16*s.* 8*d.* The Branch Associations continue their efforts to ameliorate the household condition of the poor in Aberdeen, Brighton, Birmingham, Cardiff, Manchester, Paisley, Reading, Ramsey, and Stornoway, the annual reports received being unusually encouraging. The committee, anxious to try, in the crowded parts of London, the experiment of deposits for the loan of cleansing materials, such as bath-tubs, pails, brushes, funnels, &c., raised funds by special efforts and established one in Rotherhithe and another in Poplar. They are much needed in St. Giles's, Bethnal-green, Lambeth, &c. The testimony of clergymen, of district visitors, Bible and mission women, has convinced the committee that practical aid given to the poor to cleanse their homes is a valuable auxiliary to the truths inculcated in the tracts.

—"Practical Suggestions to all Inventors and Patentees and Purchasers of Patents." By Julius Hall, Consulting Engineer. Hall, Chancery-lane." This pamphlet contains a good deal of advice to would-be patentees, but, of course, not enough to enable them to do without the services of a consulting engineer.—"Statement relating to the Home and Foreign Trade of the Dominion of Canada; also Annual Report of the Commerce of Montreal for 1871." *Montreal Gazette* Printing-house, Craig-street." This

is a kind of supplement to a daily paper. It contains a great mass of information, more especially as to the agricultural trade of Canada, both inland, and with Britain and the United States, and the trade and commerce of Montreal.—"Esse and Posse: a Comparison of Divine Eternal Laws and Powers, as severally indicated in Fact, Faith, and Record." By Henry Thomas Braithwaite, M.A. Longmans & Co." This book deals with matters quite beyond our scope; but many of our early readers will remember Mr. Henry Braithwaite's name, and will be glad to know in what direction he is now working. It is a book of denials, and will please but few.—"The Clergy Directory and Parish Guide, for 1872 (Bosworth)," appears to have been carefully posted up to the present time.

Miscellaneous.

Improvements at Stepney-green.—Under the superintendence of the Metropolitan Board, the land has been laid out as an ornamental garden. The area is nearly 1,200 ft. in length, or nearly a quarter of a mile from end to end, with a clear air-space between the boundary-walls of the properties on either side, of more than 100 ft., the total extent, therefore, approaching three acres. The great length of the plot necessitated the introduction of several cross thoroughfares, mostly old rights of way. An iron railing, 7 ft. 6 in. in average height, with enriched spearhead ornaments to the standards and decorative scroll-work in bands at various levels, indorses the whole. Nine sets of gates, corresponding in character with the railing, open into various parts of the garden. The total length of railing is nearly 2,500 ft., carried out by Messrs. W. McFarlane & Co., of London and Glasgow. The railing is carried by a dwarf wall in brickwork, averaging about 1 ft. 6 in. to 2 ft. high, with a stone coping, executed, with the other building required in connexion with the undertaking, by Mr. High, of Clapton. A sufficient number of large and well-grown timber trees, especially at the upper end of the garden, give a due allowance of shade. The laying out of the ground has been arranged by Mr. McKenzie, the landscape gardener to the Board. Additional planting has been done by Mr. Weston, the shrubs, &c., being supplied by Messrs. Barr & Sugden. The general superintendence was vested in Mr. George Vulliamy, the architect to the Board.

A Church Burnt at Paddington.—A fire occurred in Paddington early on Saturday morning last, which ended in the almost total destruction of the Church of St. Mary Magdalen. This church was erected from designs, we believe, of Mr. Street, and cost about 30,000*l.*, exclusive of the roof, just being finished, which cost an extra 4,000*l.* Inside the decorations were costly, the reredos, in particular. The organ, valued at 1,600*l.*, has not been destroyed, on account of its being situate in the transept, which is protected by a brick and grained wall, but it is seriously damaged by water. The fire is said to have originated in the following manner:—The temporary roof has lately been superseded by the permanent roof, and between the slates of the latter and the beams supporting it was a coating of pitch. A workman was engaged in the completion of these arrangements, and was endeavouring to ascertain whether what had been done would interfere in any way with the bell, when the candle which he was carrying fell from his hand on to the pitch, which it immediately set on fire. The man gave an alarm at once, but the inflammable nature of the pitch spread the flames so rapidly that the whole roof was soon burning. There is something odd about this story, and we should not be surprised to find it incorrect. The pitch when it fell set light to the seats below, and thus the whole edifice was gutted. The altar and its fittings, worth 200*l.*, were saved.

Memorial Reredos for Stroud Church.—The reredos intended to be erected in Stroud parish church as a memorial of the late Mr. William Stanton by his sons is approaching completion. The work has been designed by Mr. G. Scott, jun. It is composed of freestone from Cooper's Hill and Ball's Green, and will be about 23 ft. in width and 11 ft. high. Each end has two arches crowned with carved canopies. The central part is divided into three recesses with canopies, in which will be groups representing incidents in the life of the Saviour.

House-Lifting in Chicago.—It is by no means an uncommon thing in the United States, as our readers know, for a house to be lifted bodily from its site and removed by machinery to a new one, without disturbing the inmates; but in Chicago the operation was extended to almost the whole of the city, in 1867-68. The early buildings were generally erected without any regard to the laws of drainage, and eventually, as the city increased in size, the evil became intolerable. By means of screws acting under balks of timber, one of the largest hotels, known as Briggs's, was raised to a height of 4 ft. 2 in. above its previous level, although the building had a frontage of 180 ft., a depth of 80 ft., and was five stories high, presenting accommodation for 450 guests, none of whom were disturbed during the operation. This took twenty-seven days, although the weight lifted was upwards of 22,000 tons. Tremont House, another hotel of a similar size, was also raised without accident. The screws employed were about 2 ft. long, 2½ in. in diameter, with a pitch of half an inch. They worked in cast-iron sockets, and were moved by handspikes. 1,450 such screws, and 600,000 cubic feet of timber, were used in raising Briggs's Hotel. A similar plan was adopted in July, 1868, at Boston, when whole streets of houses were raised in blocks of six houses together.

Wolverhampton Congress of British Archaeological Association.—The proceedings of the Congress will include, on Monday, August 5th, reception by the Mayor and Corporation and address of the President, at the town-hall; visit to the Collegiate Church and Danish Cross, and Pettenhall Church; inaugural dinner. Tuesday, excursion to Wall, the Eboracum of the Romans, Elford Church, Low Hill, Haselow Hall and Beaudesert; Lichfield Cathedral. Wednesday, excursion to Longhich, Giffard's Cross, Brewod Church, Blackladies, Boscobel, and Whiteclades; reception by the President, Church at Chesterton. Thursday, excursion to Uttoxeter, Croxden Abbey, Checkley Church, Stafford, St. Mary's and St. Chad's Churches, Penkridge Church. Friday, excursion to Ludstone Hall, Claverley and Quatford Churches, Bridgnorth, Castle Ruins, Bishop Percy's House, the Hermitage, Upton Cresset and Worfield Churches, Morville and Aston Eyre Churches; and Saturday, excursion to Dudley, examination of the Castle and Priory, Kinver Church and Kinver Edge. An additional excursion is suggested for Monday, August 12, to Leek.

The Castle Gardens, Rochester.—After some delay the works at the grounds adjoining Rochester Castle have been completed, and the castle gardens have now been formally thrown open to the public. A large amount of labour and no inconsiderable expense have been necessary in carrying out the desirable object of providing a pleasant retreat, in which the inhabitants of Rochester and the general public can spend their leisure hours. The entrance to the gardens is by a gateway leading from the Esplanade. To form this gateway a breach was made by a party of Royal Engineers in a solid block of ancient masonry, which forms a part of the castle wall, and the jagged edges of the breach have been rounded into a Norman archway. Passing under this arch, the visitor ascends a flight of massive stone steps into the gardens, and is confronted by Rochester Castle, which stands at the opposite end of the grounds, which seem to have been laid out with taste and judgment. We gave a view of those grounds in the *Builder* for last year, page 1007. A covered stand has been erected on a stone base, for the accommodation of bands of music.

A Clock and Chimes for Bradford Town-hall.—This building approaches completion. The committee of the corporation which has charge of the structure have agreed to recommend the council to place a clock and chimes in the tower of the Town-hall, and to accept the tender of Messrs. Gillett & Bland, of Croydon, for the execution of the work. Tenders were also submitted from Mr. W. Potts (Leeds), Messrs. E. Dent & Co. (London), and Messrs. Cooke & Sons (York). The clock will be illuminated. There will, in all, be thirteen bells,—four bells to strike the Cambridge quarters, eight bells for the chimes, and one large bell, 3 tons weight, to strike the hours. This bell will be heard in the night-time beyond the boundaries of the borough. Fifteen tunes may be played on the chimes, and this number can be readily increased.

The Thunderstorms.—Several thunderstorms have occurred since our last notice, and have done great damage over a large part of England, especially by floods. The lightning and thunder are described as something unusual, the lightning being in general more vivid and sustained, and in some cases almost continuous, and the thunder roaring rather than in rattling peals. Of the damages we cannot give any account, but we may state that at Merthyr Tydvil a large reservoir on the hill-side, above the Plymouth ironworks, burst its banks, and the village of Troedyrhiw, near Merthyr, was submerged to a depth of from 4 ft. to 5 ft. Two reservoirs burst at Middleton, in Heaton Park, and a parsonage-house was struck by the lightning,—the third or fourth instance, this season, of parsonages being struck, as many other houses have been. At Hanley, a flash of lightning passed through the Primitive Methodist school-room while the children were in it, the lightning entering by one open window and passing out by another without injuring one of them, although they were greatly frightened, and in their flight downstairs trampled on each other as they fell, but without serious injury.

The Re-building of Chicago.—A local paper, titled the *Landowner*, gives an idea in rough engravings of the great scale on which Chicago is being rebuilt. The Illinois Staats Zeitung is seven stories high, and five and six storied buildings are frequent. The Union Buildings in process of erection on the old site at Washington-street is a massive building; but the most palatial-looking edifice among those before us is the Singer Building, also in process of erection at Washington-street, for the Singer Manufacturing Company. There is a plain-looking building, with marble front, in Walsh-avenue, under no distinctive name. A speciality of many of those illustrated is a wide open staircase descending from the upper stories right into the street, without any gate or door to close it. There are illustrations of buildings in Michigan and Detroit in the same paper; as also plans for showing an extensive transplantation of large trees into the streets and avenues of Chicago; and others showing additional dock accommodation by canals branching from the Chicago river.

Extension of Brookwood Asylum.—Two of the Lunacy Commissioners visited Brookwood Asylum recently, and reported the necessity for immediate consideration by the justices of the county for making further provision for the insane paupers of Surrey. The report says:—"We would also repeat the suggestion of our colleagues, that no time should be lost in the erection of a permanent detached hospital for the reception and isolation of patients suffering from fever or other infectious disease." The workshops in progress of construction at the last visit are now in use, and the skittle-shed and bowling-green in the airing court attached, are nearly ready. In addition to the improvements noted in the report, plus for the new recreation-hall have been approved by the Commissioners, and the committee will soon decide on the contract. This hall, for the building of which 5,500l. were voted at Quarter Sessions, will be built in the north front of the asylum. The magistrates have already adopted to some extent the recommendations of the Commissioners.

The Stein Monument, Nassau.—On a hill-side in the ancient Duchy of Nassau, a monument has been unveiled representing a Prussian politician, who renovated the domestic institutions at a time of dire misfortune, and whose liberal reforms enabled the country to recover strength, and eventually defeat the foreign conqueror, Napoleon I. Henry von und zum Stein was a baron of the Empire, and sovereign of the territory surrounding his paternal castle in Nassau. The monument is a white marble statue, placed under a Gothic canopy; it somewhat resembles Sir Walter Scott's monument at Edinburgh. It is the work of Herr Pfabl, a rising Berlin sculptor, and admired as including a striking likeness of the well-known aquiline features and proud portly exterior of the man.

Narrow Speech Room.—A meeting of the General Committee, and of the General Purposes Committee, was held on Tuesday, July 23rd, to authorise the appointment of an architect and adoption of designs for the speech-room. It was resolved that the appointment of Mr. Burgess as architect be approved, and the Building Committee were requested to consider with him a modification of his designs.

The Stamford Terra Cotta Company.—Our advertising columns have already mentioned the incorporation of this company, and we gladly direct further attention to it. The object of the company is to purchase of Mr. Blashfield, the well-known terra-cotta manufacturer, the whole of his business, together with the plant, models, moulds, machinery, stock, and other effects; and, by an increase of capital, fully to employ and develop the present works. The business carried on is for the most part the modelling and making of moulded bricks for cornices and ornamental details for architectural decoration, and for the ornamentation of gardens, terraces, and conservatories. The stock of designs and models and moulds for works of a high class in this branch of manufacture, now in daily use at these works, is the largest in England. The most important decorative features in terra-cotta for public and other buildings in England, India, and other places, have been made at these works. The manufacture is so important that we shall hope to find it efficiently and successfully carried on.

Sewage Farms not a Nuisance.—The Corporation of Birmingham have had printed, in pamphlet form, the speech of Lord Henley, M.P. (chairman of the Select Committee of the House of Commons), on the Birmingham Sewerage Bill. In one part his lordship says:—"As a matter of fact the Earl of Warwick, so far from finding the sewage farms—one of which was only a quarter of a mile from his lordship's park, and the other within a mile—a nuisance, has made an application for an additional amount of sewage to be placed upon his land on account of its fertilising properties. No less than 2,000,000 gallons of sewage daily are spread over 500 acres of land, and yet it is no nuisance whatever. One of the sewage farms received the sewage from Warwick, and the other that from Leamington; and Lord Warwick is so satisfied with them that he has agreed to take the sewage at 450l. a year for thirty years. That shows that Lord Warwick considers the sewage farm there no nuisance, and that the plan which has been adopted to get rid of the sewage of large towns is one which ought rather to be encouraged than discouraged.

The Bristol City Surveyorship.—At a recent council meeting it was resolved to secure the sole services of a gentleman to do the duties of city surveyor, and the matter was referred to a committee to make arrangements in accordance with the resolution. The committee, however, resolved,—on Mr. Thomas's proposal to perform the duties, reserving a right to do certain private work, namely, valuations within the borough, and all kinds of professional work outside it,—to recommend this to the council. There were nine for entertaining Mr. Thomas's offer, and eight against it, one member not voting. The question will therefore again come before the council in its original form, as to whether or not the city is to have the sole services of its surveyor.

Surrey Toys and Wood Carving.—In reference chiefly to the immense sale of toys and wood carving from Germany in the Crystal Palace, at Sydenham, a correspondent of the *Surrey Advertiser* says:—

"I propose to make the county of Surrey celebrated for the production of such articles, and that meetings should be convened in all the towns, to appoint committees, raise subscriptions, and hire cheap buildings suitable for homes, playgrounds, and workshops, for boys from five to ten years of age, and the machinery for carrying the plan forward under a committee of management appointed for the purpose. The children having thus acquired the rudiments of some mechanical art, their services would be eagerly sought for as apprentices in various trades."

The New Townhall, Wotton-under-Edge.—This new edifice has been opened. The market-house has simply been restored, and the hall rebuilt. It is 55 ft. by 29 ft., and 20 ft. high, with two staircases at the ends, a gallery, and ante-room. The style is chosen, as most appropriate to the existing columns of the Market-house, is Romanesque, with a light-arched roof covered with Staffordshire tiles. The work has been carried out under the superintendence of Mr. C. Pritchett, architect; the contractors being Messrs. J. Whitfield & Son, J. & W. Jotchan, H. Holloway, and G. Parker, all of Wotton-under-Edge. The cost of the building, including seats, gas-fitting, &c., has been 500l.

Baker's Deodorising Closet.—This is an ingenious and useful invention which well deserves looking into. It is automatic in its action; and the moment the lid is down, its deodorising and disinfecting properties are in action.

The St. Olave's Guardians and the Architect to the Infirmary.—A dispute which has been for some time pending between Mr. Turner, architect, and the St. Olave's Board of Guardians, in reference to a claim by the former for commission, in connexion with certain alterations in the infirmary, has just been decided in favour of the architect, by the arbitrator (Mr. Harrington) to whom it was referred. The arbitrator has awarded Mr. Turner the sum of 700*l.*, and, in addition to this amount, the Union will have to pay the heavy legal expenses on both sides of the action, together with those of the special case and the arbitration.

Salthurn Convalescent Home.—Through the liberality of the Pease family, Salthurn-by-the-Sea will soon be in possession of a convalescent home. This structure has been erected at the sole expense of the Messrs. Pease, of Darlington, for their various workpeople who may require the benefits to be derived from change of air, careful nursing, and nutritious diet. It is expected that the works will be finished by the end of August, and as the building is quite dry, the patients will be able to be removed to it at once. Mr. Thomas Oliver, of Newcastle, is the architect.

The Workmen's Club and Institute Union.—The annual meeting of this society will be held at the Albert Hall this Saturday, July 20th, at half-past six p.m., Mr. Mondella, M.P., in the chair. The Workmen's Clubs in the provinces are invited to send up delegates to attend a conference to be held in the Lecture Theatre of the South Kensington Museum on the same date, at eleven o'clock a.m., for the purpose of discussing various questions relating to the Club movement in England; Sir Harcourt Johnstone, M.P., in the chair.

A Public Hall for Greenland (Halifax).—West Vale and Greenland have very much felt the want of a public room for meetings and entertainments, and also educational facilities for the working population after factory hours. A company has now, however, been formed for the erection of a building, as a Mechanics' Institute, which will not only furnish a good public room, but a series of class-rooms for educational purposes. The amount of capital to be raised is 2,500*l.*, and already nearly 1,200*l.* have been raised in 1*l.* shares.

The Heat in New York.—The *New York Tribune* of the 4th writes as follows of the intense heat in New York:—"The sixth day of dreadful heat has passed, and still there is no substantial relief. A million of people pant for a breath of cooling air. Poisonous exhalations rise from the festering streets. Gutters reek with fever-breeding stenches. Seventy persons dropped dead from the heat in a single day, and the hospitals are crowded with delicious victims. The night brings no rest, for it is as hot as the day. The wretchedness is universal."

Lime and Cement Works.—It is announced that the old-established business of Messrs. J. & W. Eastwood, as lime, cement, and brick manufacturers and merchants, carried on for many years at Wellington Wharf, Belvedere-road, and Canal Bridge Wharf, Old Kent-road, has been joined by several gentlemen, and has been registered as a limited liability company. The business will in future be conducted under the style of "Eastwood & Company (Limited)."

The Proposed Building on the Embankment at Westminster.—The Metropolitan Board of Works are about to negotiate with the St. Stephen's Club trustees as to their projected building at the corner of the Victoria Embankment, opposite the Houses of Parliament, with the view of purchasing the land, and so obviating the erection of a large edifice which would hide part of the Clock Tower from view on the Embankment.

Improvements in All Saints' Church, Maldon.—The chancel roof is being coloured with a coating of blue, studded with golden stars. The walls of the chancel are also to bear a continuation of colour, which is to be changed with a quiet pattern of ancient devices. These additions are said to accord with the style of the church, as restored a few years ago from the designs of Mr. William Adams (then a resident architect).

The Prison Progress.—The proceedings have closed and we shall probably have to revert to them. We have no particular praise to give for the way in which they have been managed; but good has, nevertheless, been done.

A Tunnel under St. Martin's-le-Grand.—The City Commissioners of Sewers have been informed by Mr. Ayrton, First Commissioner of Works, that the Government are about to construct a tunnel under the roadway in St. Martin's-le-Grand, so as to form a means of communication between the two post-office buildings in the street, and that the Office of Works are prepared to pay the sum of 4,450*l.*, the estimated cost of diverting the sewers.

Lambeth Water Supply.—In reply to Colonel North, who asked whether, in consequence of the report of the medical officer of the Lambeth district, means were likely to be adopted to oblige the Vauxhall Water Company to furnish pure water, Mr. C. Fortescue said that the necessary notices would be issued, and that if these were not attended to the legal powers held by the Board of Trade would be put in action.

The Birmingham Sewage Injunctions.—Sir Charles Adderley and "the Gravelly Hill Relators" have served upon the town clerk of Birmingham, writs of injunction, prohibiting their present sewage works. It is said that the expense incurred by the council in connexion with the Sewage Bill, which was thrown out in the Commons, is no less than 70,000*l.*

Society of Arts.—Technological Examinations.—His Royal Highness Prince Arthur will preside at a Conference on this subject to be held at the Rooms of the Society in the Adelphi, on Saturday, July 20th, at twelve o'clock. Merchants, manufacturers, and others interested in the movement are invited to attend.

The Agricultural Labourers' Question.—Mr. George Mitchell, of the Brentford-road, has thrown himself resolutely into support of the movement for obtaining increased wages for agricultural labourers, a much-needed step, and has made a number of effective addresses in various parts of the county.

Proposed Police Station, Shipston-on-Stour.—A plan for building a new police station at Shipston, at a cost of 1,200*l.*, with a room over the cells, at an additional cost of 200*l.*, gave rise to considerable discussion at the Warwick Quarter Sessions. Ultimately the Court adopted the plan, and decided to proceed with the work.

Warrington.—At a meeting of the town council of Warrington, held on the 2nd inst., the council unanimously resolved to allow Mr. R. Vavser, their borough surveyor, to undertake private practice.

Offices of the London School Board.—Mr. Macey's timber-yard on the Thames Embankment has been cleared, ready for the foundation of the offices of the London School Board. Lucky Mr. Macey!

Egyptian Hall.—Professor Pepper and Mr. Tobin have added to their attractive entertainment here short dramatic readings by the well-known and admirable actress, Mrs. Stirling.

TENDERS

For Wesleyan Methodist New Connexion chapel and schools, Hucknall Torkard, near Nottingham, exclusive of foundations and stone walling. Mr. John Collyer, architect:—

Booker.....	£2,184 0 0
Vickers.....	2,075 0 0
Green & Ripper.....	1,998 0 0
Blandall.....	1,914 0 0
Underwood.....	1,814 0 0
Hlad.....	1,820 0 0
Vessey & Burton.....	1,910 0 0
Attenborough.....	1,988 0 0
Shepperson.....	1,834 0 0
Jelly.....	1,850 0 0
Evanson & Goulter.....	1,880 0 0
Andrews (accepted).....	1,805 0 0

For additions and alterations to Peterley House, Great Missenden, Bucks. Mr. John H. Raffety, architect. Quantities supplied:—

Timpson.....	£1,068 0 0
Waller.....	1,013 0 0
Child.....	976 16 0
Johnson.....	957 10 0
Waterson & Co.....	870 0 0
Lovell & Co.....	785 0 0
Batchelor (accepted).....	680 0 0

For additions to and alterations at the Workhouse, Watford Union. Mr. A. Allon, architect:—

Ford.....	£1,762 6 0
Elliot.....	3,480 0 0
Chadwick.....	3,156 0 0
Sharpington & Cole.....	3,120 0 0
Holland.....	3,036 0 0
Wegstaff & Son.....	2,908 0 0
G. & W. Pattinson.....	2,840 0 0
G. & J. Waterman.....	2,794 0 0
Allen & Son.....	2,568 0 0
Hatley (accepted).....	2,520 0 0

For new schools, at Crowcombe, near Taunton, Somersetshire. Mr. Robert Swain, architect. Quantities not supplied:—

Norse & Llewellyn.....	£791 0 0
Barker & Jordan.....	785 0 0
Langdon.....	775 0 0
Dinham.....	759 0 0

Accepted for the Edgewise Holme National Schools. Mr. Harry Percival, architect:—

Escorcroft, Draining, and Brickwork.....	£620 0 0
Parkinson & Son.....	620 0 0

Carpenter, Joiner, Plasterer, Slater, Plumber, Painter, Glazier, and Iron Work.

Roberts.....	503 0 0
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For new mixed and infants' schools for 200 children, and residence, at Ashington, parish of Bothal, Northumberland. Stone, bricks, timber, and lime given by the Duke of Portland. All cartage provided by the tenants. Mr. F. R. Wilson, architect:—

Hogarth (accepted).....	£688 8 3
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For new mixed and infants' school for 60 children, and residence, at Ashington, parish of Bothal, Northumberland. Stone, bricks, timber, and lime given by the Duke of Portland. All cartage provided by the tenants. Mr. F. R. Wilson, architect:—

Hogarth (accepted).....	£478 17 6
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Accepted for additions to farm-house, Rockmoor, Northumberland, for the Rev. R. W. Bosanquet. Cartage supplied by the tenant farmer. Mr. F. R. Wilson, architect:—

Mason's Work.....		£237 0 0
Sample.....		263 0 0
Short & Son.....		73 7 8
Plumber's and Smith's Work.....		65 10 0
Thompson.....		22 17 6

For two forty-five quarter maltings, at Horncastle. Mr. Geo. Seaman, architect. Quantities by Messrs. Curtis & Son:—

Deduction if Malting Store is not carried out.....		£359 0 0
Hinton, Brothers.....	£5,256 0 0	1,021 0 0
Ryton.....	7,079 0 0	1,122 0 0
Hobson & Taylor.....	6,550 0 0	1,104 0 0
Walker & Hansman.....	6,496 0 0	1,084 0 0
Pattinson.....	6,145 0 0	1,000 0 0
Walls (accepted).....	5,820 0 0	1,000 0 0

For rebuilding premises, 45, High-street, Whitechapel. Mr. W. W. Browne, architect:—

Turner & Sons.....	£2,043 0 0
Bridgman, Nathall, & West.....	1,998 0 0
Hockley.....	1,795 0 0
Eaton & Chapman.....	1,638 0 0
Bunor.....	1,594 0 0

For alterations to two houses in Lambeth. Quantities not supplied. Mr. L. Soloman, architect:—

Bridgman, Nathall, & West.....	£378 0 0
Palmer.....	512 10 0
Turrel.....	376 0 0
James.....	345 0 0

For alterations and additions to house in Little Moorfields. Messrs. E. Woodthorpe & Hill, architects. Quantities supplied:—

Turner & Sons.....	£1,068 0 0
Prince.....	1,019 0 0
Perry, Brothers.....	961 0 0
Osprey & Co.....	883 0 0
Pritchard.....	917 0 0
Bridgman, Nathall, & West.....	893 0 0

For new tavern, High-street, Whitechapel. Mr. W. W. Browne, architect. Quantities supplied:—

Turner & Sons.....	£2,043 0 0
Bridgman & Co.....	1,928 0 0
Hockley.....	1,795 0 0
Eaton & Chapman.....	1,636 0 0
Bunor (accepted).....	1,594 0 0
Luxford (too late).....	1,570 0 0

For building public elementary schools and residence at Aberystwyth. Messrs. Szlumper & Aldwinckle, architects:—

Design A.....		Design B.....
Williams.....	£1,100 0 0	£3,920 0 0
Davies.....	3,643 0 0	3,365 0 0*

* Accepted.

For external drainage, filling up ground, and forming playgrounds, to the new public elementary school, Aberystwyth. Messrs. Szlumper & Aldwinckle, architects:—

Design A.....		Design B.....
Davies.....	£430 0 0	£340 0 0
James.....	393 0 0	330 0 0
Williams.....	320 0 0	392 0 0*

* Accepted.

For school, master's house, and boundary walls, at Horley, Middlesex. Mr. E. H. Martland, architect. Quantities by Mr. W. B. Catherwood:—

School and Master's House.....		Boundary Walls.....
Dore.....	£2,238 0 0	£225 0 0
Mann.....	2,063 0 0	226 0 0
Trenshaw.....	2,059 0 0	230 0 0
Lacey.....	2,044 0 0	137 0 0
Rixford.....	2,039 0 0	215 0 0
Scrivenner & White.....	1,956 0 0	194 0 0
Kelly.....	1,923 0 0	165 0 0
Haley.....	1,875 0 0	218 0 0
Maulny & Rogers.....	1,817 0 0	173 0 0

Welsh Chapel, Southwark Bridge-road.—Mr. T. T. Greaves wishes us to say the quantities were supplied by himself.

TO CORRESPONDENTS.

H. L. (building shall be illustrated). R. J. W. (an advantage which is to arise fifty years hence is worth very little in present money)...

All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

Notiz.—The responsibility of signed articles, and papers read at public meetings, rests of course with the author.

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Ashton & Green, Slate, Iron, and Marble Merchants, and Quarry Agents, keep the largest and best selected Stocks of Bangor, Portmadoc, Green Roofing Slates, Slate Slates, and every description of Slate Goods, Marble and Enamelled Slate Chimney-pieces, Stoves, Ranges, Rainwater Goods, and General Castings.

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THE CITY and COUNTY BANK, LIMITED, 33, ABchurch Lane, Lombard-street, E.C.—This Company, being now in active and successful operation, was established for the purpose of transacting every kind of banking business...

THE STAMFORD TERRA COTTA COMPANY, (BLASHFIELD'S) LIMITED.

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A. M. JEAFFERSON, Clerk. Bridewell Hospital, July 15, 1872.

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CRYSDON LOCAL BOARD OF HEALTH. APPOINTMENT of ASSISTANT to SURVEYOR.—Notice is hereby given that the Local Board require the SERVICES of a competent person to act as ASSISTANT to the Surveyor of the Board. He must be capable of taking surveys and levels, and be a good draughtsman, and expert at figures. Salary, 100l. per annum.—Applications, accompanied by testimonials, to be sent to me by FOUR o'clock on FRIDAY, the 26th JULY inst., to Mr. J. CHEESWRIGHT, Clerk of the Board. Town-hall, Croydon, July 17, 1872.

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The Builder.

VOL. XXX.—No. 1538.

*The Character and
the Career of
Thomas Brassey.**

WHATEVER be the form of the literary memorial of Mr. Brassey, few men have ever left behind them such ineffaceable monuments of their career. A noble Latin sentence, which has been displaced from its apposite locality in the recent attempt to "improve" the choir built by Sir Christopher Wren, bade the reader who sought for the monument of that great architect, to look around. There are few regions of the world in which a similar advice might not be given to the person who asks for

the monument of Thomas Brassey. There are two modes, in either of which the biography of the great railway-maker and the history of his works, might have been worthily written. The subject might have been treated as a chapter of the engineering and industrial history of the world; or it might have been so dealt with as to present a clear and luminous view of a life and character remarkable for a combination of the qualities which command success with those which attract esteem. Either view, taken from a proper standpoint, would have possessed extraordinary interest. Mr. Brassey contributed, in his own department, more powerfully than any other man has done, to the progress of the greatest physical revolution that has occurred in the relation of man to the earth which he inhabits. Commencing with a clear and intelligent description of the condition of the British Islands, and of other parts of the world, at the time when it was first discovered that a smooth wheel would adhere to a smooth rail with sufficient tenacity to enable it to become an instrument of propulsion, such a work, as we describe, would have pointed out the great changes effected in the commerce, the social activity, and even the structural appearance of old cities, like Chester, Norwich, Peterborough, by the founding and prosperity of new centres of activity, as at Crewe, Swindon, Wolverton; and, finally, in the great architectural transformation which is now in progress in the metropolis itself. It would have probed the great problems of labour, and shown how great a revolution has been effected in the condition of the labourer by the two great elements, facility of transport, and facility of intelligence. It would have shown how the development of pith, and muscle, and skill, attendant on the introduction of organised work, good pay and generous diet, has raised the standard of manhood in our outlying counties;

it would have inquired how the different faculties and powers of men of different races and blood have been tested and utilised, and whether the strong English labourer, when well taught and well paid, can work more cheaply, because more rapidly and efficiently; than the weaker and lower paid Frenchman, or Italian, or Hindoo; it might have pointed out, not as matter of forecast or theory, but as the outcome of the experience of the lifetime of a generation, how immense an industrial, commercial, social and military revolution has been commenced by the locomotive—a revolution that bids fair to pass the limits of the material order of things, and to find its reflection and its counterpart in our views of philosophy, of political science, and of religion: all this, from the philosophical observer, who should have accompanied Thomas Brassey in his long and numerous journeys, and looked on the quaint and varied experiences of his active life, might have come out with a force and a truth that should have crystallised into a great book a memorial not unworthy of the subject.

Or, again, the task might have been attempted, not as a mere ordinary biography, but as a study of character of a high and unusual order. It would have traced the active development of qualities which are as rare as they are at once simple and noble, as much to be coveted for the welfare of nations as to be respected and admired in their unostentatious and conscientious exercise. Perhaps no biography is calculated so much to modify an ordinary definition of genius as that of Brassey. Of that quality, as we ordinarily define it, his character must be taken as almost wholly destitute. He had little of the extraordinary mechanical insight and invention of the Brunels, the species of genius most akin to his occupation. The inspiration of the artist, of the architect, of the musician, of the orator, of the revealer of the secrets and laws of nature, were foreign to his eminently practical mind. But in him common sense rose to proportions that may be termed heroic; shrewd, practical forethought ever hit the right mark; and, above all, an integrity, a generosity, a true kindness, and thus an inherent nobility of character were evident, to which we should feel it to be hard to point out a parallel. To trace the biography of such a character, to show how greatness, in influence and in wealth, came almost unwooded to the man whose first thought was the upright discharge of the duty and the obligations of the day, and how, in refusing all those short cuts and sharp grasps at wealth, power, and fame, which were inconsistent with the higher ideal of his life, Brassey, almost in his own despite, became rich, and powerful, and famous, would have been to contribute a golden lesson for the delight and the instruction of our descendants.

Sir Arthur Helps has given us a book that is eminently readable, and that, no doubt, will be read by thousands with pleasure. He has not attempted either of those graver methods of treatment to which we have referred. He commences his preface by acknowledging, as principal coadjutors, no less than thirty-six persons; and, indeed, the more fresh and striking portions of the volume are extracts from communications thus supplied. Of the special character of Mr. Brassey's occupation, his biographer has, evidently, no very distinct personal knowledge. Thus, when he speaks of the origin of railways, the distribution of contracts, and the organisation of labour, it is easy to trace the marks of an attention only recently directed to the subject. Much appears to be thought novel, or to be reproduced as original, that would be far more nervously and succinctly expressed by a writer more familiar with the profession of the engineer. We do not say that there is much that is absolutely incorrect; but we will cite one curious passage, as illustrative of our meaning:—"The English, very early in their career of railway construction, bethought them of the excellent idea of filling up

the hollows from the heights—without any intermediate operation." Such is hardly the language to be expected in an account of the life of a great railway-maker. Again, in the account of barrow-work; in the comparison of French, Italian, and English workmen; and in the reference to that well-known and admirable invention, now superseded by steam, the horse-run (which is not even mentioned by name), the man familiar with engineering work finds a strange inaptitude of phrase. At times, indeed, this unacquaintance with the technical part of his task betrays the author into positive mis-statements; at times, into self-contradiction. Thus, we are told (p. 27):—"Moreover—and this is a most important point—the system of 'sub-contracts' had not been devised, or, rather, had only been partially and slightly adopted." On the London and Birmingham Railway, under Robert Stephenson, sub-contracts, at the time referred to, were in as full operation as at any subsequent period. Again, we find (p. 96) a statement intimating the existence of an equality of the value of unskilled labour in different countries. But in Canada we are told "wages were very high. A man who received 5s. in England *per diem* would receive 7s. 6d. *per diem* in Canada. This difference in the rate of wages was caused not only by the scarcity of labour, but by the circumstance that, in Canada, out-of-door work is impossible for four months in the year." Equality of value and 50 per cent. difference in daily pay rather differ! The real pith of the matter is this. Absolutely unskilled labour is costly and extravagant, whatever be the nominal rate of wages. Whether it were on the public works of Ireland during the famine; on the first introduction of railways into Wales, and remote districts of England; or in the early experience of our engineers in France, in Belgium, and in Italy, the then prevalent low wages, the level of which they were fiercely assailed for disturbing, were simple expedients for the useless dribbling away of money. Each untaught labourer, man, woman, or child (for they set all to work in the first instance), was merely a paid idler. But the skill necessary to fill a wagon is of a low order. In two or three months it can be respectably attained; in six or eight, with good oversight, and, quite as important, with sufficient food, a raw-boned, shambling bumpkin can be made into an admirable wagon-filler. But to toss over his shoulder sixteen cubic yards of earth in the day, the labourer must be paid an adequate price. The human machine requires not only practice, but fuel. The first we call skill, and it is to be communicated, by good organisation, in a wonderfully short time. The second requisite implies the adaptation of a definite mechanical cause to produce a definite mechanical result; and it may be measured in grains of gold as well as in grains of carbon.

The most interesting portion of the book is the twenty-first chapter, consisting of Mr. Thomas Brassey's recollections of his father. With this should be coupled the first chapter, entitled, "A Brief Outline of Mr. Brassey's Character as a Man of Business," and some portions of the twenty-second, on "The Close of his Life." In those the author of the volume, although labouring under a somewhat regrettable tendency to digress from the matter in hand, speaks under the control of personal knowledge. The character, which is illustrated by many a passage interspersed in various parts of the book, is well described (p. 316) as "of a somewhat perfect kind." In this fact lies not only the charm of the volume, but, we are bound to add, its chief claim on public acceptance. "In truth," says Sir Arthur, in perhaps his happiest sentence, "Mr. Brassey was in mind one of those happily constituted and well-proportioned men who show forth a certain completeness of nature." Our readers will take a pleasure in lingering with us over the traits which justify

* Life and Labours of Mr. Brassey. By Arthur Helps. Bell & Daldy, 1872.

such a remark. They are to be picked up by the way, rather than met with as combined in a well-conceived portrait; but a certain charm attaches even to the inartificial form of the record.

The first characteristic mentioned by the biographer is Mr. Brassey's great trustfulness. "He chose his agents with great care and with consummate judgment. After he had chosen them, he placed implicit trust in them." "He looked to results, not vexing or wearying those who served under him by minute and tedious criticisms." To this ought to have been added that he *did* keep his eye on results, and that his trustfulness, noble in its loyalty, was neither blind nor sleepy.

His liberality in the conduct of business is acknowledged by all who knew him. Mrs. Brassey, whose sorrow for her loss has received such unusual consolation in the universal sense which has been entertained of its magnitude, says the great capitalist the unusual, but not undeserved, compliment of calling him "a most unworldly man." The wealth which came to him ungrudging, was but a fair return for his continued exertion, for the labour, no less than for the intelligence, which he devoted to his business. "He laid out seventy-eight millions of other people's money, and upon that outlay retained about two millions and a half." "There were periods in his career during which he and his partners were giving employment to 80,000 persons, upon works requiring seventeen millions of capital for their completion." In the continuance of "a career involving such anxieties and such labours, the consideration of the provision that it enabled him to make for so many friends and dependants, was one that was ever influential in his mind.

A consideration for the feelings of others, springing from a natural kindness of heart so genuine as to amount almost to a fault, was connected with a love of justice that was thus tempered and ennobled. If there was partiality evinced by him in any case of difficulty, it was a partiality that was the antithesis of selfishness. Perhaps no life, in modern times, has been such a daily illustration of the golden rule. Mr. Brassey had taken a leaf from the teachings of St. Louis, or rather from the same source whence that illustrious saint and king derived his own simple wisdom. "He asked me," says the *Sire de Joinville*, "if I wished to be honoured in this world, and enter Paradise through death. I answered yes; and he said to me, 'Keep yourself, then, from doing or saying anything wittingly which, if all the world knew it, you would not avow, and say, 'I did this; I said that.'" Mr. Brassey acted on this rule. He expressed it in a phrase more suited to the nineteenth century, and to the *salutis ratio* of but too many Englishmen. "How would that look?" he used to say, as to anything of the justice of which he had a doubt, "to twelve men in a box?" Perhaps this mode of putting it was more intelligible to his auditors than the motives suggested by the French king. The first wish intimated has been amply fulfilled. It is not for us here either to discuss, or to doubt, the fulfilment of the second.

Truth, regulating his own life, and therefore making him truthful, kindness and hatred of contention transforming justice often into liberality, outspoken integrity,—these are the moral elements of a noble character. With these may be noted those social virtues which partly spring from a happy and healthy organisation, and are partly of a moral origin. Such were a calm and equable temperament, a generous temper that never grieved for loss, and that found stimulus in danger, a presence of mind that was equal to the most unexpected emergency, and a courtesy that was of that grand old school that is now rarely to be found. Of the qualities of the mind, his forththought, decision, courage, perseverance, we are left to form our own estimate from that evidence to which most men are now accustomed to look, unreliable as it often is,—the evidence of success. That is one main defect in the book. Into the imaginative side of the character of a man so eminently practical, his son gives us a welcome peep. "He felt a great delight in the beauties of nature." He would diverge from a business journey to visit a beautiful country. His enjoyment in travelling in a hill country was invariable. He used to visit the churches, the public buildings, the picture galleries of the cities to which his engagements called him, with the keenest interest. He had an especial love of sculpture. He took great delight in fine paintings. He evinced excellent judgment in his admiration of architecture. He

appreciated both the art and the industry of the worker in faience. He loved to row round a fine vessel, and to compare her floating curves to those of the true model of the shipwright, the water-fowl. He was a fastidious and excellent critic of public speaking. He urged on his son not to neglect, for the lessons best enforced by the schoolmaster, the eminently English *fiat* accomplishment of good reading aloud. His hospitality was kind and genial. With no time for reading, he had the royal faculty of making those with whom he talked read for him, and of gleaming the course of daily events from conversation. Perhaps the greatest defect of his character was, that his hobby was subservient to, instead of being without, his daily life. He thus missed that refreshment, which, by diverting the action of the brain into an entirely fresh channel, a hobby is calculated to give to the mind. "Correspondence was his hobby."

Disposed as we are very generally to agree with the author on the various topics on which he takes occasion to express his private opinion, we should have gladly seen the space filled by those digressions devoted to some of those details of the life and works of Mr. Brassey of which we have so few given, in proportion to their actual number and magnitude. A large amount of sheer hard work was required in order to enable any writer to form a well-digested view of the character and history of such a man, a toil which demanded more time and leisure than appear to have been at the command of the author. Thus, in its collection of scraps and extracts, the book may be said to resemble the nest of the rat rather than that of the bee—the neat model, as Bacon well taught, of the work of the literary man; a style not to be rivalled by the happiest combinations of the skill of the ant and of the spider, of the compiler and of the essayist.

Our readers will perhaps wish for an abstract of the form and contents of a book, for the appearance of which many of them will have looked forward with interest. The first chapter attempts an outline of Mr. Brassey's character as a man of business. According to the rules of historic, or serious biographical writing, this character should be made to reveal itself in the course of the narrative, as is the case in real life; any summary or sketch being reserved for the conclusion of the volume. There is, however, a far more serious fault in this chapter, and one which pervades the entire book. The true figure of Mr. Brassey, as a man of business, is never brought before the reader at all. We hear much, and with much pleasure, of the fine moral traits of his character; but if any young man, anxious to emulate such a successful career, asks "What were the main elements of that success?" he will ask in vain. Of the rare business qualities of the man, of the sound rules of conduct which he laid down for his own guidance, which were, in many respects, peculiar to himself, and to which he adhered with undeviating consistency, we have not a hint. What is said of his trustfulness, of his mode of keeping accounts, and of his reliance on memory rather than on record, is such, taken by itself, as to give the idea of a weak and slovenly man of business. Nothing could be further from the mark; but the counterbalancing elements, the sound sagacity, the untiring industry, the penetration which seized on main points, and thus safely allowed detail to be committed to an organised staff, are by no means brought into due relief. For the conduct of his large business, Mr. Brassey laid down certain maxims, without which he would soon have been nowhere. We look in vain for a hint of anything of the kind in the book. On the other hand, matters which form the very A B C of the railway contractor are mentioned as if they were special instances of the skill of Mr. Brassey. Sir A. Helps repeats the worn-out phrase of Mr. Brassey being a representative man. He was eminently the contrary; he was unique in his calling. The means by which other men made their wealth were only in part his means; and the chief interest of his character, as a subject of imitation, lies in the manner in which the kind and liberal virtues, which usually distinguish the distributors from the acquirers of wealth, were blended, in his life and practice, with the keener qualities of his intelligence. It would be very charming if kindness and liberality alone would ensure success, as the author seems to think they might. Few men, no doubt, had their good qualities so highly developed as Mr. Brassey; but we could name those who have, and who, owing to their very want of vulgar "push," while they were not gifted with any

unusual business insight, have remained always in obscurity.

Eleven chapters are devoted to Mr. Brassey's character and career. Nine chapters are headed with the names of several of his most important works. But the works of Mr. Brassey are not more clearly grasped than his character. This chapter viii. begins with the promise, "in this chapter will be described one of Mr. Brassey's most important enterprises, namely, the formation of the Great Northern Railway." For description, however, the reader will look in vain. Some good practical, though by no means original statements, as to details of work in fen districts, and a hint that "certain difficulties arose as regards the financial part of the undertaking," form the chapter. From the chapter on the Grand Trunk Railway of Canada, no idea of the character of that disastrous speculation can be formed. The chapter on the Argentine Railway, to which readers would turn with eagerness for information as to the peculiar character of the contract, commences with informing us that the author has "for a long time thought that South America offers the finest opportunities for emigration and colonisation," and goes on to point out what these advantages are—a matter entirely foreign to the theme of the book. The extremely unsatisfactory character of the volume, viewed as a record of the labours of Mr. Brassey, may be judged from the fact that the only list given of his works makes no reference whatever to the essential element of their cost! We are left perfectly uninformed of either the individual or the aggregate magnitude of his undertakings, with the exception of the above-quoted reference to the sum of seventy-eight millions sterling.

The illustrations of the book are poor. There is a hieroglyphic on the cover unintelligible to us—containing a spade such as is not used for railway work—and a frame to which we can annex no meaning whatever. The most interesting print is a view of Bulkeley Old Hall, a charming example of timbered work; but we are not told whether it is the existing or the former house. The photograph of Mr. Brassey is said to be taken from a sketch; but it has the worst defects of camera distortion. The left side of the face and forehead are out of drawing, the line of the mouth is out of parallel to that of the eyes, and the alae of the nose are far too coarse. To those who remember the cheerful smile of the man, his features may be recalled by the portrait; but it can give no adequate idea of him to others.

We repeat, that the work before us is a readable book. It may be read with pleasure by many who have no practical acquaintance with engineering works, and no curiosity as to financial combinations. Our main cause of complaint is, first, that readers may go away with the idea that they have read the life or comprehended the character of Thomas Brassey; and secondly, that we fear there is reason to conclude that the publication of this sketchy and digressive volume will deprive the public of such a serious account of the life and works of Mr. Brassey as would be at once an honour to his descendants and a valuable source of instruction for our own.

THE STONE IMPLEMENTS AND ORNAMENTS OF PRE-HISTORIC MAN.

AFTER the manner and practice of savans in the older branches of scientific exploration, archaeologists are now dividing and subdividing their peculiar subjects into various threads of inquiry. The history of man in remote ages, as told by the dwellings and caves he inhabited, the rude monuments he has left, the tools, weapons, and ornaments that belonged to him, and his interments, is no longer one vast field, but has been cut up into allotments, so to speak, and in each of these allotments, spade in hand, or otherwise, antiquaries have set themselves to work up the particular evidence it contains. Thus, as we have recently noticed in these columns, Dr. Keller has exclusively occupied himself with the lake-dwellings; Mr. Tylor has investigated the correspondence of the habits of modern savage people with such traces of ancient customs as pre-historic relics afford; Mr. Fergusson has looked at the rude stone monuments and their bearings; and, again, the Rev. Canon Greenwell, season after season, untiringly, opens the grass-grown tumuli on the bleak moors and hills, and sunny sandy downs, to wrest the secrets of the dead from them. And now we have to notice the first work of extent upon another division of

the subject.* Mr. Evans, the hon. sec. of the Geological Society, has produced a handsome volume, treating only of the stone implements, weapons, and ornaments used and worn by early inhabitants of Great Britain.

Those of our readers who act upon our recommendation to study this substantial tome, and its four hundred and seventy-six wood-cuts, representing flint and other stone implements, will be amazed at the number of these objects that recent researches have accumulated. They will feel, however, as we do, that this quantity would be enormously increased if village libraries and mechanics' institutions familiarised every one with the forms of these rude tools and weapons, whose occupation brings them in constant contact with the soil, either in tillage or constructive works. Gravel passes in great loads through the hands of labourers, who, if thus instructed, might add to the relics of man lying in the earliest time yet certified, but who, for want of information, doubtless now pass for accidental natural resemblances, many rude bone and stone implements, or fragments of them, that collectors would, perhaps, value at their weight in silver. The weapons and tools of the bronze and iron periods are far less likely to be overlooked than those to which Mr. Evans has now drawn special attention.

The diversity of these ancient implements and ornaments will be another source of surprise. The flint arrow-head and celt that had formerly, in small museums, to content themselves with the fellowship of a few stuffed birds and fishes, a Chinese slipper or two, a tray of butterflies, and a dish of coins, are now ranged in companionship with rows of coeval objects, illustrative of the same people who discharged the one from their bows and wielded the other with their rough hands. Not only, too, is there a greater variety collected, but there are several differences in the same class of objects observed. The arrow is found to have been leaf-shaped, heart-shaped, lozenge-shaped, sometimes almost triangular-stemmed, and also stemmed and barbed. The celt, again, is found to have been some times long and narrow, sometimes widened at one or both ends. Sometimes it is found rough-hewn, unsharpened, and unsmoothed; sometimes ground at the edge only; and sometimes well formed and beautifully polished. The rough-hewn celts may have been the property of early generations of the same people, or they may have been reserved for coarse and heavy purposes, while the polished implements may have been kept for comparatively light work. The volume before us will materially aid the elucidation of this and similar uncertainties. All the relics are engraved on the scale of half an inch to the inch, and front and side views, as well as sections, are given.

Nearest akin to the celt are picks, chisels, gouges, axes, hammers, hammer-stones, grinding-stones, whet-stones, saws, scrapers, and awls or drills, all being implements used for the performance of various kinds of work. More removed are the weapons, which consist of javelins, sling-stones, balls, and lance-heads, besides the numerous varieties of arrow-heads. Many miscellaneous articles have been found that cannot be placed with either of these groups, such as spindle-whorls, discs, weights, and cups. And then we have the further division of personal ornaments, such as buttons, studs, necklaces, beads, pendants, bracelets, rings, and amulets. Specimens of these objects are figured, and minute descriptions given of them, as well as of the places in which they were found.

Mr. Evans has chosen to work up the stream of time. It is impossible, he considers, at the present stage of our knowledge, to begin at the beginning, for this has not yet been found, and no one knows where to look for it. He does not accept the views of the Abbé Bourgeois as to the occurrence of the remains of man in the Pliocene beds of St. Prest, near Chartres, and in the Miocene beds at Thenay, near Pontlevoy, but considers it probable that human relics will eventually be found in older deposits than the quaternary beds of river drift. Consequently he takes up his subject at the time originally distinguished by the Danish antiquaries as the Stone Period, and delving deeper and deeper, comes to the Cave Period, and after that to the dim, faint, mute traces of man in the River Drift. Though, as we have seen, this is by no

means the probable limit of man's antiquity, it takes us back into a hoary time, so remote that we can scarcely calculate by any method the number of centuries that have passed away since the sun shone upon it. The best way to realise the great age of the beds containing the remains of the old quaternary fauna, is to contemplate the changes that have taken place in the configuration of the land since their formation. "Who," asks Mr. Evans, "standing on the edge of the lofty cliff at Bournemouth, and gazing over the wide expanse of waters between the present shore and a line connecting the Needles on the one hand, and the Ballard Down Foreland on the other, can fully comprehend how immensely remote was the epoch when what is now that vast bay was high and dry land, and a long range of chalk downs, 600 ft. above the sea, bounded the horizon on the south?" Again, he points to the high terraces at Ealing, Acton, and Highbury, and bids us look over the valley four miles in breadth, with the River Thames flowing through it at a depth of 100 ft. below its former level, in which, beneath our feet, are human relics deposited at the same time as the gravels; and then remember that the traditions of the country do not carry us so far back as the close of the time when a bronze-using people occupied the island; that beyond this period was a time when man used only stone implements; and beyond this again, when the species of animals known to him were not in existence, and there were the mammoth, and woolly rhinoceros, and other strange forms moving about in the forests and swamps; and that all these periods must have intervened since the excavation of the valley. "It is impossible," he sums up, "not to sympathise with those who, from sheer inability to carry their vision so far back into the dim past, and from unconsciousness of the cogency of other and distinct evidence as to the remoteness of the origin of the human race, are unwilling to believe in so vast an antiquity for man as must of necessity be conceded by those who, however feebly they may make their thoughts known to others, have fully and fairly weighed the facts which modern discoveries have unrolled before their eyes." But sympathy does not prevent Mr. Evans making his long journey into the past very systematically; and, judging from the large number of references given in foot-notes, very carefully.

Looking at superstitions as remnants of extinct faiths which have survived down into an altered state of things, he thinks we may turn to early religious customs and rites to ascertain whether we have grounds for our belief in the antiquity of the use of stone implements. He points out that the ancient Egyptians, when practising the rite of embalming, cut the body open with a sharp Ethiopian stone, although they used a crooked piece of iron for the removal of the brain. Another rite performed with a stone knife was that of circumcision. The Romans ratified a solemn treaty with the sacrifice of a pig by a flint stone. And that the Greeks regarded flint arrow-heads as charms, we may ascertain from the beautiful gold necklace, of Etruscan or Greek workmanship, now in the British Museum, from the centre of which depends an arrow-head set in gold. The fact that flint implements should be held as valuable in classical times and should be used in religious rites in the days of the ancient Egyptians, appears to him to be due to the sequence that makes ancient objects discarded from every-day use at first venerable, and at last holy, and thus points conclusively to a far antiquity.

Before describing the various flint implements of the three periods—surface or neolithic, cavern, and river gravels, which last are linked together by Sir John Lubbock as archæolithic or palæolithic—Mr. Evans endeavours to show the method of their manufacture. He visited Etkingham, in Suffolk, and Brandon, on the borders of Norfolk and Suffolk, and there witnessed the process of production of gun-flints. The flint is first procured by sinking small shafts into the ground until a band of the right quality is found. The condition is the next matter of inquiry, for flint that has lain long on the surface is thought to be intractable, and that which contains too much moisture is also difficult to work. Five tools, only, are used, and of these four are hammers. The workman selects his block of flint, and breaks it by means of a quartering hammer. Then, holding one of the pieces in his left hand, in such a manner that one end of it can rest on a pad placed for the purpose on his thigh, he detaches splinter after splinter from it with a flaking hammer. Each flake is then fashioned by the knapping

hammer and a fixed chisel. Simple as this process appears, it has its difficulties. First, the blow of the flaking hammer must fall exactly in the right place; and, then, its intensity must be so proportioned that it shall not shatter the flake it has chipped off. But, with a little practice, 300 flint implements of a definite form can be produced in the course of a day with the tools at present in use. The ancient flint-workers, however, did not possess these advantages. They had to work with stone tools. When they desired to form a hatchet, they reversed this process, and, instead of splintering off the flakes they required and throwing away the core as useless, they shaped the core and threw away the flakes from it as refuse. Mr. Evans gives the following interesting particulars of the exploration of the seat of an ancient flint manufactory at Grime's Graves, near Brandon, by Canon Greenwell—

In a wood at this spot the whole surface of the ground is studded with shallow, bowl-shaped depressions, from 20 feet to 60 feet in diameter, sometimes running into each other, so as to form irregularly-shaped hollows. They are over 250 in number, and one selected for exploration was about 28 feet in diameter at the mouth, gradually narrowing to 12 feet at the bottom, which proved to be 30 feet below the surface. Through the first 13 feet it had been cut through sand, below which the chalk was reached, and, after passing through one layer of flint of inferior quality, which was not quarried beyond the limits of the shaft, the layer known as the "floor-stone," from which our flints are manufactured at the present day, was met with at the bottom of the shaft. To procure this, various horizontal galleries, about 3 feet in height, were driven into the chalk. The excavations had been made by means of picks formed from the antlers of the red deer, of which about eight were found. The points are worn by use, and the thick bases of the horns battered by having been used as hammers for breaking off portions of the chalk, and also of the nodules of flint. Where they had been grasped by the hand the surface is worn smooth, and on some there was a coating of chalky matter adhering, on which was still distinctly visible the impression of the cuticle of the old flint-workers. The marks of the picks and hammers were as fresh on the walls of the galleries as if made but yesterday.

Similar flint manufactories are to be seen at Cissbury, near Worthing, on the Sussex Downs, near Eastbourne, and at Preshyng and Spixwates on the Continent. From these and other centres the implements would be, probably, bartered away to those who had not learnt the knack of making them, or did not possess a supply of flint. In the north and west parts of Britain, where flint is scarce, various metamorphic and eruptive rocks were employed in its place.

An important class of relics is the perforated axe, or hammer, which has a hole made in it for the insertion of a haft; and much speculation has been indulged in as to the manner in which the hole was made. Some holes are thought to have been worked out with the pick; others may have been bored by the rotatory motion of a drill, hollow or otherwise; others are supposed to have been made with a pointed stick and sand and water. In Scotland, these stone hammers were called purgatory hammers down to the close of the last century, and were supposed to have been buried with their owners, so that they might thunder at the gates of purgatory till they were opened. In Sweden they are sometimes called Thor's hammers, and are thought to have been used by the valiant "war-smiths" of old as weapons as late as eight or ten centuries after our era. They, like all the other classes of objects, present many forms. These holes, too, are in various positions, some being in the centre, and others at different distances from it. And one perforated hammer has been found near Corwen, Merionethshire, covered with reticulated ornamentation. For minute particulars, we must, however, refer our readers to the volume before us.

We must pass, rather, to a slight notice of the examples of the more curious implements known as scrapers, which are supposed to have been used for scraping hides, preparing leather, scaling fish, making pins, and other small articles of bone. Some hundreds of these scrapers have been found on the Yorkshire moors. They are about the size of small oyster shells, and of horse-shoe, kite, discoidal, and duck-hill forms. On the downs, near Berling Gap, a few miles west of Eastbourne, Mr. Evans has found as many as twenty of them, in various degrees of perfection, within an hour. They are found in barrows, on the surface of the ground, and in and near ancient encampments. Frequently the edge is worn away as though by friction, sometimes completely, sometimes only sufficiently to remove its sharpness, and only on one part of it. These examples, we may be almost certain, have been used for scraping comparatively soft substances. But others are found with their edges battered and chipped to a greater extent than can be attributed to the wear of any amount of scraping. These, the author suggests, have

* The Ancient Stone Implements, Weapons, and Ornaments of Great Britain. By John Evans, F.R.S., F.S.A. London: Longmans, Green, Reader, and Dyer. 1872.

been used for striking a light, or procuring fire. "I have," he says, "already mentioned that, for the purpose of producing sparks, pyrites is as effective as iron, and was, indeed, in use among the Romans. Now the lower beds of our English chalk are prolific of pyrites, though not to the same extent as the upper beds are of flint; and it is not impossible that the use of a hammer-stone of pyrites, in order to form some instrument of flint, gave rise to the discovery of that method of producing fire, the invention of which the old myth attributed to Pyrodes, the son of Clix." Several pieces of pyrites have been found in early British barrows, in association with these circular-headed scrapers, and there is, apparently, no reason why we should not accept the suggestion that fire was procured by their means.

Another curious implement belonging to these old times, and to the same unknown, ninth century people, is the borer or drill, which is only a flat splinter of flint chipped away by concave curves into a tapering blade at one end, with a sharp point. The wide end of the flat piece of flint serves wherewith to hold it. These rude borers make true holes, it has been ascertained. Mr. Evans has bored perfectly round and smooth holes, through both stag's horn and wood, with flint flakes illustrated; and the late Mons. E. Lartet drilled the eye of a bone needle with an ancient flint borer found in one of the French caverns. By means of these sharpened flint flakes, the early people, whose tools we are now examining, perforated stag's horns, teeth, shells, fossils, and pierced the eyes of their bone needles. They have been found on the Yorkshire moors, in Derbyshire and Suffolk, Ireland, France, and Denmark.

It is a somewhat singular circumstance that the same feeling that prompted the Greek or Etruscan lady to wear a flint arrow fastened to her necklace, has caused people of many nations to regard this implement of prehistoric warfare and hunting with awe. Mr. Evans has strung together several instances in which a supernatural origin has been assigned to them. The Italian peasant calls them *lingue di S. Paolo*, and when he is so lucky as to find one, falls down on his knees, devoutly picks it up with his own tongue, and joyously preserves it. In some parts of Italy they are considered preservatives against harm from lightning; and in the isle of Elba they have been seen mounted in silver for amulets, as in Scotland and Ireland. In Scotland, if we may credit the writers of the Stuart period, they were supposed to have dropped from the clouds, because they were found, not by means of diligent search, but now and then, when least expected, and on beaten roads. Robert Gordon, of Straloch, goes farther than his contemporaries in details respecting them, affirming that they were sometimes found one day where there were none the day before, and that once a man and woman, riding, each found one in their clothes to their great surprise. In the north of Ireland, Sir W. Wilde has observed, they are supposed to be fairy or elfin darts, used by those tiny beings to shoot cattle. This view of their origin prevails, also, in Derbyshire. Aldrovandus points out their resemblance to a man's tongue, and adds they grow not upon the ground, but fall from heaven on the eclipse of the moon. Evidently they belonged to a people concerning whom not a tradition survived, or they would not thus be ascribed to elves. The chapter in which they are treated is full of interest.

There is one object found in the same class of graves as those from which many of the last-mentioned relics have been taken, the use of which is not so clearly made out. It consists of a thin oblong plate of slate, convex on one side, and concave on the other, about 5 in. or 6 in. long, and between 1 in. and 2 in. wide, perforated with a hole in each angle. One specimen found in a tumulus in the Isle of Skye, formed of pale green stone, polished, has an ornamental border composed of slightly indented ovals at one of its shorter ends; but this is a solitary example of enrichment. The others are polished, but plain. Another that we should mention specially was found in a harrow on Roundway Hill, near Devizes, in front of the breast of a skeleton, between the hones of the left forearm, with a small fragment of bronze, like the tang of a knife, adhering to it. The position of this specimen, taken in connexion with the oblong rounded form of all of them, has suggested to the Rev. Canon Ingram that they were braces, or guards for the left arm when using the bow and arrow. Mr. Evans approves of this solution of the speculation as to their use, and would accept it as

unassailable, if it were not that some of these plates have also been found on the right arm. The late Lord Lonsborough examined a harrow near Driffield, in 1851, in which, as we have heard him relate, he found a contracted skeleton, on whose right arm was "a very singular and beautiful armet, made of some large animal's bone, about 6 in. long, and the extremities, which were a little broader than the middle, neatly squared; in this were two perforations about $\frac{1}{2}$ in. from each end, through which were bronze pins or rivets, with gold heads, most probably to attach it to a piece which had passed round the arm, and been fastened by a small bronze buckle, which was found underneath the bones." Perhaps, however, there may have been an error in observation here, or the term right was inadvertently used instead of left. The only other explanations of their purpose which have been attempted are suggestions that they may have been charms, amulets, or ornaments; or they may have been made to equalise the size of cords by drawing them through the holes; but these do not seem to fit in so well with all the details as the supposition that they were used as guards.

Mr. Evans tells us he hesitated to include the ornaments found in the same interments as stone implements and weapons, because they appear to be nearly all belonging to the time when stone was nearly superseded by bronze. We are glad that he ultimately decided in their favour, as they are of peculiar interest. They bring before us the wives and daughters of the warriors whose weapons we have inspected, and are, in fact, a priceless illustration of the dim, far-away time these relics bring before us. There are no sparkling gems among them, no stone thrown into relief like a cameo, or incised like an intaglio, but, nevertheless, we learn from them that the ancient British beauty donned her necklets, bracelets and rings, as does her representative of to-day. But every ornament was not set aside to intensify female attractions. Many consisted of buttons, rude, irregular, and certainly not of attractive appearance which, from their size, we may conclude were worn by men, or used by them for a practical purpose. These have been found in interments of very early dates. "The usual shape," says the author, "is that of an obtusely conical disc, in the base of which two converging holes are drilled so as to form a V-shaped passage, through which the cord for attachment could be passed. These buttons, or studs, are formed of different materials, but most commonly of jet or shale." Bone, amber, ivory, and, very rarely, gold, have been used in the production of some of the more complicated ornaments, besides jet and shale. Beads are a common vehicle of ornament. Of various sizes and materials, and arranged in different patterns, they appear to have performed many offices. The thong or cord on which they have been strung has generally perished long before they have been exhumed; hence the exact position of the various portions of an ornament is occasionally difficult to make out; and it is to be feared that some of the whole number of beads are often lost. But, just as it is possible to outline a complete skeleton from one bone, so the archaeologist can make out the design of a necklet, or other ornament, from observation of a small portion of it. Some necklaces are formed of a mixture of jet and amber, and consist of jet beads and amber plates of graduated sizes to maintain them in rows one below the other, of forms so similar to those in use in the present that no mistake can be made concerning them. In one necklace, found by Mr. Bateman in Derbyshire, the plates were made of ivory; in another, they were made of Kimmeridgian coal; in another, there were 3-8 thin laminae of jet, fifty-four cylindrical beads, and eighteen conical studs and perforated plates of jet and bone. The heads are not always spherical, but quite as frequently long and thin, and larger in the centre than in the extremities. The pendants which drooped from these ornaments on to the bosoms of the wearers were of various forms. One, found by Mr. Lucas, in Derbyshire, resembles an eye-glass composed of three circles instead of one. The armlets of this period are also of great interest. The rings do not appear to have been worn upon the fingers, judging from their size, but to have been either brooches, or ornaments suspended from necklets or chains. Certain pebbles, too, appear to have been counted as ornaments, or valuables. In a harrow, near Everley, in which a heap of burnt bones was surrounded by a wreath of horns of the red deer, a small red pebble was found amidst the ashes with five

stemmed and barbed flint arrow-heads. A beautiful pink pebble was found in a kist at Brecon. Quartz pebbles are frequently found in ancient burials. Some of these are large enough to be sling stones. Others may have been thrown into the grave in token of respect, just as we now deposit *immortelles* upon coffins and tombstones. In India, Mr. Evans points out, the mystic Salagramma pebble, placed in the hand of the dying Hindoo, is considered a sure preservation against the pains of eternal punishment. With what awe, with what agonizing hope, may these pink, and red, and quartz pebbles have been placed in the tombs of these unknown, unremembered dead!

We have not yet touched upon Mr. Evans's review of the Cave and River-Drift periods. For the former we have, in England, centres in Kent's Cavern, Brixham's Cave, Torquay, the Wooky hyena den, the Gower Caves, and King Arthur's Cave, Whitchurch. But notwithstanding this *richesse*, Mr. Evans runs through the equally well-known Continental caverns, and arrives at the conclusion that we must agree there were two periods of cavern occupation,—a Mammoth period and a Reindeer period. French antiquaries go farther, and speak of four ages of occupation. The first, when all implements were large, broad, and rough, and made of flint, to the almost total exclusion of bone, and when mammoths and hyenas abounded; the second, when implements were more leaf-shaped and less clumsy, and the horse had made its appearance; the third, when scrapers were abundant, denoting more care in the preparation of skins, and, perhaps, the use of fire, bone implements common, and ornaments made of teeth of animals, ear-bones of horses and marine shells; and the fourth, when flint implements were well shaped, and included saws, dart-heads, harpoon-heads, and needles, when works of art began to appear on them and on the walls of the caves, and when birds and fish were abundant. The main fact that has impressed the author as he has studied this part of his subject, is the certainty that long before the Stone period had come to an end, there was a complete change in the *fauna* of these islands. Men were working in and with stone and bone, whilst the brown bear, the cave bear, the grizzly bear, the cave hyena, the cave lion, the Irish elk, the reindeer, the urus, the bison, the woolly-haired rhinoceros, and the mammoth, were prowling about; and were still humbly and patiently working with the same materials after many of these creatures were extinct, and others occupied their haunts. Forty-eight species lived in the earliest time in which it is known that man hunted and wrought, and of these only thirty-eight were able to live on into the later Stone period. Six more species subsequently died out, and the rest we have still among us. This fact is used as an argument in favour of the acceptance of a belief in the long duration of the earliest Stone period. For all the details, for all the clever marshalling of forces, and accumulation of evidence in favour of this view, we refer the reader to the work itself.

We find as much interest in the information Mr. Evans has collected concerning the drift period. Thirteen years have now elapsed since the discovery of the valley of the Somme first called removed attention to this period of antiquity. Since then numerous similar remains have been found in various parts of England, for the most part embedded low down in deep beds of gravel, sand, and clay, on the slopes of our river-valleys. In one of these beds, at Biddenham, Bedford, about sixty specimens of flint implements have been found. In another, at Brandon, Suffolk, some hundreds have been collected. Besides implements, these beds contain bones of animals which have been, like them, washed or carried there by water. So far, bones of the elephant, rhinoceros, hippopotamus, hyena, bear, bison, stag, horse, and ox have been discovered in the drift. A cell found in the gravel at Biddenham weighs rather more than 1½ lb, and has been chipped into shape both at the butt-end and at the point, showing that it must have been mounted in some handle for use. But another, smaller, has the natural crust of the flint left at the wide end, as though left to afford a comfortable hold. The original owners of these relics, also possessed scrapers, rude choppers, arrow-heads, knives, spear-heads, and lance-heads, all of flint. So far, no bones of human beings have been found in the drift, if we except the portions of a skeleton which were found in the neighbourhood of Paris, about the antiquity of which

some doubt is entertained. But the absence is accounted for by Sir John Lubbock by the calculation that, as man lived by the chase, he would require a proportion of 3,000 animals to one person: consequently, when so few remains of animals are found, it is not surprising that there should be none of man. Moreover, all bones that have hitherto been found on the gravel-beds are larger than those of human beings.

Mr. Evans has expressed a modest fear that his accumulations of hare facts may appear dull. But they do not do so. The period of which he treats is not an age of cloth of gold, purple, and fine linen; but it is a time of surpassing interest, and there is more to be seen in the dimmed sheen of the old flint implements he has represented than in many a magic crystal.

IRON AS A MATERIAL OF CONSTRUCTION.

It is highly characteristic of the present age that one of the most perishable substances with which nature supplies us should be almost exclusively employed in structures which are intended to last for centuries, and which were formerly built of stone, brick, or timber. This extensive use of iron arises from the cheapness at which it can be obtained, and the great facility with which it can be worked into any required shape. It must, however, be borne in mind that any structure of iron, if exposed to the action of air and water, will rapidly become worthless unless protected by a coating of some less oxidizable metal, or by having its surface constantly painted. In the case of such large national monuments as Westminster and Blackfriars Bridges, the author of the work before us* considers that a more durable material should have been used, and that "the handsome stone structures of London and Waterloo Bridges will be the glory of the nation centuries after their flimsy and cheap iron rivals have rotted away." The object of this book is to supply engineering students with reliable information on the nature and properties of iron, so as to facilitate the acquirement of practical knowledge on the subject.

There are three great divisions under which the material called iron is usually classified—malleable or wrought iron, steel, and cast iron; and of these there are endless varieties both as to quality and character.

Iron is never found in a chemically pure state, but always in combination with foreign substances, which it is the business of the manufacturer to get rid of as far as possible, as it is the presence of these impurities which deteriorates the metal. The ore, which is an oxide of iron, is first heated in a blast-furnace with limestone and coal or coke, the carbon from the latter combining with the oxygen of the ore and allowing the molten metal to flow away together with a "slag" composed of the earthy matters of the ore united with the limestone. The slag being light can be drawn off from the top of the molten metal, which afterwards runs out of the bottom of the furnace into furrows made in sand, and broken up into convenient lengths called "pigs."

Chemically pure iron, even if it could be obtained, would be much too soft for purposes of construction, and it is therefore necessary that a small quantity of carbon should be always combined with the metal to render it hard and strong; the proportion in which carbon combines with iron varies from $\frac{1}{4}$ per cent. to 6 per cent. In order that iron may be malleable, or readily worked by the hammer, it must not contain more than $\frac{1}{2}$ per cent. of carbon; and from this proportion up to 2 per cent. of carbon in combination gives us steel. If more than 2 per cent. of carbon is present, we obtain cast iron, the brittleness of which increases with the proportion of carbon with which it is impregnated, 6 per cent. being the highest that it is possible to combine with it.

The minerals, silicon, sulphur, and phosphorus, are found combined in greater or less proportion with all iron, and these impurities must be got rid of as far as possible, since their presence tends to weaken the metal.

Malleable iron is obtained from the "pig" by the process of "puddling," or exposing the molten metal to the action of the air, by which the greater part of the carbon is carried off, the metal being stirred until the above-named impurities are got rid of, and a spongy character is

imparted to it. The iron is then removed from the furnace to the squeezer, or hammer, by which the remainder of the slag is forced out, and the metal can then be placed between rollers and drawn out into flat bars. When bars or beams of large size are required, the puddled bars are piled up together, heated to a welding temperature, and passed several times through grooved rollers, the size of the groove diminishing each time until the required shape and size is obtained. By this means bars of any required section and length can be obtained.

Cast iron is obtained by merely remelting the pigs, and pouring the metal into sand moulds made to any required form. The quality of the metal is improved by frequent meltings, which remove the impurities, and for good work third melting should be used; and the strength is also increased the longer it is kept in a state of fusion. It is desirable to mix the pigs from different ores, as well as those obtained from different workings.

To obtain great hardness, the castings must be chilled or cooled rapidly, the surface metal which cools first being always harder and closer in texture than the interior where the castings are of large size.

The tensile strength of cast iron, or its power to resist a direct strain applied to stretch it in the direction of its length, is small as compared with its crushing strength, as well as with that of malleable iron; 7 tons being about the average force that will break a bar 1 in. square, although some bars that have been carefully prepared and kept in a state of fusion for several hours, bore double this amount of strain. It is in its resistance to crushing that the great value of cast-iron as a building material lies; experiments upon a large number of cylinders, $\frac{3}{4}$ in. diameter, and 13 in. high, gave the crushing strength per square inch, from 25 tons to 54 tons, or an average of 38 tons, the specimens shortening from 1-10th to 1-20th of their length before crushing; the ultimate tensile strength was found to be about 1-6th of the crushing, the elongation being about $\frac{1}{100}$ of the length.

The transverse strength of cast-iron beams is very variable, being greater in proportion in those of small size than in large castings. No sensible diminution of strength takes place in cast iron, if heated up to 600° Fahr., but beyond that temperature it gets rapidly weaker.

The ratio of the "working strength" of cast-iron to its ultimate strength, is as 1 to 3, or 1 to 4, for a stationary load, and 1 to 6 for a moving load, as in the case of a railway bridge. If the load is kept within the working limits, a beam of cast iron does not lose strength by a continuation, however long, or a repetition however often, of the same load.

The average specific gravity of cast iron is 7.1, or it weighs 7,100 oz., or 443 lbs. per cubic foot. One cubic inch weighs $\frac{1}{16}$ lb., so that to find the weight in pounds of a casting divide the number of cubic inches it contains by 4.

The great advantage of cast iron is that it can be made into any required shape; and when many copies of the same form are wanted, they can be supplied at a very moderate cost as compared with malleable iron. It has, however, the disadvantage of not being trustworthy, and liable to unsoundness from unequal contraction in cooling, which causes some parts to be more dense than others; this can only be provided against by allowing an excess of strength in the castings. Its brittleness also unfits it for use where it would be subject to heavy concussions or sudden changes of load; this can, however, be obviated by a process of annealing, which produces malleable cast-iron, the castings being first made in the usual way from soft and pure charcoal pig, and kept red-hot for some days in powdered red hematite ore, by which most of the carbon is extracted, and the metal is converted into malleable iron; the expense, however, of this process prevents it from being used for any but small castings, of which a large number are required. Cast iron does not oxidize (rust) so readily as wrought iron, when exposed to the weather, but the continued action of seawater is to convert it into a soft porous mass, which readily crumbles to pieces.

Although the ultimate resistance of cast iron to crushing is about six times that to extension, yet with moderate strains, such as 5 tons per square inch, they may be considered as nearly equal for practical purposes, the alteration of a bar being between $\frac{1}{100}$ and $\frac{1}{200}$ of its length, so that 5,500 tons may be taken to represent the modulus of elasticity, or that force which would

be required to extend a bar 1 in. square to twice its length, or compress it to half its length supposing the elasticity could remain perfect.

Wrought or malleable iron is the metal in its purest condition, and with the greatest proportion of carbon and other foreign matters removed in the process of manufacture. When a wrought-iron bar is broken by a tensile strain, applied in the direction of its length, it contracts in sectional area at some point before fracture, the amount of contraction depending on the quality of the metal, and being as much as 50 per cent. in some specimens. The average resistance to fracture, or tensile strength, is about 25 tons per square inch of original section, and no wrought iron ought ever to be allowed in a structure which will not stand at least 20 tons per square inch.

When a compressive force is applied to wrought iron it will stand about 9 tons per square inch before any perceptible change takes place in the form, but beyond this it becomes distorted, and yields like a lump of lead, its ultimate crushing strength being about 16 tons per inch. The tensile strength of rolled plates is 10 per cent. less across the grain or direction of fibre than with it, and the ductility is about one half.

Wrought iron may be considered as perfectly elastic as long as the tensile strain does not exceed 10 tons per square inch of section, the metal returning to its original shape and size when the strain is removed without any "set" or visible change of form; beyond this amount the extension becomes permanent, the limit of elasticity being passed, which may safely be taken at about half the breaking weight. If a slight permanent set is produced when a load is first put on, this set will not be increased by any number of repetitions of that load, but each time the force is removed it will return to the form it assumed after the first loading, provided the limit of elasticity is not passed. For every ton of load per square inch up to 10 tons the extension is $\frac{1}{1000}$ of the length.

When wrought iron is subjected to a compressing strain it is reduced $\frac{1}{1000}$ of its length for every ton per square inch up to 13 tons, beyond which the amount of compression increases more rapidly; so that up to the limit within which this material ought to be strained in practice, whether in tension or compression, it may be assumed as perfectly elastic, the modulus being 10,000 tons per square inch of section.

The toughness of wrought iron renders it useful for railways, machinery, armour defences, and wherever capability of resisting shocks and irregular strains is required; there is, however, great variety in the hardness of the metal, the soft irons being considered most valuable for withstanding heavy concussions or vibrations.

When a piece of wrought iron is broken suddenly it generally presents a crystalline fracture, but if the force is applied gradually the appearance is fibrous or silky; the fibres are, in fact, the crystals drawn out by the process of rolling or hammering. A crystalline fracture indicates hardness, while a fibrous fracture is a mark of softness and ductility; the finer and more uniform the crystals the higher the quality of the metal. As might be expected from the process of manufacture, the specific gravity of wrought iron is higher than of cast, being usually taken at 7.68, a cubic foot weighing 480 lb., and a plate 1 in. thick 40 lb. per foot super. A bar 1 in. square, and 1 yard long, weighs 10 lb.; so that the weight of a lineal yard of any section of bar is found by multiplying the square inches in the section by ton.

It is generally found that large masses of forged iron do not possess the relative strength of smaller ones, from being irregular in texture. Rolling improves the toughness more than hammering does, the latter processes hardening it, but at the same time rendering it more brittle.

Wrought iron can be case-hardened by heating it for some days in contact with bone-dust or other animal substance containing carbon; by this process the surface becomes converted into steel by the absorption of carbon.

If heat is applied to wrought iron its strength is not affected as long as the temperature does not rise above 350° Fahr., but beyond that it begins to lose strength. When the temperature is reduced very low the metal becomes less flexible and more brittle, so that its deflexion under a given load is diminished, but at the same time its liability to fracture is increased.

The decay of iron arises from the joint action of air and water, the oxygen from which combines with the metal, and forms a hydrated ses-

* Iron as a Material of Construction; Lectures at the Royal School of Naval Architecture. By William Pole, F.R.S. Spon, London, 1872.

quioxide, called rust. The prevention of rust in iron has received but little attention from chemists, but is a subject of the highest importance when we consider the enormous amount of exposed ironwork in modern structures, whose only protection is a coat of paint, which must be renewed every year to prevent loss of strength; hence there is a constant expense entailed for keeping up iron structures, and preventing them from falling into a dangerous condition. The process of coating with zinc, called galvanizing, can only be applied to small bodies: the surface is first cleaned with dilute acid, and then dipped in a bath of melted zinc, which prevents oxidation for a considerable period.

It is very important that the practical man should be acquainted with the varieties of malleable iron in the market, as they differ as much in quality as in price. The Swedish iron, being smelted with charcoal, is very fine, pure, soft, and tough, but is mostly used for making steel. The highest class of irons for structural purposes is the "best Yorkshire," made at Lowmoor, Bowling, and Farnley, which is noted for uniformity in texture, toughness, and soundness, and, on this account, the price is double that of the common iron.

The ordinary qualities of iron are generally known under the name of "Staffordshire," although often produced in Wales and Scotland, as well as the midland counties generally; of this there are three varieties, known as common, best, and best best, according to the strength and toughness.

The work before us is a valuable one to all who desire to become acquainted with iron—both as to its merits and demerits; but the author would have made it more complete by adding a chapter upon the manufacture and qualities of steel, a material which is likely to become an important building material, since the facilities for its manufacture are daily being increased.

LAMBETH PALACE AND THE HOUSES OF PARLIAMENT, AND THE LAMBETH POTTERIES.

The complaint of the Archbishop of Canterbury, made to the Home Secretary, and also by his Grace to the House of Lords, has been admitted by Mr. Secretary Bruce to the Lambeth vestry, and some practical steps to abate the alleged nuisance are likely to be the result. The archbishop's complaint is to the effect that the vapour of muriatic acid, emanating from the potteries, poisons the atmosphere, causes decay of the stone in the neighbouring buildings, and is highly prejudicial to health. The archbishop further states that the stone of Lambeth Palace has been greatly injured by it, and that it is well known that the decay of the limestone of the Houses of Parliament is attributable to the same cause. This communication having been considered by the vestry, they directed Dr. McCormack, their medical officer, to make an examination and report upon the subject. This report, which was submitted to the vestry at their last meeting, contains some interesting facts as to the effect of the vapour from the potteries on Lambeth Palace and the neighbouring buildings. After giving it as his opinion that the vapour in question (hydrochloric acid gas) is not injurious to health, and that, in his opinion, the vestry, as a nuisance authority, have no power to deal with this portion of the archbishop's complaint, the medical officer goes on to say:—"On the other hand, the allegations made by his Grace as to the effects upon the stone of the Palace and vegetable life are perfectly correct. It is a well-established fact that one part in ten thousand of hydrochloric acid gas will destroy a full-grown shrub in a short time. As regards its action upon the stone of the Bishop's Palace there can be no doubt. I subjected a portion of stone I obtained, after several days of dry weather, from the Palace, to chemical tests, and found, even in the very centre of the specimen examined, sufficient traces of the acid to satisfy me of its being the cause of the decay. I may here remark that the stone of which the Palace is built is peculiarly soft and porous, and very readily absorbs the acid, there being in this stone a large quantity of carbonate of lime, which is most readily acted upon by the acid." As regards this portion of the Archbishop's complaint, the medical officer leaves it to the legal adviser of the vestry to recommend what action, if any, can be taken. In continuation he then says, "As respects the

decay of the stone of the Houses of Parliament, I am not in a position to say whether or not it has been caused by the action of these gases; it is, however, a remarkable fact that portions of the Houses facing Parliament-street and the parks, and not therefore so likely to be acted upon by the depositing of this acid, suffer as much from decay as the river frontage."

A very long discussion, as to the course to be adopted by the vestry, followed upon the reading of Dr. McCormack's report, and it was ultimately resolved that the report be printed and circulated among the members prior to any ulterior steps being taken. It appears, however, that the proprietors of the potteries are themselves about to move in the matter, for the medical officer further stated that in reply to a suggestion from himself as to whether it was possible to suggest any means by which these gases could be condensed or prevented passing into the atmosphere, Mr. Doulton stated to him that he purposed consulting a first-class engineer, who was also a good chemist; and that on his mentioning the matter to the other manufacturers, they all expressed their willingness to co-operate with Mr. Doulton.

HEALTHY HOUSES.*

Mr. Eassie says the task he set himself in writing this book was to give the best information, and the results of the most recent inquiries, on all questions pertaining to this subject, and to write a popular treatise which should embrace all the sanitary requirements of a modern habitation, at a price within the reach of every one; and this he has done. All kinds of drain-pipes, traps, gullies, basins, water-closets, earth and ash closets, the ventilation of house-drains and soil-pipes, the construction of water-cisterns and filters, damp-proof and fire-proof constructions, the heating and ventilation of rooms, and the construction of cooling-houses,—all these things necessary to a modern habitation are fully described. If, however, more space had been given to the requirements of the poorest class of houses, and less to those of mansions, it would have been better. Those who build "good houses" can well afford to take and pay for professional advice in these matters (although they often fail to do so); while those who build houses for workmen to live in seldom ask this advice, and if the information could be given in a shilling book in an intelligible form, it would be a very excellent thing. Nevertheless, this little treatise is a very meritorious one, and useful more or less to the builders of all kinds of houses, as well as to their occupants. With the information it conveys—and it may be relied upon as sound and authentic—the tenant of a house who, either in his own person or in his family, may have suffered from the sickness caused by defective drainage and defective construction of the house he lives in, may find out the cause of it himself, and should then insist upon the landlord doing to the premises those things which are necessary to his health, and perhaps even more necessary to the health of his family, seeing that they probably spend more of their time in the house than he does.

In the matter of trapping and ventilating house-drains and soil-pipes, we are glad to see that the author takes the same view that we have always taken, and insists upon the necessity of ventilating pipes being carried up of the full size of the soil-pipe to a point above the roof of the house, and that the waste-pipes from kitchen and scullery sinks, as well as from baths, should be made, wherever practicable, to discharge into a trap outside the wall of the house.

"All theories of drainage which fail to inculcate the absolute necessity of the ample ventilation of drains and sewers are worse than useless,—they are even dangerous. So are all schemes which rely solely upon what is called trapping. Drainage without ventilation is erroneous; trapping without proper ventilation is illusory." . . . "The plain rule is this, at the head of every drain, or at the end of every ramification of the drain, fix an upright tube of as near the area of the drain-pipe as possible, but at all events not less than half its bore." (This should have been half its sectional area.)

"If a sink or wash-basin must communicate with the drain, care should be taken to carry a ventilating-pipe from the waste-pipe into the open air, and, if necessary, up to the roof."

* Healthy Houses: a Handbook to the History, Defects, and Remedies of Drainage, Ventilation, Warming, &c. By William Eassie, C.E. Simpkin, Marshall, & Co. 1872. Price 1s.

Like everybody practically acquainted with this subject, Mr. Eassie sees the absurdity of trying to ventilate the sewers of a town by a few tall shafts or furnaces, or by fans.

If the author should be called upon for a second edition, we would suggest to him the propriety of giving an example of the proper manner of draining "cottage property"—a fine name for a most wretched class of houses in towns,—for the foul gas that arises from drains and sewers is not attracted by persons' pockets, but by their lungs, and is as injurious to the labourer as to the merchant.

Within the last few years it has been insisted upon by the local authorities of certain towns, that every house-drain shall be ventilated at its head, or at the highest part of its system, by a pipe of considerable diameter, that is, from 3 in. to 4 in., carried up above the roof. This ought to be a general order throughout the country, and in course of time we hope it will be; in the meantime it behoves those who write upon this subject to remember that the inhabitants of a few well-drained houses, living in the midst of or near to large numbers badly-drained, will not gain much by their attention to their merely personal requirements and comfort, if the others are left without attention.

Where a town authority, by steady perseverance in breaking down the obstructions that are always raised by self-interested persons, ignorant of the benefits of proper drainage and water supply, has succeeded in getting over the "dead point," and getting a majority of the houses well drained and the drains well ventilated, the rest follows easily. But it is such uphill work for a local town authority to be always fighting with the inhabitants (or certain portions of them, rather), in order to get anything done, that they often never get over the dead point, or reach near to it.

If an individual is counselled to adopt in his house such means as have been proved by experience to be the proper ones to be adopted, he looks around him and says,—“What use? Why should I do what you do not make my neighbour do? Let all do alike, and then I shall be agreeable.” Here, then, we urgently want imperial legislation, and it is not too much to say that we must have it. We have plenty of Acts of Parliament, plenty of statutory law on the subject; but they are like so many bones over which lawyers wrangle, and those who look on and are waiting for the result become bewildered with their uncertainty of action.

The general Acts point out the necessity of house-drains being ventilated, but the framers of special local Acts have been allowed, while professing to incorporate general Acts, to exclude the most beneficial clauses, and in other cases, where these have been allowed to stand, they become useless, because the manner in which they ought to be applied is not specified. Thus we find that to come within the point of law in ventilating house-drains paltry little pipes of 3 in. or 1 in. in diameter are put up, and twisted round all sorts of angles, so that while the law (such as it is) may be complied with, in the opinion of a lawyer, any one practically acquainted with physical laws must know that these things are useless for the purpose they are intended for.

PROPOSED PUBLIC GARDEN IN EBURY SQUARE.

At the meeting of the St. George's Vestry last week, the Marquis of Westminster, through his solicitors, submitted a communication to the vestry to the effect that he is desirous of converting Ebury-square, Pimlico, into a public garden. His lordship states, in his communication to the vestry, that in consequence of the neglected state of the garden, which has almost become a public nuisance, he has put an end to the lease under which the garden was held, and that wishing to give the public the benefit of the ground, he has determined to lay it out and plant it, and let the public have access thereto. His lordship is also anxious, if possible, to avoid railings, as is often done on the Continent, but he suggests that the vestry should look after the property, and he further stipulates for not abandoning his rights for ever in the soil of the garden, as it might become advisable hereafter, if the place became a nuisance, to inclose it again. He wishes, however, to try the experiment of an entirely open garden in London, and thinks that the spot in question will give a good opportunity for doing so, and particularly so as it would benefit the working classes who abound

in the neighbourhood. His lordship makes it a condition that the vestry shall enter into an agreement so as to provide for the proper control and management of the gardens for the use of the public.

In a discussion which followed, some members of the vestry expressed an opinion to the effect that they were afraid we had not quite arrived at the time to appreciate the continental management of such places and that in the present case it would be necessary to look after the place. Ultimately, however, a resolution was adopted to the effect that every facility should be afforded by the vestry to enable the Marquis's liberal proposal to be carried out, and an agreement was sanctioned as suggested by his lordship. In a short time, therefore, we may look forward to see the completion and opening of this most praiseworthy undertaking for the enjoyment and benefit of the residents in Pimlico.

WIDENING THE STRAND.

ALTERATIONS AT ST. MARY'S CHURCH.

The improvement some time ago decided upon by throwing St. Mary's churchyard into the street for the purpose of widening and improving the carriage and footways in the Strand, is now being carried out. Nearly the whole of the old railings inclosing the churchyard have been removed, and workmen are now engaged in taking down the walls preliminary to the churchyard being laid out as a portion of the public thoroughfare. The alterations, so far as regards both the north and south sides of the church, will be a most important improvement, and a great public convenience, more especially that which will be secured on the south side. No one having to pass along this portion of the Strand can have failed to experience the inconvenience and danger which has hitherto been the result of absence of a footpath alongside the church. The improvements in progress will secure this desirable addition to the thoroughfare for the thousands of pedestrians who daily pass along the Strand, whilst the widening of the choked-up roadway on the north side of the church, although not to the extent of more than about 2 ft., will also confer a great advantage. We understand that the portion of the churchyard at the west end of the church is also to be entirely added to the street, with the exception of a small space in front of the steps forming the present approach into the church, whilst the footpath in Newcastle-street, at the east end, is to be widened and made more convenient for traffic by the absorption into the street of the space hitherto inclosed.

ALBERT MEMORIAL: A SUGGESTION.

I HAVE not, at present, any intention of expressing any opinion with regard to the merits or defects of the Albert Memorial, but there seems to me to be one mistake in the design which can even now be so easily remedied, that I would like to be allowed an opportunity of suggesting it.

Most people will, I fancy, agree with me in thinking that the great bas-relief, or panorama as it is called, round the base is placed too low. A Greek or classical architect would have placed it in the pediments or in friezes over the columns, not under them; nor can I call to mind, at present, any instance, either in Medieval or Eastern art, in which the feet of the sculptured figures are not placed higher than the heads of the spectators; and, indeed, common sense would seem to dictate this as a rule of art that should never be transgressed. In the present instance, those who stand on the top step to look at the sculptures, are so near that they cannot grasp properly even single figures, much less the whole group, and they cut up and hide the composition from those behind them, in a most painful manner. Add to this that they are so near that any one with a knobbed stick might break the noses or fingers of the figures, or otherwise damage them, with the greatest ease; and when King Mob adopts the Albert Memorial as a chapel of ease to the Nelson Monument in Trafalgar-square, this will certainly be done, and it may be to an irremediable extent.

The remedy for all this appears to me very simple. It would consist merely in removing the upper flight of steps, and replacing them with a boldly-designed granite sub-basement. A plain pyramid of ordinary steps, with 6-in. risers, without any ornament, and unbroken by pedestals,

or any architectural features, is, perhaps, the meanest basement that could be designed for this or any other monument; but a perpendicular podium, following the lines of the monument but projecting beyond it all round, would give height and dignity to the whole, and raise the sculptures sufficiently to be out of danger, and to allow of their being seen at a pleasing angle. The monument would then stand in a courtyard, the angles of which would be marked by the four great groups representing the four quarters of the globe, and thus, besides the additional height, would have sufficient room to stand in, which at present it certainly does not possess; the greater part of the court being now occupied by the steps in question.

Besides all this, though it may be both reasonable and appropriate to provide broad flights of steps leading to the spacious courtyard in which the monument would then stand, there seems neither reason nor appropriateness in providing unlimited stair accommodation to land the spectator exactly where he ought not to be,—where there is no door to enter by, nor room to move about, or to see properly what he came to look at. In conclusion, I may add that there would be no structural or mechanical difficulty in effecting this change. It would not cost much, and might easily be done long before the statue of Prince Albert is so far complete as to allow of the monument being finally dedicated to the purposes for which it was erected.

JAS. FERGUSSON.

ARCHITECTS ABSENT FROM THE ALBERT MEMORIAL.

ON the podium of the magnificent monument erected to commemorate the intellectual and benevolent character of the late Prince Consort, of which we may justly feel proud, as the finest thing in Europe of its kind, the architects have fared rather badly. Some of renown are ignored, while others, who have made no mark in the world worthy of perpetual remembrance, have found admission to the exclusion of the more deserving. It is distressing to find fault with any features of this national work, but justice must have her due, and a voice should be raised on behalf of those who have so strangely been neglected.

Since the days of Sir William Chambers, no British architect has deserved better of posterity than Sir John Soane. No one achieved in his lifetime a higher and more deserved reputation for originality and good taste, and no one has established a better claim on the gratitude of his country than he has by the magnificent bequest to it of his invaluable museum, with funds for its perpetual support: yet Sir John Soane is not here.

What Soane did for England, Schinkel did for Germany; or, at least, for Prussia. Like Sir John Soane, he was in his day a great reformer in architecture. The public buildings of Berlin attest his originality and cultivated taste, and the museum which he left to his nation is one of the choice attractions of the Prussian capital: yet Schinkel is not here.

Among French architects surely Claude Perrault deserved a place. There is nothing more classical in Paris than his admirable façade of the Louvre: yet Perrault is not here.

In Italy, the first to introduce the Classical style, and follow the precepts of Vitruvius, was Masuccio II. of Naples, 1328, he was somewhat anterior to Oragnas, and much anterior to Brunelleschi. The stupendous tower of S. Chiara, the earliest modern monument in Europe of regular architecture, is a marvel of simplicity and elegant proportions, and alone sufficient, one would have thought, to secure him a standing room among the immortals on the Albert Memorial: yet Masuccio is not here.

Where, also, is the worthy Pollio? Since the days of Augustus no one has rendered a greater service to architecture than Vitruvius. The whole fraternity of architects are deeply indebted to him, and always will be; he may not have erected any remarkable buildings of note, to the ruins of which posterity can still point with admiration, but he has left us what are much better than ruins, he has left us the imperishable records and rules of art; yet Vitruvius is not here. He ought to have been seen were it only in profile, like the distinguished designer of this costly shrine. Instead of these men of mark, whose presence in marble it would always have been a satisfaction to contemplate, we have other characters introduced with whom we cannot

sympathise. There is old Hiram, or Hiram, of Tyre, for his name is as uncertain as his figure is apocryphal, brass-founder to King Solomon; and there is one Bezalcel, a goldsmith and carver, whom Moses employed in the decorations of the tabernacle: what have these cunning workmen to do with the history of architecture? If a biblical association was deemed imperative, there was the builder of the Tower of Babel to draw upon, biblical to the back-bone; Nimrod had quite as much right to be here as Semacherib. Turn we from these stalwart fictions to a more genial subject: the gentle and amiable Nitocris, the only female figure here, and therefore entitled to be regarded as the personification of the art; we must all be delighted to see her, not for her own merits alone, but for the associations of 4,000 years which she represents in her ever-youthful person. Cheops, however, singular Cheops, carries us back in the world's history a thousand years beyond: it is a wonderful thing to have this giant in the building line brought home to our own doors. We may, probably, all recollect the lines of Byron—

"Let not a monument give you my hopes,
Since not a pinch of dust remains of Cheops."

But here he is, at least as large as life, or somewhat bigger. It is to be regretted that these grand figures did not begin their march from the opposite corner: architecture had its cradle in the east, but here it is made to be born in the west.

The Greek architects recall to mind some noble ruins—the Parthenon and the propylea at Athens—which rise up before our imaginations as we bear their names; but they are rather too numerous as representative men, and it is only in this capacity that they have been summoned from their graves to stand before us. The gentlemen at the opposite corner seem also too crowded. Historical fame is here made to appear by anticipation. This is quite contrary to the principle which has justly ruled the introduction of the poets on the sunny face of the monument: we there have no poet after Milton; and the reason, no doubt, was, that we had so many that the monument would not hold them all, and, as it might have seemed invidious to have selected some and rejected others, or too much savouring of partiality, especially in those of our own time, the artist very wisely omitted them all. Poetry was to be glorified in its greater gods only; personalities were subordinate to principle. The Church of Rome was careful not to canonise its saints too soon. The Victoria Tower will be the admiration of posterity; the present generation have somewhat slighted it, though nothing equal to it has been erected in Europe in modern times. Sir Charles Barry, therefore, is very properly here; but as to his associates, I have my own opinion.

The happy conception carried out on the podium of the Prince Consort's shrine, of bringing before us, in form and feature, so far as known, the effigies of those illustrious men, in poetry and in art, whose names are as beacons in the history of the world, and with whose works it is a privilege and an emolument to have our sentiments associated, is one which may be said to add to the charms of life—at least of London life; for here, though we cannot actually walk up and shake hands with Michelangelo, and Raffaele, and the divine Dante, and others, we can see them as they lived, we can stand before them as they were, and can come mune with them in our hearts in a language more eloquent than words.

H. C. BARLOW, M.D.

TECHNOLOGICAL EXAMINATIONS.

A CONFERENCE on Technological Examinations was held on Saturday, the 20th inst., under the auspices of the Society of Arts, at John-street, Adelphi; Prince Arthur, K.G., in the chair. Among those present were the Lord Chancellor, Lord Clarence Paget, Lord Alfred Churchill, and Sir J. Pakington.

The Secretary (Mr. P. Le Neve Foster, M.A.), read the council's report, which stated that the council had entered into communication with the various guilds, companies, chambers of commerce, and large manufacturers, and had convened this conference with a view of eliciting opinions and obtaining support to the undertaking. The council propose to hold their first technological examination in 1873, and to take up as the subjects the manufactures of paper and cotton.

His Royal Highness, on rising to address the meeting, which he did in a very able and appro-

private speech, was received with a round of applause.

The meeting was also addressed by the Lord Chancellor, and other gentlemen, and the following resolutions were passed:—

"That this meeting entirely approves of the proposed scheme for technical examination, and considers it well worthy of general support, with a view of meeting the admitted great deficiency of technical education in this country."

"That this meeting hopes that the advancement of technical knowledge in the manner now proposed be viewed by the public of the City of London as an object well worthy of their support and material assistance."

"That the council be instructed to form a committee, consisting of the masters of the City companies, the leading manufacturers and scientific professors, and the members of the Society of Arts."

Some remarks were afterwards made, to the effect that the council should reconsider some portion of their programme.

CONFERENCE ON WORKMEN'S CLUBS.

A CONFERENCE of delegates from provincial and metropolitan workmen's institutes was held on Saturday, in the lecture theatre of the South Kensington Museum. Sir Harcourt Johnstone, M.P., presided. There were ten subjects for discussion, the first being "The best means of interchanging the advantages of club membership between the various affiliated clubs."

Mr. Alsager A. Hill opened the discussion, observing that it was very desirable that the workmen's clubs throughout the country should be consolidated in some manner. He thought, before creating relationships between several clubs there ought to be a relationship established by the unions. If the members of clubs paid a small toll to the union the work of both institutions would be promoted and improved. He thought union cards should be issued to the members, and so show that they subscribed to the general unions as well as to their own particular club.

Mr. Edward Hall, F.S.A., agreed with Mr. Hill as to the issuing of cards, but thought they should entitle the holder to admission into other clubs. Considering that the chief reason for the existence of working men's clubs was the affording an alternative to resorting to the public-house for necessary rest and refreshment, it was not merely desirable, but essential to the success of the club movement, that each member of a club, as in London, should be free to resort to each other's club on presenting his card of membership. The whole question was connected with that of refreshments, which he had addressed himself to, along with the present one, on the occasion of the conference of 1868; but there need be no difficulty as to credentials; a card might be contrived with changeable numbers, "1," "2," &c., corresponding with the months, so that it would be at once seen whether the subscription had been paid at the club of which he was a member.

Mr. Hodgson Pratt said he had received information that there were fifteen London clubs and seventeen country clubs willing to receive members of other clubs on production of their cards.

The Rev. F. W. Beaumont moved that this discussion should be laid before the Council of Working Men's Clubs and a committee of the union, for them to arrange what should be done. This was passed unanimously.

It was thought necessary that a building fund for the erection of workmen's clubs should be established, and the question was sent up to the council. The means of rendering clubs self-supporting were discussed, and the proposals are to be laid before the council to choose the best. It was agreed to have a special organ to circulate information relating to the club movement. On the question of the payment of an annual subscription by all affiliated clubs, such payment to cover the privilege of using the library, it was considered best to allow two payments to be made. It was agreed that four "representative" members should be elected to serve on the council on behalf of the provincial clubs.

When the conference terminated the delegates paid a visit to the International Exhibition.

The annual meeting of the union was held in the arena of the Royal Albert Hall, Mr. Muddell, M.P., presiding. There were also present Lord Lytton, Mr. Cowper-Temple, M.P., Mr. T. Hughes, M.P., and all the delegates who attended the conference in the morning. The report, which was of a satisfactory character, stated that the work of the union was no longer confined to the United Kingdom. It had been extended during the year to America, France,

Belgium, and other countries on the Continent, from all of which prospects were held out of co-operation and support. During the past year sixty-six new clubs had come under the notice of the council. Of these, thirty-five had availed themselves of the benefit of affiliation. Amongst the most important undertakings in the year, the council pointed with gratification to the Grosvenor Club, towards which the late Marquis of Westminster contributed 1,000*l.*, and which promised to become a model for other clubs. In the provinces the work had not progressed at the rate which the friends of the movement could desire.

WORCESTER GUILDHALL COMPETITION.

THE designs submitted are, eight for a new building and two for restoration of the old. The cost of reconstruction is understood to be 18,000*l.*; that of restoration, 9,000*l.* To consider the entire question now brought before the city, a meeting was held at the Music-hall, on Monday, when the ratopayers had the opportunity of speaking their minds upon the advisability of expending either the larger or the lesser sum. It is thought more than probable that the town council will, at present, go no further than awarding the premiums offered.

THE PARIS INTERNATIONAL EXPOSITION OF DOMESTIC ECONOMY.

THE Paris Exposition, of which we have already given some particulars, will be opened on the 28th inst., and will be closed on the 1st of November, unless particularly successful, in which case it may remain open a fortnight longer. Medals of gold, silver, and bronze, will be awarded to successful exhibitors; and money prizes, with certificates, to workmen who have been concerned in the invention or production of objects rewarded.

The main object of the exhibition is to make known to the workman those articles necessary for his material and moral life which at the lowest cost best answer the purpose, with the view of procuring him the means of ameliorating his position by economy.

The *Société Nationale d'Encouragement des Travailleurs Industriels* have offered gold medals and premiums for the best essays on the Exposition, adapted for the use of schools and popular reading.

UNFAIR COMPETITIONS.

BRIGHOUSE.

SIR,—A few months since you published the result of the Brighouse Cemetery Chapel competition, showing that Messrs. Gay & Payton, architects, of Bradford, were the successful competitors, and that the design, in erection, was not to exceed 2,000*l.*

About a week ago, the tenders for the works were published in the local papers, showing that the lowest amounted to nearly 6,000*l.* I sum three times the amount of the cost stated as being the limit. The architects were requested to look over their quantities, to see if any error had been made, and to ascertain whether the cost of the buildings might not be brought within the limit. The result was, that a reduction of about 40*l.* was effected, so that the present lowest estimate of masons', carpenters', joiners', slaters', plasterers', painters', plumbers', and glaziers' work, is about 5,520*l.*

I leave your readers to draw their own conclusions. A NON-COMPETITOR.

P.S. Doubtless, some of your readers would like to learn, that upwards of forty sets of designs are submitted for the Blackpool New Market, and that the Board of Health met on the 19th, to consider the merits of the various designs.

WAGES.

SIR,—“H.” in criticising a recent article in the *Builder*, on Wages, says he is a believer in the potency of self-interest in governing the actions of average mankind. It did not seem to me that the article in question denied it, but, rather, admitting it, sought to show that no good could come of regarding the question of wages as having but two interests, and those opposed to each other—those that is to say, of capital on the one hand and of labour on the other; and it seemed to me to point out that, while both those interests must be satisfied, there is a third principle required to be regarded,—that of

abstract justice. “H.” says the whole question turns upon the point whether the self-interest is blind or enlightened. “Self-interest impels a thief to steal my purse. If he were better instructed, he would leave it alone.” Here we have the third principle imported at once into the question between “H.” and the thief. It is the self-interest of the one to keep his purse and of the other to steal it. As a thief, he sees only his own interest, and would steal the purse, but being better instructed, he leaves it alone. In his crude and natural condition as a thief, he sees only his own interest; but being instructed, he recognises another principle,—that of abstract justice, or, in other words, he is enlightened, and sees that to steal the purse would be unjust. Indeed, by the recognition of this principle the thief is converted into an honest man. You ought to thank “H.” sir, for giving you so apposite an illustration of the tenour of the article. “H.” says “it is, doubtless, an evil that capital and labour should take up a hostile attitude. Both are necessary to the production of wealth, and if they are to co-operate efficiently, they must be in harmony.” True; and that is what it seemed to me the article in question pointed to,—viz., that if harmony is to be brought about, the notion that the question has but two sides, and those antagonistic, must be discarded, and a third principle admitted, as forming part of the question. It may be quite true, and I am ready to admit it, that any supposed settlement under which one party is conscious of sustaining a loss for the advantage of the other, is essentially a non-permanent and hollow affair; but can anything be less permanent or more hollow than the present system, which excludes from consideration any other principle than the self-interest of the workmen to get all they can, without regard to the rights of others—their brother-workmen of other occupations than their own—and of the masters to give, not the value of the work, but as little as they can help giving? Indeed, instead of working together, and having a mutual interest in what they do, they pull in opposite directions until they break the link, and are separated until a new one can be made; but, as long as they continue to pull in opposite directions, the failure of the new link is only a question of time; and, in the meantime, dissatisfaction and class-hatreds are perpetuated in the country.

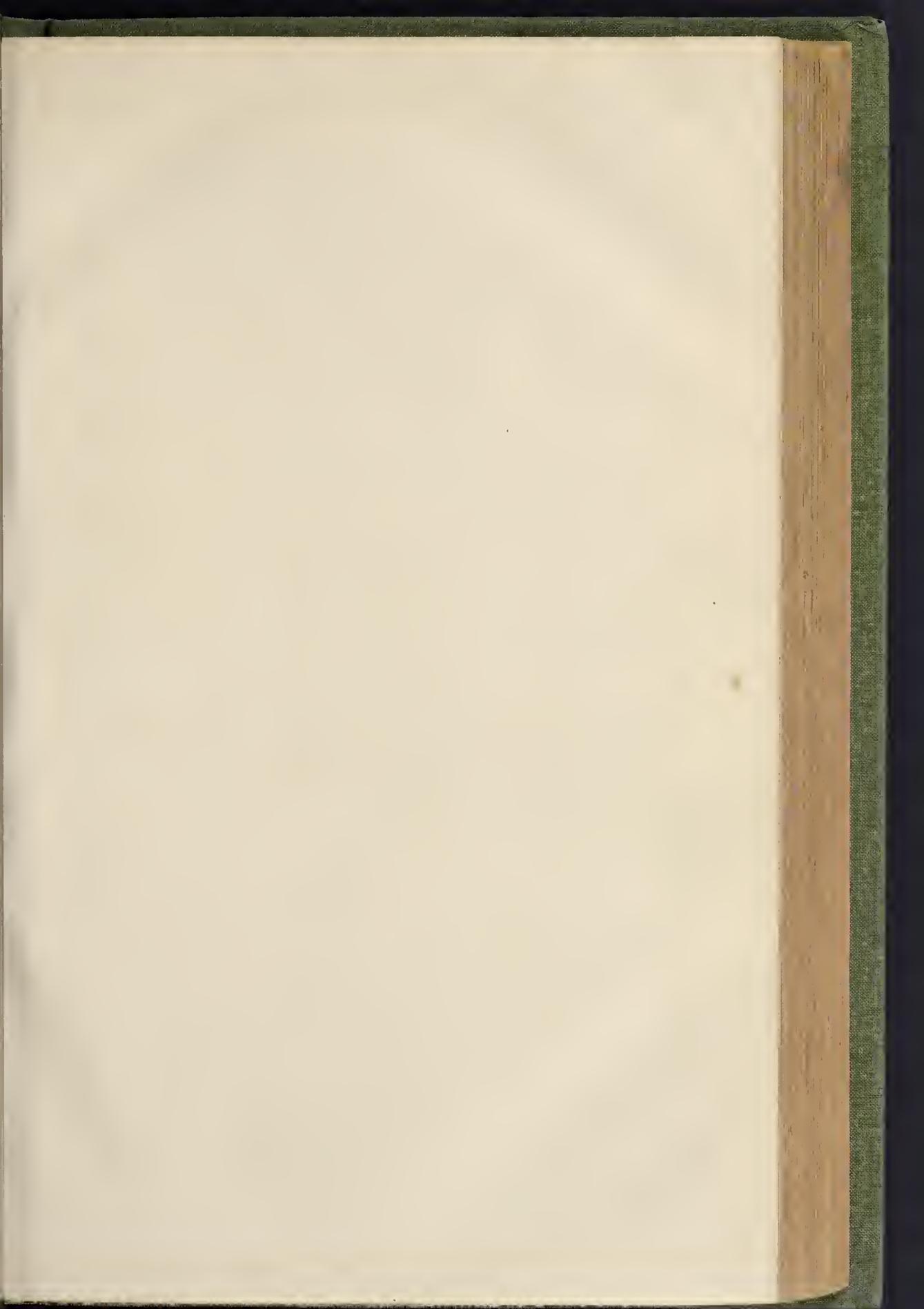
When “H.” says that the workmen should have a share in the capital employed and the wealth produced in the process, and that all parties concerned should have an obvious identity of interest, I fully agree with him; but I am at a loss to understand the relevancy of the remark, that matters will not be improved by “preaching sickening sermons on universal benevolence.” What is universal benevolence?

If it means universal patronage of one class of men by another, it is a “hollow affair,” and had better not be preached; but if it means universal effort to raise the status of those who are now called the lower classes, or the lower orders of men, and approximate their condition to that of those who are superior to them in wealth and intelligence, by giving those of them a chance to rise who have the capacity, but not the opportunity, at present, by reason of the action of those economic laws which are said to be so infallible, and which oppress those who cannot rise into the tide, and within the compass of their action; then, I think, it will not be “preached” too much.

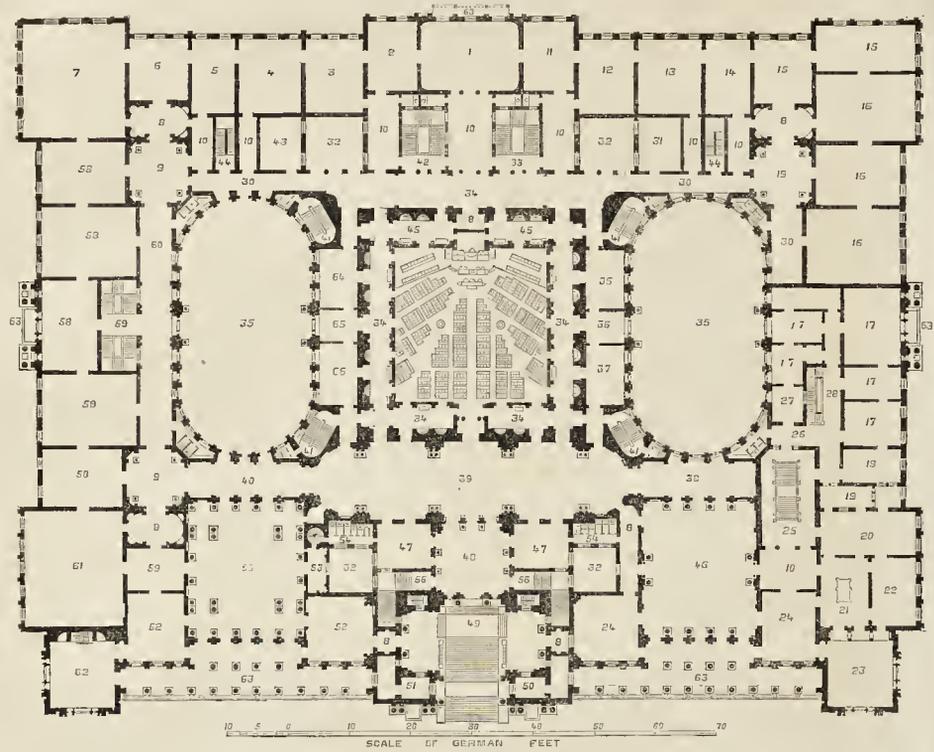
“H.” says, “surely a workman should receive the value of his work.” Surely he should; but who is to determine what that value shall be? Shall it be determined by a series of strikes and lock-outs, by which means it will be determined, in course of time, which side shall give way; the assumption being that the true value of the work is that put upon it by the side which holds out the longer? Unfortunately, while these people are trying to find the value in this rule-of-thumb way, they are preventing others from proceeding with their own proper work.

“H.” says, further, “one thing, I fear, is only too certain. Whatever agreement may now be come to, can be of no value towards a real settlement. It will but put off the difficulty for the present, to confront us anew at no distant day.”

Quite so; but these admissions are inconsistent with the tenor of the argument of his letter, and are at the same time a justification of the views of those who say that some other principle than self-interest alone must be imported into these questions before a satisfactory solution of them can be found. S.



PROPOSED PARLIAMENT HOUSE IN BERLIN, GERMANY.—Plan of Principal Floor.



REFERENCES.

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|---|--|-----------------------|--|
| 1. Hall for the sittings of the Members of the "Bund." | 20. Dining-room. | 31. Library. | 44. Staircases to the Bureau. |
| 2. Conference-chamber of the Imperial Chancellor. | 22. Private room for the President. | 32. Living-room. | 45. Hall, with resting-places. |
| 3. Conversation-room of the Imperial Chancellor. | 23. Living-room. | 24. Saloon. | 46. Great Festival Hall. |
| 4. Business-room for the President of the Imperial Chancellor's Office. | 25. Principal Staircase. | 26. Passage. | 47, 47. Cloak-rooms. |
| 5. Business-chamber for the Members of the "Bund." | 27. Servants' Room. | 28. Staircase. | 48. First closed Entrance-hall. |
| 6. Division-hall. | 30. Corridor. | 31. Telegraph Office. | 49. Grand open Entrance-hall, with principal Flight of Steps. |
| 7. Hall. | 32. Open Courts for Light. | | 50. Space set apart for the Officials of the Post Office. |
| 8, 8. Passages. | 33. Staircase for the Emperor and Members of the Imperial Court. | | 51. Ditto ditto Telegraph Office. |
| 9. Hall. | 34. Great connecting Hall. | | 52, 52. Spaces reserved for Recreation. |
| 11. President's Conference-room. | 35, 35. Principal Court-yards. | | 53. Refreshment-buffet. |
| 12. Speaking-room of the President. | 36, 37. Short-hand Writing and Correcting-rooms for the Journalists. | | 54. Water-closets. |
| 13. Secretaries' room. | 38. Vestibule of the Great Festival Hall. | | 55. Refreshment-room. |
| 14. Business-room for the Members of the Council. | 39. Inclosed Hall for Members of the House. | | 56, 56. Division Halls. |
| 15, 15. Speaking-rooms ditto ditto. | 40. Vestibule of the Refreshment-room. | | 59. Grand Staircase to Saloons. |
| 16. Commission-chamber. | 41, 41. Staircases to the Tribune. | | 60. Grand Corridor. |
| 17, 17. Living and sleeping-rooms for the President and his Household. | 42. Great Staircase for the Members of the "Bund." | | 61. Hall for the sittings of the "Fraction." |
| 18. Cabinet. | | | 62. Reading-room. |
| | | | 63. Balconies. |
| | | | 64, 64, 64. Speaking and Business-rooms for the Members of Parliament. |

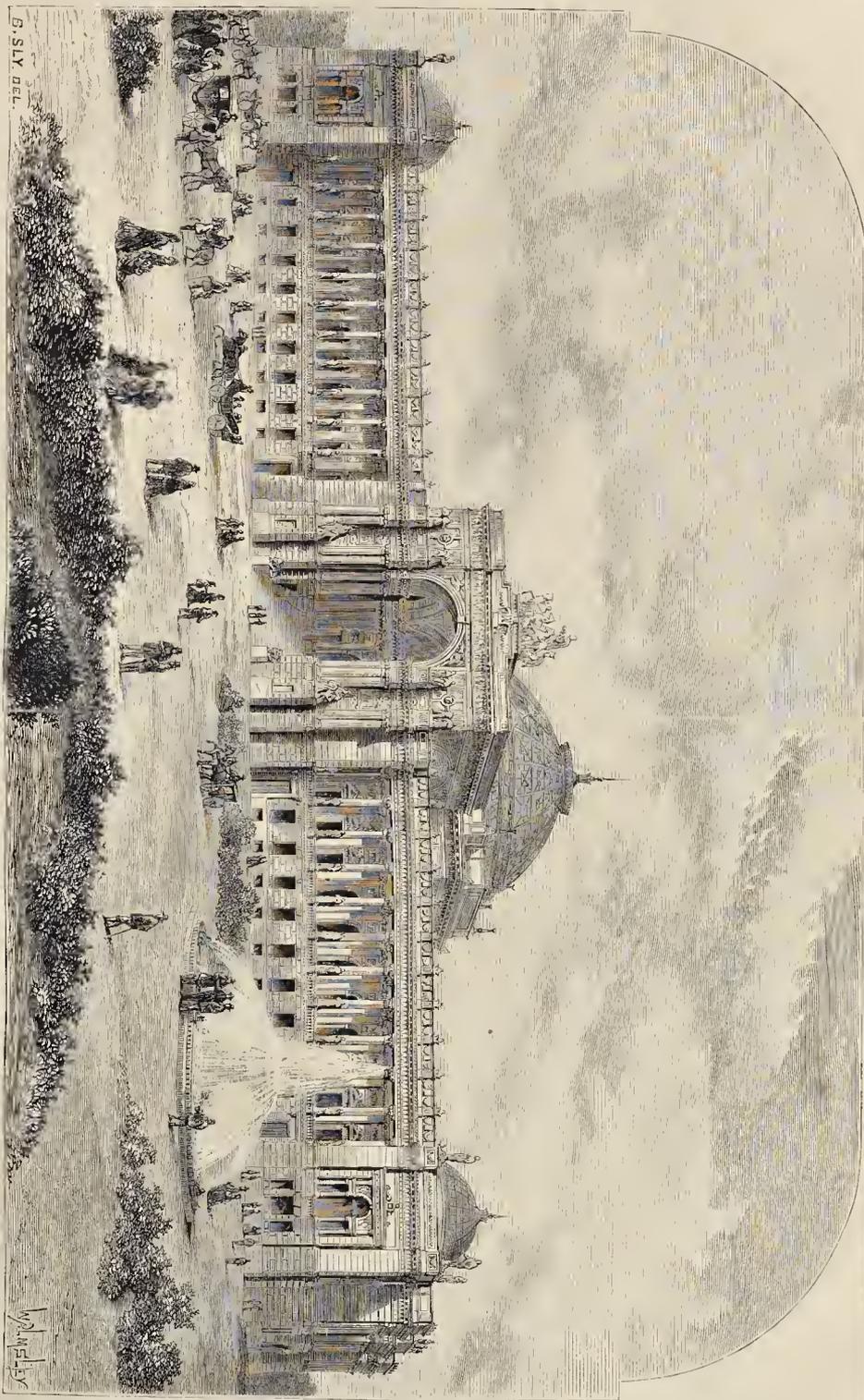
SELECTED DESIGN FOR THE BERLIN PARLIAMENT HOUSE.

We mentioned some time since the allotment of premisses to a certain number of the designs for the Berlin Parliament House, submitted in competition in accordance with the published conditions. The first premium was awarded to Mr. L. Bohnstedt, of Gotha, and with the obliging assistance of the architect, we now give some illustrations of his design, viz., a view of the main front and plan of the principal floor. Up to the present moment the proprietor of the place chosen for the building,—Duke Raczinsky,—is not willing to sell the ground. The next Parliament will have to decide as to the site and the further steps to be taken concerning the execution. We use Mr. Bohnstedt's own words in describing the design:—

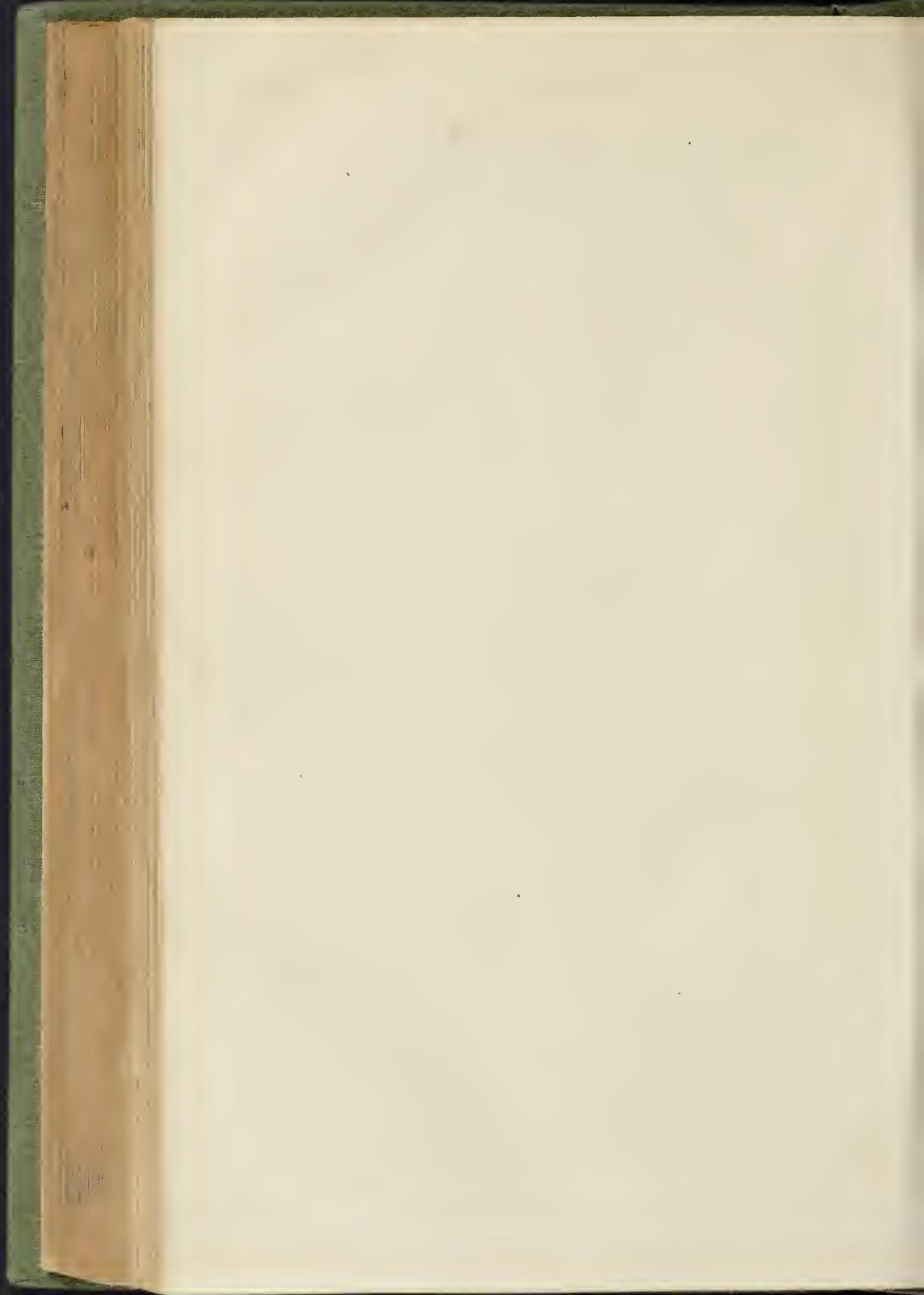
The different rooms disposed on the main story may be considered as forming the following groups:—1. In the centre of the building, the Chamber, with the shorthand writers' offices, the parlours of the members, the separate entrances, staircases and rooms leading to the boxes. 2. The offices of the Bundesrath, the president and the imperial chancellor, in the

middle of the east front (Sommer-street), with a large vestibule on the ground floor, connected with wide staircases, leading up to the rooms and boxes of the Imperial Court, and to the offices named before. 3. The committee-rooms, with their hall, special staircase, &c., on the north wing. Below them, on the ground floor, the smaller committee-rooms, the archives, &c. 4. The refreshment-rooms, with buffet, and the reading-room, which is placed at the north-west corner of the building, and connected by means of an inner staircase with the library, on the ground-floor. 5. The official residence of the president occupying the south front, connected with two drawing-rooms and a large saloon for festivals, placed in such a way as to serve, if wanted, separately from the president's private rooms, for meetings of the members. The fourth group is placed at such a part of the building where it is equally distant from the Chamber, as well as from the committee-rooms, and so that it does not interrupt the free communication between the groups numbers 1 and 3. It occupies the northern part of the west front (Königs-platz). Corresponding with it, the large saloon and the drawing-rooms of the fifth group are placed on the southern side of the same

front. 6. The lobby, the main ante-room—connected with the rooms for cloaks and hats and the closets—the large open hall, with the main staircase, &c. It occupies the centre of the west front, connecting the fourth and fifth groups, partly by the open hall, partly by the lobby, with the halls right and left, lighted from the main yards, and having direct entrances, one to the refreshment-room, the other to the saloon for festivals. In front of these two large rooms open balconies, with colonnades, are disposed for the use of the members. By such a suite of rooms (main hall, chief saloons, &c.), the west front became the main front, and a worthy preparation to the principal part of the house, the Chamber, which, by the large surface it occupies, its height and dome, is characterised even in the exterior as top and chief part of the whole building. Staircases, leading to the public galleries and closets, are placed behind the semi-circular ends of the main courts. Further, there are four small court-yards, two of which (joining the main entrance) are enlarged above the rooms for cloaks and hats, the closets, and the staircases, allowing by such arrangement to light directly the ante-room and the lobby. Gateways connect the main yards with the



PROPOSED BERLIN PARLIAMENT HOUSE: SELECTED DESIGN.—MR. L. BOHNSTEDT, ARCHITECT.



adjacent streets, on the north and on the south sides, as well as the yards themselves.

According to the programme, nearly all the rooms are covered with vaults, between iron girders.

The programme states, as one of the chief conditions, that the building ought to show a monumental character. It must be richly provided, outside and inside, with sculptures and pictures. The author of the selected plan has tried to avoid every unnecessary decoration or construction, being merely only show; he took care, he says, not to produce a false, theatrical effect, by erecting unsuitably high towers, vast useless domes, and such like.

The building is divided into two parts, the sub-structure (the basement and the ground floor being treated as one mass) and the main story.

The rich sculpture-work on the exterior of the house required simplicity in the architectural work and its groups. The main entrance, leading up to the principal story, is the prominent part of the west front, formed like a triumphal-arch (under which the chief staircase is laid open), crowned with a bronze group of figures.—German, the North and the South guiding the steeds of her victory-car. Sculptures on both sides of the central entrance bring to mind the deeds of 1812, 1815, and 1870, 1871. The inside of the hall is decorated with large semi-circular fresco pictures. The open balcony or colonnade is provided with historical *bas-reliefs*, and on the balustrade in front of the columns with statues of worthy men. The parapet is intended to show the arms of the chief places or provinces, executed in coloured mosaics. Brass-plates, with inscriptions, are enlaid in the walls. Like the west front, the other sides are decorated chiefly with historical *bas-reliefs* and statues.

Corresponding with the exterior, the architecture of the interior is treated so as to allow a rich decoration, principally with pictures. The walls of the Chamber above the floor of the galleries show panels in dark-coloured marbles and projecting pillars, bearing large marble statues representing the chief parts of Germany. The vaults there are decorated with coloured ornaments upon gold ground. The Chamber is lighted by a rich skylight, the upper part of its one being constructed of metal and glass.

FLAT TILE AND CEMENT ROOFS.

Sir,—With reference to the house No. 30 in Inborough-road, which was partially destroyed by fire on the night of the 12th inst., I can, as next door neighbour, fully corroborate all that our correspondent, Mr. Kemp, states as to the efficacy of the flat tile and cement roofs in resisting fire.

From my own experience as a building surveyor, I have no hesitation in saying that had the houses been constructed with ordinary roofing could have prevented the total destruction of the one that caught fire, and the, at all events partial, destruction of mine; instead of which, the former, although hardly burnt, was saved from entire destruction, and mine was saved from entire destruction, although the fire burnt upwards of two hours fiercely.

I think, in London at all events, these roofs would be generally adopted where houses are built in terraces, and the spread of fire from one to another is thereby facilitated; for, independently of the direct protection they afford, they greatly assist the efforts of the firemen by affording ease and safety with which they can ascend and walk upon, and I do not suppose that their cost is any obstacle to their adoption.

ROBT. RICHARDSON,
Assist. Surveyor H.M.'s Office of Works.

WEALTH AND WAGES.

Sir,—Your correspondent, "H." observes at,—“The wealth produced by the joint efforts of labourer and capitalist is to be divided between them in some proportion. What that proportion shall be is necessarily matter for discussion from opposite points of view.” For, overall, it is a clumsy expedient, cutting instead untying the knot, to add to the sufficient cost of building a percentage for additional wages. It seems to me singularly significant that neither has ventured in public prints to elucidate or establish definitely an equitable correlation; and such significance cannot, in these days, be missed by affected disregard of newspapers and public opinion. Such silence also appears, *seriatim*, to indicate in degree that both sides

prefer resting determinately on other forces than those on which prudent men readily rely, and that thus, so far, both are wrong, the employers certainly, in refusing to receive deputations. Reason appears riven, but ruin is ready; ruin to the carpenter, ruin also to the capitalist.

Still, in this desperate pass, even now, sir, I venture to suggest a proximate remedy. There is a great name,—known alike to builders and to most whom builders employ, known beyond shores, world-wide, wherever English science, literature, and politics are known:—Mr. John Stuart Mill, sometime member for Westminster, author of “Political Economy,” &c., and, in the opinion of many, the acutest thinker and most logical reasoner living, would probably, on reference, state such principles and conclusions as might, if the consummation be possible, and each side is disposed to be lenient with the other, convince and satisfy both parties, without infringing on that future which none can foresee.

E. L. TARBUCK.

PORTLAND CEMENT STAIRS.

Sir,—I have read with much interest your remarks on the risk of buildings from fire. Fireproof construction is a subject I have thought much upon for many years, and have largely carried into effect, as buildings I could refer to will testify, nevertheless, from impaired health, I might have allowed your remarks to remain unnoticed, thinking many better qualified than myself would reply to them, had not Mr. Britton, in your number of last week, invited some suggestion on Portland cement for stairs.

Presuming a matter of fact will be more to the point than a suggestion, I would refer him to a principal and back staircase wholly constructed of Portland cement concrete in a house erected under my direction, on Richmond-hill, near the church.

F. H. GROVES,
Late of Craig's-court.

A CONTRACTOR'S APPEAL.

At the last meeting of the St. George's, Hanover-square vestry, the committee of works recommended the vestry to decline to accede to the request of Mr. R. Coppock, of Buckingham-place, Piccadilly, who seeks to be relieved from his contract for the repair of these pipes, in consequence of the great increase in the price of copper and leather. In the discussion which followed, some members of the committee wished the committee to reconsider their decision, and not deal hardly with the contractor under the exceptional circumstances of the case, contending that scarcely any one could have foreseen the great rise which had taken place in iron and copper; but other members of the vestry urged that by acceding to the contractor's request a very bad precedent would be set, and that it would be useless to have contracts at all if they could be cancelled whenever either of the parties to them imagined they had the worst of the bargain. The recommendation of the committee not to comply with the request of the contractor was ultimately confirmed.

PROPOSED ASYLUM, ST. ANN'S HEATH.

Sir,—I beg to enclose to you a copy of the award made by Messrs. Donaldson & Wyatt, respecting the designs for a Lunatic Asylum at St. Ann's Heath, near Virginia Water Station, that you may publish in your next number if you think proper.

THOMAS HOLLOWAY.

In accordance with your request that we should examine the thirteen designs for the asylum which you are about to erect at St. Ann's Heath, in order to advise you as to those most entitled to the two first premiums which you have offered to the competitors, and as to those entitled to the sum of 50*l.* each, we beg to report as follows:—

Thirteen designs have been submitted, hearing the mottoes stated below, and arranged in alphabetical order:—

1. "Alpha," 2. "Au bon joueur vient la halle;" 3. "Choose the best, place the rest;" 4. "Con amore;" 5. "Economy;" 6. "Humilitas;" 7. "Inapropius labor omnia vincit;" 8. "Mens;" 9. "Mens sana in corpore sano;" 10. "Progress;" 11. "Quadrant;" 12. "Sanctas;" 13. "Vivere aut vincere."

We have carefully examined the drawings and the descriptions, having reference to the suggestions issued by you, and to the requirements of such an institution. We have also had tables prepared, showing the numbers and sizes of the

principal rooms, and the amount of accommodation provided in those designs which seemed indisputably to be the most promising, together with the cubical contents of the several buildings.

You were also so good as to call in the advice of Dr. Yellowlees and Dr. Lockhart Robertson, well known for their experience as able medical superintendents of asylums.

We must state that although there is considerable merit and taste displayed in the several projects, and evidence of a great amount of time and care having been bestowed upon the preparation of the drawings, yet there is not one of the designs which would not require more or less modification of plan and general arrangement ere it could be carried into execution for practical working, consequently we have selected that one as first which, with the least alteration and no sacrifice of its own individual character, would, we believe, be the most suited to your purpose, and the least costly.

We beg, therefore, to state our opinion that the first prize should be awarded to "Alpha;" the second to "Improbis labor omnia vincit;" and that the following should in the terms of your offer receive 50*l.* each:—

- "Au bon joueur, &c.," "Con amore," "Economy," "Mens," "Mens sana, &c.," "Progress," "Quadrant," "Vivere aut vincere."

We cannot forbear to notice the series of drawings bearing the motto "Quadrant,"—a very original and artistic design, displaying a novelty of conception in the plan, and much picturesqueness in the elevations, but with practical deficiencies and defects which prevented our placing it first or second.

THOS. L. DONALDSON,
THOS. HENRY WYATT.

TELEGRAPHY AT THE ALBERT-HALL.

The Commissioners of the Albert-hall, under the auspices of the Society of Telegraph Engineers, and with the necessary aid readily afforded by the Postal Telegraph Department, provided for the public on Thursday evening before last, at the Albert-hall, an interesting entertainment. A model of every kind of telegraph instrument used for commercial purposes was exhibited. Each apparatus was connected with wires proceeding from the central hall to the galleries, and thus the actual practical working of the telegraph system was made apparent to those present in an effective manner. By the side of the instrument by which the message was forwarded which caused the arrest of Fawcett, was placed a modern ink-writing Morse apparatus, connected up in one unbroken circuit, working at that moment direct, *via* Teheran, from the Albert-hall itself with Kurrachee, upwards of 5,000 miles. A descriptive lecture was also given by Mr. W. H. Preece, of the Postal Telegraph Department, who was introduced to the large assemblage by General Scott, and lucidly explained the action of the electric current in producing the simple elementary signals. The messages were printed in bold Roman type by the Hughes' type printer. In the instantaneous working with India, the meeting was informed, as a hit of news fresh from Kurrachee, that "locusts are swarming in Scinde," and that "Sutlej bridge has just been destroyed by floods." The Grand Viceroy of Persia sent from Teheran to the Albert-hall a message of warm congratulation to the Prince of Wales, a part of which was as follows:—"Je suis heureux que les relations entre l'Angleterre et la Perse se sont rapprochées à tel point que, pour ainsi dire, nous pouvons ici prendre part dans la réjouissance qui se trouve maintenant à Albert-hall." The rapid development of the telegraph under the Post-office was adverted to.

THE SANITARY CONDITION OF EDINBURGH.

In the House of Lords the other day, Lord Kinnaird moved for the production of the last return submitted to the town council of Edinburgh by the burgh engineer respecting the sanitary condition of that city. He considered that in anticipation of the Public Health Bill, which would soon come before their lordships, it would be instructive to them if they had the report before them for which he had moved. He had been informed that Edinburgh was in such a shocking state, from a sanitary point of view, that the death-rate had increased very much, and that the insurance companies had it in con-

templation to raise the rate of insurance. He believed that the report of the burgh engineer would show conclusively that further legislation was necessary. The only thing wanting was proper machinery. The carrying out of the law depended on the town councils of burghs and the local authorities of country parishes. It happened that a great proportion of the smoke and other nuisances which had to be complained of were caused by the very persons who were supposed to carry out the provisions of the Act. They were not, therefore, very active in enforcing its provisions. He considered that a Board appointed by the Government ought to see after the enforcement of the Act.

Viscount Melville said he did not doubt that the sanitary condition of Edinburgh required ceasing after; but that the insurance companies had ever thought of taking the action mentioned was more than he could credit. He quite agreed that an improved machinery for carrying out the Public Health Act of Scotland was needed.

The Duke of Buccleuch said that the great difficulty was to get persons to put the law in force. Even the public prosecutor himself would not proceed against offenders unless the incidental expenses and his own fees were secured. He hoped this fact would be remembered whenever Parliament came to deal with the proposition to appoint public prosecutors in England.

The motion was then agreed to.

On a subsequent occasion Lord Melville said that he had received a communication from Edinburgh authorising him to give a distinct denial to the statement that the condition of the city was so bad that the insurance offices were contemplating the raising of their rates.

Lord Kinnaird said he had received his information from the Standard Life Insurance Company, and he was told it was quite correct.

DISTRICT SURVEYOR'S FEES.

ARCHES UNDER PUBLIC WAYS.

At Guildhall, on the 19th, Sir Robert W. Carden gave judgment in a case, the particulars of which we have already published. Some time ago Mr. Wigmore, of Walham-green, contractor, built for the Corporation of London the arches under the foot-pavement in Newgate Market. Since the construction of the new market the old one had been taken down to make room for warehouses. The space formed a square, and round it were constructed fifty-two arches. Mr. Power, the district surveyor, claimed 10s. for each arch, and Mr. Wigmore offered to pay only one fee of 10s. for the whole of them. Sir R. W. Carden thought that they could not be called one building, but at the same time considered that the Act did not contemplate 10s. for each arch. He suggested that a compromise should be effected, but this was declined, and eventually Sir Robert was asked to give a decision, and then grant a case for the Court above, which he did. The case was argued in the full Court of Common Pleas, and the judges, after hearing counsel on both sides, decided that the whole of the arches could not be considered one building, nor could they be looked upon as fifty-two separate buildings; the Court, therefore, referred the matter back to Sir Robert, to ascertain how many buildings were to be placed on the ground, and to give a fee for each. Since the case was before Sir Robert there have been twelve houses commenced upon the ground, so that that question was settled beyond a doubt.

Sir Robert W. Carden made the order for the payment of twelve fees, and each party to pay his own costs.

SCHOOL BOARDS.

London.—The School Board have applied to the Metropolitan Board of Works for a loan of 40,000l., to be expended in the erection of offices. The application was referred to the Finance Committee. At the last meeting, Mr. Reed, M.P., gave notice that he would move at the next meeting that Mr. Robson be appointed architect to the Board at a salary of 1,000l. a year, with a view, amongst his other duties, to designing the schools of the Board; that Mr. Robson give his time to the Board, and that the Board provide the necessary staff and officers; also that he would on the same day move that a separate officer be appointed whose duty it shall be to assist the Works Committee in the acquisition of sites.

Bradford.—At a recent meeting of the board,

the mayor (Mr. Thompson) in the chair, a letter from the Educational Department intimated that loans would be recommended for the purchase of school-sites in Feversham-street, Bowling Back-lane, Ryan-street, Horton-hank, Whetley-lane, and Lily Croft-lane. The following tenders for the schools the committee recommended should be accepted, Mr. Neill explaining that there was an increase in the estimates of 30 per cent., owing to the time that had elapsed since the estimates were prepared, materials having risen in the interval.—Feversham-street school 14,350l., an increase of 5,850l.; Bowling Back-lane school 10,714l., an increase of 4,409l.; Ryan-street school 14,529l., an increase of 6,729l.; Horton-hank school 4,828l., an increase of 2,043l.; Whetley-lane school 8,200l., an increase of 875l. Mr. Dungan opposed the acceptance of some of the tenders, and moved an amendment that they be referred back with the view of reducing the cost, but as he failed to find a seconder, he said that his presence would only hinder the progress of business, and he thereupon withdrew from the meeting. In reference to the rise in prices, and consequently in the estimates, Mr. Neill said that in advertising for the tenders for the schools, three weeks had been allowed to the deposit of the offers, and the result was that 195 tenders had been received for the five schools. The tenders very much exceeded the estimates of the architects, amounting, he believed, to 30 per cent. That excess could be accounted for by the fact that a considerable time had elapsed between the time those estimates were sent in by the architects and the present time when the works were tendered for. It was well known that material of all descriptions had very much increased in value. Bricks, for instance, had increased by about 50 per cent., consequent upon the advance in coal, which entered in a much greater extent into the cost of producing bricks than was generally imagined. The advance in the price of coal had also affected almost all kinds of building material. Iron was much dearer; and stone had also advanced considerably in price, and particularly dressed wall stones, the advance on which would be fully 30 per cent. Taking the advance in the price of material, and also in wages, he did not think that the estimates of the architects were so far out as compared with the tenders. If they could have accepted some of the tenders sooner, they would have been able to let the work for less. Then they might be told that the cost might be reduced by referring the plans back to the architects; but to turn back necessitated the preparation of fresh plans, fresh quantities, and therefore involved additional cost. The result of that would be delay, and they might probably find that they were not a whit better than they would be by agreeing to go on with the plans as they stood. There was no hope by waiting of any reduction in the cost; the tendency, he was afraid, was the other way. He believed that the longer they waited the more they would have to pay. Looking at the price of coal, the cost of which entered largely into the cost of material, such as brick, and the tools used for dressing stones, and seeing the general advance of wages which was taking place, and especially in the building trades, there was very little hope of any reduction in the cost of building. He knew that there was at present a movement on foot, which he believed would soon convince them that the tendency was the other way.

BUILDERS' BENEVOLENT INSTITUTION.

THE twenty-fifth annual meeting of the subscribers and friends of this charity was held yesterday (Thursday), at Willis's Rooms, King-street, St. James's. The chair was taken at three p.m., by Mr. James Simpson, in the absence of the president, Mr. Joseph Taylor. The notice convening the meeting having been read, Mr. A. G. Harris, the secretary, read the minutes of the last annual meeting, which were confirmed. The secretary then read the report, which was as follows:—"In presenting the twenty-fifth report to the friends and supporters of the Builders' Benevolent Institution, the directors have the satisfaction of informing them that they have, through their kind assistance, not only maintained their previous position, but have increased the number of their annual subscribers, during the past twelve months. Four pensioners have been elected during the past year—two in November, 1871, and two in May last. The pensioners elected in November, 1871, were, Mr. W. Gale and Mrs. M. St. George; those elected in May last being, Mr.

M. Minry (blind) and Mrs. J. Brothill. The pensioners deceased during the past year were Mr. G. L. Williams, elected May, 1866, died August, 1871; Mrs. A. Buckingham, elected May, 1857, died August, 1871; Mr. G. Hunt, elected May, 1867, died November, 1871; Mrs. M. A. Farnell, elected May, 1861, died December, 1871; and Mr. W. Taylor, elected May, 1863, died February 1872. During the past year 752l. 16s. 5d. stock 372 per Cent. Consols, has been added to the funded property of the institution; 643l. 14s. 5d. for the relief fund, and 109l. 2s. for the building fund; making a total of funded property of 16,142l. 12,781l. 9s. 6d. for the relief fund, and 3,360l. 10s. 6d. for the building fund. The amount purchased for the relief fund includes the sum of 321l. 18s. 10d. received from the executors of the late Richard Alechin, Esq., of Brighton and Tunbridge Wells, who was a liberal supporter of the charity from its commencement. The annual ball, held at Willis's Rooms, King-street, St. James's, in January last, produced a profit of 76l. 6s. 7d., being an increase over the previous year of 21l. 16s. The directors, in thanking their kind supporters for their generous and continued efforts, which have enabled them to assist so many of their unfortunate brethren, hope that (there being so many applicants) they will not cease in their efforts, but endeavour themselves, and through their friends and connexions, to procure additional funds, so that they may elect a larger number at the next election. They have also the pleasure of announcing that Edwin Lawrence, Esq., has kindly consented to be the president of the Institution for the ensuing year."

The Secretary then read the balance-sheet for the year, from June, 1871, to June, 1872, which showed the receipts to have been 2,832l. 19s. 10d., and the expenditure 2,395l. 11s. 1d., leaving a balance in banker's hands of 437l. 8s. 9d.

On the motion of Mr. Joseph Bird, seconded by Mr. Thomas Stirling, it was resolved that the report and balance-sheet be received, adopted, and printed. Resolutions were then passed, thanking the patrons, the president (Mr. Joseph Taylor), the vice-presidents, the trustees (Sir S. Morton Peto, Bart., Sir J. C. Lawrence, M.P., Mr. Charles Lucas, and Mr. G. Spencer Smith), the treasurer (Mr. Geo. Plucknett), the directors (the hon. sec. to the ball (Mr. Joseph Bird), the auditors (Mr. S. H. Head and Mr. J. H. Hunter), and to the honorary solicitors (Messrs. Jacques, Edwards, & Co.) for their services to the Institution.

Mr. Joseph Taylor was added to the list of patrons, and the following gentlemen were added to the list of vice-presidents:—Messrs. G. Dines, R. Giles, M. Hall, G. Head, W. Lee, and E. Whillier. The following directors, retiring by rotation, were re-elected:—Messrs. G. Fish, F. W. Keeble, James Simpson, R. G. Smith, J. Thora, S. J. Thacker, and J. Waldram, and Messrs. R. K. Burstell, and G. P. Mace, were elected new directors.

On the motion of Mr. Joseph Bird, seconded by Mr. T. Stirling, it was resolved that Mr. Edwin Lawrence, be the president of the Institution for the ensuing year.

A vote of thanks to the chairman, Mr. James Simpson, brought the business to a close.

THE FATAL ACCIDENT IN THE COMMERCIAL ROAD SEWER, LIVERPOOL.

THE borough engineer has presented a elaborate report on this accident. The engineer states that he visited the works twice on the day of the accident, and on both occasions a very strong odour of sulphuretted hydrogen pervaded the engine room. The immediate effect was, in a modified degree, the poisoning with sulphuretted hydrogen, of which he has had personal experience. The engineer holds a very strong opinion that which may be termed the mechanical evidence is the true explanation of the cause of death and it is borne out by the chemical evidence, which shows that the deposit in the tunnel, even when stirred, was incapable of giving off gas sufficient quantities to account for death, the water containing a solution of sulphide of calcium, such as that which existed in the works was quite sufficient for the purpose. Ordinary precautions were taken to render the tunnel safe. All the manholes were open. The men did not enter until, so far as they could judge, the tunnel had been rendered quite pure by the current of air induced by the jet of water which had played for some time. He

been unable to detect the smell of sulphuretted hydrogen in any of the sewers which he has visited, and they include some of the flattest and most sluggish in the town. The engineer recommends that certain changes be effected in the Liverpool Sewage Utilisation Company's works. The report was agreed to.

HIGH ART IN THE BRITISH MUSEUM.

Sir.—The general opinion is, that pictures intended for public inspection should not be placed beyond the reach of human vision, but the authorities of the above-named establishment seem to think differently, as all the portraits are hung as near to the moon as the limits the building will allow, and any one under 5 ft. high can see no more of the paintings as a Tilburina saw of the Spanish fleet.

GEORGE ELLIS.

LIABILITIES OF AN ARCHITECT.

Some time ago proof was led before Sheriff Meigs Thompson, Aberdeen, in an action raised by Mr. Souttar, architect, Aberdeen, against Alexander Gouder, butcher, for payment of the ordinary architect's fee of 5 per cent. for the preparation of plans and superintending the erection of a cottage lately built by the defender. The defence was that there was a special agreement that the architect's fee was to be less than 5 per cent., at the original plans were deviated from, and that Mr. Souttar granted a certificate for the payment of the final instalment of the architect's contract-price before the work was completed, whereupon the money was paid, and the contractor left the town, leaving part of the work to be accomplished by another, at the defender's expense. The sheriff has issued an interlocutor, finding the pursuer entitled to his liability fee, less 3l. 8s. 6d., which his lordship deducts from the charge in consideration of the expenditure of the defender, consequent on the granting of the certificate referred to, the pursuer is found entitled to expenses.

THE THUNDERSTORMS.

PROVINCIAL newspapers of last week largely set out as to the physical commotions which are still going on; and we have had a share them in the metropolis more than once on our notice last week. One thing seems very probable in consequence of these storms of lightning and rain,—that we shall have no less this year in England; for cholera has always been close and un-thundery, and we have had no instance, that we collect of, ever since this plague first showed itself in Great Britain, of cholera after an open season like this. Meantime, great damage is being done by the storms throughout the country, especially by the floods, but there have also been fatalities to life as heretofore. In the Manser district there have been "alarming floods," at destruction of property, shocking scenes; in the Sheffield district there have been "great ds" by recent storms; and so on throughout a great part of the country. Leigh church has been struck by lightning, and part of stonework of a turret thrown down. There is no lightning conductor attached to the towers, houses, chimneys, &c., have also, as now and then, been struck, and while we write Brixton church has been struck and injured, and the arch in view of the writer has been turned into tall and flowing river. Two neighbouring trees here (in Holloway) have been struck; in one case the lightning cutting off a piece of ivy water-pipe, and in the other making a hole in a roof.

OMERSET AGRICULTURAL LABOUR QUESTION.

Sir.—As you ventured to mention my name as an actor in the farm labourers' question, I ask you kindly to send the following facts, proved at a meeting held at Lacaze, near Yeovil, June 11th, 1872, when 1,000 farm workers were present, to show to your readers whether I am right or wrong. I am, alias Jack Tucker, a very old man, in order to a question, said that he remembered when his father tried to reduce his wages to 6s. a week; but he did not accept of it. He was the forehook (first man) for six or six of the morning until nine o'clock at night, and could not make more than 10s. or 12s. a week. He did not now do a day's work. He received 1s. 6d. a

week and a loaf of bread from the parish. Mr. Mitchell asked—Do you pay house-rent? A. 1s. per week.

Wm. Chant, an elderly labourer, forty-seven years of age, was also called upon the platform, and examined by Mr. Mitchell. He said that when he was married he received 10s. a week, but he worked at Montacute House, and there were no perquisites. Farm-labourers were paid 5s. a week. Had had eight children, and paid 1s. 6d. a week rent. Q.—How much butcher's meat did you have? A.—I did not eat three-penny-worth of beef in a twelve-month.

Maria Bull, a respectable-looking woman, was called upon the platform, and said that she had had fifteen children. Q.—How much did your husband get a week? A.—7s., when we were first married. Q.—I suppose his wages were increased to 8s.? A.—Yes. Q.—His wages have been lately raised to 9s. A.—He has got 1s. extra. Q.—I suppose you have plenty of butcher's meat? A.—None whatever. Q.—Do you pay house-rent? A.—1s. 6d. a week.

Mr. Mitchell said, that he thought he had produced sufficient evidence to convince every one that something ought to be done for the labourer. He hoped that they would become members of the union, and if they had not sufficient money to pay the deposit, he would lend them some. Mr. Mitchell offered 1l. each to every man that had got a pig in a sty, and asked them to hold up their hands. There was not a hand held up.

P.S. The above are only a few of the facts.

SANITARY TRIUMPHS.

TACHE SANS TACHE.

CONELLA was not the only mother. Who rear'd sons to dedicate their lives To grand designs for building up the State, Far greater deeds than by the Græci won, More nobly work, in truth, have since begun. And sons perform'd—helped by mother's counsel, And their own strong consciousness of right. We see it in the pavement and the flags,— Find it in foundation stones and walls. The basements and the house-tops echo it, And art and science spread the knowledge far. The crystal waters welling from their fountains, God's fire undim'd in towers and cities. The music of the birds, the trees and flowers, And happy children's voices in the parks Proclaim it. But, lowering o'er all these, We greet it in the countless hearts and homes. Wou back to cleanliness and blessed health. C. H. C.

RECIPE FOR A BUILDING IN THE

"NEW STYLE."

FIRST, take an old tone, an age out of print, That's full of quaint copper-plates Of churches and mansions of antique mint, With some grim old courtyard gates. Take a piece from the post, a slice from the tower, Some doors, and windows from aisle, Mix well, and a work of most wondrous power You'll have, in the Newest Style. O.

"UTILISING DRAINAGE."

Sir.—In answer to "M. M." in the Builder, allow me to say,—Filter your sink-water through a heap of earth, stubble, or straw formed upon the surface of the ground before passing it into the drain. Use the dry-earth system indoors and out, and you will have more than solids to deal with. G. S. C.

HOME-MADE GAS.

Sir.—Having heard recently that new discoveries in the production of gas for domestic use have been made, I shall be indeed obliged if you or your numerous correspondents and readers will kindly give their experience and thoughts on the same. Some gas made of oil was mentioned as good and pure. C. W.

BEECH.

Sir.—If "W." will try the experiment of using thoroughly seasoned beech timber in his business of mallet-making, there is no doubt he will have found the only remedy he seeks. J. C.

THE TRANSPORT OF SALT WATER.

In addition to what has been said, it will be necessary to provide against the different effects of sea-water upon the pipes in which it is conducted from the sea to London. Metal pipes would, most likely, become corroded, and therefore it would be better to use earthen or stone ware. Another thing is, the deposit of calcareous ingredients which abound in a great degree in the south coast water. This may be in a great measure counteracted by depositing a small quantity of clean ballast in the pipes, to about one-fourth of their depth, at those parts where the pipes lie nearly level. Where a good fall is obtained this would be unnecessary, as there would be but little deposit, and also nearly impracticable, as the ballast would be washed down to the lower level, and cause obstruction; or burnt clay could be used instead of stone ballast; and when removed from the pipes, as it would have to be occasionally, and replaced, could be converted into a good cement. It would be worth while considering whether it would be the best plan to take the water direct from the sea, for reasons stated in my last correspondence, or whether it should be taken from the mouth of a river, such as the Adur. There are no large towns near this river, so the water ought to be tolerably clean, and should form the chief supply. The water should be first collected in a

* Seven miles west of Brighton.

reservoir near the river's mouth, and then there should be three supplies: 1. That above mentioned; 2. Pure sea-water; 3. Rain or other fresh water, for occasionally flushing the pipes, and for regulating the quality of the water. WALTER SCARGILL.

STOCKTON EXCHANGE COMPANY, LIMITED, COMPETITION.

Sir.—Inclosed, from the secretary, is a reply to my application for particulars respecting this competition. These particulars are so meagre, the demand of 10s. for a tracing of the outline of the ground so paltry an attempt at extortion, that perhaps it would be well to bring the matter under the notice of Mr. Strong, honorary secretary to the Committee on Competitions at the Late Conference, if happily his remonstrances may avail in securing even common decency to the profession. INDIGNANS.

MUDDLE.

Sir.—When Captain Coram's statue was placed in front of the Foundling Hospital, in Guildford-street, it was intended it should be seen by wayfarers from Ilolborn, along Lamb's Conduit-street. When the Metropolitan Cal-fare and distance tables were issued to the public, it was never supposed by them that the large, unsightly boards would be placed in such an elevated position as the top of a lamp-post, just beneath the lamp, which is the darkest part of the street at night, and where an average pair of eyes, over forty years of age, cannot read it by day, and after the gas is lighted can only see an angry black shadow. When the drinking fountain in Guildford-street was designed, it was supposed to harmonise with the hospital and its purpose, and was therefore made to face it; but let any one journeying that way stand a minute, and see the result of the combination. Noble-hearted Captain Coram is fix'dly gazing at the foggy gas flame, or wondering why his range of vision has been shortened by the intrusion of a cal-fare screen, and the pretty little girl of the fountain is cowering behind it, pouring out water by stealth, her presence quite unsuspected by the Captain (although close under his nose), whose world is shut out by a board and a lamp-post, which ought not to be suffered to stand there another week. The place for a lamp near that spot is behind, or over, or at each side of the fountain, certainly not in front of it,—cutting it in half with a thick black line; and the cal-fare board should be carried bodily away, and put up again in some more fitting place, where it may be read without the aid of a telescope. At present the fountain and hospital are two separate things, and if they are not to remain such, the impediment must come away; otherwise, the drinking-fountain should be turned round, so that the people may see it, though Captain Coram may not. O'GARTH.

CHURCH-BUILDING NEWS.

Belchamp St. Paul's.—The church here has been reopened by the Bishop of the diocese (Rochester). The church had been allowed to fall into a very dilapidated state, and though the fabric itself was tolerably well preserved, the fittings and whole interior were in a condition very unsuitable for the performance of public worship. The whole amount of funds collected was 1,071l. 15s. 8d., while that expended up to the present time is 108l. in excess. The architect for the Dean and Chapter is Mr. A. J. W. Blomfield, the alterations and fittings in the nave were made under close supervision, by Mr. Theohald, of Long Melford, and the restorations in the chancel and new chancel aisles were made by Mr. Rimmacles, of Halsted.

Southport.—St. Andrew's Church, Southport, has been reconstructed. The church is cruciform in plan, and consists of a nave 89 ft. 9 in. by 28 ft. 6 in.; north and south aisles, 61 ft. 6 in. by 13 ft. 6 in.; north and south transepts, 28 ft. 3 in. by 27 ft. 6 in.; chancel, 30 ft. by 24 ft. 8 in., with organ chamber and vestry on the south side. The tower, through which is the principal entrance, is placed in the angle between the chancel and north transept, in order to suit the peculiarity of the site and approaches. There is also a porch and entrance in the north aisle. The design is decorated, the principal feature being the tower and spire at the northeast. Internally the nave has an arcade of four arches on each side, the shafts being of polished sharp granite, with moulded and carved capitals. These arches support a clearstory, pierced with two light tracery windows, and opposite the transept, on each side, is a large arch, the apex reaching to the top of the clearstory. The arches east and west of the nave are supported by moulded and carved stone brackets. The chancel, which is raised three steps above the floor of the nave at the chancel arch, and two steps higher within the communion rails, has a tracery window of five lights, and an ornamental reredos of Caen stone, with marble shafts. The chancel arch is of large proportions. The large window at the west end is of six lights, and those at the north and south of transepts of four lights, traceried. The aisle windows are of three lights toward the west, and of two lights at north and south. The roof timbers are dressed and chamfered in panels. The building is con-

structed with brick walls, faced with Upholland parpentine in courses. The stone for the exterior is from the Cofn quarries, near Rulon, and that for the interior is white Stourton. The floors are of tiles, those in the chancel being laid to a pattern. The joiners' work is of selected pitch-pine, varnished. The contractors for the several works, have been—for the brickwork, Mr. Smallsaw; for the carpenters' and joiners' and ironwork, Mr. Duxfield; for the masons' work, Mr. Greenwood; for the slaters' and plasterers' work, Mr. H. Robinson; for the plumbers', painters', and glaziers' work, Mr. Boyd; and for gas fittings, &c., Mr. Rohson, all of Southport. The building contains nearly 1,000 sittings, of which half are free. Messrs. T. D. Barry & Son, of Liverpool, were the architects.

Whitby.—The Mission Chapel, at Kettlewell, near Whitby, on the estate of the Marquis of Normandy, has been opened for divine service. The style of architecture of the edifice is of a severe Gothic type. The edifice will seat 137 persons, and the total cost is about 300l. It has been erected from the plans and under the superintendence of Mr. Charles Noel Armfield, York Diocesan surveyor, architect, Whitby.

Earls Barton.—The restoration of the church here is gradually progressing. The chancel is nearly completed. The side walls (chancel) have undergone a restoration, and parapet walls of Weston and Weldon stone have been added, and suitable crosses placed upon each of the gables. On the north side of the chancel has been placed an organ chamber, which is connected with the chancel by a lofty arched opening, and the old Tudor window, which had to be removed, has been placed in the north side of the chamber. The old roof has been removed, and has been replaced by a high pitch king-post oak roof, and new leaded. The inside of the roof is oak panelled and moulded, which is set off by an oak cornice. The side walls have been stripped of the old plaster and whitewash, and have been fresh plastered. The old Norman recesses have been cleansed of all whitewash, colour, &c., so that the primary tooling has not been interfered with. The old triplet chancel window has not been overlooked, and the old mullions have been taken down and replaced with a new inner arch, and a stained window, with Scriptural illustrations, has been put in by Messrs. Bell & Almond, of London. The other windows, with the exception of two which are retained for stained glass, have been glazed with cathedral glass: one of the two low side-lights, previously bricked up, has also been glazed with cathedral glass. The floor is to be encaustic tiles, and the furniture to be carved oak. For accommodation a temporary wooden floor has been placed, so that the chancel will be used for divine service during the restoration of the nave, which is to be finished by the autumn. The architects are Messrs. Slater & Carpenter; the builder is Mr. Allen, of Irthlingborough. The restoration is under the management of the Architectural Society. There is no doubt that the Saxon tower will, under the management of the Architectural Society, be repaired in the manner it deserves.

Brixham (Devon).—Holy Trinity Church, situated in Higher Brixham, and said to be one of the most abominable specimens of Carpenter's Gothic of the Georgian era, is doomed, earlier or later, to come down. Already a new chancel has been erected, and being nearly complete, will shortly be consecrated. No chancel existed in the original church, so that this addition stands upon new ground, the site having been quarried out of the solid rock in the rear of the present building, not without much difficulty and expense. The chancel arch is supported by columns of Devonshire marble, springing from delicately-carved corbels, representative respectively of the wheat and wine, and lily, and passion-flower. Various corbels, &c., throughout the chancel, representing foliage of a Scriptural type, the rose, apple, oak, fig, &c. At present the walls are stuccoed. The roof is an open one of pitch-pine, varnished. The floors are laid with encaustic tiles. Some of the windows are of stained glass, by Messrs. Lavers, Barnard, & Westlake; the others of opaque cathedral glass. The seating is of local limestone, and the dressings throughout are of Bath stone, from the Corsham Down quarries. The builders are Messrs. Bragg & Dyer, of Paignton. The sculpture and the stone carving are by Mr. Harry Ems, of Exeter. The style of the building is Early Decorated, and has been designed by Mr. E. Asworth, of

Exeter, under whose supervision the works have been carried out. Mr. Asworth's design includes a new church in toto.

Bury.—The Church of St. Peter, near Bury, has been consecrated by the Bishop of Manchester. It is a building in the Early English period of architecture, faced with stone externally, but with red brick inside, Bath and blue Burnley stone being used in the columns, &c. The reredos, font, and pulpit are executed chiefly in alabaster, relieved with gold mosaic. An effect is gained in the interior by the contrast of the seating, which is black, with the colouring of the walls and columns. The stalls are relieved by gilding. The church is built to accommodate 500, on the usual plan of nave and aisles, with apsidal chancel, large organ-chamber, and two vestries. The remainder of the tower and spire are left for future erection. The contractors for the building are:—For the masons' work, Mr. H. Fleetwood, Manchester; brickwork, Messrs. T. Blease & Brother, Altrincham; joiners' work, Messrs. W. Jones & Co., Liverpool; slating, &c., Mr. J. Owen, Bowdon. The reredos, pulpit, font, and the carving of the chancel have been executed by Messrs. E. Williams and Millson, Manchester. The architects were Messrs. Maycock & Bell, of Manchester.

Colchester.—The rebuilding of St. Mary's Church is fast approaching completion, and was arranged to be opened on the 10th of July. As a first step towards the improvement, it was proposed last year to build an entirely new chancel, with an organ-chamber, vestry, and side chapel for children's or other seats, and, if possible, to re-seat the body of the church; it was considered to be quite impossible to undertake anything beyond this with the funds likely to be available. Mr. Blomfield was called in, and submitted a report to the committee, accompanied by a plan, each of which were adopted. When the tenders came in, however, the lowest was so considerably under the architect's estimate, that a design was asked for a new roof for the nave and aisles, next for new columns with brick arches, then a clearstory, and last of all the rebuilding the aisle walls. Thus it happened that the designs being asked for and submitted in this manner by instalments, the church as it now stands, although (with the exception of the tower) an entirely new building, was to a considerable extent necessarily carried out on the old plan, and to harmonise in general effect with the red brick building lately removed, rather than to reproduce what might be believed to be more in conformity with the original church. With the addition of a chancel, side chapel, organ-chamber, and vestry, the new church is identical in plan with the old one. The whole structure is of red brick, with a few bands of black and a moderate use of Bath stone for windows, &c. The roofs are of stained deal—as also the nave seats; those in the chancel are of pitch-pine. There is at present no reredos. The whole of the work has been carried out by Mr. Gardner, of Coggeshall. Mr. Heathcote has acted as clerk of the works. The church is to be heated by hot water by Mr. Joslin, of Colchester.

SCHOOL-BUILDING NEWS.

York.—The Clementhorpe and Bishophills new schools have been inaugurated by the Archbishop of York. The schools are situated in Cherry-street, near the junction of Numery-lane with Bishopthorpe-road. They were built from the designs of Messrs. J. B. & W. Atkinson. The length of the building is 120 ft. It is divided into infants', girls', and boys' schools, with separate class-rooms. There is a good play-ground, with conveniences. Coloured collar beams supporting the roof, give an ecclesiastical finish to the structure. The whole of the rooms are warmed by Stewart & Smith's hot-air apparatus, which, it is said, works economically, and can be made to raise or lower the temperature at pleasure. The schools will accommodate about 400 children, divided into the three classes. About 800l. have been raised towards the expense of the building by voluntary subscription, the Central York Board also contributing 300l., and the Government grant amounting to 190l.

Canterbury.—The chief stone of Holy Cross and St. Peter's New Schools has been laid. The schools will be built for the accommodation of 250 children, and include a separate school for boys (not connected with the other schools), 42 ft. by 19 ft., with an entrance from the lower part of Black Griffin-lane, and capable of accommodating ninety boys under twelve years of age.

The infants' school is 41 ft. by 19 ft., capable of holding ninety-five children under seven years of age, whilst the girls' school is 38 ft. by 17 ft., and will accommodate sixty-five children under twelve years of age. Adjoining the schools will be a teacher's residence, and the expense of the whole is estimated at 1,400l. Mr. W. O. Colard is the architect, and Messrs. Gaslin & Golden are the builders.

Doncaster.—Preparations are now being made for the erection of new Roman Catholic Schools, in Portland-place. The building is to be adapted for a mixed and infant school, and the cost is estimated at 500l. The schools are expected to be completed in about four months' time.

Worlaby, Brigg.—These schools were opened on the 12th inst. The buildings occupy an elevated site in the centre of the village, and comprise a mixed school, 50 ft. by 20 ft., with open roof of fir, stained and varnished; boys' and girls' cloak-rooms, with separate yards and offices, and commodious house, with yard and offices, for the master. The schools are surmounted with a neat bell-turret, and the total cost is about 800l. Desks were provided by Coleman & Co., Norwich. Gurnoy's stove, Moine's patent wrought-iron casements, and Dr. Arnott's ventilators. Both the schools and master's house are fitted with Moale's patent earth-closets. These schools are similar in design and construction to those at Elsbam, which were opened June 3rd and form a portion of the improvements on the Elsbam estates, in the counties of Lincoln and York, consisting of new cottages, schools, farmsteads, and houses, and repairs to existing buildings, all under the superintendence of Messrs. Dunlop & Bryant, of Westminster, with M. William Young as clerk of the works. It is intended at once to restore the village church plans of which have already been prepared by Mr. W. Scott Champion, of London.

Books Received.

Ross's Wages Calculator, for Fifty-one and Fifty-four Hours per Week, at Rates from 2s. 6d. to 4s. Edinburgh: John Ross & Co., Prince-street. London: Simpkin & Marshall. 1872.

The "Fifty-one Hour" Wages Reckoner: consisting of Computations per Week and Computations per Hour for a Working Month. With a Supplementary Comparative Table, applicable to Weeks of 48, 54, 57, and 60 Hours respectively. By a Retired Banker. Edinburgh: Johnstone, Hunter, & Co. 1872.

The titles of these publications explain the contents. It is scarcely necessary for us to more than make their publication known. *Ross's Calculator* is less than a farthing is reckoned a farthing, and less than three farthings is reckoned a half-penny, and three farthings a penny. In the "Banker's" little book farthings and three farthings are literally stated. *Wages Tables* in the latter from 4d. to 1s. 1 hour, continued from a quarter of an hour to 2 hours, can be used also as a Ready Reckoner showing the value of any number of articles from 1 to 231, at any price from 4d. to 1s. ea.

Beeton's Science, Art, and Literature. A Library of Universal Information. Vol. London: Ward, Lock, & Tyler.

This portly, closely-printed, and well-illustrated volume (991 pages, extending to the letter G) carries on the work begun in "Beeton's Dictionary of Universal Information." The latter deals with facts which relate to the names of persons and places; the volume now published gives an immense amount of information relating to things; it describes inventions, and all processes of every kind. Care and conscientiousness are obvious throughout the book, and we cordially recommend it.

VARIORUM.

The Gardener's Magazine, writing of trees in architecture, says:—"When planting in the vicinity of a dwelling-house, whether it be a mansion or a cottage, we often find ourselves under considerable restraint, because the foliage of the trees requires to be in harmony with the character of the building. It may not be necessary to consider every style or order of architecture as requiring a different assortment of trees for our purpose, it suffices to divide the trees into Perpendicular, of which the Gothic may be given as an example, and the Horizontal, which is fully exemplified by the Italian style. Irreg-

nd-headed, and weeping trees are in character either, but the laminate and round-headed most pleasing to my mind in connexion with perpendicular, and the columnar and regular with the horizontal. If the building low, tall-growing trees should be avoided, and round-headed, the laminate, and weeping especially desirable, because they direct the horizontally and downwards. It should ever be borne in mind that the presence of lofty trees in proximity to a low building has the desirable influence of still further depressing

Miscellanea.

Vienna Universal Exhibition of 1873.—Brief summary of the conditions upon which the Exhibition will be conducted has been published. The Exhibition will open in Vienna on the 1st of May and close on the 31st of October. 3. Lists of the exhibitors, with detailed plan space required, must be sent in to the chief manager at Vienna before the 1st of January. Liability on the part of the exhibitors for hangings, boarded floors, or the laying out of the dens. The motive-power for the machinery to be supplied gratis. The price to be charged for each foreign country for the entire area of space demanded, will be, in the Industrial Palace at the rate of 10 florins—1l. per square metre (a square metre contains about 10½ square feet), and the machinery hall at the rate of 4 florins—per square metre. In the courtyards of the Industrial Palace the rent per square metre will be 8s. In the park,—open air, 2s.; in spaces paved at expense of exhibitor, 6s. Exhibitors' fine arts are exempted from any charge for space. Arrangements are to be made by the Austrian Commission for the reduction of the transport charges in Austria and Hungary. Exhibitors or their agents are responsible for packing, forwarding, receiving, and unpacking of their goods. The removal of objects after the Exhibition must be completed before the 1st of December, 1873. The objects will be admitted to the judgment of an international jury. Objects for exhibition will be received at Vienna from 1st of February until the 15th of July, 1873. Exhibitors and their agents will receive tickets entitling them to free admission to the Exhibition. For further information address to Mr. Philip Cunliffe Owen, secretary, Vienna Exhibition Offices, 41, Parliament-street, London, S.W. Applications should be forwarded not later than 24th of August.

The Sewage, and what is to be done with it.—A meeting of gentlemen interested in the subject was held on Thursday last, in Willis's Rooms, under the auspices of the General Sewage and Manure Company, to receive an explanation from Dr. Anderson, of the nature of the system of which he is the author, and which is now in practical operation at London. The meeting, which was presided over by Lord Elibank, was largely attended by scientific gentlemen, engineers, and others. At fifty gallons of sewage from the Fleet were put in a glass tank, were experimented upon by Dr. Anderson. He showed how by treating sewage with sulphate of alumina in a crude solution, in conjunction with lime, the solid matter precipitated and converted into sewage manure, and the effluent water is rendered clear and non-offensive that it may without danger be allowed to run into streams. The experiment was watched with interest, and the precipitation effected in about twenty minutes. It happened, however, that the effluent water was not so odourless, and this was explained by Dr. Anderson, who said that the Fleet Ditch contained the very worst form of sewage, and that small arces from the area held in suspension could not be removed by any known process, either of precipitation, irrigation, or filtration, but which, however, would be converted into a harmless body, ammonia or its carbonate, and exposure to the atmosphere. It could be effected by intermittent filtration. Those present expressed their high opinion of the efficacy and practicability of the system, and urged the importance of its adoption by the large towns.

On Ore in Clifton.—The purchaser of a building site recently sold in the centre of Clifton, says the *Bristol Times*, has met with a mass of iron ore, in the form of iron ore, which he thinks will produce as much money as he can for the whole property.

Coal and Iron.—The increased cost of coal and iron tends to increase the cost of production in numerous departments of industry. In the Staffordshire potteries the china manufacturers have decided on an early advance in the prices of china, "to meet the increase in the cost of fuel and materials." Again, "in consequence of the increased price of coal, iron, and other materials used in the construction and working of steamboats," the penny boats on the Thames have become twopenny boats. If coal continues to rise in price, and it is said that it will, we may look for increased railway fares. In fact, prices altogether are going up fearfully, and the enormous cost of food and fuel will in all probability have very serious results among the poor during next winter. The coal miners of Northumberland have held a meeting in Newcastle, to consider what course should be pursued with reference to the advance of wages which the masters have offered them. After a long deliberation it was resolved to accept the 10 per cent., but at the same time the men considered themselves entitled to the full amount asked, viz. 20 per cent., and added that nothing short of this advance would be entirely satisfactory. The Miners' Union is a very strong one, and it is believed they will shortly apply for a still further increase.

The Restoration of Dorking Parish Church.—The inadequacy of the Church of St. Martin to meet the requirements of the parish has long been felt, and its gallery and pews make it impossible for many of those who do attend the church to see or even hear what is going on. The erection of the new chancel also threw out in striking contrast the inartistic body of the church, which is about as plain a structure as it is possible to find, though built only thirty-five years ago. A subscription list to raise the necessary funds for rebuilding has been set on foot. Mr. Cubitt, M.P., headed the list with 2,000l., and other sums given with proportionate liberality soon swelled the amount, until the committee were enabled to invite tenders for the work, from the plans of Mr. Woodyer, architect. About 6,000l. were required, and nearly the whole of that sum has been promised. It is believed that the contract will be signed forthwith, and the demolition of the present structure commenced early in the ensuing month. Negotiations are in progress with the directors of the Public Hall Company, to enable the vicar to conduct divine service in that building during the restoration.

Early Man.—According to *Galvani*, M. J. de Baye has communicated some information to the Academy of Sciences on certain grottoes in the department of the Marne, which, in times when polished flint was in use, served as burying-places. These caverns are all cut out on the same plan, and are evidently of similar origin. The sides and arched ceilings bear the marks of stone hatchets. Some are divided by a partition into two chambers; several were receptacles for the dead, but others were inhabited. The latter were more comfortably arranged, and admitted of being closed with doors, as certain grooves show. The walls are provided with hooks carved out of the solid clay; and lastly, the entrances bear traces of a degree of polish from constant going in and out. On a wall of one of these grottoes there exists a rude bas-relief representing a hatchet provided with its handle, and a sling. The flint instruments discovered here are hatchets of various shapes, knives, punches, saws, well-cut arrow-heads, &c. Some of these articles were not flint, but porphyry.

The Thames Embankment (Land) Bill. On the order of the day for the re-committal of this Bill, the Chancellor of the Exchequer expressed his regret that there was an amendment to the motion for going into committee; he had hoped the dispute might that night be settled. Mr. V. Harcourt moved that at this advanced period of the session, with a pressure of important public business, it was not expedient to proceed with the Bill. After some discussion, the House divided; and the result was, for Mr. Harcourt's amendment, 154; against it, 133; majority against Government, 21.

The Vendome Column.—Everything is now ready for the reconstruction of the column in the Place Vendôme, at Paris. The plans are all prepared, the expenses being calculated at 250,000fr., and M. Normand, the architect, is only waiting for orders to commence operations. The fragments of the pillar are arranged in one of the rooms in the right wing of the Palace of Industry.

Sales of Land.—The freehold premises, Nos. 16A and 17, Tokenhouse-yard, Lothbury, and the adjoining premises, No. 18, held for 7½ years, subject to a peppercorn rent, were on Tuesday sold by auction by Messrs. Debenham, Tewson, & Farmer for 23,800l. The freehold portion covered an area of 1,550 ft., and the gross rental of the whole amounted to 2,145l. a year.—The Freedy Estate, near Melton Mowbray, comprising 2,380 acres, producing an income of 4,250l. per annum, has been sold privately by Messrs. Chinnock, Galsworthy, & Chinnock, for the sum of 141,000l.—A sale of property in Chichester took place last week. It consisted chiefly of 42 acres of freehold building and accommodation lands near the New Cattle Market and the railway station, divided into thirteen lots. For lots 6, 7, 8, and 9, put up together, and consisting of about 11½ acres, in the parish of St. Peter the Great, Mr. Mallin (Greene & Mallin) gave 4,650l. Lot 3, consisting of over 8 acres, in the parish of St. Bartholomew, was knocked down to Mr. F. N. Hobgen for 2,350l. An enclosure, with 6 acres and 2 perches in the rear, in the parish of St. Peter the Great, was knocked down to Mr. H. J. Andrews for 1,250l.

Restoration of Croft Church.—The *Darlington Times* reports that the Chancellor, in giving judgment as to the proposed restoration or repair of Croft Church, said he had suggested that the parish could not do better than put themselves in the hands of Mr. Fowler, and Mr. Nicholson, the diocesan surveyor. They had not done so, nor had they come forward with any definite proposals. With regard to costs, the rector had plans prepared for the restoration of the chancel. That chancel he was legally bound to restore. Those plans he had submitted to this Court, to empower him to carry them out, under their sanction. An opposition had been raised, and he must say without sufficient cause. As he did not consider that sufficient reasons had been brought before him to justify the opposition that had been made to the application of the rector to restore his chancel, he felt bound to decree the faculty to issue at once, and with costs. Mr. Stevenson then, on behalf of the opponents, alleged his intention of appealing.

Opening of the New Colwyn Bay Hotel.—The *Chester Chronicle* states that the beautiful bay of Colwyn, since the estate of Pwll-y-Crochan was purchased by Mr. J. Pender, M.P., of Lady Erskine a few years ago, has made rapid improvement as a watering-place. A number of villas have been built and shops erected. A company of Manchester and Chester gentlemen have erected the Colwyn Bay Hotel, which has been formally opened. The hotel is situated in the centre of the bay. The station is about a minute's walk from the hotel. The style of the building is a domestic Gothic, and it has been built by Mr. Abel Roberts, Llaiduno, of the limestone of the district, from designs by Mr. John Douglas, of Chester, architect. The terrace-walk fronting the sea, with the rockeries and other landscape work, have been laid out by Mr. C. Ewing, of Chester. The promenade, which is of considerable length, is being further extended, and the grounds of Pwll-y-Crochan on the hill above are also free to the visitors at the Colwyn Bay Hotel.

The New Colonial Office.—In the Commons, Mr. B. Cochrane asked the First Commissioner of Works whether he was aware that when the houses in Parliament-street, opposite the public offices now being erected, are pulled down, the width of the space acquired for the public will be 87 ft. at one end and 60 ft. at the other; and what use he contemplates making of the narrow space if he did not add it to the width of Parliament-street. Mr. Ayrton said it was wholly unnecessary for him as yet to consider what was to be done with the ground. It would be time enough to do so when these houses were pulled down. He did not know exactly when the demolition would take place; but not before the new Colonial Office was finished.

Fall of a Building in Stockport.—In Rosemary-lane, Churchgate, the back part of a dwelling-house, with cellar, has fallen. It would appear that an imperfect sewer at the bottom of the cellar, added to the recent rainfall, had so affected the foundation of the building at that point, that the brickwork, separating from the adjoining wall, had fallen outwards into the yard, leaving the house-pipe and frontage, with the bed-rooms exposed, fortunately without endangering life.

Utilising Waste Substances.—Leather cuttings and scraps are, according to the invention of Messrs. Gale & Boyden, of Bristol, torn into shreds or ground into dust, then subjected to a solution of nitric, sulphuric, or other acid, and heated to make the mass glutinous, then washed in alkaline water and pure water, when it is again subjected to heat, adding glue or size prepared in acids or coal-tar; thus heated, the material is rolled or pressed into sheets, or the shreds or dust are mixed with water and glue prepared with acid or coal-tar. Before being dried, it may be used with paper pulp, also in making india-rubber, gutta-percha, and parkesine, but it is particularly applicable for the soles of boots and shoes and floor-cloths. When vulcanised, it is applicable to the purposes to which vulcanised india-rubber is applied.

Water Wanted in Kew Gardens.—The plants, we suppose, have plenty, but the thousands of people who flock to Kew at this season not only have almost literally no water supply throughout the gardens, but are restricted from taking either drinkables or eatables in along with them. If the purpose were to put a stop to the influx of the public, there would be nothing idiotical in such an arrangement, but Kew Gardens belong to the public, who are entitled and expected to flock to their own gardens, especially in the summer season. Mr. Ewan Christian suggests a simple and cheap arrangement whereby the water supply to the plants in the plant-houses might readily be made to afford an abundant supply also to the public. Here is a little work for the First Commissioner of Works to do.

How to Economise Prisons.—An interesting lecture on this subject, prepared by Mr. Aulic Schmidt, of St. Petersburg, architect, has been delivered, in English, in the rooms of the Social Science Association. The lecturer was based on the assumption that it is possible to make half the number of prisons accommodate, with equal convenience, the whole number of prisoners, by a system equally applicable to all countries. This he proposes to do by arrangements which might enable the authorities to use the existing workshops, for example, for several sets of prisoners at a time, successively; the cells of prisoners at work in the shops to be also utilised by others in the intervals of workshop occupation. How Sundays are to be got over we do not clearly see.

New Public Hall, Westbury, Wilts.—A meeting has been held for the purpose of recognising the gift of a public-hall to the town by Mr. A. Laverton. In a letter, Mr. Laverton explained that he proposed erecting, for the use of the inhabitants of Westbury, a building that should comprise, on the ground-floor, a school-room, a reading-room, and a committee-room; and on the upper floor, an assembly-room for lectures, concerts, and other useful objects. It was resolved that the gift of Mr. Laverton should be recognised in some suitable way when the memorial-stone is laid; and a committee was appointed to receive subscriptions, and, in connexion with the architect, Mr. Stent, to make the arrangements for laying the memorial-stone.

Temple Church, Bristol.—As the workmen engaged in the restoration of the interior of Temple Church were removing a portion of the floor in the south aisle, they suddenly came upon the entrance to a large brick vault, arched over, and filled with water to within 2 ft. of the arch. Floating on the surface was an air-tight leaden coffin, the wooden outer coffin of which had long since rotted away, and been left at the bottom of the vault. A cursory examination revealed the fact that there were three or four other coffins beneath the water, but the one we have alluded to was the only one floating. This case affords a simple explanation of occasional appearances in burial vaults, which have given rise to superstitious ideas as to supposed causes at work in moving the coffins.

Windsor Castle.—Extensive works are now in progress for the drainage of Windsor Castle and the utilization of the sewage of the Palace and Frogmore House. Some months back a site for the reception of the sewage was chosen upon the Ham, at Old Windsor, and a field of several acres, near the old course of the Thames, and between the latter and the navigation cut which leads to the Belles of Ouseley, was prepared by a number of the Foot Guards and gangs of navvies.

Bethnal-green Museum.—The visitors in the week ending July 20th numbered 59,619.

Prosperity of American Railways.—The *Money Market Review* says:—"Americans who understand the subject are of opinion that, should the present rates maintain, Pennsylvania will be able within two years to send pig iron to England at a profit. Never was so great activity displayed as is now being shown in opening up the coal and iron mines in the north-western portion of that state. Railways are being extended in every direction to tap the various coal fields at numberless points. Already there are no less than 5,113 miles of railroad in Pennsylvania, against 4,470 in New York; but they transport 12,000 tons per mile, against 3,615 tons per mile in the adjoining state.

Suffocation or Riddance of Vermin.—A new "patent vermin asphyxiator" has just been exhibited at South Kensington, under the superintendence of Mr. Frank Buckland, the zoologist. By means of a fan, turned by hand, sulphurous acid gas can be driven through a nozzle into drains, rat, rabbit, and snake holes [beetle or ant haunts?], and the gas either drives the vermin out, so that they can be killed outside, or it suffocates them in the holes. Sulphurous acid gas, too, is an excellent disinfectant: it is the same thing as sulphur fumes, and was long used by the Government (if not still) for fumigations of cargoes from plague ports.

Memorial Window to Sir J. Herschel.—A few days since a meeting, called by Lieut. Colonel Loyd, of Lillesden, was held for the purpose of considering a proposal to erect a window in the parish church, Hawkhurst, to the memory of Sir John Herschel. Colonel Loyd had procured a design from Messrs. Clayton & Bell, as well as an estimate of the cost. The subject of the window will be the Wise Men following the Star, and the cost 160l. The appeal has been liberally responded to, and a larger amount than is wanted for the window itself has been collected. It is expected the window will be completed at about Christmas.

The London Corporation.—The annual receipts of the City of London Corporation are nearly half a million sterling, the exact figure being 482,000l.; rents are set down at 80,000l.; markets at an almost equal amount; while loan repayments, &c., amount to 215,000l. The expenditure is pretty well equal to the imposing income, being 410,000l. The assets of the City are valued at 700,000l., exclusive of invested securities arising from the sale of properties, amounting to a third of a million sterling. The liabilities of the City of London, under bond, amount to more than five millions sterling.

Settlement of St. Silas' Church, Bristol.—The contractor for the rebuilding of this church has at length reached the bottom of the old foundations, and one of the causes of the settlement in the old building has been discovered to consist of a very old wall running transversely across the centre of the church. This wall acted as a kind of fulcrum, and where the building might have subsided equally had the wall not existed, it was prevented doing so; and the consequence was that the nave parted exactly over it. It need hardly be stated that it has been taken away, and the piling for the foundation is rapidly progressing. But why piling?

Shrine in Chester Cathedral.—Last week, while some of the workmen at the Chester Cathedral were engaged pulling down a portion of the wall at the west end of the cathedral, enclosing the staircase of the Old Bishop's Palace, they discovered a portion of what is described as the old shrine of the cathedral. It was at first thought to be part of an ancient monument, but after careful examination and comparison, it was found to be a part of the shrine, the remainder of which forms part of the bishop's throne and choir.

Antiquities.—The *Academy* says that some works undertaken in connexion with the construction of a new street at Lucera, have brought to light a statue of Venus, a marble vase, and portions of a mosaic pavement. The Venus is about seven hands high, and is undraped; at her feet are a child and a dolphin. The Italian papers speak of it as a good work, without assigning any date.

The Growth of Hove, Brighton.—We understand that the owners and managers of the Stanford Estate propose building 100 houses a year for the next fifteen years,—in all 1,500 new houses.

Royal Architectural Museum.—The Council wish to announce, as some of the results of the conferences recently held with art-employers, that two courses of lectures or explanations of the casts in the Museum, kindly offered by J. F. Redfern and Mr. William Brindley, members of Council, were arranged to take place at this season, but that in consequence of the unsettled state of the building trades it has been decided to postpone them until the autumn. Why they should be anxious to announce that they continue doing nothing is not clear.

The New Schools of Science and Art, Gloucester.—The building containing the schools and museum is about to be handed over by the builders to the trustees. The committee find that they are precluded from any further opening of the building at present. The work, although dry enough to permit classes to be held within them, are not in a fit state to allow of an exhibition of works of art, and the scientific collection is not yet sufficiently complete for an exhibition.

Sanitary State of Hammersmith.—A medical contemporary notices that it is high time that the Metropolitan Board of Works should give some attention to the creek at Hammersmith, which in its present state is nothing better than a "pestiferous open sewer." We endorse the observation.

Little Newcastle.—A new church is also to be built in this parish upon the foundation of the old one, which it has been found necessary to pull down. Mr. Thomas Richards has undertaken the contract for the first portion of the works, according to plans that have been prepared by Mr. E. H. Lingee Barker, of Hereford.

County Courts.—Upwards of 900,000 pieces are now entered in the County Courts every year, the claims exceeding in the whole at 2½ millions sterling; and, after many claims have been settled out of court, judgments given in above half a million, and for another 1,300,000l.

TENDERS

For alterations to Tutton Congregational Chapel. Mr. W. F. Pailton, architect:—

Ware	4125 0 0
Lewis	341 0 0
Toogood (accepted)	200 0 0

For enlargement of Trinity Congregational Chapel School, Reading. Mr. W. F. Pailton, architect:—

White	42,300 0 0
Mathews	2,200 0 0
Gover	2,158 0 0
Shppard	2,000 0 0
Silver & Sons	1,970 0 0
Barnicot (accepted)	1,967 0 0

For alterations at 17, Onslow-gardens, for Mr. Williams. Quantities supplied:—

Francis	4302 0 0
Paine	275 0 0
Longmire & Burge	245 0 0
Stimpson & Co.	245 0 0
Hussey (accepted)	200 0 0

For new Roman Catholic schools at Abingdon, for the Rev. Dr. O'Toole, exclusive of fittings or Mr. Edwin Dolby, architect:—

Drew	4655 0 0
Williams	593 0 0
Bryant	588 16 0
King	555 0 0

For the erection of new schools, St. Paul's, Brentford, Middlesex. Messrs. F. & H. Francis, architects:—

Dove, Bros.	43,375 0 0
Fish	3,350 0 0
Dodge	3,008 0 0
Adamson & Son	2,974 0 0
Keyes & Head	2,436 0 0
Collis & Son	2,308 6 0
King & Son	2,236 0 0
Hensou	2,707 0 0
Gibson, Bros.	2,743 0 0
Hiscock & Son	2,500 0 0

For the erection of a wooden pavilion at Porta for holding "Established Gaieties" every year, at Wales Musical Festival. Messrs. Roberts & M. architects:—

Morgan	4320 0 0
Lloyd & Co.	280 0 0
Griffith	292 0 0
Owen Griffith	275 0 0
Williams	220 0 0
Roberts (accepted)	205 0 0

For new Public Offices, for the Local Board of Health for the township of Waverley. Mr. John E. architect. Quantities supplied:—

Tomkinson	43,475 0 0
Gabbatt	3,600 0 0
Fell, Parker, & Hunter	3,650 0 0
Reddie	3,150 0 0
Moore	3,603 0 0
Burroughs & Son	3,565 0 0
Hugh & Co.	3,440 0 0
Urson	3,500 0 0
Nicholson & Ayre	3,478 0 0
Johnson	3,443 0 0
Stansborough	3,427 0 0
Jones & Sons	3,398 0 0
Okills & Morrison (accepted)	3,364 15 0

The Builder.

VOL. XXX.—No. 1539.

The Revue Générale de l'Architecture.



THE introduction to the second half of the twenty-eighth volume of the *Revue Générale* commences with an explanatory paragraph, bearing melancholy reference to events which had caused the temporary suspension of its publication for more than a year. "At the announcement of our

first defeats, the workman's tool was everywhere abandoned for the musket, and the press became but a military echo. Here and there we had pulling down enough, especially by means of cannon shot; but in the matter of construction, we were confined to cutting trenches and raising outworks; and under such conditions, journals such as the *Revue* had no pretext for existence." The twenty-eighth volume, which represented 1870, having thus been abruptly broken into at its fourth section, and not resumed till the middle of 1871, it was decided to complete the volume under the same number, but to regard it as comprising the two years 1870-71. We have before us the remaining numbers of the twenty-eighth, and the commencement of the twenty-ninth volume; and, congratulating our much esteemed contemporary, M. Daly, on the renewed excellence, both as to writing and illustrations, of the journal over which he presides, we propose to say a few words in relation to the contents of the portion before us.

The important place given in France to first principles, the predominance of the *idea*, in fact, is not less exemplified in her leading architectural journal than in her literary periodicals. A considerable portion, for instance, of numbers 5 and 6 of the *Revue* is occupied by description and illustrations of the new church at the small town of Fiers, designed by M. Ruprich-Robert. But this description is prefaced by a somewhat elaborate analysis of the conditions, and ideas, and demands upon the artist pre-supposed in the three words, "*bâtir une église*": the main tendency of these remarks being in regard to the due balance of "tradition" and "inspiration," to be preserved in the production of a design for a modern church. Archaeology, it is pointed out (the writer is M. Sirodot), with all the knowledge it furnishes as to ancient practice and the art of building, only serves to direct and facilitate the research after novel expressions; but it supplies a part only of the solution, the material element:—

"Pour obtenir l'élément qui complète la solution, qui la rend vivante et distinct de toutes les autres; entraîné par une ardente aspiration vers la vérité, animé par les grands enseignements de la religion, assisté de méditations assidues dirigées vers les célestes horizons, et soutenu par une ferme volonté, c'est à l'inspiration que l'artiste doit la demander."

All which is very true, and very well expressed.

"Fine words," however, in our homely English proverb, "batter no parsnips"; neither, we fear, do they design churches. In plain truth, we do not admire the external design of *l'église de Fiers*; and we have seen much more picturesque and beautiful churches built on much worse principles. The plan (a kind of transepted modification of the Basilica) seems an exceedingly good one; and the internal effect may probably be good, as the whole design is on Romanesque forms, which, as most of us know, lend themselves better to an internal than an external architecture. Considerable attention seems to have been paid to the internal decoration and furniture; and some of the masonry decoration (carving and diapers) is exceedingly good and well applied; and the pulpit, of wood with an ornamental canopy, a large illustration of which is given, is a very elegant and original design. It may be a melancholy satisfaction to some readers to hear that the architect in France is liable to the criticisms of amateur ecclesiologists, as among ourselves; and that the *Association Normande* at one of their meetings "sat upon" the church, and found divers faults with it, on the ground of want of adherence to precedent. The more pertinent question was also asked, why the architect had put a tower "franchement Gothique" upon a façade "franchement Romane"; a question which "the architect" has not answered apparently. His defender in the *Revue* gives excellent reasons for the arrangement; but then, if the result is bad, what is the value of the reasoning?

The same number of the *Revue* contains drawings of some of the designs for working-men's houses exhibited and premiated at the Paris Exposition of 1867; these and the descriptions and estimates annexed should be of interest to those engaged in studying this important subject. The plan which seems to have achieved the best results in comparison with the expenditure, is that of Herr Hofman, of Neustadt, whose scheme entirely abolishes wood and iron except for fittings, and employs arched construction in walls and floors, and areas for dryness in the former; the ground floor consists of a small kitchen and large living-room, the latter being warmed from the kitchen fire by a large sheet-iron box or stove, in which the smoke and heated air from the kitchen fire circulate before final dispersion by the chimney. The estimated cost of these habitations is 41 francs per square metre: some of the others are much beyond this. None of the designers seem to have succeeded in rendering the houses picturesque in appearance. The critique on the architectural works in the *Salon* of 1870, by M. Davioud, has, of course, lost its immediate interest; but some remarks suggested by the "restoration" schemes exhibited on that occasion are so well put and so much to the point that we may be excused for giving them further currency here. Speaking of the proposed restoration of the front of the church of Villeneuve-sur-Yonne, he observes that the architect, M. Rouyer,—

"Has succeeded in producing an ensemble by which the archaeologist and architect will some day be deceived as to the epoch which had witnessed this restoration. Is it so that one should think of completing the edifices which have preceded our time? We think not. Let us rejoice with the most scrupulous exactitude every feature destroyed by time, by fire, or by the hand of man; let us complete an ensemble by adding that which the history of the monument can give with certainty; nothing better. But to create new parts by circumscribing the creative spirit within a circle comprised by a score of years of art-history, under the pretext of unity of effect, is an error against which we protest. M. Chancel, for example, has been anxious to make a new project for the reconstruction of the façade of the Church of St. Eustache, at Paris, in the perfect style of the first part of the sixteenth century; but if M. Chancel, in place of a study of the Renaissance, had undertaken to find the means to add to that beautiful church a modern façade, where the proportions, the general forms, the principal lines would have been in relation to and in harmony with the corresponding elements of the church of the sixteenth century, we might have seen a very different kind of interest excited than that which results from the study in question. He should be of his own time, and speak with his own tongue, and not endeavour to deceive posterity as to the monuments which we shall transmit to them."

With which sensible remarks of the French critic

our readers will scarcely doubt that we concur; unfortunately the advice comes too late, in too many cases. In the continuation of the *Salon* article, in the following number of the *Revue*, amidst various interesting and incisive criticisms, we meet with some comments on a design for a château by our countryman, Mr. White; the same, we suppose, that was exhibited two or three years ago in London. The French critic thinks that in a house of this description, with such thickness of walls, such roughness (*après*) of details, a style so contemporaneous with Philippe-Auguste, the host of the château must have quitted the modern waistcoat for the coat of mail, and the rifle for the arquebus. All this prolonged imitation of an epoch that is no more wants the first law of beauty:—"L'unité dans l'harmonie. Il importe peu que les fragments matériels d'une habitation soient d'un même goût et conçus dans le même esprit; il faut encore que la muraille, le meuble, l'ustensile, et le vêtement, que disons-nous! la vie, les mœurs, les coutumes, et les pensées de l'habitant soient en harmonie de caractère, de forme, et de sentiment avec le cadre qui les enveloppe." In which also there is matter for consideration for some of our domestic architects.

The number from which the above quotation is made contains also a long letter from an amateur, Dr. Cattois, in relation to the design for the *Monastère de l'Assomption*, at Bordeaux, designed by M. Aymar Verdier. Dr. Cattois's letter is rather rambling and voluminous, divided between the importance of a modern Christian architecture with a correct "aesthetic," and an onslaught on the ignorance and presumption of the clerical amateurs or non-amateurs. The drawings and details of the building are very good and very interesting, the large parlour chimney-piece, in particular, of which a full-page illustration is given, is a very good piece of interior stonework, of considerable originality of design, solid, and not heavy; and the same may be said of some of the woodwork. A plan and section of the *Salamlik*, or grand reception-chamber for guests in Oriental houses, designed by M. Drevet, as an illustration for the '67 Exposition, is an interesting example of an experiment in Oriental art by a Western architect: the ornamental details, it is stated, were largely adopted from a splendid illuminated copy of the Koran, sent for exhibition at Paris on the same occasion, but which the Egyptian Commission previously availed themselves of for the purpose alluded to. The practical portion of this number includes also drawings of Swedish and Russian timber constructions, and illustrations of railroad material and mechanism.

The number 9-10 is mainly occupied by a very full report of the funeral of M. Duban (to which we alluded at the time), and of the four addresses delivered on the occasion, the fourth being that of Professor Donaldson, who attended as representing the Institute and the English profession generally; though this latter, says the editor of the *Revue*,—"No fut pas, en effet, un discours; c'était miens; quelques paroles simples et honnêtes, bonnes et fermes, le reflet de sa propre et sympathique individualité. Ces quelques mots produisirent une vive impression." An illustrated paper, "On the Strength of Cast-iron Columns," by M. L. A. Barré, engineer, and a beautifully-executed engraving of a very picturesque house at Boston, U.S. (Messrs. Cruce and Van Brunt, architects), are among the contents of this number. The concluding number of vol. xxviii. contains an amusing article from the pen of M. Garnier, "Les Envois de Rome." M. Garnier had been requested to review the designs sent from Rome, and proceeded for that purpose to the Ecole des Beaux-Arts, as he tells us, "with the dignity which belongs to a man about to fulfil a mission. I had already in my hand my notebook and pencil which I thought best to carry openly before

every one, that I might show them I was no ordinary visitor, but a veritable critic, fulfilling a sacred office," &c. When lo! as our critic arrived at the place of operation, his ears were saluted by a hot discussion between divors persons, and the words, "Parthenon," "Villa-Madam," &c., banded about, indicated that the speakers were anticipating his office. Among them were two particularly prominent in the discussion; "the one of an age that might be called respectable: he had white hair, which indicates experience; the rosette of an official, which indicates an honourable situation; and a crooked nose, which indicates a correct judgment. The other, younger, had a great black beard, indicative of goodwill; a thin frame, indicative of nervous excitability; and round eyes, indicative of a certain amount of presumption." How the pair discussed and contradicted each other about the proposed restorations of the Roman temples; how the critic followed them to make notes of their conversation; how he hid behind a kiosk for the better accomplishment of his purpose, and was subsequently nearly run over by an omnibus, in his eagerness to bag criticism; how he finally concluded to send the whole to his editor, with the sage conclusion that "Daly will have two opinions instead of one, and I shall not be responsible for the article,"—for the detail of all this, we must refer our readers to the *Revue*; but they will agree that M. Garnier has, at all events, a humorous way of putting his criticisms, and that we may fairly take the old gentleman with the "crooked nose and correct judgment" as the medium for expressing the writer's private convictions.

The volume for this year (vol. xxix.) contains in the *Introduction* some able and striking remarks on the past and future of architecture; in particular, an observation on the resemblance between the political and architectural "situations" of the present to-day. Architecture and politics are alike "cherchant toutes deux les fondements solides qui leur garantissent la stabilité et la sécurité."

"En politique, il nous faudrait un gouvernement définitif généralement accepté, un architecte un style généralement acclamé. Mais nous sommes loin de là; car, tandis que les politiques oscillent entre le Jacobinisme et la légitimité, en passant par le doute timide et le scepticisme pratiques, les architectes oscillent entre le rationalisme utilitaires et les renaissances historiques, en traversant l'éclecticisme et la fantaisie. Les hommes politiques comme les architectes ont pour limites extrêmes de leurs mouvements la *restauration* et l'*utopie*, c'est-à-dire le fait ancien qui a cessé d'être, et le rêve qui n'est encore entré et qui n'entrera même peut-être jamais dans la réalité extérieure. . . . A tout cela il faut substituer la science fondée sur l'exacte connaissance du passé et la rigoureuse observation du présent; car la stabilité et la sécurité n'existent dans l'architecture comme dans la politique, que là où il y a organisation, c'est-à-dire obéissance générale à des principes fondamentaux."

We quote the above passage, not only for its intrinsic truth, but as an instance of the manner in which, in France (and, we might add, Germany), questions as to principles of art are regarded as of equal importance with any other great questions of principle,—a point which we are very far from in England; for there are few readers, and scarcely a writer among the specially "literary men" of this country, who would not regard such a comparison of politics with architecture as an absurd parallel between great things and small. An idea which will have to be eradicated before the artistic theory of life can have any chance among us. We rather regret that the author of the admirable, well-written introductory essay should have admitted into his review, in the same number, the rather trifling and amateurish illustrated paper by M. Espérandien, on fanciful resemblances between head-dresses and buildings of different periods. The review of the exhibited designs of the late M. Duban is interesting; and also the article on the American Central Institute of Architects, one passage in which contains a suggestion in reference to France which, as it at present is equally applicable to England, we translate:—

"The success of the American Institute, as we see, is now an accomplished fact. It is, moreover, an example which young America gives to old Europe, which the Institute of America has given to our *Société Centrale des Architectes*, that it wants but the will to become itself the centre and the common bond of the local societies which may have been formed in the chief cities of our principal departments, if only it be willing to encourage them, to respect their local independence, and to call into the bosom of the Central Institute of Paris all the presidents of the departmental societies without exception. Assuredly, our central society would undergo a transformation considerable, but useful."

We leave our readers to make their own application.

Adding that the illustrations in this year's volume are, so far, fully equal in interest and excellence of execution to the standard previously maintained in the *Revue Générale de l'Architecture*, we take leave for the present of our admirable contemporary, with hearty good wishes for the future.

COAL, IRON, AND LABOUR.

THE remarkable inflation which has taken place, and which shows yet no signs of having attained its maximum, in both the price of coal and the price of iron, will hardly have failed to recall to the memory of many of our readers some of our recent remarks on the prospects of these important industries. In January last, in considering the very unreliable and optimistic report of the Royal Commission on the Coal-Supply, we said, "There are many reasons to lead us to expect an immediate increase in the price of coal. To say nothing of the nominal increase, due to the steady influx of gold, we may remark, on the one hand, the uneasy feeling among the coal-miners, and, on the other, the mode in which winning is becoming more costly and hazardous." One alternative, indeed, only presented itself to the thoughtful mind, after carefully weighing the facts that were rather obscured than brought into full light by the report above cited. The menace of the approaching diminution of our coal-supply could only be counterbalanced by the no less formidable menace of increase in price. "Between the two assumptions," writes the author of an article in the *British Quarterly Review*, for the past month of July, "of the total exhaustion of all our coal by the year 1945, and of the duplication of the present price by the year 1886, lies the curve that will determine the future consumption and price of this important mineral in this country." The limiting dimensions have shown an increase more rapid even than that here indicated. During the past few months, observes a writer in the *Daily News*, "fuel of all kinds has increased in price to such an extent that serious apprehensions are now entertained, especially by those chiefly interested in domestic consumption, lest next winter should bring us a great dearth of coal, and prices so high that the whole British public will be put to no small inconvenience, and to enormous expense for fuel alone." It is reported that almost within sight of collieries raising large quantities daily, it is often impossible to obtain supplies for local consumption, unless after considerable delay, and at prices that would have been regarded as purely visionary a few years ago. "It may be safely asserted that, as a general rule, coal of all kinds is now nearly double the price it was a year ago."

We hold it to be extremely undesirable to indulge in predictions of misfortune, or to seek either to produce or to aggravate panic. But undue optimism is a far more frequent, and a far more disastrous, cause of ultimate panic than is even undue anxiety. We were profoundly convinced, long before the attention of the public and of the legislature was directed to the subject, of the ominous gravity of the question of our future supply of coal. We endeavoured, to the utmost of our power, to call attention to the mischievous spirit of making things pleasant which, as it appeared to us, characterised the report of the Royal Commissioners. The movement of the last few weeks has been more rapid than there was any precedent to lead any one to expect; but it is only to be encountered by looking the matter full in the face.

There are several distinct elements that influence the great augmentation in the price of coal and of iron. The general depreciation in the purchasing power of gold, not in this country alone, but throughout the world, due to the large supplies of the precious metal which are steadily poured in from the New World and the antipodes, is one important element of this rise. It is, however, an element of almost infinitesimal magnitude, if regarded as influencing sudden rise, or variation from month to month. But, none the less, it must be steadily regarded, not only as a definite value in the equation which we have to solve, but as one which will prevent, in any contrary rebound of the tendency of prices, their fall to the low quotations which formerly ruled in periods of depression.

More rapid, and no less certain, in operation, has been the result of the time movement. Whoever may benefit by the reduction of work-

ing hours (and that great benefit may in some cases result we are not about to deny), it will not be, for the present at all events, the country at large. It is undeniable that a reduction in the hours of labour is equivalent to a reduction in the productive power of the country. We are not comparing spasmodic effort with steady work. We do not forget the result of a long experience, which has convinced us that one main reason why a French workman does so much less work in a day than an English workman is, that the former insisted on working seven days in the week, and the latter on not exceeding six; and we would give every man the means of occasional recreation; but we have gone far beyond such limits as these. We shall not be thought to exaggerate if we say that we are witnessing a general reduction of the normal working day in England from ten hours and a half to nine hours. That is a reduction in the producing power of the country to the amount of one-sixth—a loss to England of a day in every week. Do not let us be met with the reply that more hands may be employed. One great object of the movement has been to compel the employment of more hands; but that is a consideration entirely beside the mark. Our workmen are limited in number—whether employed or unemployed. Our time is bounded by yet more rigid lines to be used or to be wasted. Our productive power consists of our full amount of labour of man, and beast, and machine, employed for our full amount of time. That is our power, employed or not; and the reduction of either element—by the emigration of our workmen or by the non-employment of our daylight—is a reduction, to that extent, of our productive power.

Another point of extreme importance to the workman, which, we think, has never been fully brought to his attention, is the following. The actual cost of labour, as we have recently shown, forms but a portion of the price at which any article of consumption is retailed; but it bears a definite relation to that selling price, whether it be two-thirds, a half, or any other value. Let us call it a half, which is not far from the mark.

Now, it follows that for every increase in the selling price, a double increase takes place in the selling price. This is not matter of calculation; it is matter of fact. We have seen it in action within the past few days. Is there an advance of 1s. 6d. per ton in the winning of coal, the sellers instantly advance it by 3s. In fact, the advance of the market price of coal in London (which may be increased even during the interval between the writing and the printing of these words) may be taken at fifty per cent. already—say, from 22s. to 33s., with a steady tendency towards 40s. It must not be thought that this difference goes to the miner; but it is the action of the miner which has, to a great extent, set the stone rolling. So with the ironmaker; so with the engineer; so with the carpenter; so with every combined and organising trade.

It must be evident to every workman, of every class, that any advance which he obtains in his wages must, sooner or later, be balanced by an advance all round. But he may think that, in such general advance, each trade will benefit. Let us look at that view of the case seriously.

Suppose, for the sake of illustration, a law were made by which, on a given day, the value of every coin were reduced to one-half. What would be the result? First, of course, every one who had a certain amount of coin in his possession would be the loser of half that amount. That is simple. Then, every person who had neither coin nor engagement to pay, or he paid in coin would, at the very best, be no better off than he was before. Whether he would be worse off we will presently inquire, but in no way could his position be thought to be improved. Thirdly, the persons who were under engagements to pay or to be paid, in the old coin, would be thrown into a state of perplexity and confusion; and though some might for a little while appear to gain some advantage, no gross average advantage could result, and the usual distressing effects of disturbances in business relations would rapidly become manifest.

When the confusion had subsided, the following would be the result:—Every one who had a fixed income would be impoverished. Every one who had no fixed income would be free to earn what he could, but the money to pay his earnings would be diminished by great loss of custom from the persons of fixed incomes. The tradesman would re-adjust his profits. The man whose revenue is derived from his brain,—the literary man, the lawyer, the physician,—would be driven to demand higher salary, or larger

fees. He would suffer more than the tradesman, because it would be more difficult for him to raise his charges. The fundholder, the rentholder, the bondholder, would be mulcted in half his income. With regard to a species of property which we are accustomed to regard as more solid than such artificial property as funded debt, the result would be even worse. For not only would every 100l. of railway dividend be reduced to the purchasing value of 50l., but the working expenses would be so increased by the rise in the price of coal, the price of iron, and the price of labour, that the dividends would be materially reduced even in their nominal amount.

Now, no one who has the slightest acquaintance with the lessons of industrial history, can doubt that a terrible stagnation in all branches of trade would follow. We have put, let it be said, an extreme case. But the principle holds good whatever be the amount of displacement of value. When such displacement takes place in consequence of great natural causes, working over long periods of time, as in the case of the increased yield of the precious metals, the whole framework of our social relations will accommodate itself by degrees to the change. But when any artificial proceeding, such as the class action of any trade or body of men, alters the natural relation of prices, the result is sure to be disastrous to some, if not to all.

Now, it is a fact, that at this time when, owing to causes which we cannot control, prices are rapidly rising everywhere, the action of organised associations is directed to the restriction, as before shown, of the productive powers of the country. It does not need any very unusual foresight to see that the result must be mischievous.

To return to the topic which now comes so closely home to every householder, to every employer of machinery, to every one who, with limited means, has to cook or to warm himself, or to raise steam for any purpose whatever. Political writers tell him not to be alarmed, to wait a little, to remember that ups and downs occur in all human events, and that as prices rise, so do they fall. "The existing state of things," says one of the writers whom we have above quoted, "will be only temporary in its character. The iron trade has been many times before in a highly inflated state, but prices have afterwards receded to an exceptionally low point." It is natural for public writers to take that tone. Many will do so from party motives alone, others from that general cheerful frame of mind which is acceptable to the public, and which we would be the last to undervalue. But it is not too much to say that all these comfortable anticipations blink those facts which we have endeavoured to bring into daylight. They lose sight of the fact that, besides those causes which fluctuate from year to year, those recurring changes which drove the price of bar iron down to 11s. per ton in 1851, and raised it to 198s. per ton in 1855, or that raised the rate of discount from 3 per cent. in June, 1855, to 10 per cent. in May, 1856; there exist now positive elements of increase in price, which the leaders of the social movement of the day are unwisely doing their utmost to aggravate.

There is, however, a mode of relief open to the consumer, whether of coal or of iron, to which it is extraordinary that public attention has not been hitherto more steadily directed. The collieries of the United Kingdom have been the pioneers of the coal getting of the world. But they do not form a larger proportion of the area of the known coal fields of the world than the pioneers of an army do to the rank and file. They cover 4 per cent.—one twenty-fifth part only—of that area. Moreover, the English coal fields have, to a great extent, exhausted their most easily extracted beds. In other parts of the world the upper strata are still virgin. Now, of the increase which has already taken place in the market price of coal, so much occurs in the distributive process, so little goes to the miner, and so much to those who buy of the miner and sell to the consumer, that we must be near upon the limit when freight will cease to be a barrier. In other words, it will soon be cheaper, if matters go on as they do at present, to import coal than to burn our own. We will not attempt the details of a calculation at which, we do not doubt, shrewd brains and keen intellects are already at work. But we should not be surprised any morning to see an announcement of the arrival of foreign coal in our ports.*

* Since this was written such an incident has occurred.

We may yet see a new meaning given to the proverb, "Carry coals to Newcastle."

From a purely philanthropic point of view, such a new feature in our trade may be highly desirable. In fact, we shall only witness the operation of one of those laws which political economy attempts to define and explain. We shall see that the level of price can no more be permanently disturbed than that of water. The barrier which keeps prices at different levels, in fact, may he said to be ignorance. As soon as the merchant is certain, or even adequately hopeful, that he will make money in a new course, his ships will steer in that direction. As soon as the speculator is clear that he will obtain a sale for a certain product, he will find the money for its development. If labour in one part of the world costs more than its proportionate value, surplus labour in other parts of the world will flow in to supply its place. If our colliers, or our iron-workers, will only work two-thirds time, and expect full pay, or more than full pay, for so doing, it is only a question of time, and of no long time either, before colliers in other parts of the world, where men are content to work full time for moderate wages, will be called into active and remunerative operation.

The case of iron is even more serious than that of coal. The activity of our collieries intimately depends on that of our ironworks. The present state of the latter is unexampled. We have just seen an award fixing the price of Staffordshire bar iron, for three months, at 137. 10s. per ton; 137s. are quoted for several of the best-known brands. In 1851, as we have said, the average price of bar iron was 57. 11s. per ton. During the twenty years from 1845 to 1866, the extreme fluctuations were about 30 per cent. on the highest price, which was 97. 18s. in 1854. In 1861 and 1862, the price was 67. 5s. per ton. Thus the present rate is exceptional. Now, in coal, there is no doubt that we possess an article of unsurpassed excellence. We have, of course, all sorts. We are not speaking of everything that is black. But we have, in the best bituminous coals of the northern district, and in the pure anthracite of the Welsh basin, natural products which are respectively among the best of their kind. Secure in this excellence, we may allow inferior qualities of coal to contend in price with one another, there being always a means of balancing, more or less exactly, the commercial with the chemical, or heat-producing value; and the difference in the price of labour must be considerable before foreign coal can permanently compete with English coal in our own ports. That it may, almost immediately, have the effect of reducing any undue inflation of price we have intimated; but it is a great step from that to a permanent and successful rivalry.

This is not the case with iron. We have before mentioned the fact, that it is due to moral or political reasons alone, not to commercial and mechanical reasons, that Russia has not already become the great iron mine of the world. Charcoal-made iron, of the best quality, can be produced in Russia at a less cost than inferior coal-made iron in the United Kingdom. Now a certain amount of profit is enough to overcome almost every obstacle: that is the old secret of the smuggler. Such a price as iron now commands in this country is almost certain, humanly speaking, to kindle furnaces in Russia. The Government of that country is liberal and enlightened in matters relating to the development of the national resources. Such an opportunity can hardly fail of being seized. And there is this difference between the two industries, that of the winning of coal and that of the smelting of iron. The latter is harder to establish, but, when established, it takes a firmer root. The best colliery is at best but a temporary arrangement. The finest seam will be exhausted; the limit to be won from a given shaft will be reached, sooner or later. But a supply of fuel on the sixty years' division of the forests within easy tramway distance of its forges, is an establishment which, when once it gets command of the market by the low price of a good brand, may be regarded as very permanent in its position.

We confess to be among those persons who believe that, as charity begins at home, philanthropy, to be genuine, must first germinate as patriotism. The neighbour whom we ought to love as ourselves need not be one of our kith and kin, but he is not a yellow or a black imaginary sufferer at the antipodes, who is no neighbour at

all. It will be but little consolation for us if we hear that for a furnace blown out in Wales a better-appointed furnace is kindled in Russia. It is poor comfort to be told, if we see hundreds of our English fellow-subjects with straight backs and wan faces, that their suffering is economically active in equalising prices throughout the world! We own, in these matters, a selfish motive. We believe it to be a just and enlightened selfishness. We prefer to do good by acting, rather than contribute to possible good by suffering. We have, or had, in many important industries, the lead of the world. We do not wish to forfeit any advantage we have before it is unavoidable. We regret, and we do our best to fight against, whatever in our judgment tends to throw away that advantage. We are convinced that the present tendency of artificial trade combinations for at once losing time, and increasing the cost of working, must handicap us in the great race. And we know that it is on the owner and producer of labour that the first brunt of misfortune will fall. It is easy for the man of capital to displace the scene of his operations. It is far more difficult for the workman to do so. In fact, when the time arrives that labour is freed from local ties, and able to flow, like water, to the vacant place, prices will be close upon an universal equality. But a good deal of work, and, we fear, a good deal of suffering, must be gone through first. What we are chiefly anxious to show is, that artificial steps taken in order to raise wages, and to increase the number of hands employed, cannot be of any real or permanent service to the workman, but that, on the contrary, by disturbing the relations of commerce, they run the terrible risk of changing its course, and of inflicting an injury on the productive character of this country from which it may never recover.

PRINCIPLES OF MECHANISM.

A MACHINE is a contrivance interposed between the power to be employed and the work to be done, in such a manner that, firstly, the part to which the power may be applied shall be of suitable form and strength to receive it, as the piston of a steam-engine; and, secondly, that the other extremity of the machine, or the part which performs the work, shall likewise be suitable in form, strength, and the direction in which it moves, to the work to be done. Between these extremities lies the mechanism which transmits the power acting on that part of the machine which receives it directly from the motor to that other part of the machine which performs the work, as the cutting-tool of a lathe or the bucket of a pump. "Machines, in fact, are interposed between the power and the work for the purpose of adapting the one to the other." Professor Willis* says that by defining mechanism in the abstract to be a combination of parts for the purpose of connecting two or more pieces, so that when one moves according to a given law the others must move according to certain other given laws, this branch of the subject may be reduced to geometrical principles alone; whereas, by considering mechanism, as usual, as a modifier of force, the subject becomes embarrassed by a condition foreign to the connexion of parts by which the modification is produced; and which condition and its consequences admit more conveniently of separate investigation.

These three classes of mechanical organs are so far independent of each other that any given set of working parts may be supplied with power from any source. The principles upon which the construction and arrangement of these three classes are founded are different. Thus the receivers of power, firstly, derive their form from a combination of mechanical principles with the physical laws which govern the respective sources of power. The working parts, secondly, derive their form from a combination of mechanical principles, with considerations derived from the manner in which the work is to be performed. But the principles of the interposed mechanism admit of being developed without reference to the powers employed or transmitted, or to the resistance or work to be done.

The term mechanism must be understood to be in this work confined to those mechanical combinations which govern the relations of motion only, and which, therefore, admit of being entirely separated from the consideration

* Principles of Mechanism. By Robert Willis, M.A., F.R.S. Second edition. Longmans, Green, & Co. 1870.

of force. This is not the view that an engineer or millwright takes of a machine; he considers it necessary to investigate the proportion between the forces and resistances in any given case, and the strains thrown upon the different parts of the mechanism by their application, and thus to find the requisite strength of each part; but his investigations may possibly be much facilitated by adopting Professor Willis's view, which is to investigate the various combinations of pure mechanism upon geometrical principles alone.

The different forms which the details of actual construction of machinery may take, and their combinations and varied methods of framing them together, are mainly determined by the strains to which the machinery is to be exposed, and form the branch of constructive mechanism.

It will be useful to recapitulate some of the ordinary definitions and measures of motion and velocity.

A body may be at rest either absolutely or relatively, but it is only in the latter respect that the state of rest can be considered in the present case; thus a body which remains in the same place in a boat or a carriage is at rest with respect to the boat or carriage, although these may be in motion; and so a wheel or other portion of a machine may be carried into different positions relatively to the fixed frame, and yet remain at rest with respect to the arm or carriage which carries it. A body is in motion when it occupies successively different positions in space with respect to some other body, motion being relative as well as rest. Two bodies moving with respect to a third will be at rest with respect to each other if they retain in their motions the same relative positions; or a body absolutely at rest may be said to move with respect to another moving body, if the latter be assumed as the standard to which the motion is to be referred. The continuous line which a moving body describes in space is termed its path. The path being assigned, there are only two directions in which it can move in that path. The path and direction of a given point being assigned, it may move in this part and direction quickly or slowly, that is with a greater or less velocity; and this velocity is estimated by comparing the space passed over with the time occupied in describing it.

When a point describes equal portions of its path in equal successive times, the motion is said to be uniform, and the velocity is measured by the space (that is the length of path) described in the unit of time. The units usually employed are feet and seconds. Since the space described is proportional to the time employed in describing it, the measure of velocity is obtained by dividing the number of feet passed over by the number of seconds employed. Thus, if 9 ft. be passed over in three seconds, the velocity is said to be 3 ft. per second. The terms *rotation* and *revolution* are often both employed in the same sense by mathematicians, as well as in common language, but Professor Willis prefers in mechanism to employ the word *rotation* only for the act of turning about an axis, and *revolution*, or *turn*, for the course of a rotating body from one position with respect to some other given object to its return to the same relative position. Period should be confined to the sense of "time in which anything is performed, so as to begin again in the same manner," as defined by Johnson. The angular velocity of a rotating body is measured by the linear velocity of a point whose distance from the axis, or radial distance, is equal to the unit of space; and the body is said to rotate uniformly when its angular velocity is uniform.

The motion of every point of a given piece in a machine being defined by path, direction, and velocity, it will be found that its path is assigned to it by the connexion of the piece with the framework of the machine, but its direction and velocity are determined by its connexion with some other moving piece in the train. A train of mechanism is composed of a series of moveable pieces, each of which is so connected with the framework of the machine, that when in motion every part of it is constrained to move in a certain path; thus wheels, pulleys, shafts, and rotating pieces generally are so connected with the frame of the machine, that any given point is compelled when in motion to describe a circle round the axis, and in a plane perpendicular to it. Sliding pieces are compelled by fixed guides to describe straight lines, and other pieces in other paths. The pieces are connected in successive order, so that when the first piece in the series is moved, from any external cause, it compels the second to move, which again gives

motion to the third, and so on. The act of giving motion to a piece is termed driving it, and that of receiving motion from a piece is termed following it. The piece which transmits motion to the next is the *driver*, and that which receives motion is the *follower*. The various changes of motion are effected by the various modes of connexion, and the different cases under which these modes of transforming motion by transmission are arranged are termed the *mechanic connexions*. Thus motion is communicated by rolling contact (as at the pitch-circles of the teeth of spur-wheels), or by sliding contact (such as takes place between the individual teeth of wheels, by the action of a cam, or a screw), the connexion being in either case an actual contact; or the motion may be communicated by link-work (such as cranks, with connecting rods), or by wrapping connexions (such as bands passed over pulleys), in which cases the connexion is by intermediate contact.

Professor Willis groups all the simple combinations of mechanism for the modification of motion under four heads:—

1. Where the directional relation and the velocity ratio are both constant.
2. Where the directional relation is constant, but the velocity ratio varies.
3. Where the directional relation changes periodically, and where the velocity is either constant or variable.
4. Intermittent motions, wherein the continuous motion of one piece communicates a motion to the other, with intervals of perfect rest.

And he examines each one in succession, and passing on through "trains of elementary combinations," and "mechanical notation," we come to a chapter on "*Reduplication*," a term which is here applied to a mode of modifying motion which depends upon a totally different principle from those connexions before described as rolling, sliding, link-work, or wrapping connexions. It is principally employed in the construction of tackle all sorts. Then we have aggregate combinations, adjustments, and *friction*.

If we lay down horizontally a block or a slab, of whatever material, and upon it a similar block or slab of the same or other material, and having made an indent in the surface of the upper block for the purpose of abutting a rod against it, and making the upper block slide upon the lower one, we shall find the inclination of the rod to vary with the nature of the surfaces in contact, when inclined just sufficient to cause the upper block to begin to slide. If from any point of the rod we let fall a perpendicular upon the surface of the upper block, we shall resolve the two components of the force which presses in the direction of the rod into one which presses the two blocks together vertically, and another which tends to push the upper block horizontally, and make it slide along the lower one. If for any given material or state of the surfaces in contact, we find this limiting angle of resistance to be, say, 10 degrees, which is the limiting angle of resistance of metals on metals, no increase of the pressure in the direction of the rod will cause the upper block to move upon the lower one, because the ratio of the pressing component to the pushing component remains the same. If this angle be diminished by inclining the rod more nearly to a vertical position, the pressing component is increased, and the pushing component diminished. Hence the block cannot be made to slide, whatever force be applied in the direction of the rod. On the other hand, if the limiting angle be increased by inclining the rod more horizontally, the pressing component is diminished, and the pushing component increased; so that the block cannot be prevented from sliding, whatever be the amount of force applied to the rod.

The friction of materials in contact with unguents interposed is given as one-twelfth of the pressure, and the limiting angle of resistance 5 degrees; of metals on metals one-sixth of the pressure, with an angle of 10 degrees; of wood on wood one-third of the pressure, with an angle of 18 degrees; and of bricks and stones two-thirds of the pressure, with an angle of 33 degrees.

The magnitude of the friction between a pair of plane surfaces, the one fixed and the other movable, is governed by three principal laws, which have been confirmed by innumerable experiments. The first law is that the magnitude of the frictional resistance between a given pair of surfaces of any materials is proportional to the pressure that keeps them in contact. The second law is that the frictional resistance is unaffected

by the area of contact, which may be shown by placing the upper block first flatwise, and then on edge, when the friction will be found to be the same in both positions. The third law is that the frictional resistance of solids is wholly unaffected by the relative velocity of the rubbing surfaces. It is worthy of remark here that the laws of friction of solids and fluids are essentially different with regard to velocity, for while the friction of solids is independent of it, that of fluids increases as the square of the velocity.

It is curious to observe that, taking the mean value of friction at one-third of the pressure which generates it, if we take a cylinder of any diameter, as the barrel of a common windlass, and fix it, and then throw a rope over it, any weight tied to one end will support a weight about three times as great at the other end. If the rope be taken once round the barrel, and the two ends hang freely down, the small weight will support one twenty-seven times as great at the other end. Thus, with half a coil, as in the first case supposed, the rope will support at one end three times as much as at the other; with one complete coil nine times as much; with a coil and a half twenty-seven times; with two coils, eighty-one; with two and a half coils, 243; with three coils, 729; with three and a half coils, 2,187; and with four coils, 6,561 times the weight suspended at the other end. In drawing water from a well where the depth is not great, or winding up earth from sewer excavations, this property of coil friction is sometimes employed by taking three or four coils of the rope round the windlass barrel. The empty bucket or skip takes the place of the small weight in the illustration, and the full one that of the greater weight, the coils grasping the cylindrical surface so firmly as to sustain the load. But although the friction of these coils is sufficient to sustain the load, there is a practical difficulty in the method, from want of clearance room, where the buckets or skips pass each other up and down.

Professor Willis's book has already an established character: we need only mention the appearance of a new edition.

THE INTERNAL EMBELLISHMENT OF ST. PAUL'S CATHEDRAL.

THE "Surveyor to the Fabric," Mr. F. C. Penrose, having now completed his designs for the internal embellishment of St. Paul's, is exhibiting them, by the courtesy of the Dean and Chapter, in the Chapter-room. The question of the adoption or otherwise of these designs is not at present ripe for discussion, and we confine ourselves to publishing Mr. Penrose's own description of his scheme, simply promising that it is set forth in some very effective drawings by Mr. Woodington, Mr. H. W. Brewer, and Mr. Michael:—

Quite irrespective of the question of cost, there seem to be only two ways of ornamenting such a building as St. Paul's: one, that of profusely covering every available space from vault to pavement with subjects combined with enriched material or ornament; the other, that of concentrating the chief attention on certain points, and leaving much of the framework of the building unaltered, proper care being taken to connect the ornamented portions by adequate but subordinate embellishment. In designing the scheme, of which a considerable part is now submitted, conformity with the last-named principle has been aimed at.

There are four main points on which the ornament is concentrated:—

1. The choir, including the apse and the baldachin.
2. The dome.
3. The painted windows at the ends of the four arms of the cross.
4. The smaller dome at the west end of the nave.

With the exception, to some extent, of the last-mentioned, much less display of coloured decoration is proposed for the nave and transepts than for the choir and dome.

The connexion between the parts more elaborately treated is looked for from the vaulting, which is to be richly worked in mosaic throughout (although colour is to be used predominantly in the choir and dome), and from the pavement and the attic panels, in which a good deal of marble inlay is contemplated. Ceramic ornament might, however, be partly substituted for marble inlay in the attic panels.

In the apse, real marbles are proposed to supersede the painted work introduced as a tem-

porary expedient by Sir Christopher Wren. This would necessitate the carrying on the marble work to some extent along the choir, but not to the transepts or nave; and the principal cornice and the piers arches and their supports are intended to remain Portland stone, as at present. Some marbling to the panels and plinth, and gilding to the soffits of the arches, would, however, probably be requisite. The object aimed at, however, is to connect the rich work in the vault and clearstory with the pavement, with no great alteration of the existing framework, a treatment which not only appears peculiarly proper for St. Paul's, but has the advantage of having several very important and successful analogies in Italy.

As respects the windows. There are at the east end eight windows,—five already occupied; at the west end, three windows, all already occupied; and at the ends of the two transepts, six windows, all unoccupied, which admit of being treated pictorially; but the glazing of nearly all requires to be altered to suitable patterns, only seven of these windows having as yet been done.

The designs at present prepared for the committee are shown on three perspective drawings, and a section of the cathedral from east to west to serve as an explanatory diagram, and two models. The choir, roof, and tribune are shown by one of the perspective drawings, and a model to the scale of 1 in. to the foot. As respects colour, however, the vault in the model more nearly represents what is now intended for the nave and transepts, and the perspective drawing that proposed for the choir.

The principal feature in the tribune, after the precedent of several of the early Christian churches, is the colossal figure of our Lord, with the signs of the Apocalypse.

The subjects in the apse windows are those combined in that verse of the Litany, "By thine agony and bloody sweat: by thy cross and passion: by thy precious death and burial: by thy glorious resurrection and ascension: and by the coming of the Holy Ghost: Good Lord, deliver us." In connexion with these subjects are the figures of angels in the spandrels of the clearstory windows of the choir, hearing the "elements of the Passion,"—such as the Cross and Scourge, the Crown of Thorns, &c.

The pavement in the apse is of choice marbles, forming part of the original construction; but the pilasters and parts of the walls were painted as mentioned in the "Parentalia," "to serve the present occasion." It is now proposed to substitute real for the painted marbling. The group proposed for marble intarsia, under the apse windows, is from a design by the Baron de Triqueti.

The Baldachino, of which there is both an uncoloured model and a coloured perspective drawing, is composed, so far as it can be recovered, from an imperfect model and a short description in the "Parentalia." The columns and entablature are intended to be of marble, and the superstructure of bronze.

The dome is exhibited by a model to a scale of $\frac{1}{2}$ in. to the foot, as yet finished only as respects the cupola, and by a perspective drawing. The figures in the spandrels are intended to be the four major Prophets and the four Evangelists. One, that of St. Matthew, is taken from Mr. Watt's design already executed in mosaic, and three of the major Prophets from Mr. Stevens's designs; the others are mere sketches. The figures in the cupola are by Mr. Woodington, by whom are also those in the upper part of the model of the east end. The subject of the cupola is the Te Deum. There are two main horizontal lines of pictures, with eight compartments in each, the Apostles being seated at the twelve gates of the heavenly Jerusalem in groups of three. These occupy the north-west, north-east, south-west, and south-east compartments of the lower range, those toward the cardinal points being devoted to the Prophets and Martyrs.

Above these are the angels, cherubim, and seraphim, and the powers of the heavens, represented by angels hearing the signs of the sun, planets, and stars. These, with the worship of the Cross and of the Lamb, occupy the eight upper compartments; the last-named subject having been already suggested by the inscription running round the frieze of the drum, "Worthy is the Lamb that was slain to receive honour and glory." The whole is surmounted by a continuous ring of angels and blessed spirits, playing on various instruments of music, or singing "Holy, holy, holy, Lord God of Sabaoth." The interior of the cone

above the cupola is intended to have gold stars on a blue ground.

This treatment of the interior, whilst preserving the general framework of the architecture with very little alteration, offers very considerable and probably sufficient space for iconography, i.e., arrangement of subjects; for, in addition to the figures proposed for the apse and choir, the great west door, if covered, as has been proposed, with bronze, admits of a great series of Biblical subjects. The exterior might well be devoted to the history of St. Paul, and the interior to the acts of the other Apostles.

The western dome offers a fine scope for the Creation. This subject was first proposed for it by Archdeacon Hale, and has met with very general acceptance, including that of Mr. Burges, in his scheme for the iconography of the cathedral. The north and south chapels might receive on their panels subjects derived from more recent ecclesiastical history. The panels on each side of the windows of the aisles offer places suitable for historical subjects in bas-relief. There are twelve such panels in the nave, eight in the transepts, and twelve more in the choir. There would still be spaces below for monumental subjects in continuation of those which have already been commenced.

There are twenty-two windows, including one in the north chapel and two north and south of the western dome, which either have received or admit of receiving Scriptural subjects. Lastly, there is the great dome, with its eight spandrels, its eight niches in the drum, and its cupola, which, according to the design submitted, would have about 200 figures, many of which, especially the Apostles, Prophets, and Martyrs of the lower range, would admit of individuality of treatment.

F. C. P.

CHARING-CROSS HOSPITAL.

EXTENSIVE alterations and enlargement of this hospital have lately been effected. The establishment has for many years past had only a passage of entrance, and a small back staircase as its means of access to the several wards, accommodating about 150 patients. It has now a spacious hall, 28 ft. by 20 ft., with a periphery of columns, of simple character and effect.

On each hand are a pair of folding doors. One leads by a corridor to the board-room and other official parts of the hospital; the other to the out-patients' department, having a range of waiting-rooms, with physicians' and surgeons' departments, and a dispensary.

The out-patients have also a separate entrance provided in Chandos street, as well as a way of egress by a caged turnstile to avoid confusion in the stream of attendants.

The medical school has also a distinct approach; and, besides a hall and reading-room on the ground-floor, the greater part of the basement is devoted to their accommodation. It comprises a good dissecting-room with top-light, and lavatory for students, an enlarged post-mortem room, a museum, chemical and pathological laboratories, and lecture-room. The new staircase, exceeding 20 ft. square, and 40 ft. high from ground-floor, is well lighted by a cone lantern, as well as by side windows, and is provided with a sun-burner for winter illumination.

In the construction of the stairs, besides tiling into the walls, they have cast-iron carriages moulded and framed together, and a balustrade throughout; a lobby, of ample width, leads on each story to a range of wards about 200 ft. long and 28 ft. wide.

The first is devoted to female patients; the second to male patients; the third to obstetric cases and children's wards; and an operative theatre.

Each floor is provided with lavatories and sculleries, and groups of water-closets. Urinals, &c., are erected in the rear of the hospital. There has been also remodelling of the drainage by the substitution of glazed earthenware drain-pipes, so as to prevent the ravages of vermin, and its consequent escape of noxious gases. The latter operation has also enabled the authorities to form a new and lofty kitchen, which was greatly needed. These changes have placed the hospital in a greatly improved position before the public, and the Council have felt justified in giving more prominence to the structure by the addition of a portico. It is composed of four monolithic shafts of Portland stone, 11 ft. high (Greecian Doric), supporting an entablature and pediment of suitable proportions.

The architect, Mr. James Thomson, has been

careful both internally and externally to sustain the simple and appropriate character which had been given more than forty years ago to the original structure by Mr. Decimus Burton; and should public support justify the council in doing so, they propose yet further to extend their facilities of "doing good."

LABOUR-SAVING MACHINES FOR JOINERS' WORK.

It would almost seem that every fresh collision between masters and men leads to the production of improved machines for lessening the necessity for hand-labour. On Thursday, the 1st of July, a number of the leading builders and contractors met to test a new series of labour-saving machines for joiners' work, at the works of Messrs. A. Ransome & Co., King's-road, Chelsea.

The series of machines, eleven in all, have mostly been brought out within the last twelve months, and each exhibits improvements and features of novelty which have not hitherto been imported into this class of machinery. The chief point which distinguishes them from other machines of this class is the very high speed at which they are driven, which not only enables them to turn out a proportionately greater quantity of work, but the increased velocity on the cutting edge of the tool gives a remarkably high finish to it. In order to enable the machines to be driven at these high speeds, special arrangements have been made to secure effective lubrication of the various working parts. The bearings of all the high-speed spindles are constructed with a large oil-chamber underneath, from which the oil rises to the spindle through a piece of felt fixed in a diagonal slot running through the bottom brass. The speed at which these spindles revolve is such as to pump the oil through the felt, so that it flows freely over the spindle, and channels are formed in the bottom bearing, through which the surplus oil finds its way back into the receiver; the result of this is that the spindles are literally floating in oil, which is being continually pumped up, and filtered as it comes through the felt. The cutter spindles, many of which perform as many as 6,000 revolutions a minute, are made of a special quality of cast steel, which, although extremely hard on its outer surface, and capable of taking a very high polish, is also soft and tough in the centre, thus combining the greatest amount of strength and toughness with the minimum diameter. The bearings are all of great length, and, notwithstanding the high speed at which they work, run perfectly cool.

The first machine we noticed was one for cleaning off and sand-papering doors, shutters, parquetry, &c., entirely without skilled labour; and a good notion of the saving which it effects can be formed from the fact that when worked by two labourers, it will clean off both sides of a full-size door, leaving it glass-papered and ready for painting, in four minutes.

The machine exhibited (which was made in America) is of somewhat rude construction, but Messrs. Ransome & Co. are occupied in constructing one with various improvements, the framing of which will be of iron, and will have a self-acting feed motion. This alteration will enable it to be worked by one man, and thus dispense with the labour of the second man who is required with the American machine to assist in feeding the work through. We were surprised to see the very rapid manner in which the machine removed considerable inequalities in the doors that were passed through it; some of those which we saw cleaned off were very rough, but they left the machine perfectly flat and smooth. The glass-paper used is specially manufactured for the purpose, and we are informed that one set of paper, which costs about 4d., will last for five hours in constant work, without requiring renewal. This machine can scarcely fail to come largely into use.

The planing and moulding machines, of which there were two, are from entirely new designs; their chief features being their great compactness, the high speed at which they are driven, the powerful feeding apparatus, and the arrangement of the cutter-blocks, which are so placed as to enable the cutters to be readily adjusted. One of these machines was turning out a bold hollow moulding, with excellent finish, at the rate of 30 ft. a minute, while the larger one was running 7-in. architrave mouldings with equal finish at the rate of 24 ft. a minute.

The Richards's patent mortising machine at

tracted considerable attention on account of its simplicity and the novel method for reversing the chisel, which is effected instantaneously, while the machine is making 500 cuts a minute.

The tenoning machine, which is fitted with an upright center-spindle for forming double tenons, also describes the shoulders at the same apparatus, and the distance between the shoulder and the tenon is governed by self-acting stops, which avoid the necessity of marking by hand and ensure the greatest accuracy.

Messrs. Ransome's patent "complete" joiner is already pretty well known in the trade, having been exhibited for the first time at the Wolverhampton show twelve months since. The one exhibited on the present occasion will plane boards up to 9 in. wide by 3 in. thick on all four sides, or cut mouldings up to 9 in. wide, also worked on all four sides, at rates varying from 8 ft. to 15 ft. a minute. The same machine makes very perfect tenons; several being cut at the same time, and the shoulders scribed in the same operation. A peculiar feature of this joiner consists in the planing and tenoning arrangement being entirely independent of the saw-spindle; thus enabling either side of the machine to be worked, independently of the other,—two distinct machines.

A hand-saw, of entirely new design, was at work, cutting sweeps in wood of 12 in. thick. The main standard of this machine is cast hollow, giving great strength and stiffness without undue weight; and the design gives great space between the saw and the standard in which to turn the work. The saw is supported immediately above and below the work, by an improved packing-box, which Messrs. A. Ransome & Co. now fit to all their hand-saw machines. This packing-box supports the saw not only on the back, but on the sides, and enables it to bear considerably more forcing than it would take in the ordinary manner.

An improved saw-sharpening machine was working with Ransome's patent emery discs, invented by Mr. F. Ransome, of East Greenwich. These discs, besides cutting very freely, are entirely free from the nauseous smell, which is a great drawback to those in general use.

We also noticed a small machine for planing, shaping, chamfering, mortising, and boring, which is so arranged that two lads can work at it at the same time. It is more particularly suited for short work. The mortises are formed with revolving bits on the French principle.

A Sims's patent mitring machine, which cuts with ease mouldings up to 5½ in. wide, completed the set.

All these machines were driven by one of Messrs. Ransome, Sims, & Head's new patent economic expansion portable engines, fixed on cast-iron saddles. These engines appear to be peculiarly adapted for driving builders' machinery, as the boilers are constructed with large fire-boxes for burning saw-dust, chips, and other waste wood, and have various appliances for economising the fuel and heating the feed-water before entering the boiler.

LAW AND THE DRAMA.

THE recent decision in the case of funds left by the late T. P. Cooke for the advancement of dramatic literature, seems to show that no man can hope to have even his reasonable and proper wishes carried out after his death. The managers of the Dramatic College were made trustees of a sum of money in order that a premium might be offered at certain intervals for the best original drama connected with the sea that might be submitted, the selected drama being afterwards acted, if it could be so arranged, for the benefit of the funds of the Dramatic College. The first result was very successful, and "True to the Core" brought a considerable sum of money to the institution. Since then, through accident or want of proper management, a good drama has not been obtained; and on the argument that the sum offered is not large enough to induce capable authors to submit works in competition, and the assertion that Mr. Cooke's main object in the bequest was to benefit the Dramatic College (which we assert from personal knowledge is incorrect), the law has handed over the capital sum to be used for the general purposes of the college. The act seems to us equally unjust and unwise. The amount will be swallowed up, as hundreds and thousands have already been swallowed up before by this institution, and dramatic literature, the progress of which Mr. Cooke desired to aid, will be in no degree ad-

vanced. Surely if it were found that the amount offered was not large enough to obtain good plays, a reasonable course would have been to allow it to accumulate, and offer a larger premium at longer intervals. This occurrence will scarcely tend to increase the number of specific bequests to the college for specific purposes.

EDUCATION FOR THE STAGE.

THE following communication speaks for itself. We commend it to the attention of those who desire the improvement of our stage:—

I have long been impressed with the absence of professional education in many of those actors and actresses who essay a high standard (or any standard) in the dramatic world; and it has occurred to me that probably the most useful and appropriate memorial to Shakespeare would be to establish a school or college for the instruction of intended actors or actresses under such professors as have distinguished themselves in their art, and retired from the stage, many of whom would, no doubt, be delighted to impart their knowledge to the rising generation.

I should much like to see a "Shakespeare College" established, and throw out this suggestion for your opinion.

R. RICHARDSON GAEDNER.

ALEXANDRA PARK AND PALACE.

WE have received from the Lord Mayor copies of certain resolutions passed at a meeting held in the Mansion House, July 23rd, approving of a plan suggested to enable the people themselves to become the purchasers of the park, and pledging to ensure the prompt and complete success of the enterprise." As, however, the plan does not accompany the resolutions, we are unable to judge whether or not it is likely that the meeting will do what it promises. There have been so many flashes in the pan in connexion with the Alexandra Palace and the recreation of the people, that we have lost faith in promises. That it is quite time, and very desirable, that the building and grounds should be properly utilised, we say again, as we have said before; but, have the right men come? From the beginning till now, the whole affair seems to have vibrated between bungle and job.

WANTED: AN ECONOMIC STOVE.

SIR WILLIAM BODKIN has a friend who wishes to lead persons conversant with the subject to consider the practicability of producing a form of stove for ordinary sitting-rooms and kitchens, to consume as far as possible its own smoke, and to ensure the most perfect and judicious use of the coal to be consumed therein, and has empowered Sir William to guarantee any reasonable amount (say 500*l.*) for prizes or otherwise, in the confident expectation "that the effort may lead to a satisfactory solution of what has been truly stated to be one of the urgent problems of the day—the attainment of sufficient warmth for cooking and for comfort, with the least possible consumption of coal." The Council of the Society of Arts have accepted the duty of appealing for designs, and have appointed a committee to confer with Sir William Bodkin, and concert with him the proper action to be taken.

We advise some of our readers to set to work and get the prize, which will be not the 500*l.* offered, but a fine fortune.

THE PROPOSED DUBLIN CENTRAL RAILWAY STATION.

THE proposed new central railway station in Dublin, which has been before a committee of the House of Commons within the last few weeks, will be one of the largest ever yet built in any part of the United Kingdom. The station, which has been designed by Mr. Barry, is 2,000*ft.* in length, and 146 *ft.* in width at the narrowest point, the platforms being very extensive, and intended to meet the most extensive requirements of the anticipated traffic. In addition to the ordinary platforms, there will also be a special platform 700 *ft.* in length, which is intended for the marshalling of the trains, and there will also be ample accommodation for the exchange of traffic. In length of platforms and other points, the proposed station will exceed most of our city termini, and the cost is estimated

at 540,000*l.* The site selected is considered the best adapted for a central station, being in the vicinity of the Bank of Ireland, Deane-street, and the Castle. It is proposed to unite the new station by connecting lines with four of the railways having their termini in the city—namely, the Great Southern and Western, the Midland Great Western, the Dublin and Drogheda, and the Dublin and Kingstown lines. In proof of the citizens of Dublin being in favour of the project, it may be stated that when the Bill was before Parliament a large number of the most influential inhabitants of the city gave evidence in favour of the Bill.

MODEL OF THE HOLBORN VIADUCT.

MR. THOS. D. DIGHTON, who has executed in his time many very fine models of architectural and sculptural works, has just now completed for the Corporation of London an elaborate model of the Holborn Viaduct where it crosses Farringdon-street, as executed from the designs of Mr. Haywood. The subject scarcely lends itself to the production of a compact work of art, the sectional blocks of houses which butt diagonally against the bridge necessarily give it an aspect of incompleteness, but this was not the real object of the model, which is intended to show the actual construction of the bridge and adjacent roadway, with the chambers for gas and water pipes, the vaults and sewer. All the engineering work of the bridge is most carefully produced, and the ornamental ironwork, of which there is a very large quantity, is represented with amazing fidelity and elegance. The model is to be placed in the Guildhall Library, now rapidly approaching completion.

PROFESSOR DONALDSON.

THE King of the Belgians has conferred the Cross of the Order of Leopold on Professor Donaldson, and the Belgian Ambassador has delivered to him the cross and credentials of the order. Professor Donaldson has been a member of the Belgian Academy for thirty years.

We recently gave an account of the proceedings at the Centenary Festival of the Academy of Sciences and Fine Arts at Brussels, on which occasion Professor Donaldson attended as a delegate from the English Institute of Architects, and it is doubtless in recognition of his services in that connexion, as well as his numerous contributions to the history of his art, that has led to the honour lately conferred upon him. There is, perhaps, no member of the profession more universally esteemed, both at home and abroad, than Professor Donaldson, and not one who has striven more earnestly to uphold the status of the architect. We heartily congratulate him upon the well-merited distinction that has been accorded him.

THE ARCHITECT OF SOLOMON'S TEMPLE.

ONE of the great points sought to be made by the writer of the recent article in the *Quarterly Review* on "The State of English Architecture," depends largely on his assumption that Hiram, whom Solomon fetched out of Tyre, was the architect of the Temple at Jerusalem. Dr. Barlow, on the other hand, is content to allude to him, in your last number, as "Old Hiram, or Hiram, brassfounder to King Solomon." Can it be possible that they have headed the architects sculptured on the Albert Memorial,—Calliocrates, Erwin von Steinhael, Wren, and the rest,—with a brassfounder?

Such seems to be very nearly the case; for though he was an artist in brass, and a good many things besides, neither of the accounts which we have of him,—in the Books of Kings and Chronicles,—give the slightest hint of his responsibility for the design of the Temple. They are not merely silent as to his architectural qualifications, they do not bring him on the scene until after,—probably long after,—the whole of those arrangements which we call, for distinction, "architectural" had been settled. Not only were the various parts, with their relation to each other, determined on independently of Hiram, but the most minute details of the whole house, with its surroundings, were fixed. So far as we can see, therefore, nothing but the intelligent execution of the work remained for him and the other "willing skilful men" whom David fore-

told that Solomon would have with him for the service.

If, indeed, the account in Chronicles (xxviii. 11) is to be relied on, David, who undoubtedly projected the building, and left a vast store of money and materials for its erection, left also the drawings. He "gave to Solomon his son the pattern of the porch, and of the houses thereof, and of the treasures thereof, and of the upper chambers thereof, and of the inner parvouses thereof, and of the place of the mercy-seat, and the pattern of all that he had by the Spirit," even to the vessels for the service, in minute detail. ["All this, said David, the Lord made me understand, in writing, by his hand upon me, even all the works of this pattern" (ver. 19).—Ed. B.]

If there is any truth in all this, what title has Hiram,—however respectable otherwise,—(I will not say to the patronage of the *Quarterly Reviewer*—but) to that salient angle on the fringe of our new memorial? Indeed,—as Solomon lays no claim to the honour,—is there any person, other than King David, who ought to be regarded as the architect of Solomon's Temple? THOS. BEASELL.

INSURANCE AGAINST LIGHTNING.

Sir,—In reply to the letter of "R. J.," which appeared in your issue of the 29th ult., I beg to say that none of our fire offices insure "a house or other building against damage done by lightning."

The ambiguous announcement made by some companies that "losses occasioned by lightning will be paid," certainly fosters the erroneous supposition that some offices do hold themselves liable for "damage done by lightning" where no fire supervenes; but as such is not the case, the phraseology is misleading and objectionable.

In cases where lightning has actually fired property insured, no office could evade payment, unless it had specifically negatived such liability on the face of the policy.

The Britannia Fire Association goes so far as to state that "animals killed by lightning" are "paid for, if insured;" but, in other respects, adopts the common doctrine that to constitute liability there must be actual loss by fire.

It is obvious, however, from the very nature of a fire insurance policy, that, without specific notification to the contrary, it is simply a contract to indemnify the insured against loss or damage by fire; therefore, unless the property insured is *actually set on fire* by the lightning, or burnt in consequence thereof, there is no loss within the meaning of the policy.

Many offices, however, respond to claims for reinstatement of "damage done by lightning" with a liberal hand, and, while absolutely repudiating their legal liability, recoup the insured in the form of a donation equal to his loss.

Hence it is manifest that "no compensation can be obtained under existing policies" for such casualties as those contemplated by your correspondent, "R. J." The only security, therefore, which lessees who are bound "to uphold, maintain," &c., have against such accidents is to provide a lightning conductor to their premises. Indeed, no "tall factory chimney," or other high or exposed building, should be without one. B.

LIGHTNING AT BRIXTON CHURCH.

Sir,—I see that Brixton Church was damaged last week by lightning. I have found an interesting account of damage done to it by the same means on April 24th, 1832. This account is contained in the "Proceedings of the London Electrical Society," and is headed "The Effects of a Lightning Flash on the Steeple of Brixton Church, and Observations on Lightning Conductors generally. By Charles V. Walker, esq., Hon. Sec." It is illustrated with a sketch and section.

After alluding to a lecture that Faraday had delivered some time previously on "Lightning Conductors," Mr. Walker proceeds to give a description, which I have copied in an abridged form:—

"The localities of the damage done to the exterior are shown in the sketch to be at the summit by the cross, and at the base of one of the columns near the roof of the church, distant apart upwards of 50 ft. Some idea of the violence of the explosion at these two spots may be formed by considering that the masonry on which the cross stands is nearly 10 ft. thick, and that so much of it was disintegrated, and with such force as to drive the cross into the position delineated, and the column, the ball of which was shattered half through and to a height of 3 ft., was about 3 ft. in diameter. The portion of the dial which passed within the tower did no further mischief than to fuse or else tear apart (most probably the latter) an iron wire one-tenth of an inch thick, and in passing from this to an iron clamp, to tear up the woodwork with which the clamp was concealed. The glass was broken of three windows of the room containing the clock; also of the window of a door at the foot of the steeple. The frame of the latter window presented the appearance of having been blown outward. So far as I have been able to determine by a careful survey, the breaking of glass did not result from the direct force of the blast, but from the great concussion and vibration of air consequent on the terrific explosion. The probable direction by which the lightning reached the cross is shown in the section. It is a plain cross of thick sheet copper, containing an iron rod which passed through the masonry, and was secured by a nut below. The sections of the masonry are secured together by lead poured into the parts of juncture. The fluid passed from the cross, and pursuing its path down one of these lines of lead, made its escape from the termination offering least resistance, and produced the disruption. It then passed down the inner side of a column, and divided itself, the greater portion pursuing its course outside the building, but some part passing within. The latter obtained access through the metallic communication at the clock-faces, and travelled from the clock along an iron wire 30 ft. long by 1/16th in. thick, passed down this wire with comparative tranquillity (except as regards the destruction of the wire itself), and tore up the woodwork in reaching the iron clamp before mentioned."

Outside the tower the lightning was conveyed safely from the top of the belfry by an iron water-pipe; this pipe, however, terminated a few inches above the stone parapet supporting the columns, and here it appears to have traversed one side of the square tower, and shattered the base of a column on its way to a lead slope; from hence it passed safely to the ground, by means of the gutters and water-pipe.

Mr. Walker concludes his paper with suggestions for guarding against another such visitation. He says,— "The workmen have now removed the metal cross. Let its place be supplied by one of stone. I am no architect, but presume that could readily be accomplished. But if the summit *must* be of metal, then let the cross be furnished with a few points, to draw the lightning off quietly, and let the lower end of the rod be connected with an iron water-pipe by a copper rod or plate, and let a similar connexion be made between the end of the same pipe and the lower pipe by means of another copper rod or plate. Thus will provision be made, at very small expense, against the possibility of a disruptive discharge."

Mr. Walker also dwells on the necessity of guarding against a "lateral discharge," even supposing the former precautions were taken, and says, "This simple fact should be borne in mind, that every piece of metal, every bolt, or clamp, or har, within striking distance of the conductor, unless it be in direct connexion with it, is liable to cause a lateral discharge." I must confess that I feel some curiosity as to how far last week's damage resembled that of April, 1812, and also how far Mr. Walker's suggestions had been carried out. H. T. G.

A NEW JETTY AT CHELSEA.

THE VESTRY AND THE THAMES CONSERVATORS.

The Chelsea Vestry are anxious to erect a new jetty, but the Thames Conservators will not grant them permission to do so; at which the Vestry are indignant, more especially as, whilst the Conservators have refused them this privilege, they have just consented to allow a private individual to erect two at Cremorne. The subject was brought before the Vestry last week, when there was a warm discussion, several of the members suggesting that on any future occasion they should go direct to the Conservators' "masters" and Mr. Carter bitterly complained that the parish had been deprived of one or two landing-places, and could really get materials up in consequence of the Embankment. It appeared that the parish was not to have a landing-place because the Thames Conservators did not choose to allow one. He hoped the matter would be made as public as possible, and he thought it was quite important enough to warrant a public meeting being called.

TRINITY CHURCH, FINCHLEY NEW ROAD.

This church was formally opened by the Bishop of London on the 9th ult. It is calculated to contain 900 persons, and can, by the construction of galleries, be made to contain nearly 1,100. The nave is 90 ft. long up to the chancel arch, and of the unusual width of 34 ft. It is lighted by a lofty clearstory, with windows of large size. The north and south aisles are 11 ft. wide, and the same length as the nave. At the western end is a large porch, with three doors, the porch being as long as the width of the nave, viz., 34 ft.; from this porch are two doors opening into the church, to lessen the

usual draught from the western entrance; the two inner doors not being opposite to the three outer. There is also a north porch, and another doorway on the south side of the church, so that the egress of the whole congregation can be effected in a few minutes.

The arcade on each side the nave is supported by polished granite columns, 20 in. only in diameter, thus intercepting the view as little as possible, and the nave walls are decorated with ornamental brickwork and coloured brick bands. The capitals of the columns and responds are all carved to represent natural foliage, this being especially desired by the vicar. The style of architecture is Gothic of the Geometrical period. The chancel is not yet erected, nor are the tower and spire, but these will be proceeded with as funds permit. The chancel is intended to have a semicircular apse, and to be 36 ft. deep and 27 ft. wide, and to be brick vaulted; also to have a chancel aisle on the north side, and organ-chamber on the south, with vestry.

The architect is Mr. Henry J. Legg; and the contractors are Messrs. Dove; Mr. Austin being clerk of works.

The lord of the manor, Sir John Wilson, liberally gave the ground on which the church is built.

THE WHARFS AND WAREHOUSES STEAM-POWER PRESSURE COMPANY.

OPENING OF STREETS.

THE Wharfs and Warehouses Steam-Power and Hydraulic Pressure Company have given notice of their intention, within the next few days, to break up, for the purposes of their Act, New Bridge-street, Earl-street, Upper and Lower Thames streets, and Great Tower-hill. The company's pipes, which, it appears, are at present in use in several docks in Europe, will be laid under the direction of Sir William Armstrong, the patentee. It appears that any paving works rendered necessary by the operations of the company will have to be done at the company's expense, by the Commissioners of Sewers. In the course of a discussion which took place on the subject at the last meeting of the Commissioners, it was remarked that, if the pipes could be brought into use in case of fire, they would be found to be of immense benefit.

THE NOTTINGHAM TEMPORARY HOSPITAL.

Now that the epidemic of small-pox, which fell heavily on Nottingham, is at an end, congratulations are being offered as to the means employed. A temporary hospital, on the pavilion principle, was run up by Mr. Lyman, under the direction of Mr. Tarbotton. The buildings are fifteen in all. There is under one roof the committee-room, dispensary, and surgeon's apartment; the three apartments of the matron and store-room; the kitchen, laundry, nurses' apartments, stewards' apartment, servants' dining-hall, and general store-room; the night superintendents' apartment, the isolating ward, nurses' dormitory, bath-room, and disinfecting closet; the mortuary (suddenly converted from an old greenhouse), and wards for 120 patients (male and female separately arranged), with 2,000 cubic feet of air for every bed, and each building being considerably detached from the other. The service staff of the establishment consisted of nearly sixty persons. The building part of the hospital arrangements cost about 2,500l., and the establishment charges something under 5,000l.

The temporary institution will be finally closed with a thanksgiving service.

ROYAL ARCHEOLOGICAL INSTITUTE.

THE annual meeting of the Royal Archaeological Institute of Great Britain and Ireland, was to open to-day (Thursday), at Southampton, under the patronage of her Majesty and the Prince of Wales. The Bishop of Winchester is the president of the meeting, the patrons being the Duke of Wellington, the Earl of Carnarvon, the Earl of Malmesbury, the Earl of Normanton, and Viscount Eversley. The presidents of sections are:—Antiquities, Sir Edward Hume, A.M.; Architecture, Mr. A. J. B. Beresford-Spive, M.P.; History, Lord Henry Scott, M.P. The inaugural meeting was to be held in the Hartley Institution at noon, and an address presented by

* Considerably out of the perpendicular.—H. T. G.

the mayor and corporation. The afternoon would be occupied in examining the local antiquities, and the mayor was to give a *soirée* at the Hartley Institution in the evening. On Friday a meeting of sections, after which an excursion to Romsey and Porechester, with a *conversazione* at night. Saturday a long excursion to Christchurch, Beaulieu, Rufus's Stone, and Lyndhurst. On Monday, the 5th, another meeting of sections in the morning, followed by an excursion to Winchester and St. Cross, and a *conversazione* in the evening. On Tuesday an excursion to Silchester, Basingstoke, and Basing, and an evening meeting for the reading of papers. On Wednesday a meeting of sections, with an excursion to Newport and Carisbrooke, Isle of Wight, followed by a *conversazione* in the evening. On Thursday, the 8th, a last meeting of sections in the morning, with the general concluding meeting in the afternoon. Southampton and the neighbourhood are rich in historical associations and archaeological remains.

THE WORCESTER GUILDHALL RESTORATION.

A PUBLIC meeting, convened by the Ratepayers' Protection Society, has been held to consider the question, now before the Town Council, of rebuilding or reconstructing the Guildhall, the former at a cost of 18,000*l.*, and the latter at a cost of 9,000*l.* The attendance at the outset was somewhere about a hundred, according to our authority the local *Chronicle*, but it increased to double that number. Most of those present seemed to be working men of the mechanic class.

It was unanimously resolved:—

"That the proposal of the Town Council to rebuild or reconstruct the ancient Guildhall of this city is altogether unnecessary, and would entail upon the already heavily-taxed ratepayers an additional financial burden which is unequalled. This meeting is therefore of opinion that the project ought to be at once abandoned, and steps taken for putting the fabric into a state of necessary repair."

"That a memorial to the town council be signed by the chairman on behalf of this meeting, and that Mr. Councillor Atrey be desired to present the same, and to move such a resolution thereon as may appear necessary in accordance with the memorial."

The memorial urged the views of the meeting. It stated that the—

"Memorialists believe that, with necessary repairs, the present building is sufficient for all the ordinary uses of a town-hall, and would answer such purpose for many years to come; and especially would they regret to see the ancient front destroyed, being of opinion that it is an ornament to the city."

The memorialists, therefore, respectfully begged the town council to abandon for the present the contemplated rebuilding or reconstruction of the guildhall.

CUT NAIL WORKS AT MIDDLESBROUGH.

Messrs. Jones, Brothers, & Co., of the Ayrton Rolling Mills, have inaugurated a new branch of industry in Middlesbrough. On about an acre of ground adjoining their mills they have erected thirty nail-cutting machines, three shears for cross-cutting, a number of grindstones, lathes, and drilling-machines, requisite for making tools and keeping them in order. The cut nail trade is a special branch of a number of trades included in the term nailmaking. The nails are made out of sheets or strips of Cleveland iron, and the thickness of the sheet varies according to the length of the nail required. The sheets are cut into strips transversely, the width of the strip being identical with the length of the nail. A youth "feeds" the machine with strip, which is seized by a "claw," and turned over at each cut, the nails being produced at the rate of from two to three per second. The machines are constructed by the firm of Messrs. J. Rice & Co., of Birmingham, and embrace the latest improvements in nail-cutting machines. The machines are driven by a horizontal engine, the steam power being derived from two horizontal boilers, which are fixed outside of the building. Foundations are put in for another engine, to be coupled to the one already erected, when additional machines are laid down. Provision is also made for the erection of half a dozen "washer" machines. The sheets from which the nails are made are manufactured in the adjoining mill belonging to the firm, and an interesting system of three high sheet rolling has been introduced for the purpose of turning out those sheets more rapidly, and with a better surface than is done by the old process. Gene-

rally, cut nails are made in Birmingham, Leeds, Manchester, and Gateshead. At present, the price of cut nails, from 3 in. to 6 in., is 22*s.* per ton. There is no place in the United Kingdom where cut nails can be manufactured cheaper than at Middlesbrough. The town is also favourably situated for the London and Scotch markets. The works are producing rose, clasp, and clout nails, joiner's spig, ceiling brads, floor brads, lath nails, colliery plate nails, and any other class of cut nail not less than 1 in. in length. The machinery is capable of making about forty tons per week, but the works are laid out for ultimately turning out about 100 tons of cut nails per week. The building is erected with the view of giving as much light as possible to the interior, and for this purpose a good portion of the roof is constructed of glass.

ST. EDWARD'S SCHOOL, OXFORD.

THE foundation stone of new premises for this school has been laid at Summertown, their present premises in New Inn Hall-street being too small. A large and open space, covering five acres of ground, and situate at the corner of Woodstock-road and South Parade, Summertown, has been provided for the new buildings, and it is intended that they shall cover about one acre and a half, the remaining three acres and a half being devoted to cricket and playgrounds, and carriage-drive approaches, and there will also be a considerable portion of ground set aside for ornamental planting. Mr. W. Wilkinson, of Oxford, is the architect; and the contract for the work has been taken by Messrs. T. Orchard, Brothers, of Baubury, for 8,659*l.*, but this does not include the chapel, which it is proposed to erect close to and in connexion with the schools. The cost, it is understood, will be principally borne by the Rev. Algernon B. Simeon, and the works during their progress will be in the main charge of Mr. J. Hards, the foreman of the contractor. It was an instruction to the architect, we believe, to produce a plan for the building of a simple nature, and suitable for academical purposes. The soil is a marly one, and the site is free from surroundings of crowded buildings. The architecture will bear Early English characteristics, and will be ornate, but not pretentious in appearance. The main front will face the south towards Oxford, while the master's residence, which will be separate, although in communication with the main building, will be situated at the south-west corner. At the same end will be the school and class-rooms, and eventually it is proposed to continue a cloister to the projected chapel. The south frontage will extend nearly 200 ft., the west or kitchen front about 112 ft., and the building will comprise three stories, this being necessitated in consequence of the height of the large school-room and refectory, both of which are intended to be 60 ft. by 21 ft., with a height of 17 ft. The building will be of brick, with dressings of Bath stone, and all the windows will be provided with iron casements. The library and masters' rooms will be spacious. A main stone staircase will lead to the dormitories on the second and third floors, where accommodation will be provided on the "cubical" system—which means really a separate division for each boy, with a small window,—for 100 boys, the number on each floor being equally divided. There are in addition designs for private bath-rooms, and one larger one for the use of the smaller boys. In case of any infectious disease making its appearance, complete isolation will be secured by the sufferers being transferred to the gardener's cottage, where accommodation will be provided somewhat after the fashion of cottage hospitals.

CONCRETE WALLS AND ENCAUSTIC TILING.

Sir,—I have been very much struck with the suggestions of more than one of your correspondents of late as to the uses of encaustic tiling. That it would set at rest all questions as to repainting, repointing, and cleansing of stone, is evident, and would possess, what is so important in our climate, a power of being restored to pristine brightness and freshness with the minimum of labour, are advantages which cannot be overlooked by those who build, and by tenants. To architects it offers, by its capability of thorough and extensive use in an artistic and uniformly architectural character, an opportunity for the display of genius in a new direction, which

might open out a way from the perpetual charges against all our architecture that it is stale, and nothing but the working-up of old types of art.

But my object in writing this is chiefly to suggest that, if over concrete becomes largely employed in building, which seems very likely, the facing it in an architectural manner with encaustic tiling, suitably studied and worked out in colour and pattern in unison with the whole design, would be a natural and excellent combination; and there seems no reason to fear that there is any technical objection to the combination of the two materials, *i. e.*, concrete, with an encaustic tile facing. Its partial use, as at present employed, while giving a pleasing variety, does not come up to what we mean, which, we reiterate, is the making it the sole vehicle of exterior decoration, in a well-studied and artistic manner as to colour and pattern, in harmony with the design and uses of the building; and as solving the many problems which now afflict the profession. BETA.

THE DRINKING FOUNTAIN ON CLIFTON DOWNS, BRISTOL.

ON the completion of this drinking-fountain we printed a few particulars of its origin and construction, and we now give a view of it, repeating so much of the account as may render looking back unnecessary. It was erected at the cost of Mr. Alderman Proctor (late high sheriff of the county), and presented to the people of Bristol for ever. His motive for this liberal act may be learnt from the inscription cut in a panel at the base, and which runs thus:—

"Erected by a citizen of Bristol to record the liberal gift of certain rights over Clifton Down made to the citizens by the Society of Merchant Venturers, under the provisions of the Clifton and Durdham Downs Acts of Parliament, 1851, whereby the enjoyment of these Downs is preserved to the citizens of Bristol for ever."

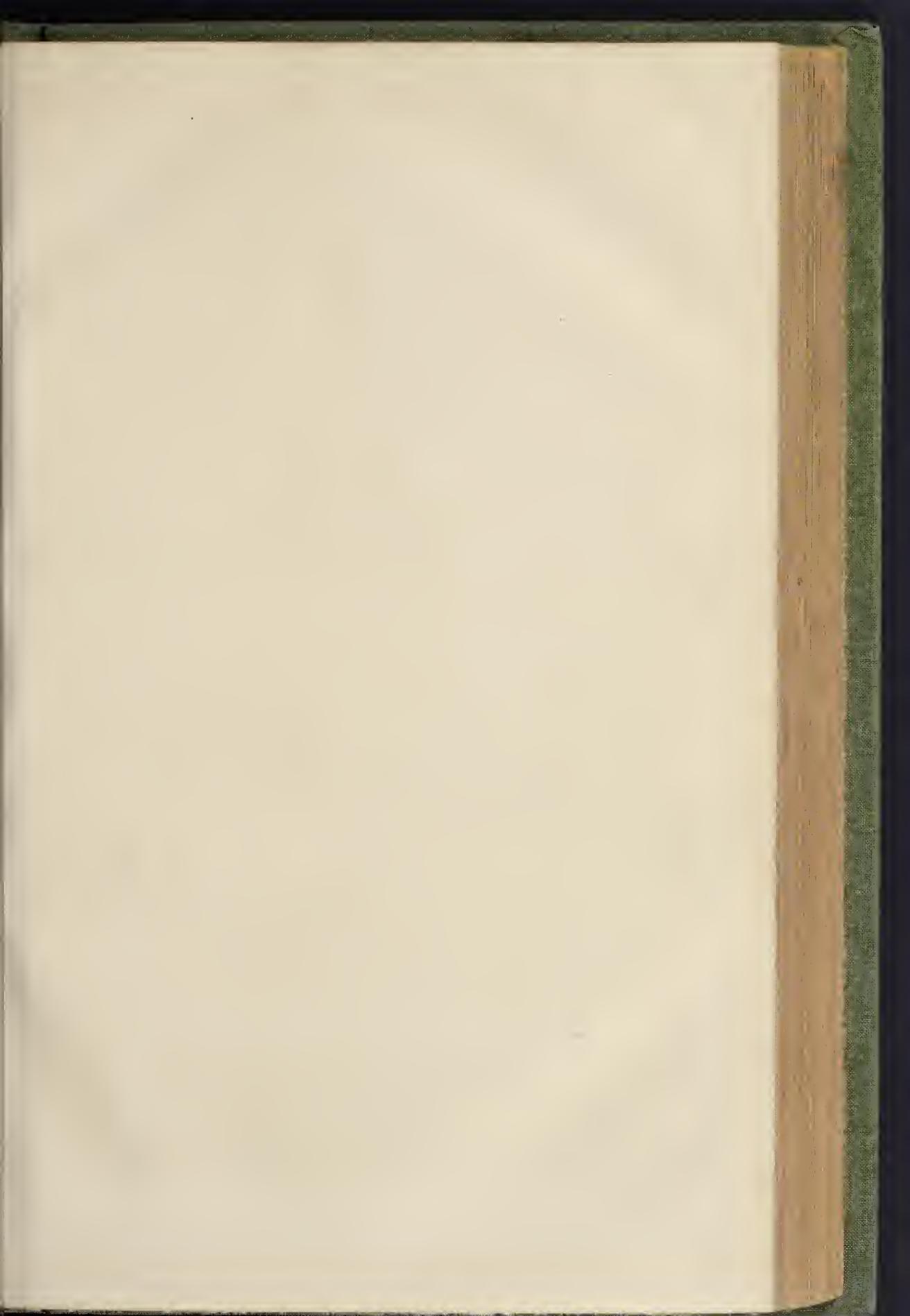
The fountain stands on the site of the old turnpike, and is approached by four roads, as well as by a pathway from the new zig-zag walk up the cliff. The structure has the novelty of being triangular on plan. The stone used is the Box ground, with alternate voussoirs to the arches of red Mansfield; the three arches spring from columns, the shafts of which are of Rouge Royal marble polished; the basin is of red Mansfield, with a veined marble curb. Inside the basin stands what may be termed the fountain proper, from which the taps project; this takes the form of the structure, and there is a tap in front of each arch. The under side of the superstructure is groined. Over the arches are gables, with coping and carving under it, and they have each a carved finial. At the three angles there are buttresses, terminating with gables detached from the pyramidal roof which rises from the centre, and is topped by a handsome finial. In the gables over the three arched openings are circular sunk panels containing the arms of the Merchant Venturers, the arms of the city of Bristol, and those of the donor, Mr. Alderman Proctor, carved in red Mansfield stone, with their several mottoes.

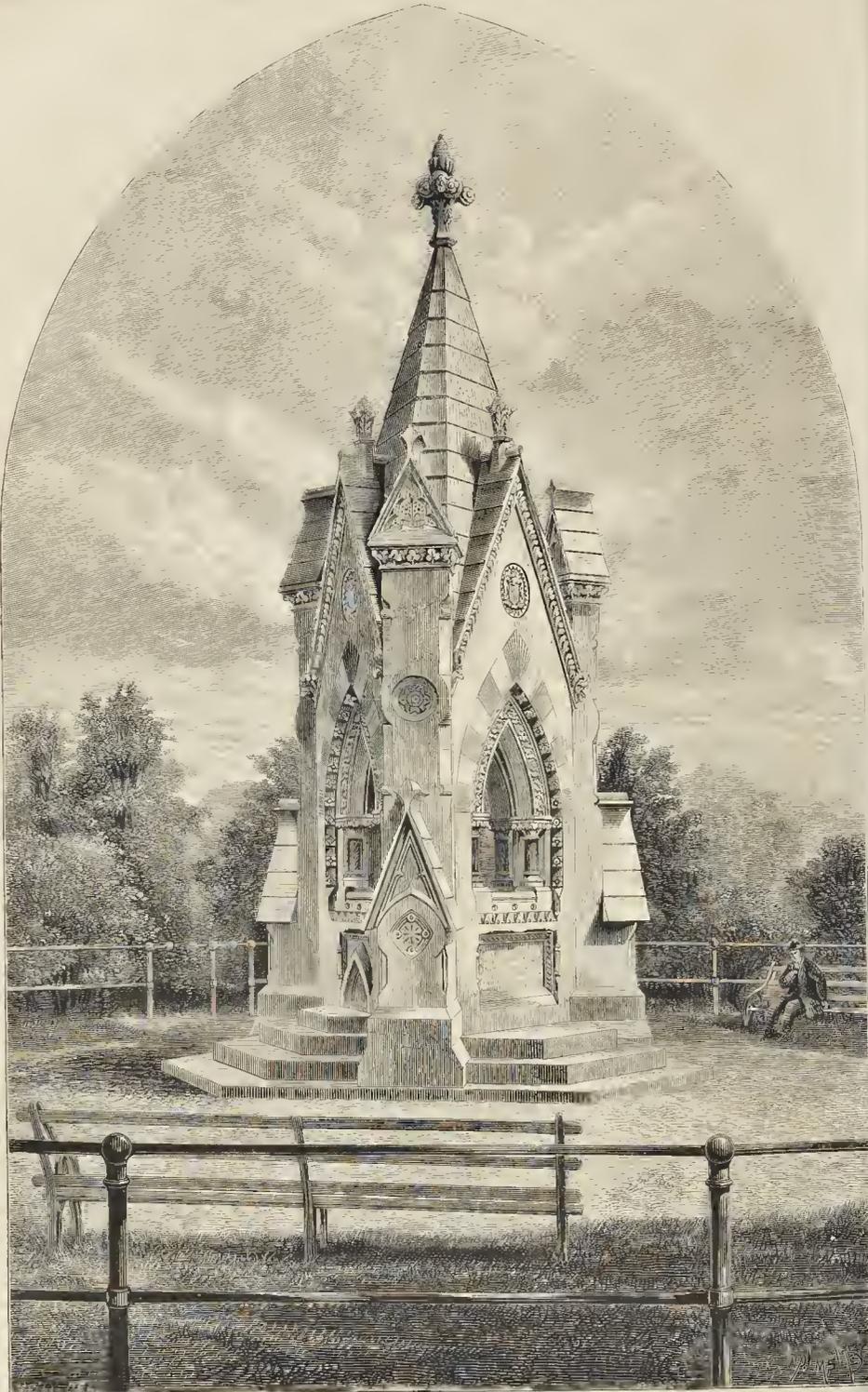
The structure stands on three Pennant-stone steps: on one side is a fourth, for the accommodation of children: a similar step will have to be added at the other openings. The whole erection is 25 ft. 6 in. high, to the top of the carved finial. In connexion with the fountain there is a cattle-trough, not far off, which is continually supplied with water.

The work has been carried out from the designs of Messrs. George & Henry Godwin, of London, architects, by Messrs. Broad & Tucker, of Bristol.

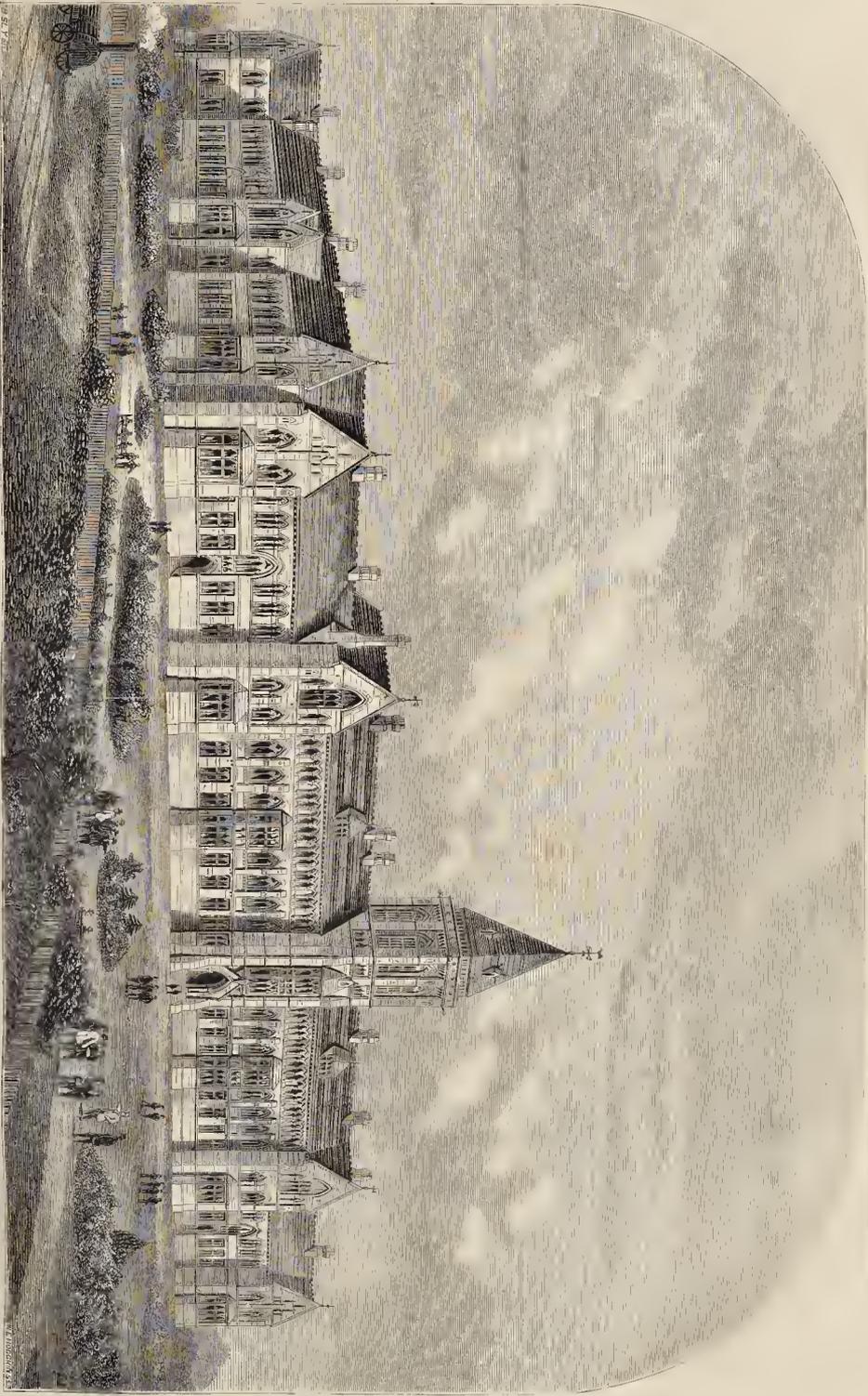
The donor writes as follows:—
"I am much pleased to find that the drinking-fountain is greatly appreciated by all classes. We find a great advantage in having the supply of water direct from the main, as it tastes cool and fresh. We are also enabled to satisfy any extra demand that arises from the visit of excursionists, the increased number of persons that walk on the downs when the band is playing, or the thousands who avail themselves of the advantage of the downs on the Sunday afternoon and evening.

Ordinarily, the three cups attached to the fountain are sufficient; but to meet any extra demand, my man takes out a number of half-pint mugs, and turns on an extra supply of water, according as it may be required. The Bristol Water Works Company supply the water by metre, at a charge of 1*s.* per thousand gallons."

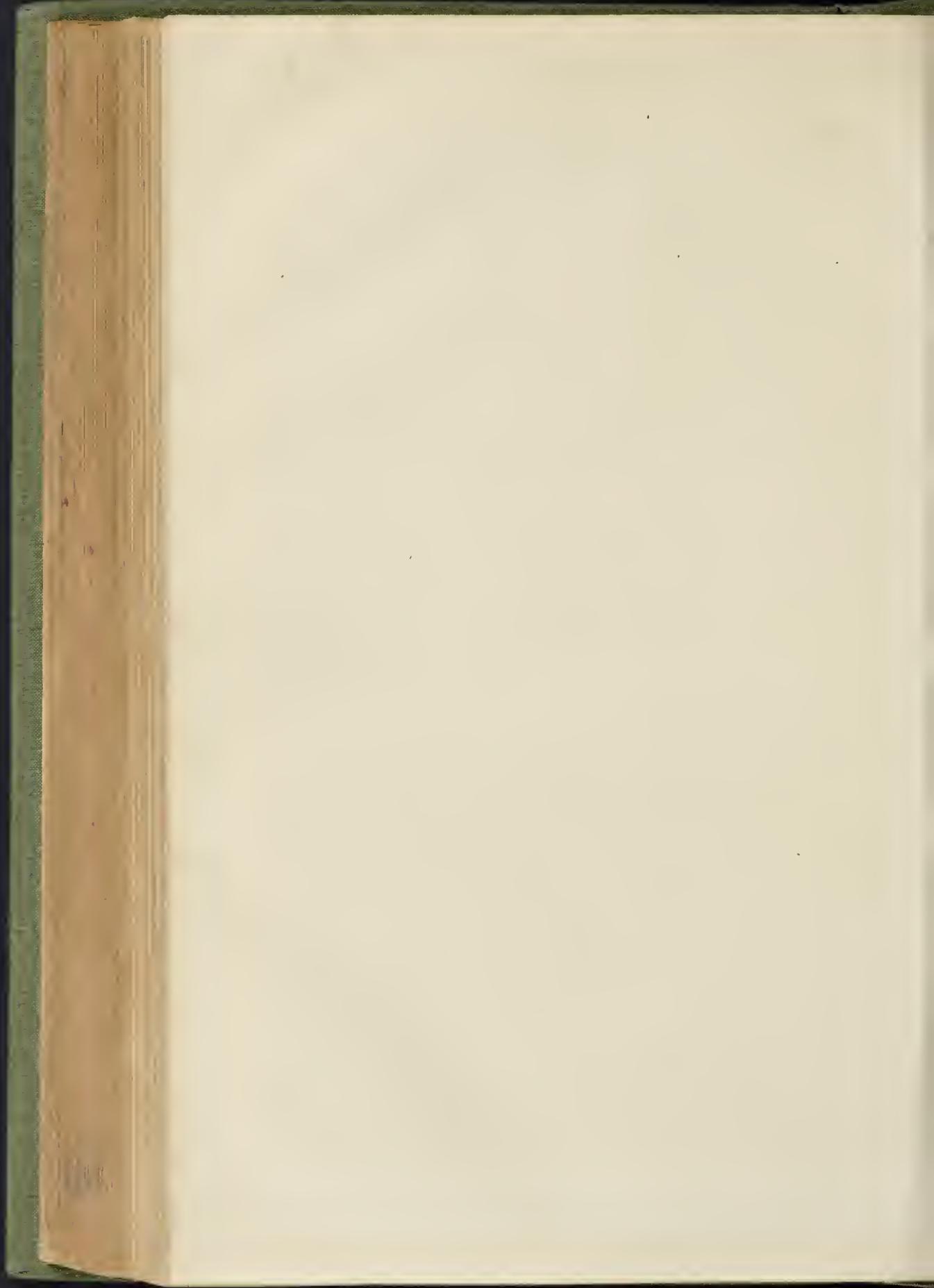




DRINKING FOUNTAIN ON CLIFTON DOWNS, PRESENTED TO THE CITIZENS OF BRISTOL
BY MR. ALDERMAN PROCTOR.—MESSRS. GEORGE & HENRY GODWIN, ARCHITECTS.



PROPOSED LUNATIC ASYLUM AT ST. ANNS HEATH, VIRGINIA WATER, WINDSOR.—DESIGN TO WHICH SECOND PRIZE WAS AWARDED: MR. ALFRED SMITH, ARCHITECT.



PROPOSED LUNATIC ASYLUM, ST. ANN'S HEATH, VIRGINIA WATER.

The report of the referees on the thirteen designs submitted to Mr. Holloway, was printed in our last. By this the first premium was awarded to the drawing marked "Alpha" (by Messrs. Crossland, Salomons, & Jones); the second to the set marked "Inprobus labor minus vincit," submitted by Mr. Alfred Smith, in our present issue we publish a view, illustrating Mr. Smith's design. It is right we should say, however, that in doing this, no reflection whatever on the referee's decision is intended; it is the result of a published mistatement, which gave the first place to the design we have engraved; and we know nothing of the other designs. We propose in an early number to illustrate fully the design by Messrs. Crossland, Salomons, & Jones, to which the first premium is really awarded.

Readers of the *Builder* will not require to be told that the plan of an institution such as this is the most important part of the design: at present it is not before us. With reference to the elevations, we quote Mr. Smith's own particulars:—

"I have endeavoured," he writes, "to make every part of the building graceful and of good proportion, and in perfect harmony and keeping throughout, so that the total ensemble shall be at once simple, dignified, and imposing, and derive all its effects from the well-studied arrangement and proportion of the necessary parts, and not from any gaudy or meretricious. Very little stone need be used, as it will be desirable, both for the general effect of the building and economy, to give it a thoroughly brick expression, using terra-cotta or Ransome's patent one for the portions which cannot be executed in brick, and to avoid the too common, unsatisfactory, and costly error of fitting stone and brick together in such a way that it is hard to decide whether it is intended to be a brick or one building. Under any circumstances, the repetition of good forms is an advantage as regards cost, whether stone is used or not. Very little ornament or carving has been introduced, because good carving is very expensive, and buildings of this nature ought not to depend upon its for success, and a few touches here and there from a master-hand is all that should be necessary to make them thoroughly effective."

We understand that all the designs will shortly be exhibited at the House in Conduit-street.*

WAGES.

Sir,—I did not expect that my former communication on this subject would please every one, and I see an unsparing criticism this week under "S." (By the way, to select that sibilant consonant as a signature was a most happy one. It is seldom that the whole essence of a letter is contained in the signature.) I do not, indeed, that your correspondent has a good word for a single sentence of my letter, unless follow it with a fatal "but," and it is perhaps very reasonable to infer that the parts passed over in silence have equally failed to secure his approbation. Of convincing so decided an opponent I have, of course, no hope. I will not use your indulgence, therefore, by replying to his criticisms. Most of these I am content to refer to the judgment of your readers, provided they that they will suspend their opinion until they have glanced again at what I did actually intend. It may be well, however, to notice so much of your correspondent's letter as will suffice to explain and briefly re-assert my position; namely, this, that in determining what is a proper rate of wages the question is simply a question of value. The labourer sells something which the employer buys, and the wage which the former receives is the supposed value of this. It is settling what that value is (in other words, the price) economical considerations could alone be introduced. "Abstract justice," contend, has no more to do with the value of our than with the value of wheat. In the former case the conditions are more complicated, the principles on which both must be decided are fundamentally the same. You must expect the labourer to be content unless he is conscious of obtaining the full value of his work; and, if he were instructed in economic science, his "enlightened self-interest" would only prompt him to insist on this, but would remind him that it is suicidal to exact more than this when he has for a time the power. I therefore regard the notion of "abstract justice" here as simply misleading. The very term, I confess, in this connexion grades on my mind. It conveys an idea of dreaminess and sentimentality, and seems to me to stand self-

condemned. I observe that "S.," though writing specially to censure me for wishing to exclude this notion, makes no attempt to show how it may be introduced with advantage. I believe it absolutely incapable of application. I would here remark that "self-interest" as a motive is often looked upon with unjustifiable disfavour. It is a very different thing from individual selfishness, and when actuating a class numbering perhaps many thousands, it is not incompatible with a great deal of *esprit de corps* and not a little chivalry. In the present strike, for example, there are no doubt many men who, for the sake, as they think, of the general benefit, willingly suffer losses for which they well know complete success would not compensate them.

I do not wish to be understood to assert that moral considerations should not govern the relations between masters and men. Only too glad should I be to see more employers whose object of existence is not simply to amass large fortunes as rapidly as possible, and on the part of workmen a little more of that pride and sense of honour which would prompt them to give good work for good wages. I do not think this inconsistent with my other opinions.

"S." is very severe on my simple illustration of the old maxim that "honesty is the best policy." After carefully reading the passage again, I can candidly affirm that I consider it quite incapable of the construction he puts upon it. I am almost forced to think he never heard the term "enlightened self-interest" before. Indeed, when "S." found himself involved in the curious assumption that "abstract justice" and "enlightened self-interest" are different terms for the same idea, he might have suspected he had somehow got wrong. This is surely logic in its swaddling clothes. Not many of your readers will follow "S.'s" example. I think, indeed, if our friend had not accidentally misquoted the passage he gives, and lost sight of the next three sentences, he would not himself have fallen into the error.

"S." does not see the relevancy of my remark that matters will not be improved by "preaching sickening sermons on universal benevolence." That I regret; but it is not for me to decide on the relevancy of my own remarks. The "universal benevolence" I alluded to, and which we are sometimes exhorted in the public prints to practise, is usually a kind of magnanimous self-denial by each party for the sake of the other. A very easy doctrine, indeed, to recommend to others; but to set each party watching to see if the other is acting on this golden rule (for this is what it amounts to) is not a likely way to abolish the "class hatreds," as "S." calls them, which we all deprecate. If "S." has not seen any of these "sermons" he is to be congratulated.

I have little sympathy with the benevolence whose object is solely to raise the status of those who are now called the lower classes, "by assisting some of them to rise." The qualities of the workmen who "rise" above their fellows are seldom those of the highest order, as is shown by the absence of sympathy they usually display towards the comrades they have left behind. Besides which, such benevolence will at the best benefit only an infinitesimally small proportion of the multitude. A wise philanthropy will rather try to benefit the workmen in their class than to raise one or two of them out of it, and this by teaching them how to improve permanently their general condition for themselves, both in material and moral respects. As Mr. Mill has well written on a kindred subject,—

"There is reason to rejoice at whatever makes the privileged classes of skilled artisans feel that they have the same interests, and depend for their remuneration on the same general causes, and must resort for the improvement of their condition to the same remedies as the less fortunately circumstanced and comparatively helpless multitude."

Those who will put into the workmen's hands the power which comes with knowledge, and teach them to understand the laws which govern the production and distribution of wealth, will earn their lasting gratitude, though they must expect to be regarded as visionaries for a time. Your correspondent's sneer at "those economic laws which are said to be so infallible," is amusing enough, and reminds one of the gentleman Sydney Smith knew, "who used to speak disrespectfully of the equator!" And if they "oppress," as he says, not only "those who cannot rise into the tide," whatever that may mean, but also those who are not "within the compass of their action?" they must be remarkable laws indeed, and no wonder "S." does not

like them. I am, of course, unable to say whether their doctrine will or "will not be preached" too much," but they must be preached a little more clearly if they are to be understood.

I dislike the present system of the complete dissociation of capital and labour as heartily as any one, and principally for the reason that under it we have two sets of interests necessarily hostile. So long as the labourers and the capitalists are distinct sets of men this will be the case. And it is because, in the present dispute, there are no signs of any change of system, that I fear, "whatever agreement may now be come to can be of no value towards a real settlement." The workmen will get most, perhaps, of what they now ask, grudgingly granted by their masters; the present mutual ignorance and blind distrust will continue; and in a few years the same fight will occur again. When workmen have acquired sufficient knowledge and public spirit to co-operate intelligently, so as to be able to do without the individual capitalist, then, and not before, trade wars will cease, for the cause of them will have passed away.

It is not to be concealed that workmen have still much to learn before that time can arrive. They are not without instructors. They have the teachers of Christian forbearance and abstract justice on the one hand, and on the other the positivists, who recommend combination,—not to render warfare unnecessary, but to make one of the helligens stronger for it. When the sentimental and the heroic teachers have both had their say, the scientific way may, perhaps, obtain serious attention. Mr. Tarbuck, I fear, will find that we are far too "practical" a people to place faith in any one who proceeds on principles. Nor is there any reason to suppose that the masters would place Mr. Mill in possession of sufficiently full information as to their profits, &c., to enable him to form a judgment.

I must apologise for the length of this letter; but I shall not trouble you with any further remarks on this subject. H.

BITS OF BROMPTON.

MR. T. F. DILLON CROKER, following up a pleasant work of his father's, is contributing to the *South London Press* some "South-Western Sketches," which will be read by many with interest by-and-by, as well as now. We reprint a few paragraphs from a chapter headed "The Oratory to Stamford Bridge":—

"A wag once observed to us that he did not know why so many actors lived at Brompton unless because it was the *Hamlet* that gave advice to the players. The street which divides Pelham-place from Thurloe-square is Pelham-street, the right side of which is now all down to make room for the railway, and which street takes us immediately up on the left to the South Kensington station of the Metropolitan, where formerly stood Pelham Villas. This station was opened in the Christmas week of 1868. Of the railway we are happily, on the present occasion, independent, since its convenience is its sole recommendation, and the means of transit can hardly be said to compensate for numerous annoyances and high fares. In the underground railway carriages, every one quietly submits to sit in a thorough draught, which would be immediately resented in an omnibus. This is one of its dangers; but there are others resulting from the general busting and excitement, stopping in tunnels, chances of fire, &c., which appear to be quite as likely to occur as on other lines. No, let us keep above ground as long as we can, and when we cannot, there is the Brompton Cemetery (of which we shall have a word to say by-and-by) always open to us. This by the way. It was at the South Kensington station that the serious collision took place, in consequence of which that clever actress, Miss Bufton, obtained a verdict of 1,600*l.* damages, to which the railway company demurred as excessive, although they owned themselves entirely in fault; and 1,600*l.* is poor compensation for the possible wreck of an entire future.

Opposite to this station at the corner of Cromwell-lane still stands Brompton Hall, said to have been the residence of Lord Buteleigh, and visited by Queen Elizabeth on the occasion of her proceeding to Queen's Elm. A stone engio yet remains perched above the wall in solitary state, where once was the old gateway, which is now, alas! disfigured by an ugly hoarding. No. 7, Cromwell-place, is the residence of Mr. J. R.

* The following are the competitors who are to receive for the award 50*l.* each:—Messrs. T. R. Smith, R. F. Iers, Seddon, E. W. Godwin, Quilter, T. H. Watson, & Francis.

Millais, R.A. It is one of a fine row of houses leading into Cromwell-road. In Cromwell-lane are some quaint almshouses about 230 years old, built by Mr. Methwold, who lived in Hale House (afterwards Cromwell House). The inmates of these houses (one of whom is upwards of ninety years old, and has been there twenty-three years), seemed cheered by an occasional visitor, more especially if also a sympathetic inquirer; but they appear to be very carelessly treated, as the rooms are terribly out of repair. Sixteen acres of land, it would appear, were left to keep these old houses in perpetuity. This, like many another trust, owing to negligence, not to no a barster term, on the part of those on whom the responsibility devolved, has been lost to those for whose advantage it was intended, and has, we believe, in some curious manner, merged into a portion of the South Kensington estate. It may be suggested to the inhabitants of the neighbourhood, and the charitable generally, that a trifling amount would restore the houses to at least comparative comfort.

There used to be a square old wooden pump in the front garden not very long ago, and we remember constantly passing the houses when they were in a narrow lane: now they are almost the sole remnants hereabouts of a by-gone age; and we understand that they are purchased by the railway company, so that the chances are they will come down in these days of progress and desecration, unless some zealous archaeologist should interfere."

THE ASSESSMENT OF ST. THOMAS'S HOSPITAL.

THE proceedings at the general assessment sessions at Westminster last week on the appeal of the governors of St. Thomas's Hospital against the assessment made by the parish of Lambeth on the new structure, contain several features of interest as to the value and rateability of public buildings. The parish had rated the hospital at 20,722l. gross, and 17,580l. rateable value, whereas the hospital authorities contended that the extreme rateable value was 5,000l.; but the magistrates last week decided that the rateable value was 10,900l., which, although that sum is nearly 7,000l. less than the amount claimed by the parish, is, nevertheless, more than double the sum at which the hospital authorities contended the building ought to have been rated. The matter is not, however, yet settled, inasmuch as a case was granted, on an application by the counsel for the hospital, involving a point of law as to the liability of the hospital to be rated at all. A feeling of dissatisfaction seems to prevail at the decision arrived at by the magistrates, as it involves an annual contribution from the income of the charity of a sum approaching 3,000l. towards the rates of the parish of Lambeth, and it is urged that it is not just that a charity freely relieving and treating the sick and injured poor of a parish should be subject to such an impost.

The opposite views of the several valuers and others connected with building as to the annual value of the hospital was somewhat striking. Mr. E. Ryde, on behalf of the hospital authorities, stated that he had had great experience in London as a valuer, and the result of his valuation was that the gross value of the hospital should be 6,000l., and taking off one-sixth, the result would be 5,000l. as the rateable value. Mr. Carrey, the architect of the hospital, also believed that 5,000l. was the fair rateable value; and Mr. Clifton corroborated the two first-named gentlemen. On the other hand, Mr. C. Lee, who appeared on behalf of the parish of Lambeth, said for the building he allowed 360,000l., and 90,000l. for the land. That sum was less than the cost, for he had left out the decorations. It was worth 9d. per cubic foot, but he had calculated it upon 8d., or 450,000l. at 3½ per cent., making the gross value 19,350l., and the net 15,750l. Mr. Castle stated that the principle upon which the parish of Lambeth had assessed the hospital was a fair one, namely, its structural value. He put down the land at 90,000l., and the foundations at 48,000l., making 138,000l., and upon that he allowed 4 per cent., giving 5,520l. net. He estimated the buildings at 854,153l., and allowed 5 per cent. on them, making 17,770l., which altogether amounted to 23,227l. net. Adding one-fifth to that, the gross value would be 27,872l. Mr. Marsb Nelson fully agreed with Mr. Castle's principle, but he thought a fair basis would be 21,000l. gross, and 20,000l. net. Mr. Vigers gave similar testimony.

He had surveyed the premises, and put down the land at 90,000l. and the foundations at 48,000l., making 138,000l.; and the buildings be valued at 8d. per foot.

MORE THUNDERSTORMS.

A REPETITION—almost a continuation—of thunderstorms has been going on throughout the country since the date of our last notice. On Thursday night in last week the metropolitan display of silent lightning was curious; it seemed to be beyond a range of clouds in the north-east, and ten or a dozen times a minute lighted up the dark outlines of these with its gleams, attended occasionally with zig-zag displays, but otherwise like the aurora borealis than ordinary lightning. Double storms appear to have been frequent, the second recurring after a longer or shorter interval, as if the storms were circular, and returned upon their own track; and indeed they were accompanied in certain cases by a whirlwind, or a water-spout. The rain descended in deluges in many districts. A fearful storm burst over Hampshire on Thursday morning. Emsworth Station, on the London and Brighton Railway, was struck by the lightning, and speedily destroyed. The streets of Portsmouth were flooded. During a most violent storm at Burnley, Trinity Church was struck and the flag-staff was shattered to pieces. Berwick Light-houses has been struck, but the masonry is believed to be uninjured. Many persons, horses, cattle, &c., have, as before, been struck, but fewer persons killed than heretofore. One gentleman was killed in bed, and his brain was found to be dissolved into an oily substance. The heat or other oppressive influence of the atmosphere has also caused some deaths. In New York these continue; and a cooler sunshine does not seem to have caused the deaths to cease, or the lassitude and oppression of spirits to diminish.

COTTAGE DESIGNS: ROYAL AGRICULTURAL SOCIETY.

I AM told fifty-two designs for cottages were sent to the meeting of the Royal Agricultural Society held this year at Cardiff, but not one was found of sufficient merit to receive the seal of the Royal Society. How is this? Are architects too honest for them, and have not indulged in sufficient ornament to suit the judges? But surely out of fifty-two designs there must have been one found possessing a well-distributed plan.

Is it possible, sir, for an architect to send in competition an honest æsthetic design for a pair of cottages, containing each five rooms, with offices, for the sum of 220l. ? H. F. T. C.

SCHOOL BOARD FOR LONDON.

THE Board have selected a design by Mr. Frederick Roper, for their schools to be erected in Great Hunter-street, Southwark. Accommodation, 320 boys, 320 girls, and 400 infants. The estimated total cost is 7,000l.

THE BUILDERS' STRIKE.

ON Wednesday afternoon deputations from the carpenters, bricklayers, plasterers, painters, metal-workers, and labourers waited upon the sub-committee of the Master Builders' Association, with the object, if possible, of effecting a settlement of the existing dispute. The carpenters' deputation, which attended as an independent body, were first admitted to an interview, and on being asked by the chairman of the committee, Mr. Hannon, under what instructions they acted, Mr. Sadler, a member of the deputation, handed in the following resolution, adopted at a meeting of the carpenters' delegates on the previous evening:—

"That we instruct our deputation about to wait upon the masters' committee to offer the following terms,—viz.: fifty-one hours per week, to be worked regularly throughout the year, in shops and on jobs, at the wage of 8½d. per hour, up to the 1st of March, 1873, with a guarantee that on and after that date an increase of 3d. per hour be given; also, that a code of working rules be arbitrated upon, the men not to resume work until such code is finally agreed upon."

Mr. Sadler added that himself and colleagues were prepared to make a settlement upon the above terms.

Mr. Hannon said his committee had been invested with full powers to settle the dispute upon any terms they thought fit, and they could not treat with any deputation not possessing the same powers.

It appeared that the carpenters had found their deputation not to go outside a hard and fast line, and therefore it was of no use to prolong the interview. After a few remarks, the deputation retired.

The other deputations from the trades belonging to the amalgamated committee were then introduced, and stated they came to discuss a re-arrangement of the bours as accepted by the masons, and the necessity of a code of working rules.

The Chairman said it appeared to him that none of the deputations had come with full powers to settle, and therefore it was useless to prolong the interview. The hours must form the basis of any code of working rules, and as the different trades could not agree upon the hours it was useless to go into that question. The masters were prepared to consider a code of rules to regulate overtime, but they could not recognise any rule for the abolition of piece-work.

The deputation then retired, without having come to an agreement upon any single point.

BEECH.

SIR,—If "W." will try the experiment of filling up the ends of fresh-sawn beech with soft soap, and placing the beech crossways to season, he will find it to his advantage. I have seen beech so treated for the manufacture of joiners' bench planes. W. W.

THE IRONWORK AT BRADFORD COVERED MARKET.

SIR,—I have taken great interest in your description of the new covered market in Bradford (see p. 562), and wish you would add the names of the contractors for the ironwork. Having been myself connected with the firm, beg to state that the late Messrs. Ratcliffe Nuscheler (now Mr. A. Nuscheler, Hexthorpe Ironworks, Doncaster) have been the contractor for the ironwork. I can further state that the weight of plain castings has been about 30 tons, the ornamental castings about 40 tons, and the wrought-iron in the dome and roof principals about 13 tons. A special feature in this market is the elaborate half-circular windows in the openings, formed of cast-iron framing, and ornamented with cast-iron scrollwork of flowers.

H. NADHOLZ.

PORTLAND CEMENT STAIRS.

SIR,—If your correspondent, Mr. Britton, or other of your readers interested, will take the trouble to look into the wharf of Messrs. Bailey White, Brothers, cement manufacturer of Millbank-street, Westminster, they will there see a flight of steps up to their offices, done some eight years ago, and which has stood the wear and tear daily of a large number of carmen hob-nailed boots during that time, and are at present in as good a state of preservation as on the day when done, thus proving to ocular demonstration that Portland cement, well banded, an excellent material for that purpose.

WILLIAM PULHAM.

STOCKTON EXCHANGE COMPANY (LIMITED), COMPETITION.

SIR,—In this, as in kindred instances, it will probably be found that the promoters have erred from ignorance rather than intentionally. The conference committee on competitions will meet again until after the holidays; and I, hon. sec. of that committee, have as yet no authority for remonstrating *ex officio* with the authors of unfair conditions. In the meantime the "General Regulations for the Conduct of Architectural Competitions" are now in the press, and will shortly be issued; and architects having the good of the profession at heart will do well to provide themselves with copies, and send them for the guidance of such committee directors, and private promoters as they know are about to invite competition.

With regard to the Stockton Exchange competition, on seeing the letter on this subject in last week's *Builder*, I immediately wrote for it

particulars, but received the laconic answer, "List of competitors closed." Judging, however, from the conditions as advertised, your correspondent appears to have a bundant grounds for signing himself "Indiguans." The particulars by nothing about a professional assessor; the timber and scale of the drawings are not stated; employment is not promised to the author of the design; the aggregate amount of the premium is only 55*l*. instead of 1*l* per cent. on the proposed outlay; and finally we are told that the premium will merge in the commission. Unless these conditions are modified, I would paragon *Punch's* celebrated advice by saying, "To lose about to compete—DON'T."

ALFRED STRONG.

TO THIRSTY FOLKS.

MANY a weary and thirsty person could often get a good drink of water, if he would carry out with him, especially when he goes into the country, a short length of India-rubber tubing. By putting one end into the water, and the other into his mouth, he may frequently get draught of pure and clear water from very all springs and pools, where it would be impossible to get it in any other way.

J. R. EDMONDS.

WASTEFUL FIRING.

—Will you allow me to ask some of your readers in Scotland, if it would not be possible to retain and utilise the large amount of gas usually allowed to go to the chimney? I confess that I do not understand all the processes of gas-making, but it strikes me that the coal used in an ordinary kitchen ought to light the house; and if any one would produce a stove to accomplish that, I should think his fortune would be made.

FOR WHAT IT IS WORTH.

TREATMENT OF BUILDERS.

—On the 18th of June invitations were issued to five eminent builders in Hull and elsewhere to inspect the plans, &c., for the proposed alterations and restoration of the old castle in the East Riding of Yorkshire, prepared by a firm of Hull architects, with a note appended that the tenders must be delivered on Friday, the 23rd, at noon; and, in complying, all the tenders (one of which was delivered on the Friday, and, as a matter of course, the lowest was recommended to the proprietor for acceptance, and was actually accepted on the Saturday, in strange to say, the tender referred to (by a Scarborough) was forwarded on the Saturday, at 4 p.m., thus only seven hours behind the specified time, when, when found to be upwards of 1,000*l*. below the price stipulated at the appointed time, and was consequently accepted. Will any of your correspondents advise me the right way for architects to treat builders, or spending so much valuable time in taking out and weighing quantities?

A LOVER OF STRAIGHT DEALING.

THE REPAIR OF PAVEMENT OVER CELLARS.

THE VESTRY OF ST. GEORGE'S, HANOVER-SQUARE, W. COL. R. W. HAMILTON.

MR. POLAND (for the Vestry) explained, in opening the case, that he was instructed at the Westminster Police Court, that he was instructed to take out a summons against Col. Hamilton for the recovery of 8*l*. 13*s*. 4*d*. being for repairs executed by the parish in making good the pavement at 108, Eaton-square. He rested upon the 11th & 19th Vict., cap. 120, sec. 102, which said that all cellars, arches, and cellars were to be kept in proper order and repaired by the owner or occupier of the house. The question in question was really the roof of the cellar, being on its walls. When originally put down, the pavement was 5 in. thick, but it had now worn to 2*1*/₂ in. and Mr. Hamilton had repaired the landing, and called upon Mr. Hamilton to pay the expense; but he repudiated all liability, and hence the present proceedings. He (Mr. Poland) contended, however, that the defendant was bound to put down flagstones 11 ft. long to re-cover the roof of the vault, for as the rule the flagstones they put down as pavement were much smaller. The vestry had taken many others, and involved very considerable expense. Mr. Turner (for Col. Hamilton) supposed his learned friend had not disputed the facts, but the inference he drew therefrom. If the decision was adverse, he would ask for a case for a superior court. He wished to know, that Col. Hamilton's lease was granted in 1829; that Act on which Mr. Poland relied was passed in 1855, and steps had been taken till the present time. His learned friend had said the pavement was the roof of the vault. True, the under-surface was, but the roof of the cellar was also the pavement at Eaton-square. It was not, then, Eaton-square had no pavement. He submitted that this pavement was not a "covering" within the meaning of Michael Angelo Taylor's Act (57 Geo. III., c. 29), sec. 70, and moreover 7 Geo. IV., cap. 25, s. 68, this pavement was vested in the trustees of Lord Bunsford's property, and by the 18th & 19th Vict., c. 120, sec. 95, their powers and liabilities were transferred to the vestry of St. George's; so that the parish

was clearly bound to repair this pavement. Besides, there was already a decision of Chief Justice Erie (Robbs v. Jones, 13 C.B. N.S., p. 231), where an action was brought against the owner of a pavement, to recover damages in consequence of an accident through the pavement falling. It appeared that the pavement was in front of a house on the Surrey side of Waterloo Bridge, and a crowd having assembled, through a distress being put into the house, the pavement gave way, several persons were injured, and one was killed. The judge ruled that the plaintiff must be non-suited, and gave judgment for the defendant. He (Mr. Turner) contended that as the pavement in front of Col. Hamilton's house was worn out by public traffic, the vestry were bound to repair it. After some further remarks on both sides it was agreed that Mr. Poland should draw up a case for a superior court.

RE-ARRANGEMENT OF THE METROPOLITAN BOARD-ROOM.

SIR,—The public are largely interested in this matter; the question being, shall the public enjoy as much facility as they have hitherto enjoyed in hearing the debates of the Metropolitan Board of Works? Several classes of persons need accommodation in the public meeting-room of the Board:

1. The chairman and the officers.
2. The members of the Board.
3. Any deputation or other persons who may have been called upon to transact business with the Board.
4. The Press.
5. The public.
6. Those visitors who, by reason of their rank, &c., are privileged "to occupy seats on the bench" beside the chairman.

It is in the interests of Class 5—the common, vulgar, impertinent, inquisitive, awkward, rate-and-coal-tax-paying public—that I write. Hitherto, these intruders have been placed in a small gallery at one end of the room, and have been able to hear the debates and proceedings very well indeed; and they heard them because the reporters were also placed in the same gallery—these latter upon the front seat. Now the move is to place the reporters in the body of the room, and, I suppose, to leave to the public the whole of the gallery at the end of the room. Hitherto, the members of the public were obliged to speak in such a tone of voice that the public must hear, or (as the reporters were close to the public) the speeches could not be reported. The officers, also, in reading their reports, were obliged to speak up, or the reporters could not catch the drift of the debates on the reports. Let us hope that, in rearranging the public meeting-room of the Board, the seven members who constitute the committee to which the question is intrusted will remember that their duty is to arrange the room so that the public can hear the proceedings.

RATEPAYER.

ACCIDENTS.

A SHOCKING accident has taken place at Messrs. Culhite's building yard. A labourer employed in white-washing the premises got his clothes entangled in the machinery, and had every bone in his body literally crushed to pieces. He had sufficient consciousness and self-collectedness to state that he was taken round fourteen times by the wheel. He died shortly afterwards, and a verdict of accidental death has been returned.

A fatal accident has also occurred at the works of Messrs. Cooke & Swinerton, Grimesthorpe, which resulted in the death of two men and the more or less serious injury of three others. Messrs. Cooke & Swinerton have been adding to their works by the erection of a large forge and rolling-mills. The new buildings were commenced in March last, and it was expected they would have been completed in the course of a few weeks from the present time. One of the buildings is so far advanced as to permit it to be roofed, and at the time of the accident the workmen were engaged in putting up a portion of the roof of the second building. The framework of the roof consisted of a number of heavy iron principals, spanning the whole width of the building, and resting upon the walls on either side. Eight of these principals were up and fixed. Just as the men were about to raise the ninth, "something seemed to give way,"—as was described by an eye witness,—and seven of the principals came tumbling to the ground. Eight men were at work at the time, and only three of them escaped uninjured. Mr. Francis Taylor, the contractor for the roof, was in the building at the time of the accident, and he had a very narrow escape. As it was, he was knocked down, and one of his men fell upon him. The cause of the roof giving way is unknown, and at present the accident seems inexplicable.

CHURCH-BUILDING NEWS.

Cleator Moor.—The new church of St. John, at Cleator Moor, has been consecrated by the Bishop of Carlisle. The new edifice is an adaptation of the Norman style of architecture to the requirements of the present day. Externally, it is a plain, unpretending building, suited to the district in which it stands, where any external ornament would rapidly become disfigured with soot, and he out of harmony with the immediate

neighbourhood. The width of the walls—all 4 ft. thick—give a solidity, in look and reality, which is in their case necessary, as the whole church is covered with vaulting which rises to a height of 40 ft. over the nave. This vaulting supports the timbers of the roof. In the chancel, the groining ribs and the chancel arch are of wrought stone. All the other portion of the church is lined with brick, pointed, and a cavity between the outer wall and the inner one of brick is filled with asphalt, to keep the inner wall dry. The seats are of pitch pine. Stained glass windows (donations) adorn the east and west ends. The original estimate given by the architects (Messrs. Cory & Ferguson, of Carlisle) for the church, without the parsonage house and cemetery walls, was 3,300*l*., which sum is rather above the finished cost. Accommodation is afforded for 600, 450 being adults and 150 children.

Rickmansworth.—The church erected by public subscription at Croxley Green, has been consecrated by the Bishop of Rochester. The edifice has now been completed some months. It stands on a portion of the green immediately abutting the high road from Watford to Rickmansworth, and is built in the style which prevailed in the thirteenth century, or transition from the Early English to the Decorated. The exterior is cased with Bath stones, the quoins, windows, &c., being composed of a stone obtained from the quarries of Douling, in Somersetshire. The roof is covered with Staffordshire tiles, and the circular spire surmounting the tower with ornamental tiling of the same description. The entrance is on the south side, where there is a porch with a flight of steps. The tower, which is placed on the north side of the church, forms an entrance to the vestry. In the interior, the walls are cased with red bricks, diapered with blue bricks in ornamental patterns. The roof is of open timber, the chancel being vaulted with wood work. The flooring is for the most part of Godwin's plain tiles, but the chancel is laid with ornamental tiling. The seats are made of English oak, and the chancel is fitted with carved stalls. The reredos is composed of arcading in Caen stone, the centre panels being adorned with some wrought canopy work. The pulpit is composed of Douling stone. At the east end is a painted glass window. The building will be lighted by gas, by means of three coronas. The church, which has been erected at a cost of some 2,500*l*., is capable of seating about 250 people. The edifice has been built by Mr. Clark, of Bath, from designs by and under the superintendence of Mr. Norton, of London, architect. The ground surrounding the church has been laid out by Mr. Skidmore, of Rickmansworth.

Balderstone, Rochdale.—St. Mary's Church, which completes the group of buildings, comprising church, vicarage, and schools,—all erected by the liberality of the Messrs. Radcliffe,—has been consecrated by the Bishop of Manchester. The site is triangular in shape, bounded on the east by the main Oldham-road; on the west by the old road to Oldham; and on the north by a street passing close to the churchyard, and leading to the Greenfield Mills. The principal view of the church,—if, indeed, one be superior to another,—is the north-east, which is seen on approaching the church from the town. It takes in the east chancel gable, mainly occupied by a large five-light traceroed window. The stonework of the window is moulded, and on each side of it is a slender shaft, with a carved capital. This, like each of the main gables, is surmounted by a carved stone cross. The tracery of the windows is considerably varied, although there are some forty or fifty in the church, besides those of the heiry. On walking round the outside from the east towards the north, on the north side of the chancel is seen a two-light window, lighting the sanctuary; and farther on, under the eaves, a pair of clearstorial rose windows. The east gable of the organ-chamber, containing a three-light traceroed window, a little square quatrefoil on the north side of the organ-chamber, and a small window in the east of the transept, come next in order. In the north gable in this transept is a rose window, 10 ft. or more in diameter. Below it is a buttress, circular on plan, resting on an hexagonal base, and flanked on either side by a pair of narrow cusped windows. A carved head runs across this gable, above the large rose window. At the extreme north-west corner stands the steeple, with a tower and spire rising to a height of nearly 150 ft. The spire is a broached octagon, with canopied pinnacles rising from the brackets. The west gable contains a large four-light window; below it is a projection of some

feet, with a battlemented cornice. The south elevation generally resembles the north, except that the details are different. In the interior, the marbles, granite, and alabaster; the coloured mural decoration; and the colours of the stained glass, all contribute to enhance the general effect. The eastern end especially attracts the eye. The chancel fittings are of oak. The east wall of the chancel is almost entirely occupied by the rosettes and the east window. On each side of the chancel are large arches, opening into vestry and organ-chamber respectively. The east chancel-window is of five lights, and is filled with stained glass, in subjects, by Messrs. Heaton, Butler, & Bayne. The transept windows, and those at the west ends of the aisles, are also filled with stained glass by the same firm. The great west window,—which is a memorial one,—is filled with subjects all relating to the Resurrection. The rest of the glazing is in simple patterns in various shades. The church is lighted by brass gas standards, one in the centre of each of the nave arches. There are two gas coronas in the chancel, and supported against the wall by floriated brass brackets. The general contractor is Mr. Mark Foggett, who has carried out the work from the designs, and under the superintendence, of the architects, Messrs. Medland & Henry Taylor, of Manchester.

Little Lever.—The church of St. Mary the Virgin, in this parish, has been re-opened, after having undergone alterations, embellishment, and enlargement. The ancient fabric, which possessed several features of interest, has been completely renovated; the old eastern wall and window have been replaced by a chancel arch, and a new chancel has been added, thus considerably increasing the accommodation. The church is benched with new carved oak benches, choir stalls of the same material being substituted for the high-backed pews. The restoration has been in progress about twelve months, and has been carried out under the direction of Mr. J. Goldie Turner, of London, architect, the cost having been defrayed by the Rev. Richard Palmer, rector of Purley, Berks, the brother of the late rector, and as a tribute to his memory.

Middlesbrough.—The foundation-stone of St. Peter's Church, Lower Feversham-street, Middlesbrough, has been laid. The church is cruciform in plan, consisting of a nave, two transepts, and a chancel. The chancel has an apsidal end. The style of the architecture is Early Gothic, of a plain description. There will be sitting accommodation for about 315 persons on open benches. The roof will be open-timbered. Mr. Blessey, of Middlesbrough, is the architect. It is estimated that the cost of the church, which will be built of red-pressed brick, will be about 1,600l. Mr. H. W. F. Bolckow, M.P., gave the site.

Rotherhithe.—A new church at Rotherhithe, erected to a great extent at the expense of Field-Marshal Sir William Maynard Gomm, G.C.B., lord of the manor of Rotherhithe, has just been opened. The church, which is dedicated to St. Barnabas, is situated in Plough-road, on what was once an expanse of market-garden ground, extending from the Surrey Commercial Docks and the new Southwark-park, to the boundary of the parish of Deptford, where the counties of Surrey and Kent join, but which is now a populous neighbourhood, laid out in numerous streets. The architectural proportions of the church are striking, although the materials used are plain. A large portion of the interior fittings and other articles are presents from friends. A costly marble font is a present from Lady Gomm. The pulpit is given by Mr. Charles Churchill; the altar by the architect (Mr. Butterfield); the lectern by the Rev. H. Bailey; the font-ewer by Mrs. Bailey, and the organ by the rector (the Rev. J. E. Beck) and his private friends. The cost of the church, exclusive of the gifts named, is 6,000l. In connexion with the church a site has been given by Sir William Gomm for new schools, which are to be immediately erected.

Wetheral (Cumberland).—The restoration of the church here is commenced. The contract has been taken by Mr. Ormiston, of Warwick. It is intended to complete the chancel before proceeding to commence the nave and aisles. The dean and chapter of Carlisle undertake the chancel, the rest falling to the parish. Mr. Withers, of London, is the architect. The estimated cost is about 2,000l.

Southleigh.—The parish church has been re-opened, after having undergone a restoration. The bishop of the diocese separated the living

from that of Stanton Harcourt, and gave it to the present vicar, the Rev. G. Moultrie, and Mr. Sibthorp added considerably to the endowment of the church. A house for the clergyman to reside in being now very much needed, his present residence, which is a commodious one, and designed by Mr. John Gibbs, of Oxford, architect, was soon afterwards built by voluntary contributions and grants from different societies, at a cost of about 1,600l. Next came the new schoolrooms, which have been erected just below the village green. Mr. Sibthorp gave half an acre of land on which to erect them, and also a large sum of money towards the carrying out of the work. This gentleman has also been instrumental in the restoration of the church. The chancel has been newly roofed, and the floor laid with encaustic tiles. There is also a new oak altar, the front of which is carved and decorated. On the centre vesica is painted Our Lord in glory, and on the side panels are four figures symbolising the worship of heaven and the worship of earth. There are new oak stalls for the clergy and choir. The ends of the stalls are carved, and in the front part of the backs of the same is tracery work. The roof is of open deal, varnished. The whole of this part of the work was done by the Ecclesiastical Commissioners at a cost of about 300l., and the architect for the same was Mr. Christian, of London. A new stained-glass east window has been placed in the church, this being the gift of the family of the late Mr. S. Druce, of Eynsham. The subject is that of St. John the Baptist, who points to the Lamb of God in the distance, and in the top lights are angels holding instruments of the Passion. The wall paintings have been restored by Messrs. Burlinson & Grylls, of London. The subjects are "The Resurrection," "The Gates of Heaven," "The Weighing of Souls," "St. Clement of Rome," and "The Annunciation." The ancient oak pulpit in this church, in which John Wesley preached his first sermon in 1726, has been preserved. The base of it, however, has been rebuilt with Milton stone, inlaid with encaustic tiles. The chancel is divided from the nave by the old carved oak screen with tracery work, and surmounted by a cross. The old deal pews and other seats in the body of the church have been replaced by low-backed seats of pitch pine, varnished. The ends of these seats are also carved. The floor of the aisle and nave are laid with black and red tiles; and that under the seats is of wood. The church is heated with hot-water pipes, which run along the whole length of the building under the nave and aisle. The old altar has been removed to the side chapel, which is at the east end of the north aisle. The wall-paintings were restored at the expense of Mr. Sibthorp. An olive-wood cross has been presented to the church by Mr. Evans, to be placed on the altar; the wood grew on Mount Calvary. The porch at the south entrance to the church was in a very dilapidated state, and it was therefore taken down and rebuilt with local stone. The dressings are of Milton stone, as are also the cornices, springers, coping, apex, and cross above. The churchyard has, for the most part, been levelled, and new paths laid out. Mr. C. Rolfe, of Reading, was the architect, and Mr. Groves, of Milton, the contractor for the whole of the work. What has already been done has cost about 1,000l., and an outlay of upwards of 300l. more is required for re-roofing the body of the church. The wood-work of the tower and the bells are also in urgent need of restoration.

Hertford.—The alteration and extension of All Saints' Church have been long talked of, and at length the works have been begun. Mr. Norris is the contractor. The proposed alterations and extensions comprise an addition to the north transept, which will run parallel with and nearly to the end of the chancel, comprising within its walls a new organ-chamber and a vestry-room, and a number of additional sittings. The gallery, which now extends over the north transept, is to be shortened, to correspond with the opposite side, and the pulpit and reading-desk are to be new, and placed opposite to their present positions, and material improvements are to be made near the communion-table. The works are from the designs of Messrs. Wilds & Son. Delay has been caused by suggested alterations in the plans, and impediments of various kinds.

Donarh (Carringtonshire).—The church has just been re-opened, after extensive alterations. The nave and chancel were modern, and have been entirely remodelled, with new windows, roofs, and fittings, and the ancient tower

repaired. The expenditure has been about 900l. Mr. Withers, of London, was the architect, and Messrs. Jones & Sons, of Llywngog, were the builders.

SCHOOL-BUILDING NEWS.

Salterhebble.—A new infant school, to be connected with the national schools at All Saints, Salterhebble, is about to be commenced. The site is on the sloping ground in Chapel-lane, and the design is by Mr. Barber, architect. It will have a large room, 40 ft. by 19 ft., and a classroom, 17 ft. by 13 ft. Beneath the school-room is a covered playground, 30 ft. by 19 ft., opened by large arches into the playground. The building will be erected at the cost of C. Holdsworth.

ROMAN CATHOLIC CHURCH-BUILDING NEWS.

Northfleet.—The school-church of SS. Mar and Francis has been opened by the celebration of Pontifical mass by the Bishop of Southwark. The building is of flint, with stone and brick dressings, and is the work of Mr. Thomas Blak from designs by Mr. James Multon, of Gravesend. It is in the Early English style, and measures 64 ft. outside 64 ft. by 24 ft. It has an open rosette on the outside, with ridged tiles at the centre, and surmounted by a bell-turret, and crosses at the extremities. The chancel can be screened off at pleasure by a serviceable covance.

Greenburn.—The new Roman Catholic Church about to be erected here, will be in the Early English style, and will consist of nave, semi-octagonal sanctuary and vestry, the accommodation being for 600 persons. The architect are Messrs. W. & R. Ingram, of Glasgow.

Wigan.—The chapel in Caroline-street, which formerly belonged to the Primitive Methodist Society, and used by them as a place of worship, a chapel has been considerably enlarged—has, in fact, been almost rebuilt,—and it has been formally opened as a church, dedicated to St. Joseph. The edifice is situated on the north side of Carlisle-street, and it consists of a wide nave and north aisle, wooden arches and columns separating the nave and aisle; a space is raised at the end of the nave for the purpose of a sanctuary. At the same end of the church, and the aisle side, the sacristy is situated. The chancel is constructed above the sacristy, and, consequently, its position is close to the sanctuary. From the end of the building opposite the altar may be seen the gallery, and under it in the south or street wall the porch, with a glass screen and folding-doors. On the north side, the foot of the gallery stairs, is an extra door, he used in cases of emergency. The plot of land which the erections occupy is nearly a square. On the north side there were the lights of the adjacent buildings to be studied; this circumstance accounts for the shape of the roof on the north side, and of the low aisle. The south Caroline-street elevation is lighted by a series of lancet windows, the jambs of which are worked in moulded bricks from St. Helen's. The entrance door is moulded with brickwork. Generally, the materials have been of the simple character, and the old work, where possible, has been used up again. The principal object of the design seems to have been to arrange the building to be comfortable, and adapt it to modern requirements, and at the same time out of plumb materials to obtain as much church-like effect as possible. The church will accommodate about 1,500 people, and the entire cost will be about 1,500l. Mr. Aspinall, of Wigan, was the builder employed, and the works have been carried out from the design of Mr. Edmund Kirby, architect, Liverpool.

Harrrogate.—Dr. Cornwailton, Roman Catholic Bishop of Beverley, has blessed the first stone of the high altar of a church now in course of erection at Harrrogate, and dedicated to St. Mary's. St. Robert. The altar stone was laid, of course with the rites and ceremonies of the Roman Catholic Church. The church is being built at the designs of Messrs. Goldie & Child, London; the contractor being Mr. Wood, builder, Leeds. It consists of nave and two aisles, divided by pillars. The cost of the building will be 3,100l. exclusive of the internal fittings, and there will be accommodation for 600 persons. The building is of red brick, with stone dressings, and an open timbered roof, and square tower of brick and stone.

FROM SCOTLAND.

Moffat.—The new Episcopal church at Moffat has been opened for divine service. The church, which is built on a deep-laid brick foundation, is situated in Milburnside, which has been recently much widened, and stands about 30 feet off the road, surrounded by gravel walks and shrubbery plots. The walls are of wood, coated with galvanised, corrugated iron, of a dull bluish tint. The sides are buttressed, and up these buttresses the gas pipes are led, concealed, and are taken thence into the interior. Along the ridge of the roof, ventilators are arranged, and these are topped with ecclesiastical ornaments. At the western end, over the porch (in which there are two entrances), there is a small heltry. The whole structure externally assumes the form of a cross, the chancel at the east forming the top, the transepts with the organ chamber and the vestry, the arms; and the nave, with the porch, the foot. The chancel is 14 feet by 15 feet, the vestry and the organ space each 9 feet square, the transepts are 21 feet by 8 feet, and the nave is 55 feet by 22 feet, with a passage 4 feet wide up the centre. The walls rise 14 feet inside, and the roof slopes up till the mid height rises to 26 feet. Over the sliding entrance-door there is a traced and painted trefoil window. In the side walls there are three long painted windows, and in each of the transepts there is a tripartite Gothic window. Above the altar there is a memorial window, in three divisions, executed by James Ballantine & Co., Edinburgh, to whose taste also the other interior ecclesiastical decorations are due. The central design of this window is a Crucifixion scene. On the right is the Holy Family in the stable at Bethlehem, while the wise men worship, and the star in the East shines overhead. On the left we have the angel at the sepulchre, with women around him. An organ (manufactured by Willis, London), occupies the space on the left. The church has been erected at the expense of Mr. J. Toulmin Laurence, of Liverpool, resident in Craigielurn House.

Peterhead.—The foundation-stone of a new public hall for Peterhead has been laid, with Masonic ceremonial.

The Caithness Railway.—The works on the Caithness Railway are being rapidly proceeded with, the contractors for the different sections being strong forces of men engaged. The comparatively level nature of the county renders railway-making an easy task. One of the heaviest cuttings in Caithness, about two to three miles from Wick, is from 18 feet to 20 feet deep, and its excavation is being vigorously prosecuted. The large bridge which will span the river in this cutting, has, it is understood, been contracted for by an Inverness gentleman. In the west end of the county the work is considerably further advanced than in the neighbourhood of Wick.

PROVINCIAL.

Appleby, Westmoreland.—Mr. John Alcock Clarke is just having completed the erection of a mansion (Carbridge House), on the east of Bonthe, near to which runs the Eden Valley, and the Settle and Carlisle Railways, parallel with each other. The style of the building is Early Domestic Gothic: Mr. Octavius Hansard, of London, is the architect. The ground-floor comprises drawing-room, morning-room, library, dining-room, smoking-room, entrance-hall, and a spacious staircase, and servants' offices. The first floor consists of six rooms, with dressing-rooms attached, together with bath-room, and a wardrobe, 29 feet by 18 feet, the latter being constructed with wagon ceiling, 15 feet high, and superior ventilation. The whole of these rooms are fitted with pitch-pine varnished, with the exception of the airing-room, which is of English oak. The ceiling is panelled with oak beam and pitch-pine panels, the floor of the same having a carpet of parquetry, 2 feet wide. The principal fireplaces are of pitch-pine, with twisted balustrades and ornaments with a variety of fretwork, the top being lighted with a ribbed dome-light, rising into a lead flat in the centre of the ceiling, the floor of which is all of parquetry. A private stair leads to servants' bedrooms, on second floor. There is a cistern in the roof capable of containing 1,200 gallons of water, which is pumped up, after being filtered, from a cistern outside, of 5,000 gallons, and underground, entirely depending on the rain that falls for supply. The elevations are of the height of the roof, with two bay windows, of large dimensions. There is also a large oriel window. The

entrance-porch, of rather large dimensions, gives the north front relief, from its carriage-drive. It is ceiled by a ribbed groined arch, and externally finished with a parapet. The masonry is of stone from Barwise Quarry, and is lined with 9-in. brick, leaving a 3-in. cavity between stone and brick. The offices not directly connected with the house are composed of the same material. The whole of the work has been carried out under the direction of the architect, by Mr. M. Little, of Penrith, contractor; Mr. Wm. Court, Carlisle, joiner; Johnston, Brothers, & Co., plasterers; Martindale & Jackson, Appleby, plumbers, painters, and glaziers; the slating by T. Dodger, of Appleby; hot water, Bailey & Son, London. The self-closing shutters, of which the whole of the principal or ground-floor are fitted, are by Clark & Co., of London. The clerk of the works is Mr. McDonald Taylor, of London.

VARIORUM.

"PROFESSIONAL PAPERS ON Indian Engineering: Second Series: edited by Captain A. M. Lang, R. E., Principal, Thomason C. E. College, Roorkee. No. IV. April, 1872. Roorkee: Thomason College Press." Two of the chief papers in this publication are on irrigation in India—the one titled, "Is Irrigation Necessary?" by Captain C. S. Thomason, R.E.; and the other, "A Report on certain Experiments in Irrigation," by E. C. Palmer, C.E., Exec. Engineer. It also contains reports, &c., on bridge foundations on Punjab State railway; a paper on the Toolsee Water Supply Project, by Rionzi G. Walton, C.E., acting executive municipal engineer, Bombay; and matter on the subject of the Delhi Iron Pillar, with a frontispiece.—"Papers on Subjects connected with the Duties of the Corps of Royal Engineers, contributed by Officers of the Royal Engineers. New series, vol. xx. Printed by Jackson & Sons, Woolwich. 1872." The leading paper in this series is an excellent memoir of Field Marshal Sir J. F. Burgoyne, bart., G.C.B., by the Right Hon. Sir Francis Head, bart. We have hitherto known too little of this great general, and it is to be hoped the present brief memoir will be extended. Most of the other matter in the volume is strictly professional, but includes notes on earthworks, demolition of bridges, huts in war, rails and turn-tables, tunnels, &c.—"Transactions of the Manchester Statistical Society, Session 1871-72. Manchester: Roberts, Printer, Chapel-street, Salford. 1872." The paper of chief interest to our readers in this volume is one on "Town Dwellings for the Working Classes," by G. T. Robinson, F.R.I.B.A. There is an inaugural address on the scope and method of statistical inquiry, and on some questions of the day, by John Miles, the president. A paper on "Certain Fallacies in Local Rates of Mortality," by Dr. Rumsey; one on some published results of the census of 1871, by Thos. A. Welton; one on the "Growth of the Commercial Centre of Manchester, Movement of Population, and Pressure of Habitation," by H. Baker.

From *Cassell's Technical Educator* for the new month we get some information as to the means of turning a cube in a Lathe:—

"To turn a perfect cube in the lathe would appear, at first sight, an impossibility; but in reality this is a most simple form to produce,—much more so than the sphere. The cube is a six-sided solid, and all its sides are plane surfaces. We already know that it is as easy to turn a plane surface in the lathe as to turn a cylinder; and to produce a cube, it is only necessary to turn six plane surfaces in certain positions, the one with the other. The turner would proceed as follows:—He would first take a piece of wood sufficiently large to enable him to turn a cylinder out of it, with a diameter equal to the diagonal of the square side of the cube. And this also he would do, cutting the cylinder off to a length equal to the side of a square. This would then show a short cylinder, with two flat ends, or a thick flat disc, and this disc would be placed in a chuck in a position at right angles to the position in which it was turned,—that is to say, the axis of the cylinder is placed parallel to the surface of the chuck, and the lathe being set in motion, a third surface is turned upon the article, which is then removed from the chuck, and replaced with the third flat surface bearing against the surface of the chuck. In this position a fourth flat surface can be turned upon the article; and if the settings have been carefully made, these two last surfaces revolve in right angles to the two, forming the ends of the cylinder. Two further similar settings of the work in the chuck will enable two other surfaces to be turned, and these will complete the cube."

Bursting of a Sewer.—The immense quantity of rain which fell during the thunderstorm in London on Tuesday evening in last week, caused a sewer just above King's-cross Station to burst. A large body of water flowed into the tunnel, in some parts to the depth of 5 ft.

Miscellanea.

The Brighton Meeting of the British Association.—The meeting will commence on Wednesday, August 14, and continue till Thursday, August 22, when it will close with the usual excursions for members and associates. The president-elect is Dr. W. B. Carpenter, F.R.S., &c., who will deliver his inaugural address on the evening of the 14th. On Thursday evening, the 15th, and on Tuesday evening, the 20th, soirées will be held. For these the northern block of the Pavilion property will be appropriated. The Brighton Natural History Society are arranging a complete flora of the south coast, both living and dried specimens; also a microscopical display to which the most eminent London makers and the leading metropolitan societies will contribute. On Friday evening, the 16th, and Monday evening, the 19th, lectures will be delivered by eminent scientific men. It is authoritatively announced that the information received from Dr. Livingstone will be communicated in the geographical section. Mr. Stanley and Dr. Livingstone's son will probably attend the meeting. The geological section will have especial importance by reason of the boring now being made on the estate of Mr. W. Mappin (of Regent-street) at Netherfield, near Battle. The problem is, what underlies the Wealden formation of Kent and Sussex; is there any coal there? Four "half-day" excursions are arranged for Saturday, August 17; and five "whole-day" excursions for Thursday, August 22. The new Brighton Aquarium will be opened and stocked for the meeting. The Brighton Railway Company will issue return tickets to members of the association, available on the 12th August and any following day, to return by any train and on any day to the 26th August.

Steam Whistles.—Mr. F. S. Powell has laid before Parliament, too late, it is said, to pass in this session, a Bill proposing to prohibit, under a penalty, the use of any steam whistle or steam trumpet for the purpose of summoning or dismissing workmen without the sanction of the sanitary authority. The Bill gives power to the sanitary authority to revoke such sanction, and power to the Local Government Board to revoke it on representation made to them by any person who is prejudicially affected by such sanction. The Bill has passed through committee in the House of Lords. It is nothing to be done, however, towards restricting railway stokers or engine men from amusing themselves, at the public expense, both night and day, with noises of the most hideous description, which, even on their own showing, are frequently most excessive and unnecessary, inasmuch as some of them habitually act with a little common sense and consideration for the public, while others as habitually do the contrary, and without the least restriction from the railway authorities; whose searchers, moreover, are obviously, in some cases, of tenfold too great strength, since others used under similar circumstances are far weaker and yet are kept in use, and must therefore be sufficient for the purpose? Such an infamous nuisance ought to be abated, and would very soon be abated if it were committed by the costermongers or other poor and defenceless persons.

Cottage Hospitals.—The new cottage hospital at Tewkesbury has been completed, from designs furnished by Mr. Middleton, of Cheltenham. Seven years ago a cottage hospital was established in Tewkesbury, two cottages having been taken for the purpose. The new building is near the temporary hospital, and not far from the railway station. The foundation stone of a new cottage hospital has been laid at Driffild. The site of the building is on the Nafferton road, in a pleasant and healthy position, and about a quarter of a mile from the town. The building will be a commodious one. The architect is Mr. Howe, of Beverley; and Mr. George Whiting is the contractor. During the five years the institution has been in operation, it has effected much good, and a great number of patients have been cured, and some remarkable surgical operations performed.—The village hospital at Ditchingham, Norfolk, is now being roofed in. It will provide about twenty beds for patients, besides all the necessary accommodation for sisters, nurses, and domestic arrangements. Mr. Botwright, of Bungay, is the builder, who also supplies all the bricks and tiles from his brickfield. The cost will be about 3,000. The architect is Mr. R. J. Withers, of London.

The late Fire at Hartshill Church, Stoke-upon-Trent.—A meeting of the pewholders and congregation of Holy Trinity Church, Hartshill, has been held to receive and consider Mr. Gilbert Scott's report of damage done by the late fire, and estimate of restoring the church. Mr. Scott, in his report said that the damage to the nave and chancel was not great but the tower had been considerably damaged, whilst the spire was also slightly injured. He made suggestions for restoring the church, the cost of which he estimated at 1,900l. Mr. Campbell, who produced the report, added that the cost of the recent decorations was about 300l. A new clock would cost 190l.; a new bell, about 100l.; and a new organ, such as they could manage with, at least 600l. Mr. Scott had made suggestions for the better lighting of the chancel, which would cost 400l. That would make about 3,500l. In addition, there would be the architect's commission and other costs. The alterations required for improving the chancel he (Mr. Campbell) would pay for, and he would give another 100l., making his contribution 500l. Beyond his contribution, they would have to raise over 2,800l. A committee was appointed for the purpose of raising subscriptions. The total amount promised in the room was about 620l.

Serious Risks on the Underground Railway.—During the thunderstorm that passed over London on Tuesday night before last a most exciting scene took place near York-road Station, which is situated in a deep cutting, and the fall of rain was so heavy that a large amount of water had accumulated. As soon, therefore, as the 6.18 train from Barnet, filled with passengers, emerged from the tunnel, the water had reached such a height that it put the engine fires out, and the train was brought to a standstill. The points would not work, the sleepers were afloat, and the wires of the telegraph could not be used. The express which runs on to Farringdon-street was at the time overdue. The majority of the passengers were unable to leave the carriages, owing to the depth of the water; women were fainting; and even the servants of the company seemed paralysed with fear. In the midst of the crisis the express did come up; but the same cause which had placed the Barnet train in its terrible position proved its salvation, for the water also put out the fires of the express engine, which drew up within about 5 ft. of the hindermost carriage of the former train!

The Worcester Model Dwellings Association.—The annual meeting of the members of this association has been held. Mr. G. W. Hastings presided, and there were also present Rev. T. L. Wheeler, Messrs. F. Parker, J. W. Isaac, and H. Aldrich (secretary). Mr. Aldrich read the report, which was unanimously adopted. It thus opened:—"In presenting their eighteenth annual report, your governors are sorry to observe that the causes which have for some long time militated against the well-doing of the model buildings still continue, and, indeed, with greater force. During the past year the two adverse influences, viz., reduced rentals and increased expenditure, have been more strenuously at work than before, to render the financial position of the association more unsatisfactory. . . . The proprietors may rely that if the anticipations are unfortunately not realised in the course of the next twelve months, they will then be called together to consider the best method of dealing with their property."

Tunbridge County Bridge.—A work of some importance to Tunbridge has just been commenced. It is that of pulling down the narrow, dangerous, and inconvenient structure known as the Little Bridge, and of widening the northern approach to it. The entire expense of re-construction has been undertaken by the county, at a cost of 1,471l., the contracts accepted being those of Mr. George Butchard, for the smith's and founder's work, at 995l., and Messrs. Lucy & Tockington for the remainder of the work, at 476l. The preparatory work of constructing rafts, driving in piles, &c., is already completed. The county surveyor (Mr. Martin Bulmer) has the superintendence of the work, and the surveyor to the Local Board (Mr. Hobbs), is to render assistance as the work progresses.

The Late Dr. Aldis.—We hear with very great regret of the death of Dr. C. J. Aldis, the earnest and painstaking medical officer of health for St. George's, Hanover-square. He threw himself heart and soul into all sanitary work: knew what to do, and did it.

Ancient Remains at Compton, Berks.—On the summit of "Cowdown," in the occupation of Mr. Mathews, is a large circular entrenchment called "Purhorough." It consists of a high bank, having a ditch or fosse without, and enclosing an area of about six acres. The vallum throughout its circuit exhibits unmistakable evidence of the action of fire. Here and there, large "Sarsen" stones, or drift boulders, have been met with, but always on the line of the earthwork, some of which are so large that the labourers have found it impossible to raise them, and so have sunk them beneath the reach of the plough. There are four large circular pits, or excavations, on the eastern slope within the enclosure; they are cut in the chalk. There is a Roman encampment visible at the "Slade," in the vicinity of Compton. This entrenchment at "Cowdown" was a stronghold of the Britons, which they must have endeavoured to hold against their more disciplined foe.

New "Constitutional Hall" for Dukinfield.—The foundation stone of a new Constitutional Hall at Dukinfield has been laid by Mr. W. Cunliffe Brooks, M.P. The St. John's District Constitutional Association was established four years ago, and since that time its members have met in premises located in Oxford-road, Dukinfield. The site of the new hall is in Hyde-street, one side of the building being in the Gothic style; the external dimensions being 60 ft. by 47 ft., and comprising one large room (60 ft. by 28 ft.), billiard-room, reading-room, library, and smoking-room. The usual conveniences for hot water, &c., will be in the basement. It is expected that the cost of the structure will amount to 850l., but in addition to this 200l. have been paid for the land. The architects are Messrs. J. Eaton & Son, of Ashton-under-Lyne; and the builder is Mr. J. Crabtree, also of Ashton.

The Steam Roller in Hackney.—A report on the use of a steam roller in the repair of roads, by Mr. James Lovgrove, C.E., chief surveyor to the Hackney District Board of Works, has been issued in a printed form, by order of the Board. It recommends the continued use of the roller, which "will do more good in three turns over the road than the horse-roller will do in twelve." It is more desirable, the reporter thinks, to hire than to purchase, at starting, with option of purchase. Its first cost is 550l.; and it can roll 700 to 800 yards per day. The horse-roller, at work in Hackney, costs 1l. 4s. a day, and the steam-roller belonging to the Islington district costs, in working, about 1l. 12s. a day. On hire, including watching and water, it cost 4l. 10s. 6d. as against 2l. 10s. a day with watching and water.

Presentation to an Employer.—On Tuesday evening last, the workmen in the employ of Mr. J. Dalby Holson, Wesleyan Chapel builder, of Duke-street, Adelphi, invited him to a supper at the St. Martin's, after which they presented him with a handsome alabaster time-piece, bearing a suitable inscription, engraved on an ornamental plate. The presentation was made on behalf of the subscribers by Mr. John H. Jones, the general manager, who, in his address, alluded to the good feeling which has always existed, and to the total absence of strikes in the firm. Mr. Holson, who has just completed some contracts at the Wesleyan Training Colleges at Battersea and Westminster; also chapels at Richmond, Putney, North Woolwich, and Hadley, was necessarily much gratified by the demonstration.

Unhealthy Houses.—The Artizans and Labourers' Dwellings Act, 1868, has been put in force by the St. Giles's District Board of Works for the removal of thirty of the most squalid houses in that district. The medical officer of health having certified that these houses were unfit for human habitation, the legal notices were issued for their demolition. In the case of two the property was in Chancery, and an appeal was lodged against the decision of the Board. The appeal was heard on Wednesday before the justices at Westminster Guildhall, when the Board's decision was confirmed.

In Japan considerable reforms were taking place when the last mail left. The Government had established a patent law. Women have been granted the same rights as men as regards visiting the temples, &c.; all indecent pictures and exhibitions are henceforth prohibited; gas will shortly be laid at Yokohama; a fine suspension bridge is being erected at Yedo; and the burnt-down part of that city is being laid out in streets, 90 ft., 60 ft., and 48 ft. wide.

Monumental.—The statue of the late Lou Stanley of Alderney, by Mr. George Nelson, has been placed on the altar-tomb in Alderley Church, Cheshire. The figure is life-size, in a recumbent position, and represents his lordship in the peer's robes. The likeness, which was obtained from a cast taken after death, is pronounced by Lady Stanley and the different members of the family to be very successful. Of the tomb we have already spoken.

Monument to King Robert the Bruce a Stirling.—A monument is to be erected in Stirling to King Robert the Bruce. Government have given permission to erect it on the esplanade of Stirling Castle.

Builders' Benevolent Institution.—In the report last week of the annual meeting of the charity, it was omitted to mention that while the accounts showed an increase in the amount paid to pensioners, the working expenses of the Institution had decreased.

New School Board Offices.—By an Act, Parliament just printed, the powers of the Elementary Education Act, 1870, are extended in regard to the borrowing of money to enable the School Board for London to purchase land required for the erection of offices for the Board.

Strike of Masons in Preston.—The stone masons in Preston are at present out on strike in consequence of the masters refusing to accede to their demand of an advance of wages of 6d. per day, and 6d. a day extra, as expenses, for every mile they are employed beyond the boundaries of Preston.

TENDERS

For alterations to the workhouse of the Westminster Union. Mr. E. R. Blatchley, architect:—

Warne & Son	£1,459 0 0
Harding	1,375 0 0
Simpson	1,290 0 0
Cock	1,250 0 0
Copp	1,169 12 10

For stables, &c., at Blackfriars, for Messrs. Spicer Found. Quantities supplied:—

Avis	£3,650 0 0
Adamson	3,649 0 0
Manly & Rogers	3,580 0 0
Fulley	3,450 0 0
Braucher & Son	3,305 0 0
Trevan	3,289 0 0
O'Brien	3,280 0 0
Henshaw	3,179 0 0

For a gentleman's residence at East Sheen. Quantities by Mr. Gaudy. Mr. E. Ingress Bell, architect:—

Simpson	£4,580 0 0
Henshaw & Co.	4,322 0 0
Henshaw	4,318 0 0
Gibbs	4,207 0 0
Higgs	4,207 0 0
Sharrington & Coils (accepted)	3,979 0 0

For rebuilding the parish church of Ypsbury, Ypsbury, Cardiganshire. Mr. Withers, architect:—

Williams	£389 0 0
Tower	2170 0 0
Jones & Sons	725 0 0
140 0 0	

For building parochial institution for St. Mark's, No. 1, Audley-street, George-street, Oxford-street. Mr. Withers, architect:—

Allen & Sons	£4,483 0 0
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For sewers, &c., at Plumstead:—

Lowgan	£3,600 0 0
Henshaw	3,150 0 0
Harris	3,124 0 0
Morris	3,100 0 0
Bloomfield	2,968 0 0
Hubbard	2,750 0 0
Tongue	2,670 0 0
Marshall	2,600 0 0
Pizzey	2,487 0 0
Stevens & Crook	2,460 0 0
Kirk	2,369 0 0
Hiscock	2,282 0 0
Riley	1,890 0 0

For vicarage-house, &c., at Hinckley, Leicestershire. Mr. William Wigginton, architect:—

Forster	£1,722 0 0
T. & G. Harold	1,623 0 0
J. & W. Harold	1,458 5 10

For warehouse, &c., Ely-place and Charterhouse-street, Holborn. Mr. William Wigginton, architect:—

Merritt & Ashby	£2,857 0 0
Alford & Wain	2,600 0 0
Kent	2,311 0 0
Eaton & Chapman	2,351 0 0
Heath	2,293 0 0
Falser (accepted)	2,113 0 0

For St. Michael and All Angels' Vicarage, Lothfeld, Hackney, E. Mr. Wm. Wigginton, architect:—

Hill, Keddie, & Waldram	£3,107 0 0
Hill & Sons	3,063 0 0
Killy	3,015 0 0
Heath	2,915 0 0
Falser	2,898 0 0
Merritt & Ashby	2,851 0 0

For alterations to St. Mark's Schools, Old-street. Mr. William Wigninton, architect. Henshaw (accepted) £275 0 0

Accepted for Congregational Church, Hornsea, East Yorkshire. Mr. S. Musgrave, architect.— Bricklayer's Work. Hulke & Stephenson £550 10 6

H. & W. K. Barr. Joiner's Work. £533 5 0 Mason's Work. £598 10 6

Denton. Plumber, Glazier, Gasfitter, and Painter's Work. Barr. £115 0 0

Dawber & Sons. Slater's Work. £70 0 0 Ironfounder's Work. £41 0 0

Accepted for Congregational Church, in William-street, Mr. S. Musgrave, architect.— Bricklayer's, &c., Work. Musgrave & Son £725 0 0

Raven. Joiner's Work. £698 0 0 Waller £299 0 0

Plumber, Glazier, and Gasfitter's Work. Harrison. Ironfounder's Work. £138 0 0

King & Co. £62 0 0 Wilde & Sons. Slater's Work. £97 4 8

Painter's Work. Wright £17 15 0

For house and business premises, at Leeds. Mr. S. Grove, architect.— Pawson £2,257 0 0

Thorpe £2,249 15 0 Hill & Sons £2,248 12 0

Longley, Bros. £232 0 0 Whately £2,182 10 0

Oakes & Son (accepted). £2,150 0 0

Accepted proposed new premises, at corner of Notford-place, Edgware-road, for Mr. R. Tyrell. Mr. Daniel Rudde, architect.— Bullant £3,549 0 0

Rodgers £3,367 0 0 Hill & Sons £3,240 0 0

Eblis £3,167 0 0 Nightingale £1,075 0 0

Wignone (accepted) £2,946 0 0 Atkinson & Walker £2,935 0 0

For stables, &c., at Beckenham Kent, for Captain H. N. Mr. W. C. Banks, architect.— Simpson & Co. £435 0 0

Carmody £332 0 0 Grubb £85 0 0

Accepted alterations at Southend Mills, Lewisham, for Messrs. W. C. Banks, architect.— Hubble £497 0 0

Stimpson & Co. £46 0 0 Grubb £49 0 0

Accepted Mission Hall and British Workmen's Institute, Hogar-road, Bow. Messrs. Hills & Fletcher, architects. Quantities supplied:—

Wicks, Bangs, & Co. £1,450 0 0 Alexander £1,428 5 0

Gregar £1,393 0 0 Abraham £1,365 0 0

Abraham £1,357 0 0 Grever £1,267 0 0

Salt £1,220 0 0 Sheffield (accepted) £1,185 0 0

For Infirmary at Aston Union Workhouse, Birmingham. Mr. Yeoville Thomson, architect.— Smith £11,694 0 0

Mathews £10,880 0 0 Evers £9,655 0 0

Bennet £9,740 0 0 Parnell & Son £9,458 0 0

Jones £9,290 0 0 Barnsley & Sons £9,270 0 0

Cresswell & Sons £9,227 0 0 Jeffrey & Pritchard £9,065 0 0

Garlick (accepted) £8,648 0 0

Accepted proposed works in forming a warehouse at Cross-st, Hatton-garden, for Messrs. Hopkin & Williams, Messrs. Scurry & Wright, architects.—

Tovner & Sons £2,100 0 0 Mashman £2,069 0 0

Kilby £1,923 0 0 Langmaid & Way £1,800 0 0

Watson Brothers £1,779 0 0

Accepted schools and residence, Chilworth, Surrey, for the Rev. Northumberland.—

Edipen £750 0 0 Etherington (accepted) £695 0 0

Sherborn £477 0 0

Accepted incidental builder's work to engine boilers, flues, &c., at the new Lambeth Workhouse, Kensington-lane, Messrs. R. Parris & T. W. Aldwinckle, architects.—

Elliott £434 0 0 Crockett (accepted) £35 0 0

Treble & Morley £374 10 0 Crockett (accepted) £189 0 0

Elliott £175 0 0

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Poster (accepted) £2,266 0 0

For conservatory and vinery works, at "The Lodge," East Acton. Messrs. Hutchins & Ogden, surveyors.—

Winks & Co. £591 0 0 Ramsey £393 8 2

Harris & Wondrop (accepted) £319 0 0

For house at Dockhead, for Messrs. Poocok. Mr. Geo. Elkington, architect.—

Capps & Co. £1,010 0 0 Kirk £988 0 0

Ferret £975 0 0 Deven £959 0 0

Buller £918 0 0 Tarrant £900 0 0

For alterations and additions to Nottingham Lodge, Eitham, Kent, for Mr. Alexander McEwan. Mr. Welby Pugin, architect. Quantities supplied by Mr. R. O. Harris.—

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The Builder.

VOL. XXX.—No. 1540.

Wolverhampton Congress of the British Archaeological Association.

NOTWITHSTANDING indifferent weather, the British Archaeological Association have been spending a useful and satisfactory week in Wolverhampton and its neighbourhood. When it was first arranged to visit this part of England, the Black Country as it is called, it was said on all sides that there was nothing to be seen, while the fact of the matter is, that the difficulty has been to select what should be omitted from the programme. The approach to Wolverhampton by rail, from London, is not calculated to raise expectations: the scene is one of ruin,—all black and irregular: furnace chimneys, smoke, masses of *debris* from the foundries, are the prominent elements of the picture. No order, no regularity; heavy nowhere—all ruin. And yet from this ruin comes wealth: call Earl Dudley into court to prove it if necessary. Arrived at the town, it is found much brighter in parts than could have been anticipated. Of its ruins, it is not intended to speak now, but we all have something serious to say about these on another occasion. Every endeavour ought to be made in a town like Wolverhampton, to bring in art to its aid, and yet one of the speakers, on the first day, was found saying, and with truth:—"There were many things in Wolverhampton calculated to strike the eye of a stranger, and one matter which had struck his attention very particularly was the fact that in an important town like this, where art formed so great a feature in connexion with the chief manufactures of the town, although there was a school of art in the town, yet from the inquiries he had made, he found that it very much lacked support, and was in anything but a flourishing condition. He should be very glad if a few words like these addressed to the working men of the town, or to those who had the leading of them, would induce them to make an effort to alter this state of things. It was a matter of most respect that in Manchester, Rotherham, Sheffield, and many other towns, more attention was paid to the making of money than to the promotion of happiness. He did believe that the cultivation of art, through the mediums of schools of art, established in our large manufacturing towns, and thus adapting it to the various modes of spreading that which was beautiful, he believed that this would materially conduce not merely to the physical good, but to the happiness of the people."

The Mayor and Corporation received the Association with much apparent satisfaction. The Earl of Dartmouth, the president of the congress, delivered an inaugural address, which was listened to with much interest. Wolverhampton, the president said in the course of it, had long been distinguished and remarkable for its productions in metal-work. Those who had visited exhibitions of late years could not have failed to remark the admirable specimens of clock-work exhibited by the artisans of Wolver-

hampton. Besides that, going back rather more to archaeological times, passing over the period when shoe-buckles were worn, and when gentlemen walked about in full dress, with steel-hilted swords by their sides, which were the production of Wolverhampton, they might go back to the period of the civil wars, a period which he thought would, during the excursions of the week, be vividly brought to their recollection. In this town itself there was a very strong Royalist feeling in former days; he believed he was right in stating that the Goughs of the Old Hall were conspicuous as energetic supporters of Charles I. in those troublesome times. He had alluded to Dr. Plot, and perhaps he might say, by way of a parenthesis, that he very much regretted indeed, in looking over the magnificent engravings which adorned Dr. Plot's volume, that so many of the old Staffordshire houses had passed away, and been replaced by what some considered more tasteful, but what he thought perfectly atrocious buildings, considering what they replaced. So much was this the case that he was almost inclined to shut up the book in despair, and regret that a period of such Gothicism had intervened between the time of those old houses, as represented in the engravings, and the present. Passing on to another topic in connexion with the history of the county, his Lordship remarked that some of them who had read the London papers might have thought that the county gentlemen and magistrates of Staffordshire were extremely unworthy of books, that they had had a very magnificent library offered to them, and had done nothing towards availing themselves of the offer. He was happy to tell them, however, that all difficulties had passed away, and that the Salt Library was now the property of the county in every sense of the word. On the following day he believed a meeting of the committee would be held at Stafford for the purpose of appointing trustees of that valuable gift. He need not enter into the reasons for the delays that had taken place now that they were overcome, but he thought they, in Staffordshire, had reason to be exceedingly grateful to many gentlemen who had taken up the question, and he would particularly refer to Mr. Sneyd and Mr. G. Wrottesley, to say nothing of their excellent chief constable, Captain Congreve, who was half a Staffordshire man, and who had taken a very active part in bringing the matter to a successful issue. He hoped that if the British Archaeological Association ever visited Staffordshire again, the Salt Library would be ready for their inspection. He merely mentioned this to show that they were not so black as they had been painted, although they lived in a Black Country; but, on the contrary, they had a large appreciation of objects of art and antiquity. Referring to the programme for Tuesday he found that one of the places to be visited was Lichfield. He would say nothing about the cathedral, but when they saw the grand west front of that beautiful edifice disfigured, as he must call it, by stucco, they would, he thought, join with him in the hope that the day was not far distant when it might be replaced by solid, durable stone. In the cathedral itself they would find many old monuments well worthy of their attention. Then, again, they must remember that they would be in one of the most ancient cities in Great Britain, situated as it was so near to the great Watling-street, which was one of the most ancient roads in Britain.

Archdeacon Moore, when moving a vote of thanks to the Earl, said,—Earl Dartmouth had expressed a great desire to see the plaster upon the west front of Lichfield Cathedral replaced by stone. No one could more desire to see that done than he (the archdeacon) did. It could only be done at a vast expense; but he believed that if the dean and chapter were permitted to make an agreement, funds would be found for

commencing the work, and no doubt all persons in the county who took an interest in the work would assist in its completion. That front was a great warning against some sorts of hero worship in general, and against plastic worship in particular; but still it was the best specimen of plastic work to be seen. Yet it was plastic, and so far had; and he hoped that there would be no more such plastic work again; and he would be glad to see the noble front of that important edifice of the grand old Church of England which was so much and so seriously indented in these days to the Earl of Dartmouth, once more stone and no longer plaster. His lordship had said that there was little to be seen that was picturesque immediately around where they were assembled; but he (the archdeacon) thought that any one with an eye for the picturesque might there find much that would interest it. When he went out on what people facetiously termed his "steeples chases" (visiting and inspecting the churches), he could find even among the tall chimneys and the whirl of their machinery much that was picturesque, amid all their smoke.

A Vice-President of the Association, speaking to the same resolution, observed that it seemed to him that a visit from such an association to such a town was most appropriate. Here was a place which seemed so wholly of the present, yet was so largely connected with the past; and it seemed to him most important that all that recalled to them the past should be preserved, and that they should not permit their old landmarks to be swept away. Here they were executing works in iron and other metals, wherein much beauty was not always obvious; while the remains of old metal-work showed them a beauty of workmanship often wanting in the work of these days. Even then for the sake of their present work, it was well for them to preserve that which recalled the past. Some told them that such associations as that now visiting the town had done their work, but he thought that that association was more needful now even than twenty years ago; for every day time itself was sweeping away the remains of the past, and where man lent his hand to the spoiler's work there was little hope of preservation. By such visits as that now being paid to Wolverhampton, inhabitants of towns were led to look more closely and curiously at the remains of the past, and to conclude that that which was worth the visit of so many from so far was worth preserving.

At the ancient parish church, to which all then repaired, a paper by Mr. Parke was read, which gave an able sketch of the history of the structure, together with some extracts from a report by Mr. Ewan Christian, who restored the church some years ago, and rebuilt the chancel. The nave is of the Perpendicular period, and is remarkable for its dignity and majesty. It is disfigured by ugly galleries and inappropriate seating, the removal of which is contemplated. A carved stone pulpit, formed round one of the south pillars of the nave, is noticeable. It was built with the column, notwithstanding the opinion of the rector (the Rev. J. H. Iles) to the contrary; the courses run through. An interesting monument to Col. John Lane, who helped King Charles to escape after the disaster at Worcester, some of the old screen-work, and a bronze statue by Le Sueur of one of the Levisons, interested the visitors, and doubtless some of them noticed in the porch a marble tablet, dated 1732, the inscription on which commences thus oddly:—"Near this place lies Charles C. Phillips, whose absolute contempt of riches, and inimitable performances upon the violin, made him the admiration of all that knew him."

The Ancient Pillar.

The great point for discussion, however, was the pillar in the churchyard.

Mr. E. Levis, M.A., said it was believed to be a Danish column from the remains of what were supposed to be the figures of ravens sculptured upon it; ravens having been held in great veneration by the Danes as the companions of their god Odin, as eagles were believed to be those of Jupiter, the owl of Minerva, and the Dove of Venus, showing how the gods of our forefathers were believed by them to be gods of an ornithological tendency. The Danes had two emblematical ravens—one indicative of victory and the other of defeat; and the question was which of these two ravens seen by some on this pillar were. It was known that the Danes committed excessive ravages in Mercia, in 1385, and it was thought on the one hand that this pillar was put up to commemorate some victory of that date, as it was not usual for people to commemorate their defeats. The Saxons on the other hand, were quoted to show that the Danes suffered an enormous defeat in this part of Mercia; but that was the Saxon version, while there was no doubt that the Danes succeeded in firmly establishing themselves here. The cross, he thought, might have been erected to commemorate the same victory; but whether of the Danes or Saxons remained undecided.

Mr. G. M. Hills remarked that whether crosses were erected to commemorate victories he would not pretend to say, but it was well known that in ancient times crosses were erected merely as landmarks. Without any idea of a religious character, it was well known that the Romans raised crosses as landmarks; in fact, it was one of their rules, when surveying a country, that crosses should be erected at special points. It was very probable that a cross, occupying the position which this did, belonged to very ancient times, but its date depended very much upon what meaning they attached to the words "very ancient." He had no hesitation in saying that this cross was of great antiquity; but he failed to discover anything known of the Danes upon it, or to see anything of the ravens of the Danes about it. They would observe certain open spaces in the lower part, and then certain figures in the form of half a lozenge. Five of these could be traced half-way up, leaving five spaces below for a figure under a canopy. In one of these spaces there were distinct traces of a figure. The figures to be traced above those canopies showed that it could not be a Danish, but that it must be a Christian monument. He found in one the ox of St. Luke; in a second, the angel of St. Matthew; in a third, the lion of St. Mark; and in a fourth, the emblem of St. John; while the fifth was filled with scroll-work. This showed that the design was to give the symbols of the four Evangelists, and from this they could venture to hazard a notion of what filled the spaces below the canopies; and from the absence of symbol in the fifth canopy, they could venture to assume that in the fifth space the Crucifixion was represented. The enrichments above were merely scroll-work, with various animals,—griffins and others,—represented in grotesque form and of monstrous description. He thought the date of the cross was about the twelfth century,—the beautiful scrolls would be the work of that century. He had examined the top of the column, and found evidence of provision for the insertion and fixing of another stone, probably a cross. He had no doubt it was Norman work, and belonged to the Norman period, namely, the twelfth century.

At the public dinner afterwards (which was generally presided over by Lord Dartmouth, and passed off very satisfactorily),

Mr. Colwin, in the course of some observations, said he gave Mr. Gordon Hills very great praise for the admirable acuteness with which he described the old pillar in front of the Collegiate Church; still he (Mr. Godwin) was bound to say, as an old Saxon himself, that he could see no reason why the cross should not be of the Saxon period. It had the balustrade shape, which was generally understood to show the work of an earlier people than the Normans, and, without expressing any decided opinion as to the exact date, he must say that he could see no reason in the world why the cross should not be considered as of Saxon origin.

Mr. Edward Roberts, speaking at the same dinner, thought that although it might be true, as had been said, that the cross belonged to the twelfth century,—and he must say that he himself had not examined the details of it with any particular care,—still his impression was that it was Saxon; in other words, it might probably have been executed by Saxon workmen, and not by Normans, just before or after the period of

the Conquest. They all knew that between the Saxons and the Normans there was a very slight line of demarcation, and that what had been for centuries regarded as Saxon now turned out to be Norman, and things that had been regarded for centuries as Norman turned out to be Saxon. Therefore it was quite possible that this cross was executed by Saxon workmen just at the turn of the century where the terminaries of the mouldings showed the character of the age to which they belonged. They had certainly no desire to lessen antiquity, as was shown by their having put eighty years of age on to the central tower of the Collegiate Church.

The matter is so interesting that we shall return to it and give a view of the pillar hereafter.

The Etoctum of the Romans,

now called Wall, was amongst the places visited on the second day. We are not giving a full account, and shall merely touch on a few of the more interesting incidents of the week. Excavations had been specially made at the expense of Col. J. N. Bagnall. Mr. Molineux having collected the visitors around him on the rising ground, which is marked as the site of the old city, reminded them that Etoctum was one of two large Roman stations established in Staffordshire, and was at the junction of two Roman roads—Wattling-street and Icknield-street. By what means Etoctum became a hurried city he did not know. It did not appear to have been occupied by the Saxons; in the word "wall" they had, he considered, evidence of its early ruinous condition. He referred to the notices of the station by Camden and Dr. Plot, who spoke of coins of Nero and Domitian having been found there. Plot spoke of the city as being in a field called the Butts, by which name the field they were now standing in was known to that day. It was believed that the city or its walls extended to Chesterfield (a village visible between the trees). Shaw also described it as a Roman station of large magnitude, and as having been erected about A.D. 120. He exhibited some relics which had been excavated from the holes at their feet on the previous day—pieces of plaster, coloured outside, red, white, and yellow in hue; some nails and pieces of large tiles turned up at the side; patera, a brass stud, pieces of draining pipes, a fowl-bone, &c. These excavations had been made in anticipation of a visit from the British Archaeological Association. A few days since some excavations had been commenced in the Castle Croft, and a chamber had been laid open which it was difficult to identify. Whether it was a public bath, or what it might have been was an open question; but he thought there was no question that the whole of the district was filled with buildings. They found no coins, but some black Roman pottery, and some concrete made of Walsall lime and pebbles. They also laid bare a wall, and found it built of sandstone and concrete, and 3 ft. thick, running north and south. In the orchard below they had traced a wall for 120 yards in length, which was 9 ft. thick, and they hoped to follow both that and the west wall until they came to one of the gateways by which the town was entered. He had no doubt that Etoctum had originally a frontage of a mile to Chesterfield. They looked forward to the discovery of the cemetery with much interest, and it was intended to prosecute these excavations up to Chesterfield, and to show, as he believed they could, that they had at Wall as interesting and important a Roman station as the Shropshire people had in Uriconium.

Eiford Church, Eiford Lodge, a luncheon at Haselour Hall, and other incidents kept the members too long from Lichfield Cathedral, so that Mr. Gordon Hills was forced to condense overmuch his account and comments on that most interesting structure. To what he did say we may return.

Early Constructions.

At the first evening meeting, held in Wolverhampton Town-hall, Mr. J. S. Phené read a paper on Uniformity of Design in the earliest British and Continental Constructions, illustrated with a number of carefully prepared diagrams. He commenced by drawing attention to the uniformity which prevails in the remains of early British places of occupation, which, notwithstanding their rareness and wide separation, arising from removal for agricultural purposes, still retain features which make them so identical as to represent the work of a single people. He considered this by no means affected the question of another race having immigrated amongst them, or even been sparse pre-

occupants of Britain, and the very fact of the extreme distances between British remains of the same design and class, for the illustration of which he selected the most remote places,—from the Hebrides to Kent, and from Northumberland to Cornwall,—evidently formed a strong support to the idea; as it was not, he thought, probable that the same race could have occupied these various remote points without also occupying at least a large portion of the intermediate space. Their forts, dwellings, utensils, and ornaments, he said, had a common uniformity of design, not only with themselves respectively, but with each other; nor was this accidental, for he found articles of apparently common interest having a superior meaning attached to them. Thus the quern was, for some reason, an emblem of eternity, while the gold rivulet surmounting some of the Irish monoliths found in the peat morasses evidently had reference to solar worship. He then compared these remains with some bearing the same features in other countries, including very similar constructions on the Alps. He dwelt upon customs connected with the preservation of the human heart in Britain, and showed approximating religious customs in connexion with the heart as almost universal. He drew attention to certain parallel indications in the sculptures of Easter Island, Egypt, America, and Britain, at least so far as vastness of design is concerned to the sculptured solar altars of Nineveh, very similar emblems being found in this country, in Mexico, Easter Island, and elsewhere; and also to the remarkable incisions in the rocks of Northumberland, Ilkley, Scotland, New Grange, and Carnac, which were also to be traced along the Mediterranean route as far as Greece, and even had representatives in India and America.

The Chairman (Mr. Godwin) said whatever they might think of the theory of sun-worship he was sure they would unite in a feeling of gratification that Mr. Phené was applying himself to investigations upon a subject of so much interest. The uniformity of those early structures all over the globe was scarcely to be doubted, nor was their antiquity. But Mr. James Fergusson, whom they all held in the highest esteem, seemed in the most extraordinary way to have shut his eyes against indications and proofs of their great antiquity. Because he finds evidence that some such structures were of tolerably modern date, therefore he would have it inferred that they are all of modern date. He (the Chairman), however, was quite unable himself even to read the Bible without finding ample proof of the early existence of that exact description of structure of which he (Mr. Fergusson) spoke as modern; the monuments of unhewn stone, the setting up of single stones, the forming of a cairn, and so on. Mr. Phené had alluded to some singular structures, especially in Scotland. It was to be hoped that other gentlemen who had applied themselves to the same branches of antiquity, with the view of bringing their minds to bear upon this particular subject, would help in guiding them to a true solution.

Mr. Burgess read a paper on "Ancient British Remains in the Forest of Arden." He explained that the forest of Arden, to which his paper referred, was a wide district of England, with (according to Drayton) "one hand touching Trent, the other Severn side"; and his remarks applied to the remains of earthworks and British forts to be found in different localities and in lines within that area. He endorsed good deal of what had been advanced by Mr. Phené as to the uniformity of these works, and exhibited drawings of earthworks at Brinklow and Seckington. He believed these were not Saxon earthworks, but that they belonged to an earlier period.

Mr. E. Roberts observed on these papers that the more he saw and heard of this subject the more he was impressed with the similarity of the whole of the productions of the pre-historic period. He had gone over to see the Paris Exhibition almost for the purpose of studying the illustrations of the different periods of labour, and he was amazed at the precise similarity of all the tools exhibited there from all parts of the known world. He thought they could not come to any other conclusion than that there was a larger amount of intercourse between nations in the earlier days than they had been inclined to believe.

Here we must break off for the present.

Mahogany wood has been discovered in the Guinea region of Africa.

SOME HOUSES IN SEVEN DIALS.

CONSIDERABLE improvements have been made in Seven Dials and the rest of the parish of St. Giles-in-the-Fields, since we first commenced those explorations and illustrations of the Shadows of London and our large towns, which, not to speak in any degree arrogantly, have assisted in producing the present state of public opinion on the subject, and the increased attention now paid to sanitary reform. We could point to some dark pictures of portions of this neighbourhood, scattered through our earlier volumes, and afterwards gathered into little books, and then reproduced far and wide by a more or less sympathising daily press. Seven Dials, as our London readers know, is an open space in St. Giles's, whence radiate seven streets, and had its name from the circumstance that there was a Doric column in the centre of it, which bore on its upper part seven sun-dials, one of them facing each street. As we find in "Trivia,"—

"Where famed St. Giles's ancient limits spread,
An hour's ride column rears its lofty head;
Here to seven streets seven dials count the day,
And from each other catch the circling ray."

The column was removed a hundred years ago but the name remains: words are more lasting than things. Well, one of the seven rays from this central point is called Great St. Andrew-street, and here, notwithstanding the improvements we have alluded to, are still to be found dwelling-places in which there can be no healthy life;—places where virtue is difficult, and decency impossible. Nos. 40, 41, and 42 were of this class, and had gone on from bad to worse, until they were utterly unfit for human habitation, and past hope of any aid from the commercial principle; the basements were full of decomposing rubbish, the drains stopped, the floors and ceilings broken through, the roofs were guttermless, the walls in part saturated.

By a series of fortunate accidents, so to speak of a number of generous acts, the Society for Improving the Condition of the Labouring Classes, better known, perhaps, as Lord Shaftesbury's Society, came into funds at their last general meeting, applicable to such a purpose, and have descended on this neglected and terrible piece of property. Mr. Eborall, the builder, under Mr. Eytan, as architect, has been set to work to render the houses fit for human habitation. We do not know if it be intended to make any re-arrangement of the premises so as to fit them better for occupation by a number of families, or merely to repair them and introduce such sanitary requirements as may be practicable in their present form. We shall watch the work with interest, and report upon it hereafter. The Society has done good service in this same direction before, and it should not be forgotten in judging of its proceedings that it seeks to provide healthful and humane dwellings for the very poor, which in London can only be done by so great an expenditure, and accepting so moderate a rental, as put large dividends quite out of the question.

DIAMONDS, AND THE IDEA OF BEAUTY IN NATURE.

It would be a somewhat curious speculation to go into to theorise as to what sort of a being man would have been had he had no such faculty conferred upon him as the perception of beauty, and the desire to create it. How very different would the external world have looked and seemed to him. All the colours and forms of nature would have been to him as nothing. It would have mattered nought how things about him looked. Would he have been the happier for it, or no? For we are told in a very impressive way that "he who increaseth knowledge increaseth trouble;" and perhaps it is so. But, however this may be, there is no help for it, and the love of the Beautiful is, without doubt, an inherent faculty in human nature, and cannot be got rid of, and will in some way or other be gratified;—nay, so powerful is it in some minds, that no cost to themselves seems too great for its gratification, and they will turn the very world itself over to find some new beauty. It would be a difficult thing to say which is the most beautiful object in nature hitherto found. Some will declare for one thing, and some for another; but for a combination of rare and unique qualities, and for the comprehension of much in little, the diamond is perhaps the most beautiful object in existence. The subject is a most curious one, and will show, even in these few

thoughts on it, how much there is in nature and art yet to be theorised about, and to be inquired more deeply into. Most people are aware that the diamond is seen in rings and in other articles of jewelry, and as cut into certain regular forms, is not to be found so in nature. As dug up from the earth, or as found amid the sand of a river, it is hardly to be distinguished from a common smooth pebble, or a bit of glass with the rough corners worn off; there is little or nothing of the diamond to be detected in it. It is only after "cutting" into some regular geometrical form that the magnificent beauty of the stone is to be found. Those regular forms into which the diamond is by nature crystallised, the sharp edges of which are worn off, and which exist under the rough surface of the rounded pebble, are most commonly the octahedron, and the dodecahedron, and the multiples of these: as twenty-four, thirty-six, and forty-eight sided figures. Those who wish to understand the subject of diamond-cutting, we would mention in parenthesis, should make drawings of these figures. The pure octahedron form is not, it may be noticed, so advantageous a form as the others, the loss of weight and size in the cutting of the stone into the brilliant form being much greater than it is in the more numerous sided crystals. But all these regular forms are much better for the purposes of the jeweller than the more irregularly shaped stones, with jagged corners, or of forms nearer to the cylindrical or prismatic. It is also noteworthy that there is a form of crystallisation very frequently to be found in the South African diamond, known in mineralogy as the "Maacle crystal." It is triangular in form, and consists of two distinct crystals, welded together by nature. While speaking of African diamonds, about which there has been so much talk lately, it may be noticed, as a curious circumstance, that they are not quite white, or colourless, but of a very pale, and, to our thinking, beautiful straw colour, even adding to the beauty of the gem. The famous Golconda diamond is colourless. In the cutting of a diamond, without which the beauty of the stone is hidden away under a ragged coating, it may be generally calculated that about one-half, a little more or a little less, is lost, so that it is only at a great sacrifice that the beauty of the diamond is made to show itself.

It is a little difficult to explain without a number of diagrams, the curious nature and effect of this diamond cutting, and to hint at what would seem to be a shortcoming in it, if the production of pure beauty be the object sought. A "brilliant" diamond, to give an example, may be thus described. The top of it is an octagon, and on the size of this octagon, or "table," as it is termed, the value of the gem to a great extent depends. From each side of this octagon, at an angle of about 45 degrees, spring triangular facets; connecting these are square, or nearly square, ones, and between these again are double triangular planes. In all, therefore, there are thirty-two facets, or planes, at angles to each other, and which together make up the upper face or top of a "brilliant" diamond. It is from these facets or planes, round the central octagon or table, and which is flat, that the magnificent sparkle comes which makes the beauty of the diamond, and which is to be got from no other substance in nature hitherto discovered. It is produced, as many will recollect, by the great refractive power of the substance of the diamond, and the sight of which suggested to Newton that the diamond must be combustible. The diamond is pure carbon, or charcoal, like a bit of burnt wood, and nothing else; and perhaps in nature there is nothing more surprising than the fact that such a substance as charcoal, black and opaque, and dull as it is, should exist in so different and wonderful a form. Thus far the upper surface or top of a brilliant diamond. The under surface, or bottom of the diamond, mostly hidden in its setting, is equally noteworthy. It is the same as the top, with the exception of the table, which, instead of being as large as may be, is extremely small,—indeed, almost a point. Hold up a large diamond to the light, and the whole of it will appear almost black and impenetrable, with the exception of this small octagonal space; but through this the light comes, and objects may be seen as through a small window. It is not, therefore, by transmitted but by reflected light, and by the blending of the light that the beauty in the diamond is made to manifest itself. It is only by carefully examining a good stone, or by making a careful drawing of one, that these curious facts can be usefully tested. The knowledge

gained will amply repay the trouble it takes to do it. Nothing can possibly surpass the beauty of a clear, well and accurately cut diamond. You are never tired of looking at it; it is always changing, and never seems to look twice alike.

We cannot help thinking that something, and perhaps not a little, yet remains to be accomplished in the cutting of diamonds. A very large diamond, as the Kohinoor or the Regent, is a somewhat disappointing object to look at, after the sight of a smaller stone, finely cut; for the facets are too large, there is too much of the multiple mirror in them. It is in the intensity, and exceeding brightness of the infinitely divided and separated coloured sparks of fiery light, that the marvellous beauty of the diamond lies; and where these are too large, or too wide apart, a great deal of the real beauty and exquisite feeling of the gem is lost. Diamond-cutting is an art and mystery in itself, and there is a "regular way" of doing the work which it seems to be almost impossible to improve upon. So, indeed, you are told. It is, too, a very costly process, so that experimenting is hardly to be thought of. We have gone a little into this curious subject, and have come to the conclusion that the art and mystery of diamond-cutting is not among those things that are "progressing." It is, as it seems to us, something like fiddle-making; it is not a mere trade, it is a fine art, and takes the hand, and eye, and brain of an artist, and an artist-workman to do the work. A "Stradivarius" is the man that is needed; a fine and knowing workman, with hands as well as brains, and brains as well as hands,—both together, and together only, making the artist-workman.

It is not only the artistic beauty in a diamond that makes it remarkable, and worth some study; there is also the value of it; and it is this, indeed, that makes the subject so full of wonder, for in no other substance or thing in nature can you compress so much "value,"—commercial value, even, as in a fine diamond. Without taking into account the very large diamonds, such as the Kohinoor, the Regent, the great Russian diamond, and a few others which have an almost fabulous value, we may well pause to wonder at the value, in other goods and chattels, of a small stone, say of 500l. or 1,000l. in price. Why is this? It is among the mysteries of nature. The wonderful beauty enshrined in the stone responds to the wonderful sense or perception of beauty in the human mind, and actually compels the sacrifice. What would the "sustained splendour" of modernism do without the diamond? Gold itself could not make up for the loss of it! Diamonds are valued according to size; and it may interest the curious to know that the very latest quotations are 4l. per carat for rough diamonds weighing ½ a carat each; for 1 carat, 4l. 10s. to 5l.; for 10 carat stones, 26l. to 25l.; for 20 carat stones, 40l. to 42l. per carat, and so on to those fabulous amounts which the world now and then hears of. But whether the diamond be great or small the principle is the same: it is a price paid for the sight and possession of a thing of beauty and of rarity, and that only; for of the value of the diamond as a mere working tool to cut glass, and for other useful purposes, we need not here speak.

It is impossible to talk of the diamond without some thoughts of its "setting." Diamonds cannot be worn and can hardly be looked at without they are in some way or other "set" or fixed into some other substance, as gold, to make them wearable. Indeed, the art of the jeweller consists in the setting of gems, and the devising of forms to enhance, if possible, their beauty, and to bring them together. Unfortunately the art of the jeweller is little at present above a trade. The work done is all very neat, and highly polished, and carefully filed down, and finally smoothed; but as a fine art, and as dealing with the richest and rarest of substances in nature, it lacks almost everything it ought to have. Let any one who doubts this examine carefully, and minutely, the engraving or chasing of an ordinary finger-ring, or locket, or the back of a watch, no matter what the price: no one will deny it to have neatness, and care, and finish, but where are the drawing and sculpture in it to be found? We had almost said where is the designing power in it? Whole rows of watch-backs may be looked at on which certainly no expense would seem to have been spared, and it will be in vain to look for inventive drawing. Unfortunately it is a trade. Things like these are left to the mere workman. The designer and thinker will be found to be a man working out his ideas, such as they are, "on paper." Perhaps he would hardly condescend to write upon gold. He certainly never does so;

if he did we must see it. If the art of jewelry be a fine art, as we think it is, then most surely is it one of those things that are not "improving" in an artistic sense, though they may be in a *productive* one. More jewels may be made, and cheaper, and more diamonds and rubies may be cut and polished, and put into gold cases, to hang round pretty necks and fair arms, but most certain it is that they will not bear the looking into which the older and rougher work of bygone days will, when machinery was not, and tools were fewer, and human labour was not so divided; and when every workman was asked personally for his work, his own work; and when, too, he thought out his own work as well as executed it. If *buildings*, on a great scale, show, as they undoubtedly do, what the old workman was without machinery, to almost do his work for him, then also may the minute work of the jeweller and the diamond-cutter show what is done, and what is yet to be done, with gold and gems.

THE ROYAL ARCHÆOLOGICAL INSTITUTE AT SOUTHAMPTON.

The inaugural meeting was held at noon of Thursday in last week, in the Hartley Institution. The Bishop of Winchester, the president for the occasion, was unable to take the chair, having been unexpectedly subpoenaed to attend a trial for libel between two quarrelsome neighbours at Guildford. In his absence the permanent president, Lord Talbot de Malahide, F.S.A., temporarily occupied his place. The room was very well filled for an opening day. The mayor and corporation attended in state to welcome the officers of the Institute, and among the gentlemen present were the Marquis of Bristol, Lord Henry Scott, M.P., Sir Stafford Carey, Sir E. Smirke, A.M., and some other persons of note.

At three o'clock the party reassembled at the Bargate, in the centre of the town, and which formed a portion of its original defences. Here Mr. J. H. Parker pointed out the peculiarities of the building. After inspecting the interior, which presents little of interest to the antiquary, Mr. Parker conducted his party along the site of the walls, and pointed out an old water-gate. The inspection of other local objects of interest occupied the time till dinner-hour.

The *soirée* given by the Mayor of Southampton at the Hartley Institution in the evening of the opening day brought together a very pleasant party, the mayor and Mrs. Buchan having a surprise in store for many of their guests. Their entertainers had prepared a concert for their delectation. At the close of the musical performance, the Bishop of Winchester made a pleasant speech to the guests from the front of the orchestra, assuring them that he neither meant to sing a song nor play on the double-bass violinello, but to call upon them for three cheers in honour of the mayor's birthday, which the bishop led with hearty good will. The party was attended by a large number of the officers of the American fleet.

On Friday morning there was a meeting of sections at the Hartley Institution. The bishop presided for a short time, and introduced Lord Henry Scott, who read them an introductory address in the Historical Section, confining his remarks to a history of the county of his adoption. Lord Talbot de Malahide, in moving a vote of thanks to Lord H. Scott, which was carried by acclamation, endorsed his lordship's observations as to the want of a good county history and a good archaeological association, which latter he considered would greatly help to accomplish the former. Kent, Somerset, Sussex, and Wilts, and nearly all the counties in the south of England, had good archaeological associations, and it would be a proud remembrance on the part of this Institute if they should be in any way instrumental in giving an impetus to a similar action in Hampshire.

The reading of another and shorter paper brought the morning's proceedings to a close, and in the afternoon the archaeological pilgrims wended their way as far as Romsey and Porchester, and on the route some of them took the opportunity of inspecting Broadlands, which, by the courtesy of Mr. Cowper-Temple, M.P., they were enabled to do. Broadlands, formerly Lord Palmerston's seat, is situated on the top of a slope, commanding a good view of the Test. Within the house are some fine paintings of the old masters, and a monument by Flaxman to Viscount and Viscountess Palmerston. Porchester, the *Portus Magnus* of the Romans, is said to have been the lauding-place of Vespasian.

Since then the sea has much receded from it. The present quadrangular fortress is Norman, partly erected on the old Roman works, and exhibits in a portion of its walls specimens of Roman material applied in later construction. The keep has two massive Norman towers. The parish church of St. Mary is situated within the outer part of the castle area. The west front contains a Norman window, and much enriched doorway. At Romsey the vicar, the Rev. E. L. Berthon, gave a running discourse on the abbey, and exhibited the result of recent excavations. At Porchester, Mr. G. T. Clarke was the *cicerone* over the castle.

At a general meeting of the members of the Institute, Exeter was selected as the place of meeting in 1873.

Next day, there was an excursion through the New Forest to Christchurch, the party visiting objects of interest in the New Forest on their return homewards. They started from Southampton at nine o'clock, and on their arrival at Christchurch proceeded to examine the antiquities of this pleasant and ancient town, which is watered by the crystal Avon, so famous for its salmon. The chief object of attraction, of course, was the priory church, which is said to have been founded on the site of a Roman temple. In 1150 it was converted into a priory of Augustinian monks. The castle, a little to the north of the priory, has only two ruined walls of a small keep left standing. After spending some time in the examination of the church and the ruins of the castle, the party "refreshed" at the town-hall, and then returned by rail towards Southampton, stopping *en route* at Beaulieu-road station, and thence by turnpike road to Beaulieu. Here they were received by Lord Henry Scott, M.P., and the Rev. F. W. Baker, who conducted them over the remains of the abbey. The gatehouse of the latter is now the residence of Lord H. Scott, and is called "The Palace." This was an abbey of the Cistercian Order, founded by King John in 1209. Near the centre of the hospitalium was the access to the conventual buildings. There are relics of the sacristy and chapter-house, and a passage and portion of the monks' refectory. The ground-plan of the ancient convent church has been traced by the stones on the sites of its pillars. The parish church is the ancient refectory. There is great variety of sculpture in the intersections of the ribs of the roof representing the Montagu and Buceleuch arms, the Beaulieu arms, &c.

At a *conversatione* in the Ordnance Survey office, some interesting objects were shown. Among these were flint implements from the drift found near the Southampton Cemetery, 80 ft. above the level of the sea, and supposed to have been deposited there about the commencement of the glacial era; a model of Ben Nevis (4,066 ft. high, the highest mountain in the United Kingdom), and of the surrounding country; a model of Stonehenge, with drawings and photographs exhibited by the electric light, and of some cromlechs; plan of the ancient, the fortified station of the Romans at Bitterne Manor, Southampton; plan of the town of Southampton and of its ancient walls, and plan of Netley Abbey, with photographs; plan of Silchester; model and plan of Jerusalem, with photographs shown by the electric light; model of the great pyramid of Egypt to illustrate the use of its interior arrangements. Photozincographic *fac-similes* of Domesday Book, of the national MSS. of England, Scotland, and Ireland, with some very interesting originals of the latter, &c.

On Monday, after a morning sectional meeting, at which an address by Sir Edward Smirke, president of the Section of Antiquities, on the records of Southampton, was delivered to an audience not large, and followed by an illustrated address upon Silchester by the Rev. J. G. Jones, Winchester was visited, and the cathedral and other objects of interest in that ancient city inspected.

On Tuesday, the members of the Institute visited Silchester, which derives its name from the Saxon "Sil," great or best, and the Roman word "castrum," and has been described by us before now. It has the largest area of any of the Roman fortifications. The walls at present are about 13 ft. high and 8 ft. thick. The city had four gates,—north, south, east, and west,—and beyond the wall was a deep ditch, and beyond the ditch a vallum 15 ft. high. The amphitheatre is situated outside the city, 150 yards from the north-east corner of the wall. The members also visited the remains of the Chapel of the Holy Ghost at Basingstoke, and Basing House, formerly the abode of the Marquis

of Winchester, by whom it was gallantly defended against the Parliamentarians, and when stormed was utterly destroyed. In the evening the members returned to Southampton, and held an evening session for the reading of papers at the Hartley Hall.

THE BISHOP OF WINCHESTER ON ARCHÆOLOGY.

At the Southampton meeting of the Archaeological Institute, the Bishop of Winchester said he was sure they would all sympathise with him in his having to deliver an inaugural address in the middle of the meeting, which was like a stale egg. They all knew what a stale egg was, and he had to produce before them that day an egg which had evidently been "sat" upon; and he hoped they would not sit upon him for doing so, for then his only chance would be a long rope, whereas he had only the shortest possible "yarn" then allowed him. It was evident that what he should have to speak about then was the general purpose and idea of these gatherings and meetings, and the good that they and he might be able to deduce from that particular one. Many people, when an antiquary was coming to them, expected something amusing, and sometimes rather absurd, but there was a far deeper side to archaeology, upon which he should like them to rest. Perhaps it was stated almost as beautifully as language could do it by the great Lord Bacon, in his hook "Advancement of Learning." He said, "Antiquities are history diffused, or some remnants of history which have happily escaped the shipwreck of time"—a beautiful idea in itself; and then he went on to speak of what constituted the true antiquary and what he might do, and set a deep view of the whole of their pursuits before them. Returning to his old idea of the shipwreck of time, he spoke of antiquaries as persons who, "by an exact and scrupulous diligence and observation, out of monuments, names, words, proverbs, traditions, private records and evidences, fragments of stone, and the like, do save and recover something from the wreck and deluge of time." He (the Bishop) did not agree with him that it was history diffused. It was more especially the establishing of the remaining facts out of which history had to be formed; because history itself, as they commonly understood it, was far more a theory about facts than a mere relation of the facts themselves. Such a pursuit as they were engaged in was full of every advantage, especially to a people in a higher state of civilisation, and that, he thought, every reasonable man would see in a moment. There could be no future to a people about whom there had been no past: the future developed itself just as it did in life in the world around. The future carried it out of the past. Dead vegetable matter made the humus; into that the roots of the living tree were struck; and because there had been vegetation in the past there was vegetation in the future. And so it was with regard to the higher life of a nation. Unless there was a past to which it could refer, there could not be in it any high sense of its own mission in the world. New peoples were predatory—they came as the Goths of old, to plunder and overrun countries which had a past, and extinguish them, and as they acquired for themselves a past they began to develop a future out of the past, and so that which led them to love and venerate the past did, in fact, give them the best standing-point for helping in the present to make provision for the coming of the future. They did not want to bring the old times back again, but they would understand the present around them far better if they could trace the present back into the past, see what it arose out of, what it had been the development of, and what it contained to serve for the future before them. There was nothing which so tended to keep the mind of men from rash experiments, from those things which destroyed nations altogether by the sudden imagination crossing the mind that some very great result might be obtained by some entire subversion of everything. There was nothing on the one side that more guarded a people against that than by having a reversion for the past, and nothing more truly directed those shapings of the present, which every reasonable man knew he had to give way to, than the being able in the new shaping to have before him the old, out of which he was going to shape it, so that his shaping might only carry on more completely the purposes for which that he was now altering began

to exist. They might see all that he had ventured to suggest when they looked round the grand old cathedral they were to visit that day. With it grew up the life of England, out of the remains which were left at the Saxon invasion, which extinguished the earlier Christianity. Out of the restoration of the Saxon element as it became historic, developing itself through a series of great priests and princes, the wonderful building had been erected.

THE RESULTS OF ARCHÆOLOGICAL TEACHING.

An old correspondent from the Royal Archaeological Institute, writing from Southampton, says:—

I do not send you any notes on the present occasion, first, because this is such a trodden ground; secondly, because the newspapers have been so full of our proceedings; and, thirdly, because I have lost faith in archaeology. Twenty-six years have elapsed since the Institute visited this spot,—the Association has, I believe, been here since,—and yet there has not been a local society established, or anything done towards a county history, both of which things we are continually told are the beneficial objects and results of these gatherings. But the greatest outrage to one's feelings is on revisiting the locality to find that there is nothing to notice but two strange works: Lyndhurst Church, by Mr. White, and the colouring of St. Cross, by Mr. Butterfield. The latter is the greatest satire on taste ever perpetrated by a modern architect. The unmistakable sounds of reprobation which were uttered during Mr. Parker's address will, I hope, be communicated to the architect. The joke that passed about was, that after the present thirteen members who enjoy the charity of the founder are dead, they will be succeeded by thirteen clowns; hence the motley on the walls. If such monstrosities as these are all we can show for studies, papers, architectural institutes, and whatever other institutions exist for the development of art, the sooner such institutions be made to come to an end the better. The Bishop's address, which was very good, you may like to give. F. S. A.

THE NEW THEATRE AT THE ELEPHANT AND CASTLE.

The large new building near the Elephant and Castle, which was erected a few months ago for the purposes of a public hall for meetings, lectures, and musical entertainments, in connexion with swimming and private baths, but which has never been completed, is now in process of being converted into a theatre, the original owner having disposed of the building to new proprietors. The building, which occupies a very large area, being about 120 ft. in length, including the space for baths, from the New Kent-road frontage, to the extreme back, is now undergoing extensive structural alterations preparatory to the fitting up and completion of the interior. A considerable portion of the roof of that part of the building which is intended to be devoted to the auditorium department has been removed for the purpose of carrying the main walls to a greater height in order to admit of the construction of galleries and additional tiers of boxes beyond those contemplated in the original structure. The interior from the entrance in New Kent-road to its communication with the intended great hall, which consisted of about sixty private baths approached by stone staircases, and also leading to the upper part of the hall, is being entirely reconstructed. The walls and compartments forming the baths, together with the corridors, have been altogether removed, and the space which they occupied will be converted into a vestibule, with approaches and staircases leading into the various parts of the theatre. The interior arrangements will provide accommodation for an audience of upwards of 3,000, the two tiers of boxes, twelve of which will be private, seating 500, whilst the pit and stalls, which will be of large dimensions, owing to the great width of the building, will have sitting-space for an audience of 1,500, in addition to which there will be standing-room for 200. The amphitheatre and gallery will have accommodation for about 1,000 persons.

In addition to the audience department, there will be large refreshment saloons in the different parts of the building, communicating, through iron doors, with an ample promenade, attached to which will be smoking and refreshment.

rooms, together with lavatories and gentlemen's dressing-rooms. In connexion with this feature in the arrangements for visitors, the practice adopted in Continental theatres will be introduced by the ringing of the stage-manager's bell in the refreshment-saloons and promenade, announcing the commencement of the performances. The interior of the theatre is to be chiefly lighted from sun-lights in the ceiling. The erection of the stage, which will be very spacious, has been entrusted to Mr. Ellis, who has had a large experience in this department of theatrical construction. The principal entrance to the building, leading to the boxes and stalls, will be in the New Kent-road, the pit and gallery entrances being in the Walworth-road, nearly opposite to the Elephant and Castle.

The entire cost of the new theatre when completed is estimated at about 15,000*l.*—4,000*l.* having already been expended on the building before it came into the present proprietor's hands. The architects are Messrs. Dean, Son, & Co., of Mark-lane, City; and the contractor is Mr. Giles Bennett, of Vauxhall. The theatre is announced, by Mr. E. T. Smith, under whose management it will be conducted, to be opened in September next, and we understand that the contractor has undertaken to have it ready by that time.

THE WORK OF ENGLISH CARPENTERS.

Now that carpenters are prominently before the public, by virtue of the "strike," a glance at the work of their predecessors may have some interest.

The Middle Ages have left us nothing more characteristic of "Old England" than the work of the old carpenters,—old to us, but youthful and gallant enough to the dames and maidens who glanced up at them when they were deftly raising the great oak and chestnut beams that were to group into the glorious roofs we now gaze upon as masterpieces. The closer we look into their work the more we are impressed with its artistic comeliness, sturdiness, and grandeur.

In the fourteenth and fifteenth centuries English workmen seem to have looked upon the roof of a large building as a firmament. They treated it so literally; for they coloured the spaces between the rafters deep cerulean blue, and they set countless golden stars in it; and this firmament they filled, so far as they were able, with an angelic host. They carved angels on every corbel, and high above these they placed angels again. Sometimes they folded their great wings close, with soft, drooping curves; sometimes they spread them out into a bold, wide, glad sweep. Generally they placed a shield, or a book, or a musical instrument in their hands; always they made them expressing adoration, joy, or devotion.

The thoughts of these old workers could not have been sordid, nor even always homely. They overlaid their work, clearly, with captivating fancies, as lustrous, it may be, as the gold with which the Syrian workmen overlaid King Solomon's ivory throne, or they would not have given such surpassing names to details or parts of structures as they have done. They must have been thinking of more than shaping an oaken beam, for instance, when they called the stanch central-pieces of a roof the king-post, and the two smaller pieces that perform a corresponding central service, queen-posts. We are sure they felt that these were the crowning pieces of their framework, to which all the others were attached, for strength's sake, and that they gave them these names because they answered in their minds to the dignity of the service they rendered. We do not wonder that the slater was impressed with the thought, and that when he came to cover their roofs with slates he distinguished one size from another by an elaboration of the same association of idea, and that he called them duchesses, countesses, and ladies, according to their measurement.

Look at the roof of Westminster Hall. Note the bold span of the curved braces that form the mighty arches; note, too, the dignity and interest given by the winged figures, and the lightness of effect produced by the open cusped tracery. We can never cease to admire the graceful and sufficient contrivances to carry weights and resist strains. Six hundred years have sped since the bold fellows who reared it departed to the mercy of God; yet it has not been surpassed in any country in the world.

But the old carpenters did not reserve their skill for the halls of kings' palaces or other high places; for some of the ancient farm barns

present equally wonderful specimens of their constructive powers. Modern architects look up with awe into some of their stolid roofs over these humble huddings, raised there 400, perhaps 500, years ago, and yet surpassing the wide spaces with undiminished strength and beauty. The great beams stride from side to side of the high walls, stretch forth and jut out to meet others, rise up to support more, slant away towards the dim, shadowy apex, or slope downwards from it, forming an angle here and a curve there, with a labyrinthic effect that bewilders the unskilled eye; yet those who are the most competent to judge aver that there is not an inch of timber used but has its deep purpose and scientific use. Scorners have but to look upon the great, cumulous, hoary, mellow barn at Harmondsworth, Middlesex, or upon that at East Barsban, or upon another at Easby Abbey, to be convinced of the nobleness of old carpentry.

It is allowed that England has carried the science of carpentry to greater perfection than any other country. Its insular position, and consequent necessity for "wooden walls," caused naval architecture, in all times, to draw to itself the boldest and most original constructive geniuses; and, of course, it was easy to transfer to the land the cunning devices intended for the formation of floating homes. Moreover, some was always difficult to be procured in some localities, while on the other hand the sea to forest furnished timber in abundance down to Tudor times. The clever carpenters in the days of the Plantagenets sometimes built churches entirely of timber, as we may see at Greensted, in Essex. More frequently, however, they were content to span the walls of stone churches with open timber roofs; or to cap them with wooden turrets, or delicate spirelets covered with cleft oak shingles, or otherwise; or to shade them with timber cloisters; or to fill them with elaborate screens, stalls, pulpits, and pews. They made bridges, too, of timber: notably, the first bridge over the Thames. But far more freely they employed their skill in dwellings.

Half-timbered houses still abound in many of our ancient towns, such as Coventry, Canterbury, Chester, Shrewsbury, and Sandwich; though, as in the metropolises, fires, edicts, and frequent clearings to make way for improvements, have removed immense numbers of them. We are all familiar with the quaint, projecting stages; peaked, and sometimes hipped or slant, copped gables; grotesquely carved corbels; their charming bay windows and oriels; their coquettish dormers, diamond-paned lattices, and sun-baked, weather-beaten lines. We may see that the foundations were generally made of stone or brick. Upon this base were laid large timbers, the full length and depth of the first stage. Into these timbers, called wall-plates, the corner and other principal posts of the first stage of the superstructure were firmly fixed. Where there was a window or door to come, upright and horizontal pieces were placed to frame the opening. And between all these posts and beams were inserted curved braces, which linked the framework together and strengthened it. The joists to form the floor of the next stage overlapped the lower rooms considerably, and so caused the next chamber to project over them. They received the wall-plates, into which the main timbers of the upper chamber were to be tenoned, just as the foundations received those of the stage below. When there was a second or a third story the same process was repeated; and then, over all, rose the steep gables, deeply hooded in the verge-boards with which they were protected. A paper read by Mr. Street to the members of the Institute of British Architects, describes the construction of several examples of ancient roofs and dwellings.

Very proud some of the old carpenters were of their work. On the great window of the hall of Little Moreton Hall, Cheshire, there is this legend: "This windows whire made by William Moreton, in the yeare of our Lorde MDLIX.—Richard Dale, Carpéder, made this window by the grac' of God." Very austere, too, were some of them. On the beams of a roof at Crawley, one cut this admonition:—"Man in Weal beware: Beware before what cometh behind."

A carpenter cut upon a beam in the parlour of the old parsonage-house at Meppershall, which was upon the boundary of two counties, this little joke: "If you wish to go into Hertfordshire, hitch a little nearer the fire." But the usual tenour of their inscriptions is serious and devout.

There are many old writings extant in which mention is made of carpenters and joiners and

their work. The early archives of the City of London give many curious particulars of them. One entry in a venerable tome belonging to the Corporation, dated 1308, sets forth that Simon de Canterbury, carpenter, came before the mayor and aldermen on the Saturday after the feast of St. Martin, in that year, and declared he would undertake to make, for William de Harrington, peltreer, a hall and a room with a chimney in it, and a ladder between the two, and a sun-parlour with an oriel in it over them, and cellars and sewers below them, as well as a stable with a sun-parlour and garret over it, before the feast of Easter next ensuing; and that the said William de Harrington undertook to pay for the work aforesaid, the sum of 9l. 5s. 4d., half-a-hundred of eastern marten skins, fur for a woman's hood, value five shillings, and fur for a robe for him, the said Simon.

The churchwardens of the parish of St. Michael, Cornhill, as we mentioned in these columns, in our notice of Mr. Waterlow's volume, have a pale vellum volume, rich with clerly flourishes in faded ink, in which the parochial accounts were kept four hundred years ago. In this there are many entries relating to workmen. One line tells us that a carpenter received fourpence for half a day's work in "mendynge of a pew," in 1460; and others show that he was frequently employed in putting the men's pew, the women's pew, or the mayor's pew, in repair, at a similar rate of pay. Various small sums are put down in the accounts for "trashie" (trifles) for the joiner. "Paid for an hnge for Russes wyfes pew 1xd," wrote the churchwardens in 1457. The price of labour brought carpenters a shilling a day in Queen Elizabeth's reign. So when we read against the date 1565, in this same volume, "1tn. To Mr. Owghtinge, Carpenter, for mending the pulpitt in the churche yarde iijjs.," we know he was hammering, sawing, screwing, filing, wrenching, and planing, for four long days before he had earned his money.

The account-rolls of the priors of Holy Island, preserved by the Dean and Chapter of Durham, yield many similar references relating to the north. Among southern records we must particularise the expense-book of Prior Moore, preserved in the chapter-house of Worcester Cathedral, of which we gave some account in our notice of Mr. Noakes's works on Worcester Cathedral. This document throws light, too, upon the way in which the trade of a workman gave him a surname. From the evidence to be gathered from it we may be sure, for instance, of the original rank of one of the executors of Dick Whittington's will, John Carpenter, though we know he was a worthy citizen of renown when appointed to the trust. In a word, neither the quaint-cropped verbiage of the old English statutes, nor the tawny pages of Medieval manuscripts, nor the glitter of jewelled goblets, albeit, in the days of yore, they flashed upon the *dressoirs* of a dozen abbots in succession; nor, indeed, the sight of any relic we can name, affords us the vivid realisation of the old times that we obtain from an examination of ancient carpentry. It behoves us, therefore, to conserve every example of it reverently. We feel, too, as we gaze upon it, that if to execute work of a high rank, stately, great, and hold, is to be noble, then, truly, English carpenters have a noble ancestry. *Noblesse oblige.* Let their successors look to it.

KENSINGTON PALACE AND GARDENS.

So far back as 1631, Sir Henry Finch was proprietor of these grounds, and of the mansion, then called Nottingham House, on the descent of Notting-hill, and thus contra-distinguished, as the Ham or Vale. Sir Henry was recorder of London, an office of much greater importance in those days; and about the year 1690, William III. bought the estate, made sundry additions, and adopted it as a royal palace.

Sir Christopher Wren made several improvements, and built what was then called the south front; but if the east front was erected, as is recorded, in the reign of George I., then the present south and west elevations must certainly have been carried up at a later period.

John Evelyn records in his diary, that he visited King William III., A.D., 1690, at this palace, which was then "a packed and altered villa;" so it is clear that a great part of the original foundation, perhaps of 300 years' standing, is embodied in the existing amalgam of courts, corridors, entrances, chambers, and state rooms, both low and lofty.

As we now view it, the grand escalier, auditorium, and state apartments, although once highly ornate, and decked with gilt statuary, are divested of their splendour, unused, and going to decay; the rain and embellishment. Still portions of the wide palace are occupied, and in order. The Duchess of Inverness, the Prince and Princess Teck, and others, have their allotted portions, but the general aspect is one of waste, if not desolation.

The west front slopes upon the outer boundary wall line, under its tile roofs and dormers, but external to the quadrangle and in continuation we find four small ancient cottages or villas, as also a large stable, built in ordinary rural style, of the Cromwellian era, in fact, viewing its fine position, the whole is an incongruity, if not an absurdity, unsuited to the age.

Outside the palace, and external to Kensington Gardens, all along the west boundary, from Bayswater-road to Kensington High-street, there is a waste margin exceeding 100 yards in width, which ought to be added to the gardens, and bounded by an iron fence similar to the Park railing; this, together with the site of the antiquated palace, if it were removed, would add 40 acres or more to the extent of Kensington Gardens; and a new palace built upon the highest plateau of the Park, near the Round Pond, need not cover more than ten acres, or at most 15 acres; thus, 30 acres might be gained in Park range, besides the advantage of an extended circuit, and the attainment of a truly Royal palace, worthy of the country, and encircled by forest trees of mature growth.

In the reign of George I., Kent built the cupola, and made other additions, besides laying out the grounds, and as all the noble wide glades concentric at the point of the Round Pond, this would seem to be the position fixed for the erection of a suitable palace, commanding views on all sides through stately forest glades; on the east across Hyde Park, and extending a mile and a half to Park-lane, the position being elevated, open, and healthy, as well as easily accessible to the metropolis of fashion, no other site in London, nor indeed of any other European capital, can equal it.

Have we at present any metropolitan palace adapted for the occasions of Royalty? The convenience for drawing-rooms, levees, receptions, but, above all, the healthfulness of position, and adaptation for occasional residence; all these combined are to be found in the open, dry, and elevated site herein described, and alluded to in the *Builder* of the 13th July.

As to style of building, our national palaces,—and they are many,—have little to admire. Windsor Castle is a glorious old relic, but for modern usage has little to recommend it. Hampton Court, although William III., Queen Anne, George I., and George II. frequented it much, is now only used as an asylum for pensioners. St. James's is wholly antiquated, and yet it opens the portals for levees and drawing-rooms, notwithstanding its decrepitude. Buckingham Palace may be commodious, but its low position renders it very uninviting for any continuous abode, and the elevation, although solid and somewhat ornate, is anything but attractive.

The appearance and effect of the new Foreign Offices, viewing also the dignity of the interior, its solidity, convenience, and aptitude for the occasions, would seem to suggest that character of building for a new palace in Kensington Gardens; for here at least all that is commanding in architecture should bear evidence of a truly Royal palace.

The connexion of Hyde Park with Kensington Gardens, both being now free to the public, having intercommunicating walks, surrounded by a continuous fence, and forming one integral liberty, makes it essential to refer again in the *Builder* to the grievous nuisance of Knightsbridge Barracks, which is a foul blot and disgrace to the Ladies' Mile,—the most fashionable and ornate portion of the whole enclosure.

If old Kensington Palace be removed, surely some space might be found in the outer margin for a suitable Guards' harracks—that is, in case Government should not wish to build new quarters in Chelsea (near the Foot Guards), or in case the officers should decline to surrender their messroom, which overlooks the Drive.

It is clear that wherever the Household troops get new barracks, at least six or perhaps eight additional public-houses must be opened; therefore the writer takes the liberty of suggesting to head-quarters that an extensive caserne, with large reception and refreshment rooms, be

opened and licensed for the entertainment of the troops and the public, within short distance, but subject to such regulations as may assure free enjoyment with due decorum.

The old harrack, as it stands, is not only a blot upon the Park-whin, but it degrades and depreciates the value of the choicest spot on the Kensington line of road, while it also restricts the thoroughfare on the principal grand western route from Piccadilly to the royal town of Kensington. If the building were abated and the railing continued, but withdrawn where the harrack impinges full 24 ft. upon the road, the open view would give a seeming expansion to both road and Park; and were the beautiful floral border continued from Albert-gate, then Hyde Park would really become a delightful place of resort worthy of London, and a solace to that portion of its three millions who daily use the promenade.

Kensington, formerly a rural hamlet, is now a most important suburb, if not a royal town; therefore the enlargement of the main road; and Knightsbridge has become a necessity, and especially so if hereafter the palace become the abode of royalty. Our Queen Victoria was born there. After William III., Queen Anne resided there principally until her death in 1714; then George I. up to 1727; but George II. and Queen Caroline made this palace their treasured home and solace till 1760. Afterwards, during the reign of George III., Windsor and Claremont were more in use, and Kensington became the "retiro" for members of the Royal family or pensioners of the Court. Thus this splendid foundation, now in its decadence, awaits the revival of its hygone magnificence.

QUONDAM.

NEW RAILWAY FROM HUDDERSFIELD TO KEIGHLEY.

A NUMEROUS and influential meeting has been held at Halifax, as to a scheme for securing to the town better railway facilities and accommodation. The mayor (Mr. J. D. Hutchinson) presided, and was supported by Lieut.-Colonel Holdsworth, Mr. John Crossley, Mr. E. Crossley, and others. A committee reported that, having carefully examined the plans and considered the scheme submitted by Mr. Fulton, they adopted the following resolution:—

"That after mature consideration this committee recommend to the public meeting that the scheme of a new railway from Huddersfield to Keighley, as laid down by Mr. Fulton, be adopted. The committee are also of opinion that at least 20,000 shares, at 10s. each, should be subscribed before the proposed railway should be proceeded with; but it is distinctly understood and stipulated that no promoter shall be liable beyond the deposit of 10s. per share until the Act of Parliament is obtained, and that no future calls exceeding 3s. per share shall be made in any one year."

The adoption of the report was carried unanimously, and the committee were requested to continue their services, and to modify the plans as they might think necessary, but not to abandon a central passenger station and a high-level goods station in the town, and also to take every step to secure subscriptions for shares.

THE SEWAGE QUESTION.

Purification of the Thames.—For several years past, as our readers know, the local authorities of Kingston-on-Thames, Hampton Wick, Teddington, East Molesey, Richmond, Twickenham, Isleworth, Mortlake, and Brentford, have been under imperative orders from the Thames Conservators to divert the sewage of their respective towns from the River Thames. In consequence of the great diversity of opinion amongst scientific men as to the best means of dealing with town sewage—some recommending irrigation, others filtration, and a third class deodorisation—as well as owing to the difficulty of obtaining land for the utilisation of the sewage, no definite action has hitherto been taken, although the authorities of Kingston and Richmond have spent several hundreds of pounds in vainly endeavouring to procure eligible sites for irrigation fields. The Conservators, it appears, have decided to wait no longer for preliminary investigations and experiments, for the Twickenham Local Board have just been informed that unless they take immediate steps for the diversion of the town sewage from the river, the Conservators will proceed against them for penalties. The penalty for non-compliance with the order of the Conservators is 100l. per day.

The Birmingham Sewage Injunction.—Vice-Chancellor Bacon has given his decision respect-

ing an information filed at the instance of certain inhabitants of Gravely-hill, near Birmingham, to restrain the town council of that borough from committing a nuisance by carrying on a sewage-farm at Salbey. An injunction had already been granted, and a motion was now made for an order of sequestration against the council for disobedience of the injunction. The Vice-Chancellor said he could not but feel the great difficulty the corporation were in, in dealing with the enormous mass of sewage they were bound to get rid of; but it appeared, from their own evidence, that they were able, with their present powers, to do much to abate the nuisance; in fact, their very application for more time showed that they thought that to be the case. Little, however, had been done, even since the Bill was thrown out of Parliament. He found himself, therefore, bound to allow the writs to be issued; but, as a matter of indulgence, he would direct that they should not be issued till after the second motion day in Michaelmas Term next.

Visit to the Merthyr Sewage Farm.—Several of the members of the Council of the Royal Agricultural Society have visited the Merthyr Sewage Farm. The sewage lands belonging to the Local Board of Health are said to be one of the most successful speculations undertaken in the country for the utilisation of sewage. The Board was driven to find out some means for the disposal of the town sewage, the population being 50,000. There were constant fights with other local authorities for polluting the already polluted river Taŕ. Ultimately the Board was placed in Chancery, and the town was then put under the professional care of Mr. Bailey Denton, who, after due consideration, recommended that the new remedy suggested by Dr. E. Frankland should be tried at Merthyr. This new remedy, it is said, has been successful. The cost has been great, but the cure is said to be perfect. From the day when the filtering was first used in February of last year to the present time the sewage of Merthyr has been cleansed by the twenty acres laid out for filtration at Froedryth. This acreage was divided into four plots. Upon each of these plots a fourth part of each day's sewage has been distributed evenly, after being strained. The whole of the land thus divided has been drained nearly 7 ft. deep, and in such a way that no sewage can descend directly to the drains from the surface. Mr. Denton obtained, on the 10th of March last year, authority from the Local Board to prepare the surface of the filtering acres for the growth of crops, and to plant such vegetables as he considered were suitable under the circumstances. Accordingly, on the 14th of June following, the land being ridged up for the purpose, the planting of cabbages and sowing of mangolds commenced. On the 30th of August, seventy-seven days after the commencement of planting, part of the crop was offered for sale by auction, and realised 17l. 15s. an acre, while some portions withdrawn from the sale realised afterwards 20l. an acre. During this period of seventy-seven days, the sewage of the district was poured on to the filtering areas, thus affording conclusive proof of the capability of producing vegetables during the filtration of the maximum amount of sewage through the soil upon which they grew. Since the crops thus raised and sold have been cleared from the grounds, fresh ones have taken their place, and were inspected. Some portions of this year's crops have been already sold at 22l. 13s. 4d., 27l., and 32l. 13s. 4d. an acre respectively, yielding an average of 27l. 9s. an acre.

ARCHÆOLOGICAL EXCURSIONS.

The Kent Archaeological Society.—The annual meeting and excursion of this society took place at Faversham and its vicinity. The meeting was held in the large room of the Faversham Institute, under the presidency of Earl Amherst. The Rev. W. A. Scott Robertson read the report, which thus opened:—

"In this their fourteenth annual report, the council can give, as always, a satisfactory account of the progress of the society. Our members steadily increase, and are growing beyond the number of 1,000, about which we have hitherto for some years. Forty-two members have been elected in the year. Many more are awaiting election at your hands to-day. The balance at our bankers is payable 92l. 16s. 9d., but the greater half of this will be payable in a few days to our printers, engravers, &c., for the expenses of the eighth volume of 'Archæologia Cantiana.'"

The report was unanimously adopted. Mr. Beresford Hope, M.P., had given notice of a motion to alter the rule for the time of the general meeting, which at present must be held in July, August, or September, by providing that it may also be

held in October. Mr. Hope, however, was not present, and Earl Amherst called attention to the notice, and expressed a doubt whether it would be judicious to make the alteration. Ultimately Lord Fitzwalter said they would all agree with him that any proposition coming from Mr. Beresford Hope should meet with every attention; but as they could not, by reason of his absence, hear that gentleman's reasons for the proposal, he would move that they proceed with the orders of the day. The motion was agreed to. The ladies and gentlemen present then went to inspect the parish church. The Rev. C. E. Donne, the vicar, described the church. The Elizabethan Grammar-school was next visited, by permission of Mr. Crosswithe, the head master, and the site of the ruins of Faversham Abbey proved to be interesting, the few remains being pointed out by Mr. Bedo. Davington, a small village about a mile from Faversham, then became the centre of attraction. On leaving Davington, the company returned to the town, where dinner was served at the Institute, Lord Harris presiding, supported by Earl Amherst, Lord Fitzwalter, Sir Walter Stirling, &c., there being a considerable number of ladies present. At the evening meeting, which was held in the reading-room of the Institute, Mr. F. F. Giraud, town-clerk of Faversham, read a paper on the Ancient Charters of the Corporation. The Rev. C. E. Donne then read a paper on "The Tragic Story of Arden, of Faversham." Mr. Bedo read a paper on "Roman Remains discovered in Faversham," and this brought the evening meeting to an end. A local museum which was formed here, consisting of objects of antiquarian interest, contributed by members and friends of the society, and a collection of the ancient documents as well as the insignia of the town of Faversham, excited considerable attention during this and the morning of the following day. On Wednesday, an excursion took place, under the guidance of the Rev. W. A. Scott Robertson, to various places of interest in the neighbourhood of Faversham. Preston Church, which is in close proximity to the Faversham railway station, was first visited. From Preston Church the party, which numbered in all about 100 ladies and gentlemen, proceeded in carriages to Ovingde, where the remains of the Maison Dieu (which has almost entirely disappeared) and of a sort of hospital for lepers, of the date of the fourteenth century, were inspected. Thence the company passed on to Syndale Park, the seat of Mr. W. Hall, and anopposed to have been the site of a Roman camp (probably the Durolevum of Antoninus). The house as well as the grounds was thrown open to the company, and Mr. Hall entertained the numerous party to a cold collation. At Syndale Park, a paper on the Roman camp, prepared, we believe, by Mr. T. G. Godfrey Faussett, was read by the Rev. Scott Robertson. The company afterwards made progress to the ruined church of Stone, which is specially noticeable from the fact that it was of the Roman Britannic period, and is almost the only place of the kind in England where any part of the building is held to be undoubtedly of Roman origin. Eastling Church was visited, and from Eastling the party proceeded to Ovingde Church, which was shown to them by the vicar, the Rev. W. N. Griffin. From Eastling the party returned to Faversham, after a pleasant day's excursion, with fine weather, beautiful scenery, and objects of antiquarian interest to recommend it.

The Norfolk and Norwich Archaeological Society. The annual summer excursion of this Society has been held. The unfavourable character of the weather on the previous day, combined with other causes, rendered the attendance of members but small; still the day was an enjoyable one. The first place visited was Wroxham Church, and here the members were welcomed by Mr. R. Blake-Humfrey and his wife, and by the vicar. The parish church of Horning was next visited, and then that of Potter Heigham. At Ludham Church a brief paper, sent by Mr. Gann, was read by Mr. Fitch, the secretary. On their way from Ludham to the ruins of the Abbey of St. Bennet's at the Holm, the members visited Ludham Hall, the site of the Grange of the Abbey, and subsequently of the summer residence of the Bishop of Norwich. Dr. Beasley read on the spot a report of the fire, made by the Rev. A. Harrison, rector of Catfield. The members next proceeded down the marshes to the ruins of the Abbey Gate-house. A paper was here read by the Rev. C. R. Manning, from Taylor's "Index Monasticus," which summarised all that is known about the rise and fall of the

abbey. After the reading of the paper the site of the Abbey Church was pointed out by Mr. Powell. The visit of the Association to the abbey was one of the most pleasant features in the day's excursion, and ended the summer gathering, the members dispersing immediately on leaving the marshes.

The Essex Archaeological Society.—The annual meeting of this Society, took place at Maldon, from whence excursions were made to various places of historic interest in the neighbourhood. The programme, as has been the case for the last few years, was much too full for the few hours allotted to it. The proceedings were initiated by a general meeting in the large room of the Public Hall, which had been turned into a museum of antiquities. The audience consisted of about 100 persons, including thirty or forty ladies. The Bishop of Rochester, who was accompanied by the Hon. Mrs. Clanghton, presided. Mr. King presented the twentieth annual report of the Society, from which it appeared that there was a balance of 120l. at the bank, of which about 80l. were an "available working balance." The number of members was 173, showing, unfortunately, a loss of seventeen since the last revision of the list. The museum at Colchester has been greatly increased during the year by valuable gifts of coins, medals, and various objects of antiquity. In 1870 the number of visitors was 10,155; in 1871 it was 13,969, and during the past year it was 14,780. The meeting listened with interest to a speech from the Rev. E. R. Horwood, descriptive of the old church of All Saints, Maldon, and of the ancient history of the town itself. Mr. Nichols explained the stained glass. The bishop, in closing the meeting, deplored the fact that this interesting and useful society had only 173 members. In Kent an archaeological society had 1,000 members; in Sussex there were as many; and even the Surrey Society, which was quite a young one, had more members than this. The history of the most ancient inhabitants of our land was very much bound up with Essex, and it was a pity that the spirit of archæology should not be much more dominant in the county. The party then partook of luncheon, served at the Blue Bear Hotel. Afterwards, the churches in the town, Dr. Plame's Library, Beoligh Abbey, the site of Woodham Walter Hall, Daubury, Little Baddow, and the priory church of Hatfield Peverel were visited, a paper on the last being read by the Rev. T. Debary. Next year's meeting is to be at Dedham.

Sheffield Architectural and Archaeological Society.—The members of this society, to the number of about five-and-twenty, recently made an excursion to Hardwick and Bolsover, under the generalship of Mr. J. D. Webster, one of the honorary secretaries. At Hardwick Hall, the Rev. J. Stacey, president of the society, read a paper on the history of Hardwick, and the career of the famous builder of the Hall, Elizabeth, Countess of Shrewsbury. On the way to Bolsover, a short digression was made to see the curious old Norman church at Ault Hucknall. At Bolsover, the church was first visited, and then the castle. At the latter place, the party were received by Lady Frances Beaulieu. On reaching Chesterfield, tea was provided at the Angel, and the party then returned to Sheffield. The day was very fine, and the arrangements were satisfactory.

A WORKMEN'S CITY.

This was the term used by Lord Shaftesbury, on Saturday last, after laying the first stone on an estate at Wandswoth, called the Shaftesbury Park Estate, which has been acquired by the Artizans', Labourers', and General Dwellings Company (Limited), and is to comprise 1,200 dwellings. The company was formed in 1867, in consequence of the destruction of houses by railroads, and other improvements, for the purpose of enabling working men to erect dwellings combining fitness and economy with the latest sanitary improvements, and to become themselves the owners of these dwellings in the course of a stated number of years, by the payment of a small additional rent. On every estate purchased by the company a suitable space will be reserved as a recreation-ground, a co-operative store will be built for the special benefit of the tenants, and public-houses will be absolutely forbidden.

"We have founded this day," said his lordship, "a workmen's city, and we have founded it upon the very best principles. We have founded it upon the great

principle of self-help, and upon the great principle of independence. By independence, I mean without any other assistance than that which every man has a right to receive from his fellow-man,—sympathy and kind aid,—and that is what every man, either great or small, stands in need of from another. You have founded the workmen's city upon your own efforts, and by your own contributions, and for the great and wise purpose of advancing your social position and bodily health, as well as your intellect and general prosperity. And most heartily do I say for myself, and I also say it in the names of hundreds and thousands of your fellow-men,—that the blessing of Almighty God will rest upon the good work which you have inaugurated to-day. I like the principles you have laid down for your guidance. You have shown your wisdom, in a moral point of view, by excluding the public-house and the tap-room; and you have done with them as the people did of old by the lepers, you have put them outside the camp.

We are not quite certain that we desire to see workmen's cities established. We have no desire to segregate classes; but we shall doubtless have an opportunity before long to know more of the plan proposed. Lord Shaftesbury gave, as he always does, some excellent advice, and has doubtless satisfied himself of the wisdom of the scheme proposed to be carried out.

THE RAILWAY ARCHES QUESTION.

THE St. Saviour's Board of Works have followed the example of Lambeth, and determined to take proceedings against the Chatham and Dover Railway Company to compel them to remedy the nuisance caused by the percolation of water through their railway arches. The company are also to be further proceeded against with reference to the noise and alarm caused by the trains passing over the bridges, which has now become an intolerable nuisance, and a source of positive danger to invalids. It is contended that the loud noise could be materially abated, if not almost completely stopped, by the face of the girders being covered over and enclosed, instead of being exposed as at present, the rails being laid upon the top of the girders with only a thin sheet of iron between them. The bridge at Ludgate-hill, which is already enclosed and covered in, is pointed to as a proof that the nuisance complained of with respect to the several bridges in Lambeth and other railway bridges south of the Thames could be easily got rid of.

LONDON SCHOOL BOARD.

At a recent meeting of the Board, Mr. C. Reed, M.P., moved, in accordance with a previous recommendation of the Works Committee:—

"1. That Mr. E. R. Robson be, and he is hereby, appointed architect of the Board, at a salary of 1,000*l.* per annum, with a view, amongst his other duties, to his designing and building the schools of the Board; that Mr. Robson give his time to the Board, and that the Board provide the necessary staff and offices.

2. That it be referred back to the Works Committee to make arrangements by which Mr. Robson may be relieved of the duty of looking out for sites and negotiating for their acquisition."

He said, in consequence of the increased labour thrown upon the committee in reference to the acquisition of sites and arrangements for buildings, it had been found necessary to make a re-arrangement of the architect's department. At the present time, the Board had acquired fifty-four sites, and had appointed thirty-one architects to build schools, including seven who would be proposed at this meeting. In response to the appeal for competitive designs, about 180 architects had sent in their designs, with regard to the schools where the competition had been limited to six architects for each school; and in regard to one open competition, fourteen architects had sent in designs. Practically, therefore, the Board had arranged for buildings on thirty-two sites. As the Board proceeded with this work, they found a difficulty in getting superior architects to compete; the Board had not offered any fee for the preparation of the designs, but had given to the successful competitor the execution of the work. Under the circumstances the committee felt there might be a difficulty in future in getting a sufficient supply of competitive designs. Within the next eight months fifty or sixty more schools would have to be arranged for; and the question arose as to the best way of dealing with this moiety of the work to be fulfilled within the term of the present Board's existence.

Mr. Freeman said when the Board commenced their operations they gave an opportunity to the architects of London to compete and bring out anything good in the way of schools, but that had practically worked itself out, and it would be a serious thing to go on paying a commission of 5 per cent. for all schools, so that the payment

of 1,000*l.* a year to their own architect would really be a considerable saving to the rate-payers. Mr. Robson had given abundant evidence that he was thoroughly qualified for designing and building schools for the future.

The resolution was then agreed to.

The following were appointed architects for carrying out the schools to be erected on the undermentioned sites respectively:—(i.) Eelbrook-common, Chelsea, Mr. Basil Champneys. (ii.) York-road, Islington, Mr. F. W. Aldwinckle. (iii.) Cottenham-road, Finsbury, Mr. Lucy W. Ridg. (iv.) Wilmot-street, Bethnal-green, Messrs. J. Giles & Gough. (v.) Harper-street, New Kent-road, Mr. Robert W. Ellis. (vi.) West Ferry-road, Millwall, Mr. R. Phénix Spiers. (vii.) South-road, Brockley-road, Mr. H. Saxon Snell.

Since then the following appointments have been made:—New Winchester-street, Finsbury, Mr. Charles Barry; Bunnell-street, Islington, Mr. T. Roger Smith; Woodpecker-road, Newcross, Mr. Frederick Warren; Turin-street, Bethnal-green, Messrs. Bodley & Garner.

SCHOOL BOARDS.

Leeds.—A report recommending, among other measures, the acceptance of tenders for building three new schools, amounting in all to nearly 20,000*l.*, has been adopted, after some discussion, by this Board. The foundation-stone of the first school building to be erected by the Leeds School Board has been laid in Bowerley-street, Dowsbury-road, by Sir Andrew Fairbairn, the chairman.

Walsall.—The following tenders were presented for the erection of the Tantarra-street School:—Mr. D. Moore, Walsall, 3,005*l.*; Mr. J. Rowley, Walsall, 3,168*l.*; Messrs. Rowley, jun., & Lyneux, Walsall, 3,210*l.*; Mr. G. Heveingham, Wolverhampton, 3,387*l.* 4*s.* For the erection of the Bloxwich School:—Mr. D. Moore, 2,923*l.*; Mr. J. Rowley, 2,977*l.*; Messrs. Rowley, jun., & Lyneux, 3,280*l.*; Mr. G. Heveingham, 3,161*l.* 12*s.* The offer of Mr. Moore for the erection of the Tantarra-street school was accepted, and that of Mr. James Rowley for the erection of the Bloxwich School. The architect's estimate, it was stated, was in each instance 3,000*l.* It was stipulated that the first-named school should be completed within eight months from the 1st of August, and the other within eight months of the contractor receiving notice to begin the work. Payment of the undermentioned sums was ordered:—560*l.* to Mr. D. Moore on account of his contract for the erection of the Wisemore School; 610*l.* 3*s.* to Mr. T. Highway for the Wisemore site; 857*l.* 12*s.* 6*d.* to the Rev. J. Barrow for the Bloxwich site; and 150*l.* to Mr. S. Russell, for his interest in the Paddock site. The clerk produced a statement showing that, inclusive of these contracts, the Board had become liable for an aggregate sum of 10,700*l.*

Southampton.—The clerk read a communication from the Education Department, returning the plans for the erection of Board schools in Bevois-town, which they deemed satisfactory, and intimated that before tenders for the building were accepted an accompanying form should be filled in and sent up, in order that the Board might consider what amount of grant they could recommend towards the school. It was resolved that the form be referred to the general purposes committee, and that tenders be advertised for.

Hereafter.—On the question of the appointment of a clerk of works, Mr. Scott doubted the wisdom of going to the expense of appointing such an officer, knowing the integrity of the builders, and considering the fact that the architect resides near the works. Mr. T. R. Hill did not agree with Mr. Scott's views. No one could have greater faith in Messrs. Wood than he had, but where over 100 workmen were employed it was necessary some responsible person should be employed to see that the character of the material used and the quality of the work done were satisfactory. He mentioned that, in point of economy, this might be done without going to great expense in the election of an officer. Mr. Rowe, the architect of the prison buildings, had arranged for the supervision of the works by one of his clerks at a weekly payment of 1*l.* Mr. Day, the architect, who attended the meeting, stated that he could arrange for a similar supervision; and Mr. T. R. Hill moved:—

"That Mr. Day having said that such supervision of the works as would be requisite, in addition to his own, to enable him efficiently to protect the interests of the Board, would be obtained by the employment of one of his clerks, at a salary of 1*l.* per week, without the employment of a

clerk of works, resolved that the employment of Mr. Day's clerk on the terms named be sanctioned."

The Rev. Canon Wood seconded this resolution, which was carried unanimously.—The seal of the Board was affixed to the contract of Messrs. Wood for the building of the new schools.—The Board decided that the principal stone of the new school-buildings should be laid, with due ceremonial, on the 19th inst.

Huljao.—The clerk read the report of the Sites and Building Committee respecting the erection of the schools belonging to the Board and containing specifications as to their construction. The report was adopted, and it was resolved that the competition for designs should rest with the architects within the limits of the borough.

THE ARTIFICIAL DESICCATION OF WOOD FOR FUEL AND ENGINEERING PURPOSES.

THE methods hitherto employed to preserve the soundness of timber may be classed under one or another of the following heads:—

1. Applications to the surface of the wood, to prevent contact with the air.

2. Open-air immersion in some antiseptic liquid.

3. A process of suction or filtration, of which Boucherie's method is a type.

4. Injection with an antiseptic fluid with the aid of successive processes of exhaustion and atmospheric pressure.

5. Artificial desiccation in closed vessels, as a preliminary to some one of the above processes.

Several of the above-mentioned processes have formed the subject of valuable memoirs from the pen of the late M. Payen, in various scientific journals. In the paper now before us his observations are designed chiefly "to illustrate the advantages of stove-action, both in the simple desiccation of wood and in preparing it for the aforesaid treatment." Some preliminary remarks are made upon the advantages attendant on the uses of thoroughly-dried fuel in metallurgical operations and other industrial processes:—

"The presence of air and moisture in the pores of wood is one of the most active promoters of fermentative action in the organic tissues, and of the consequent changes which involve the ultimate destruction of the wood. These changes frequently carry off a notable proportion of heat-producing substances; in like manner, the water contained in the wood, in the process of evaporation, absorbs and carries off a portion of the heat generated by the heating of the surrounding ligneous matter, the heating power of which is reduced accordingly. To obtain a clear idea of the advantages secured by drying wood intended for use as fuel, we must compare the volume of heat generated by the combustion of a given weight of dry wood with that obtained from an equal weight of the same wood when wet or full of sap. The comparison may readily be made by taking the ordinary chemical composition of oak wood as a standard, and comparing the equivalent amounts of carbon which it represents in each state. Now, 100 parts of dry oak wood contain 59 parts of carbon, 6.20 hydrogen, and 43.80 oxygen. The heating power represented by the carbon must be augmented by the equivalent of the excess of hydrogen over and above that required to convert the oxygen present into water. In oak, this excess of hydrogen is about 0.630, which would be equivalent in heating power to 1.89 of carbon. The heating power of 100 parts of dry oak is therefore equal to 50 + 1.89, or, 51.89 parts of carbon, i.e. of pure charcoal. But to determine the amount of useful heat, we must reduce the above amount by the volume of heat absorbed by the hydrogen and oxygen which pass off in combination in the form of water. The water thus formed amounts to nearly 50 per cent. of the component elements of the wood, and the heat absorbed by it in the process of evaporation, at the temperature of combustion, is equivalent to five parts of carbon. Consequently, the amount of useful heat generated by the combustion of 100 parts by weight of dry oak wood is equal to 50 + 1.89 - 5 = 46.87, or very nearly that of 47 like parts of pure charcoal.

We can easily compare the useful heat obtainable from 100 parts of wet wood, by assuming

* From the French of the late M. Payen, Member of the Institute;—"Annales du Conservatoire des Arts et Métiers," vol. ix, 1871.

that oak-wood in this state will hold 45 per cent. of water; 100 parts by weight will thus consist of .45 of water and .55 of dry substances. As 100 parts of dry oak-wood are equivalent to 46.89 of carbon, 55 such parts will equal 25.79 of carbon. From this must be deducted the heat absorbed in the evaporation of the 45 parts of water, which will equal 4.50 parts of carbon. The useful heat obtainable from 100 parts of wet oak will therefore equal 25.79-4.50, or 21.29 parts of pure charcoal only. In other words, to generate a volume of heat equal to that supplied by 100 parts by weight of dry oak-wood, we require 225 parts of the same wood when it contains the proportion of moisture we have supposed above.

In addition to the loss thus occasioned directly, which in itself is serious enough, there are certain operations—such as glass-founding, the fusing and volatilisation of zinc, and the like—in which it would be impossible to secure the desired results with damp fuel; the heat developed would only balance the loss caused by draughts and radiation. Thus, it will be seen that the desiccation of fuel—always of essential service—is, in certain metallurgical processes, absolutely a necessity. The preliminary drying can be most advantageously performed when it is possible to effect it with the waste heat carried away by the gaseous products of combustion. In cases where the wood is to be injected under atmospheric pressure, the previous elimination of the moisture contained by it will be useful in many ways, and is, indeed, essential to the penetration of heavy antiseptic preparations, such as creosote, sulphate of copper, and the like.

Two methods are available for this purpose:—
1. Natural desiccation, by exposing the wood for a lengthened period to the air, sheltering it, of course, from rain.
2. Artificial desiccation, in stoves of various descriptions.

Again, it is obvious that the impregnation of the wood with antiseptic fluids, in closed vessels, can only be effectually performed when the wood is in a sufficiently dry state to admit of the exhaustion of the air from its pores, and the entrance therein of the injection. If damp, or newly-cut wood be subjected to the injecting process, the fluids contained in the tissues being confined on all sides, and virtually incompressible, cannot give place to the antiseptic fluid whatever may be the pressure exerted. Practically, therefore, injection in closed vessels is only feasible when the wood is sufficiently dry to admit of the exhaustion of the air or gases contained in its tissue and their replacement by the antiseptic fluid supplied by the pumps. This fact was recognised long ago. Hence the great number and variety of apparatus designed for the purpose. But in spite of the advantages which might fairly be expected to result from their employment, the latter have been very rarely in coming into general use; a fact which may, no doubt, be explained by their high price and imperfect construction, and the tediousness and costliness of the processes. It is only within the last few years past that the artificial desiccation of wood before its impregnation with an antiseptic preparation in closed vessels has been generally adopted in practice. Previously, it was customary to leave the wood—railway sleepers more especially—exposed to the air for a period of eight to twelve months, according to the season. This was very objectionable, not only on account of the loss of interest on the capital represented by the wood during this tedious process, but also by reason of the injury done to the wood by atmospheric influences, and the necessity for large and costly timber yards, and the concomitant expenditure in labour and transport, which were often ruinously great.

The first essays in the art of drying wood artificially carry us back to a period now tolerably remote. Wollaston and Fourcroy both recommended the drying of wood in ovens. Newmann, a German chemist, suggested another method, which has since been adopted in a somewhat different form, *i.e.*, steaming the wood. Newmann placed the wood to be dried in a large wooden chest, taking care to leave spaces between the pieces, and then turned on the steam on a boiler provided for the purpose. The condensed steam, charged with albuminous matter taken up from the wood, or rather from its surface, was run off from time to time, and the progress of the operation was judged by the colour of the water. When the latter was clear and colourless, the chest was opened, and the wood withdrawn for use, without further pre-

paration. The process would have been useful enough if superheated steam, which would have dried the wood by absorbing the moisture, could have been used, but the cost of the process would doubtless have been too high to permit of its practical application.

In 1837, M. de Mecquenem devised a method of desiccation in which the pieces of wood to be dried were placed in a closed chamber, and subjected to a current of hot air, heated for the purpose by a special apparatus, and driven by a blower. The air entered by apertures in the lower part of the chambers, and escaped at the top, laden with the moisture absorbed from the wood.

In 1839, M. Charpentier obtained a *brevet d'invention* for a process of drying wood in hermetically-closed chambers. The wood was subjected to the action of air heated by contact with metal plates covering the flue of a coke furnace. This air entered by conduits on the level of the floor of the chamber, and escaped at the top, through apertures leading into the chimney of the furnace. Between 1848 and 1853, Bethell, who had paid much attention to the subject, obtained several patents, both in England and France, for stoves for drying wood. In his English patent of 1848, and the subsequent French one of 1853, we find a description of a peculiar kind of stove on the following plan:—

It consisted of a rectangular chamber formed of three walls, and vaulted over; the whole in brickwork, with a certain thickness of slag in the centre, to prevent loss of heat. One extremity of the chamber was open to admit of the introduction of the wood by means of a truck running upon longitudinal iron rails. The opening was closed with a double door when the chamber was full. On the exterior of the opposite end of the chamber was a furnace to burn coal, coke, wood, or tar, according as it was desired to dry the wood simply, or, in the words of the inventor, to smoke it, *i.e.*, to impregnate it with the antiseptic gaseous matters evolved in the imperfect combustion of certain tarry substances. The heated air or smoke entered through a flue running along the floor and branching out at the end; and it escaped, or was pumped out at the top of the vaults. Bethell kept at a temperature of 110 Fahr., and that the duration of the process should be regulated by the condition of the wood. His experiments showed that this time varied from eight to twelve hours,—the rapidity being attained at the cost of a relatively large expenditure of fuel. In point of fact, the draught was too great to permit of the utilisation of the full amount of heat contained in the gaseous matter, which escaped at a temperature very little below that at which it entered. The heat produced by the fuel was badly utilised, and it is open to question whether, under any circumstances, large pieces of wood, such as sleepers, could be dried in so short a time as eight or twelve hours. The drying could only be effected by the use of a very high degree of temperature, tending to split the wood and weaken its strength. This view was confirmed by the results obtained in a long series of experiments made in 1852-3 by an English manufacturing company, known as the Desiccating Company. A low temperature, and long continuance of the drying process, appear to be the conditions essential to the success of artificial desiccation, particularly with wood intended for cabinet-making, turning, joinery, ornamental work, &c., in which it is desirable, as far as possible, to prevent splitting, warping, and other changes of structure in the material. These results, it would seem, were not secured, by the arrangements above described.

THE HORTON INFIRMARY, BANBURY.

EVERY week tells of the devotion of large sums of money by individuals for public purposes. The result of a recent instance we illustrate in our present number. The Horton Infirmary, which abuts on the Oxford turnpike-road, about a mile out of Banbury, and was formally opened a few weeks ago by the Bishop of Oxford, was commenced in June, 1869, by the late Miss Horton, of the Holt, Middleton-Cheney, and of a gift to the town of Banbury. Her death, shortly after, caused a stoppage of the works for some months; they were, however, resumed in May, 1870, by her great-nephew, Mr. J. H. Horton, who, being desirous of carrying out her wishes to the fullest extent, has spared no expense to

make the building as complete as possible for the purposes for which it is intended.

The infirmary stands in its own grounds, and is constructed in red brick with black bands and Box-ground stone dressings. The centre block contains the executive portion of the establishment, and the two wings the wards for patients. In the executive portion there is, on the ground-floor, an entrance-hall, 10 ft. by 16 ft., paved with encaustic tiles, leading into a corridor about 150 ft. long, varying in width from 9 ft. to 7 ft., by which access is obtained to all parts of the building. This corridor affords means of exercise to patients in wet or severe weather. On the right and left of the entrance-hall, and connected with it and the corridor, are the surgeon's, matron's, and porters' rooms; opening from the corridor is the operating-room, 20 ft. by 16 ft., with an open-timber roof, which is lighted by four large windows and a lantern-light. A gallery is provided for the students' use, under which are lavatories and sinks, with hot and cold water laid on, as also to the sinks for the use of the operating-room. There are waiting-rooms for men and women, and dispensing and consulting rooms; a room for convalescents, 16 ft. 6 in. by 14 ft., and rooms for hospital stores and comforts. The wings contain the wards for male and female patients respectively; they are each 48 ft. long by 24 ft. wide and 16 ft. high, with fire-places at each end, and lighted on both sides and at end. At one end of the wards, and having a direct ventilation from the external air, are lavatories, sinks, and bath-rooms, with an ample supply of hot and cold water laid on; and at the other end are ante-rooms, sculleries (with sinks), and nurses' rooms. The wards and rooms appertaining to them are plastered throughout with polished Parian cement; the dressings to doors and windows are executed in cement; and the floors are wainscot, waxed over. The floors of rooms adjoining are ventilated by means of openings in the ceilings, air-flues, &c. With the exception of the kitchen and the bedrooms for the surgeon and matron, the whole of this hospital is on the ground-floor, and the plan has been so arranged that the building can be readily added to should it be found necessary to extend the accommodation of the present building.

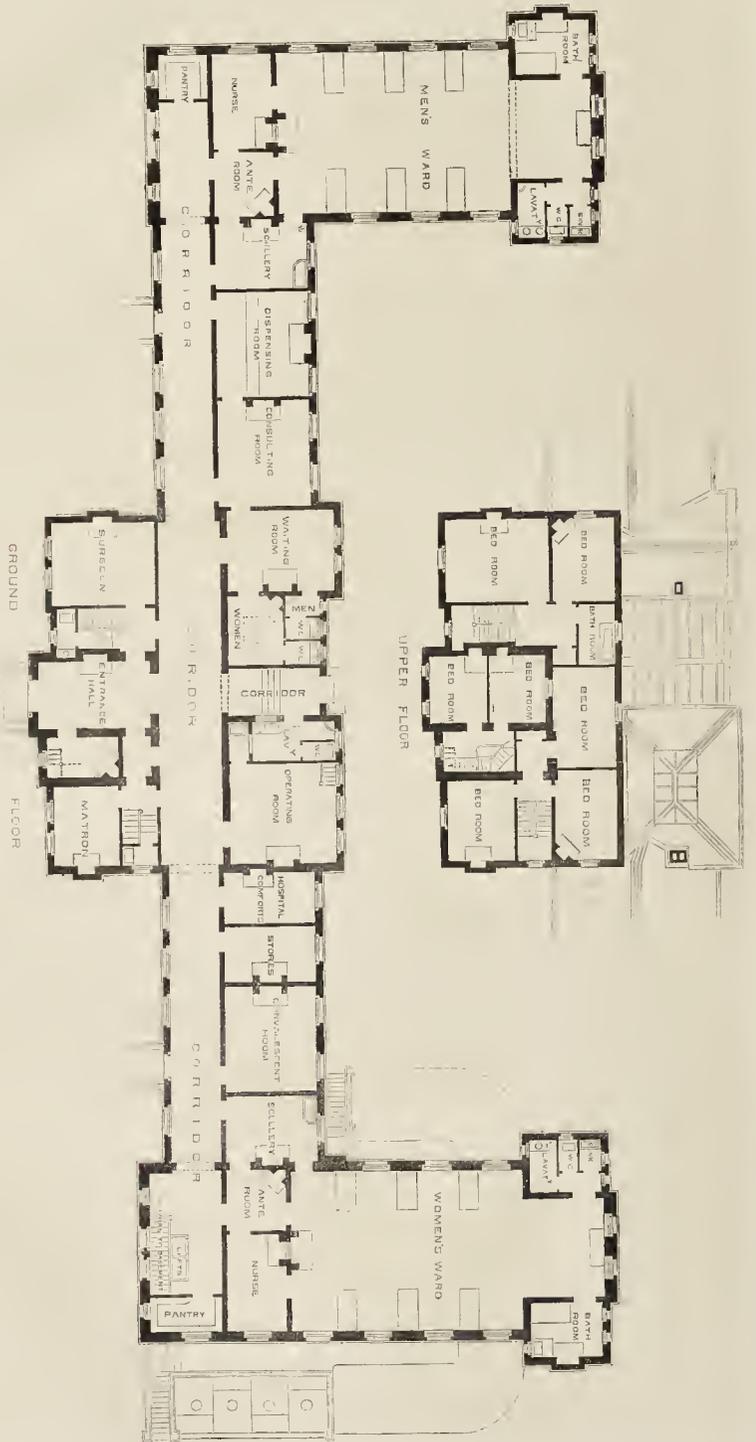
Taking advantage of the natural slope of the ground, a large kitchen is obtained under the women's ward, with scullery, pantries, wine, beer, and coal cellars, with a lift to the ground-floor.

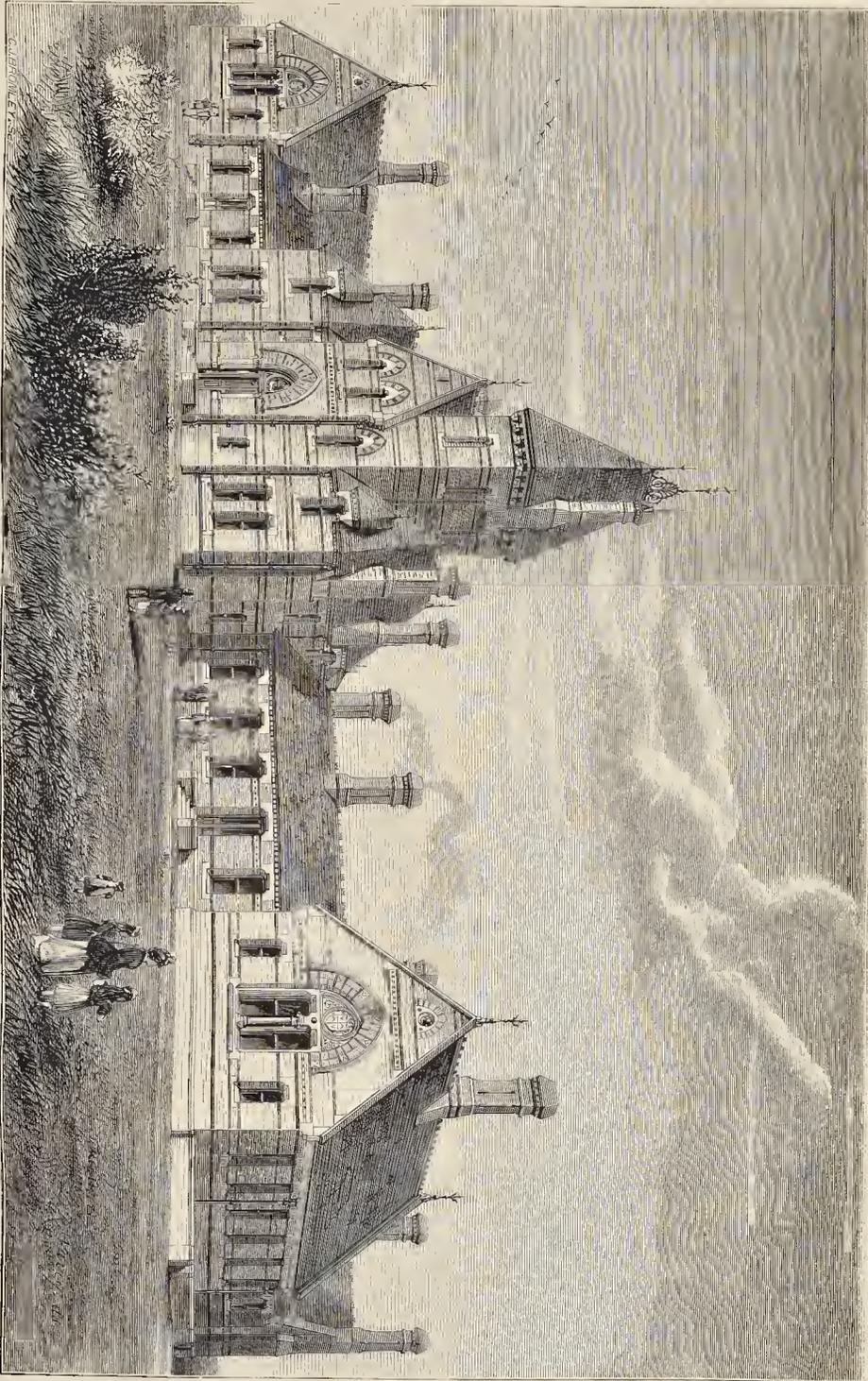
In the upper part of the centre block are bed-rooms for the surgeon, matron, porter, and servants. In the tympanum over the windows of the wards are carved the arms of the Horton family, and the monograms of the late Miss Horton and Mr. J. H. Horton combined. The grounds have been laid out as a garden for the use of the patients by Mr. P. J. Perry. A handsome railing and gates form the boundary of the hospital ground towards the end.

The whole of the works under the contracts have been carried out by the builders, Messrs. Franklin & Son, of Deddington, from the designs and under the personal superintendence of the architect, Mr. Charles H. Driver, of London.

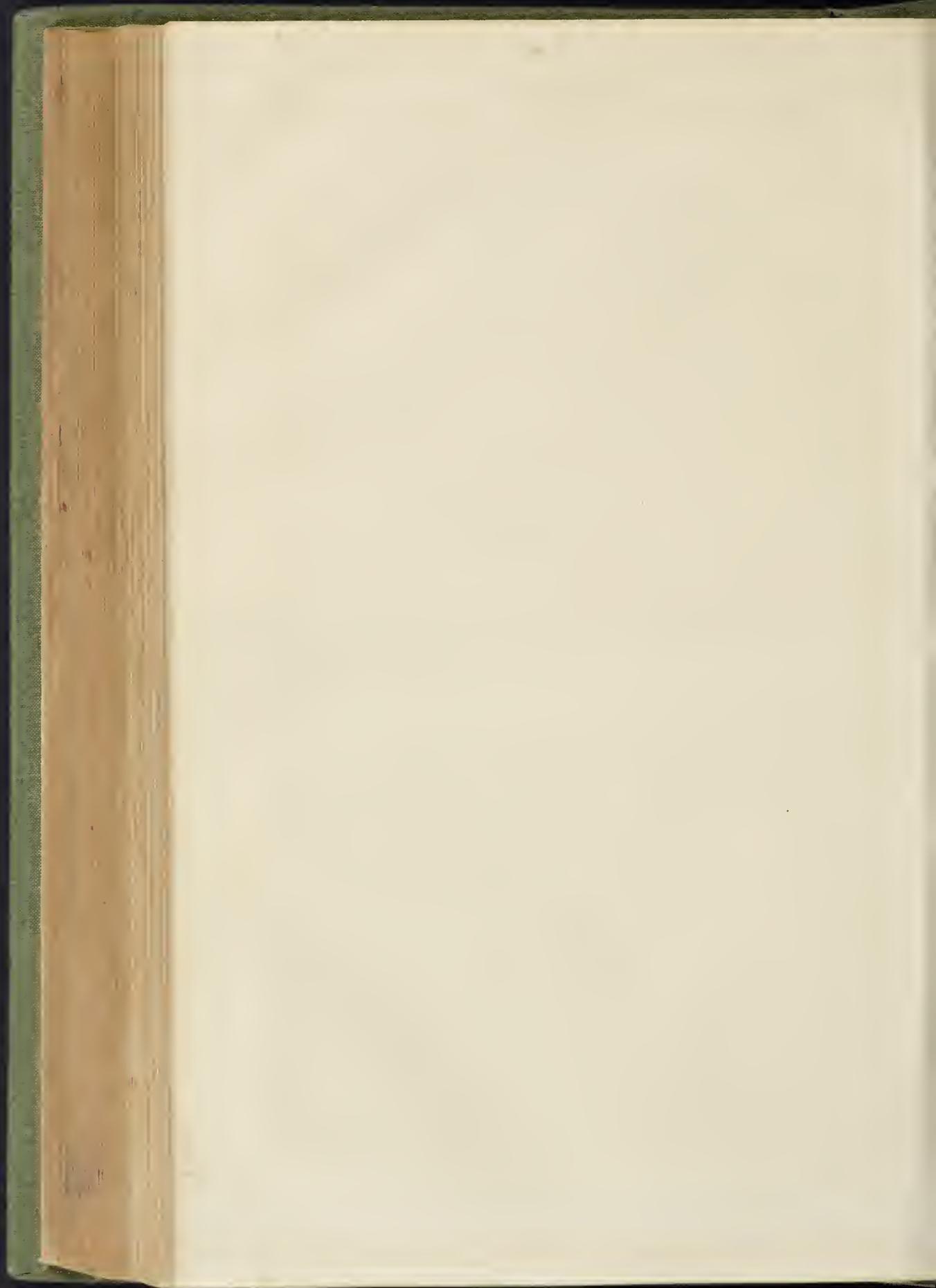
Together Mr. Horton and the late Miss Horton have given 10,000*l.*, including the value of the site, for the building and endowment of this institution. The erection of the infirmary cost 6,200*l.*, and the furniture about 900*l.*, and Mr. Horton has given 831*l.* 1*s.* 7*d.* towards its endowment, being the balance of the sum set apart by the donors for the purposes of the hospital. The total amount of donations towards its maintenance is now 3,500*l.* Mr. Hitchcock, of Leamington, has given 500*l.*, besides a promised subscription of 100*l.* a year. That donation was promised upon condition that 1,000*l.* were contributed by others towards the endowment fund, and it is gratifying to be able to state that that sum was not long in forthcoming. A portion of the land which was given for the site of the infirmary, and which is not at present required, is let at an annual rent of between 30*l.* and 40*l.* a year. This sum will go towards defraying the cost of the maintenance of the institution, which it is estimated will be about 600*l.* a year. The infirmary is intended for the use of the poor of Banbury and those residing within a radius of ten miles. In connexion with it is the Provident Dispensary, and a person can by a subscription of 1*d.* a week, or 3*d.* a week for himself and family, provided his children are not more than fourteen years of age, secure medical advice, medicine, and in case of serious illness, medical attendance at his own home.

THE HOITON INFIRMARY, BANBURY.—Plan.





THE HORTON INFIRMARY, EANBURY. — MR. CHARLES H. DRYDEN, ARCHITECT.



SEVERE THUNDERSTORMS.

We have a larger collection than ever of notes on all parts of the country as to the continuance of storms, and damages to life and property, but not occupy much of our space with their details, especially as the damages to buildings are mostly of a minor description, such as knocking down chimneys, and otherwise damaging houses, schools, tents, &c. Many persons have been struck by lightning, and more or less injured killed, but the deaths are few by comparison with the number struck; and often the results strange escapes from any injury at all to a person, while portions of the dress were torn away. Insensibility or blindness for a short interval has been frequent. Among those killed is again a person in bed. Fright has killed one, and a horse broke his neck with his owner from fright. Whole families have been struck, and yet none killed. At Derby, Mary's Roman Catholic Schools were struck, yet not one of 400 children in them was hurt. At Leicester a manufactory was on fire, and at Tewkesbury a circus-tent was burnt up. A gentleman whom we know taking shelter in the Holloway-road under a pavilion, when it was struck and shrivelled in a moment by fire. Thunder is even on Wednesday rolling in this same district; and we hear that St. Giles's, Cripplegate, has been rather severely injured, as also the Holy Trinity Church, Windsor. Stacks of hay and straw in various places have been burnt, and glass roofs broken. At Smithfield, hundred thousand pounds' worth of meat is tainted by the recent sultry heat of a single day. The heart of England has suffered severely again since last we recorded the occurrence of these extraordinary storms, and Ireland had its share of them. The accompanying winds in England have done much more damage in the lightning direct itself. At Douglas, in the Isle of Man, immense waves from the Atlantic have suddenly done much injury. These waves, and a peculiar vibrating motion of the sea, are supposed to have had something to do with the electric disturbances. An earthquake on the bed of the ocean might produce such shocks and vibrations. Violent thunderstorms swept over Germany and Switzerland. At Lux de Fonds the Festival-hall of the Swiss gymnasiasts was unroofed. Four persons lost their lives on the Zurich lake. Upsala (in Sweden) and its environs were visited by a terrible hailstorm on the 25th of July. The hail-stones, as big as pigeon's eggs, covered the road 11 in. deep; all the windows were smashed, trees broken, and the crops utterly ruined in the district. Together, these physical commotions have probably far exceeded those which in 1869 produced the great earthquake.

WHO GETS THE PROFIT?

Permit one who lives on Pit Bank to say a few words on the prevailing topic, and your remarks thereupon. In South Yorkshire, during the fall last year, the price of steam coal at the pit's mouth ranged from 3d. to 7s. per ton. Since then there have been four advances of 10d. per ton each, and an advance of 2s. 6d. per ton; so that now the price of coal is from 12s. 6d. to 13s. per ton. At the same time colliers' wages have advanced 1s. per ton only, while the cost of coal to the collier has advanced 6s. 6d. to 7s. per ton. Sixteen pence per ton will cover all the extra expenses added by increased wages to engine-drivers, fitters, &c., cost of coal, oil, fodder for horses, and a clear additional profit to the owner of 5s. to 6s. 6d. per ton, making, in all, some 10 per cent. Now, sir, it seems to me a very odd and pertinent question to ask what this collier does to deserve these enormous profits. The seventh of the additional profit has been taken from him by the workers, while he quietly sets the other six-sevenths, and is, I hear, Oliver, asking for more. A complaint, noticed by you, has been going round of the papers, that the colliers are getting their increased earnings in drink, and neglecting their work thereby. If this charge is true, it is, of course, much to be regretted, though my own observation does not bear it out. An increased cost of food and clothing alone would swallow up his increased earnings; so that if a collier drinks more, he must eat and dress less. But then colliers are, and have ever been, a very debased class, with no pleasures

or desires other than their belly and their "dawn"; and if the public wants cheap coal, let an afraid colliers must be kept ignorant, as now, knowing no fear and fearing no danger. Let the Education Act have force through a couple of generations, and I venture to doubt whether, in spite of any or all the securities against danger which the Legislature may be able to enforce, and human ingenuity devise, men will be found in sufficient numbers to raise as much coal as will be required to carry on manufactures alone in this country, even if our present ruinous export is stopped. No man of any education can be persuaded to hurry himself in the bowels of the earth ten hours or even eight hours per day, so long as he can earn a living in the sunshine.

I cannot pass by this question of reduced hours of working without protesting against the tone of the complaints made by the employers, who seem to assume that workmen have no right to workless, whatever their remuneration may be. I say it distinctly, that no one who works for wages likes long hours, but will do all he can to make them as short as possible. Fancy, going down into a mine in the early morning twilight, and working there in darkness all the time the sun shines above, and returning to the surface just in time to see his last rays. Who but a slave would submit to this?

The hours of labour will be much shorter in the future than they have been in the past; and justly so, or why should we invent and use labour-saving machines, and more economical modes of working? When there are no *draves* in the country, and every person earns his dinner by brain or hand before he eats it, it will be time enough to complain of short working-hours, should the production be insufficient for our wants. E. G.

A BOX-IRON.

Sir,—A new American box-iron for laundry purposes is advertised. It consists of a hollow box-iron, with a short bent flue at the top of the nose end, and a regulating draught-hole at the butt end, so as to form a small furnace, in which wood charcoal is burnt for the purpose of heating the iron. Will not the products of the combustion consist largely of carbonic acid gas, and is not the apparatus likely to be detrimental to the health of persons using these irons and breathing the gas thus thrown off? R. M.

THE ROYAL AGRICULTURAL SOCIETY.

Sir,—I can sympathise with your correspondent of last week as to the behaviour of the Royal Agricultural Society in the case of the competition for two cottages, as they behaved in a precisely similar manner to a number of competitors sending in designs for the "best mode of laying out a lot of land for cottages for the labouring classes in various degrees of accommodation and size."

I took an immense amount of pains, trouble, and expense to send in a set of plans, and the result was, "No design comes up to the mark of the Society's ideas," &c. This was at the Leeds show, about twelve years ago. J. NUNN.

OPENING OF THE NEW PIER AT HASTINGS.

The opening of this pier by Lord and Lady Granville, on the 5th inst., was an important event in the annals of Hastings and St. Leonards. The pier has been constructed after the model of the West Pier at Brighton, but the floor or deck of the pier is flush with the parade, from which it is approached, thus rendering steps unnecessary throughout its whole length, and at the sea end there is a pavilion or "palace on the sea," entirely closed in and capable, it is said, of holding about 2,000 people. The position of the pier is on the Hastings side of the dividing line between the two towns, being opposite the garden of the Sussex Infirmary. The deck, which is closely and smoothly laid like that of a vessel, is 45 ft. wide for half its length. At the shore end it gradually widens out to 190 ft., giving ample room for separate entrances on the east and west sides. At the south end or "head" there is an expansion until an extremity of 130 ft. is reached. As the entire length from the shore seaward is 910 ft., it will form a promenade for visitors seeking to enjoy the sea-breeze of the south coast. The pavilion,

or saloon, out in the sea, is in the Alhambra style. Its dimensions are 150 ft. long by 100 ft. broad, and 30 ft. in height. The possible strain, as well as the weight of this superstructure, have made it necessary to impart additional strength to the part of the pier on which it stands, and to that end the floor of the saloon is raised about 3 ft. above the general level of the deck, and the main girders beneath are arranged diagonally, so as to give greater stiffness. The columns supporting the saloon and the girders are so braced together that there is said to be no vibration even amid violent storms. A covered way, answering the purpose of a verandah is made all round the saloon on the outside, and beyond, at the head of the pier, is a wide open space, where a fine view of Hastings and St. Leonards is obtained, including the whole coast-line between Fairlight and Bex-hill. 300 cast-iron columns with screw-piles have been used in the structure. Towards the shore the piles have been forced into the solid rock 2 ft. deep, and the remainder have been driven to a considerable depth into the clay. The sides of the pier are occupied with a continuous line of seating to the extent of 2,600 lineal feet. For walking a total area of 75,000 superficial feet has been provided. The engineer and designer was Mr. Eugénus Birch, of London, and the contractors were Messrs. R. Laidlaw & Sons, of Glasgow, gentlemen who have held the same relative positions in the construction of the Brighton, Blackpool, and other piers. The amount of the Messrs. Laidlaw's tender was 23,250l.

A PROPOSED NEW CHURCH IN PIMLICO.

A New Mission Church is about to be erected in Pimlico, in connexion with St. Peter's, Eaton-square, which has for some time been so crowded that there is not accommodation for the constantly increasing congregation. A site has been secured on the waste land lying between the printing-office of the London, Chatham, and Dover Railway Company and Gillingham-street, and having a good frontage into Wilton-road. The part reserved for the church will give a ground-floor accommodation for about 700 persons, and leave a space to be used at any subsequent period for enlarging the church or erecting schoolrooms. All the seats are to be free, but it is proposed to adopt some plan to secure the rights of those living in the district over strangers, by keeping their seats until a certain time.

PITCH AS A PROTECTION AGAINST DAMP.

Sir,—I should feel much obliged if any of your numerous readers could give advice, or the result of their experience on the following matter. Some years ago, in the erection of a large country house in an exposed position, where the outer walls were of stone and lined with brick-work, instead of having the south and western walls battened, I had a coat of Stockholm pitch paid completely over the whole internal surface of these walls; and whilst in a soft state the pitch was roughly scored with a stick, so as to form a key for the plaster, which was subsequently applied in the usual manner, and with three coats. The result was perfectly satisfactory. No damp of any kind has since appeared. The rooms were papered within a very short period of their completion without any subsequent discoloration, and there has been no annoyance from smell. I have subsequently applied it on brick walls as satisfactory a result; but last year, in the erection of another large house, where the main walls were of flint, lined with brick, and covered with Portland cement on the outside, I had the inside walls rendered with pitch in the same manner as above described: the pitch seemed longer drying than usual, and the smell continued for a longer period. After the joiners' work was finished considerable annoyance was experienced from the smell of pitch, and some of it had to be taken down with a view to give air and vent to the smell. After leaving it exposed for two or three months, the annoyance seemed at an end; but now, on the return of the family from abroad and the occupation of the house, the smell seems to have returned, to the annoyance of every one. The builder declares that he used the best pitch, and that no tar was mixed with it.

Can any of your readers say why that which answered perfectly in former cases should prove

an annoyance in this case? And can they suggest any application which would counteract or remove the smell? As a protection against damp from the outside it answers perfectly.

T. H. W.

OPPOSITION TO THE PROPOSED NEW SOUTH LONDON CEMETERY.

The proposal to construct a new cemetery in the neighbourhood of Penge by the recently formed "South London Cemetery Company," is likely to encounter a considerable amount of opposition from several sources, on the ground that the site is unsuitable, the soil consisting of a dense clay, and unfitted for burials. The company propose that the cemetery shall occupy an area of 42 acres, and they have already secured the principal portion of the ground; an extension of 17 1/2 acres is, however, required to make up the required 42 acres; but before obtaining this for cemetery purposes, the sanction and licence of the Home Secretary are necessary, and for these they are applying. The inhabitants of South Norwood are adverse to the cemetery being formed in the locality, alleging that the formation of a cemetery in a district comprising upwards of 900,000 inhabitants, would have a depreciating effect on the surrounding property, and encourage the erection of an inferior class of buildings. A public meeting has just been held on the subject, at which it was decided to oppose the granting of the licence by the Home Secretary, and a committee was appointed to carry out the object of the meeting. The Lewisham District Board of Works are also opposing the project, and a petition against the granting of the licence for the additional 17 1/2 acres has been signed and presented to Mr. Bruce by the Board.

ORIGIN OF FIRES.

SIR,—Captain Shaw, the Chief Superintendent of the London Fire Brigade, has published, recently, a very useful work upon the nature of fire-risk, &c., which you have reviewed. A work, compiled by some competent person, upon the origin of fires in buildings, especially in ancient houses, would be useful, as scarcely a year passes without some old edifice being destroyed by fire in Britain. Neale's "Views of Seats," A.D. 1820, contains an engraving of Heythorpe House, near Chipping Norton, then a "stately residence," erected by Robert Archer for the Duke of Shrewsbury, A.D. 1705, and occupied by the Duke of Beaufort, A.D. 1820. Subsequently it was destroyed by fire, caused, I believe, by linen, which had been placed to dry, taking fire at night; and when I saw the place, in 1819, the walls alone remained. Frequently, a wooden beam or an over-heated flue causes the disaster. The fire may smoulder for several days, and break out at night unexpectedly. I believe that a plainly-written work, by some experienced architect competent for the purpose, showing the general reason of fires in edifices, especially in old buildings, with useful practical hints and suggestions, would be popular, and prevent some old houses from being destroyed before they might be without such information. If I were the owner of an old mansion, I would have it examined by a surveyor, at least annually. I think Longiton Hall, Essex, which I saw on fire in the winter of 1837, was burnt owing to a beam becoming ignited in a chimney.

CHR. COOKE.

PROTECTION OF IRON.

SIR,—Whilst admiring the construction of the scaffolding and the steam appliances thereon at the Town-hall, Manchester, yesterday (and, of course, the elegant structure within it), my attention was suddenly drawn to the rusty state of the railings inclosing the Albert Memorial, and the faded appearance of the heraldic painting and gilding; in fact, it appears to be too minute and delicate in character and detail for a work exposed to the elements.

How will the enormous quantity of gilding appear on the Rochdale Town-hall when it has weathered as many winters as the Memorial? Its renovation will be costly and dangerous.

I think it high time that some more permanent and inexpensive coating should be introduced for preserving iron from rust. Take, for instance, railings round tombs, first put up and neatly painted; families or friends of the departed leave the neighbourhood; a few years

pass, and paint gives place to rust. Galvanised iron answers to a certain extent, but would hardly serve in this case.

I feel certain there is a fortune to be made by any one who will invent the desired material.

H. J. P.

UTILISATION OF SEWAGE WORKS AT LEEDS.

TENDERS have been opened for the construction of a reservoir with twelve compartments, providing for a constant flow of sewage. The proposal of Messrs. Longley, Brothers, was accepted. The following is a list of the tenders:—

Table with 2 columns: Contractor Name and Amount. Includes Boothman & Broomhead, Helm & Co., Westley, Ryecroft, Abbey, Whitaker, Bros., Nichols, Longley, Bros., and Mr. Alfred M. Fowler.

Mr. Alfred M. Fowler, borough surveyor, Leeds, and Mr. W. W. Symington, Native Guano Company, London, are the engineers for the works.

THE COURTS OF JUSTICE.

In reply to statements by Mr. Cavendish Bentinck on Saturday last,—

Mr. Ayrton said his hon. friend had hardly done justice to his own view. Some time ago the hon. member for Whitehaven submitted for their consideration a motion which he then stated was four years too late, because he proposed that the whole question should be reconsidered; and he made some reflections on Mr. Street, as if he were incompetent to perform the duties for which he was appointed. The appointment of Mr. Street determined the style and character of the building to be erected, and that gentleman was singularly well qualified to carry out that style and to produce a building of as much beauty as any other architect that could be named. The hon. member had fallen into considerable confusion between the general plan which had been laid in the Library towards the close of last session and the more detailed drawings from time to time varied in minute ornamentation; but the general scope of Mr. Street's design had not been altered since it was exhibited in the Library. No benefit would result from commencing the House from time to time any change which Mr. Street might make in the ornamentation of the front of his building. In August last year the Treasury gave their sanction to the south front, and, according to contract, Mr. Street was bound to deliver the contract drawings which were necessary to enable the contractors to make tenders in February, this year; but he deemed it desirable to request much more time than he anticipated, and, so far as he could judge at the present moment, the Office of Works would not be in a position to receive tenders for the construction of the building for the next three or four months. His hon. friend wished to know what was to be done with the approaches to the Courts of Justice, and nothing was to be done with it. All the land would be required by the contractors for the enormous works undertaken, for the preparation of the stone, and shoring up the building.

Mr. Alderman Lawrence wanted to know whether the architect had entered into a contract under seal to carry out the works for a certain sum.

Mr. Ayrton replied that contract for the performance of the work for a certain sum had been signed, and the time necessary for the completion of building would be between six and seven years.

Mr. C. Bentinck said that, having learnt there was no probability that the work would be proceeded with this year, he would go no further.

"UNFAIR COMPETITIONS: BRIGHOUSE."

SIR,—Having been absent from home, I have only just seen the letter you published on the 27th ult. under the above heading. It is so absurdly mistaken, or so utterly malicious, that, as regards its author, it is unworthy of notice. In justice to your public position, however, it is necessary to advise you of the truth. With this view, I send you copies of The Brighouse News of July 18th and 20th respectively; the former containing a list of the tenders originally submitted for the chapels, lodge, &c., referred to in the letter in question, and the latter an account of the reductions effected.

You will see that the total of the lowest tenders was not 6,000l., but 2,931l. 5s., which sum included 275l. for boundary walling. On estimating, as made in the letter, in accordance with the requirements of the Board, was, without the boundary walling, 2,656l. The comparison, therefore, lies between 2,831l. 5s. less 275l., 2,556l. 5s., and 2,000l. showing a difference of 556l. 5s., instead of 4,000l. The real difference is sufficiently amazing, without any such exaggeration as has been placed upon it by your ingenious correspondent; but it is by no means peculiar to the case in question, as may be seen by recent reports of similar affairs in this district,* and probably also in other districts,—perhaps even in your correspondent's own practice, if he has any.

The second of the two cases herewith sent reports the value of the reductions proposed, namely, 19s. 7d., of which the Board, having been satisfied that the intended modifications could be effected without lessening the accommodation and without injuring the structural solidity of the buildings, adopted alterations which resulted in a saving of 18s. 11d., which left the amount of the lowest tenders 2,312l. 11s. 1d. Deducting

* Vide Bradford Observer, July 18.

from this amount the cost of the boundary walling, 275l., we have 2,037l. 11s. 1d. to compare with our original estimate of 2,000l.

I leave your readers to draw their own conclusions. The announcement referred to in the opening paragraph of the letter appears to have emanated from the same source, for it conveyed as much error as truth, and, practically speaking, failed in its gratuitous prophecy but it had the merit of correcting itself to some extent before it was absurdity.

From what point of view the competition in question can be classed as an unfair one it is difficult to see, unless it be from that of a disappointed rival. Our position was gained under motto, by the plainest style of drawing, and neither Mr. Gay nor myself had the honour of being acquainted with any gentleman at the Board or in the district, nor had we the slightest "influence," nor did we attempt to gain it.

When a gentleman, fired by public zeal, seizes his pen to meddle with the business of others, it is obviously his duty to make sure of his facts. In the absence of such approximation to accuracy, he exposes himself to certain natural suspicions, which belie your correspondent's statement and his professed motives. If, however, he acted in bona fides, he cannot fail to show his regard for truth and justice, by publishing a statement, signed with his own name, indicating the means by which he has been led to make such reckless and unfounded charges; and I would do well to win to remember that it is not necessarily a fraud to enter a competition; and that fair play does even to those who succeed.

F. BARTRAM PAYTON, who writes the letter in question sent us a new paper, in which the amount he named was given. He was probably misled by this.

THE FIRE AT ST. MARY'S, PADDINGTON.

SIR,—I feel sure that many of your readers, as well as mine, will be interested to know a little more as to the exact cause of the late fire at St. Mary Magdalen's Church, Paddington. The newspaper report states that a layer of pitch was spread over the roof of the steeple, and that the steeple, and thus ignited the whole roof. Is not pitch somewhat unusual substance to employ in such a situation? I have often described "pitched-incombustible roofing felt," and do hope that the latter is really what it professes to be. Would it be giving too much of Mr. Street (the architect of the church), to ask some slight explanation of the origin of the fire? EDWARD B. FERRIS.

"TREATMENT OF BUILDERS."

With reference to a letter in our last number which had we received a communication from a firm of solicitors in Hull, on the part of Messrs. Smith & Brodbeck, architects, stating, "1. That no acceptance of any tender made until that from the 'Scarboro' builder' had been received. 2. That the 'Scarboro' builder's' ten was forwarded by the 4.40 p.m. train from Scarborough Friday, and not on Saturday. 3. That his tender was 700l., and not 1,400l., below the lowest previously offered." We willingly insert this contradiction of statement in the letter referred to, and must request explanation from the writer of the letter.

MASTERS AND MEN.

SIR,—Will you allow a workman to say a few words on the question of wages? I think that the question of wages when looked upon as a mere question of political economy, as your correspondent "Brighton" says, it, "enlightens the mind," will always tend to promote antagonism between employer and employed. While, on the other hand, if the employer treats the workman as a man, he will be as well as himself, and not as a bale of cotton; and if any commodity that brings him in so much cash so doing he will create a reciprocal feeling on the part of the workman, making him feel that he is a kind of partner in the enterprise, and that wherever he is, it is a privilege to do his best for his employer. I am at this time only brought about by a better understanding both on the part of the employer and the man, and the Christian principles in the relations of every-day life. J. R. GOSLIN.

INJUNCTION AGAINST "INTERPOLATING" A HOUSE.

In the case of Bidgood v. Preston, heard in the E. Court, the plaintiff, who is owner of No. 21, Brunson terrace, Brighton, sought to restrain the defendant gentleman who had recently purchased the adjacent corner house, No. 20, from "interpolating" a house the rear of No. 20, between it and No. 27, Brunson square. The plaintiff relied on a covenant entered by the defendant's predecessor in title with the owner of the property. The defence was, that this similar covenants affecting the other houses in Brunson terrace were abrogated by a clause in a local Act passed in 1830, and that the covenant was still in existence; the plaintiff was precluded from enforcing it by acquiescence. The Master of the Rolls said the Act of 1830 had no operation to the covenant in question, and the acquiescence only came to this, that some owners houses in other parts of the terrace had not chosen to insist on their rights. A perpetual injunction restrained the defendant from erecting any building at the rear of No. 20, except appropriate domestic offices, was granted.

REIGATE AND ITS REQUIREMENTS.

CONSPICUOUS amongst the places that are left undone that they ought to have done stands Reigate—a town well known to Metropolitanians, being the same distance in point of time from the City that Notting-hill is. As has done her utmost to make Reigate one of the most delightful retreats for such of the high kind as are addicted to commotion; it is

ed from the Polar blasts of winter by the softness of the Surrey hills, and the heat of summer is tempered by an abundance of umbrageous trees. It would appear, however, that the more hountiful nature is, the more remiss are recipients of that bounty are. As soon as the South-Eastern Railway opened up this truly cadian district, paterfamilias, "habbling of green fields," was not slow to betake himself and progeny to a spot hitherto given up to nalaids and satyrs, and soon many of the most sylvan spots were bought and built upon by him, and a naturalist who may be dubious as to whether he is gregarious in his nature might have been misled by an opponent's argument, backed up by such a fact as this migration. In a single decade the population was doubled. Dives was fully represented by the migrants, and, as usual, he did his utmost to shut Lazarus out of his earthly Paradise; and, to a great extent, he was successful. The great unwashed came in train; but it dwelleth apart in rows of ill-lit, draughty tenements, that afford a striking contrast to the luxurious villas of the opulent. There was a time, long past now, when a householder's duties ceased at his garden-gate, and there are many who call it "the good old times," who would like them restored. "Every man for himself and the devil for us all," is their motto. The wise sanitary laws that our forefathers in their wisdom did not pass compel us all to look to ourselves collectively as well as individually. If we are not bound to administer to our neighbour's stomach, we must satisfy ourselves that his house is fit to be occupied by a nobler man than a pig. To the disgrace of Reigate, a part of the duties of the inhabitants has long been scandalously neglected, and the balmy has become fetid and pestiferous, fevers frequently recur, and the smallpox has paid the "n" visit, and left its mark behind; and the order is, that it did not depopulate whole parishes, for the sanitary arrangements and water-courses are more primitive than those of Moses. We expect to find such things in parts of Staffordshire, but to find them in a refined and Elysian suburban suburb takes our breath away, literally well as metaphorically. A few days ago, the lord mulcted a Reigateite for building a set of tea-chests: surely those nasty laundries that have not provided proper closets ought to be made to explain the reason why. Such a set of things ought not to be tolerated a single

any are asking how it is that for three or four years there has been no migration to Reigate, and that building operations have entirely ceased. Some attribute it to the heavy drainage that the new drainage will make necessary, but it is not because the town has been left drained until its fair reputation has been damaged? There are several tenanted villas, but have evidently been occupied; perhaps the late occupants have fled to a place less propitious to the difatory organs.

Amongst the other sins of omission that strike the visitor to Reigate are the absence of channels for many of the thoroughfares, the paucity of pavement, and the had street architecture. The Public Hall scarcely has a façade, and though it may be close upon it, he will have to "seek for it till he finds it;" but a hideous Georgian hall is conspicuous in the extreme, and is not possibly be overlooked. The former is a fine, but of the most insignificant type. The castle precincts, which are situated in the centre of the town, have been made into a public park, but more evergreens are wanted, and the protection for shade of a few more trees would say "the trustees" open that the charge of "patriotism." I could not learn that the band of volunteers play so often as twice a week, or twice a year. I should suggest to the trustees that the public would be drawn thither more than it is if 10s. or 1l. per week were put upon music, and more seats would be provided to make the gardens perfect.

GARGOYLE.

NEW SCHOOLS OF SCIENCE AND ART, AND MUSEUM, AT GLOUCESTER.

The new edifice, except a few minor portions, and some of the fittings, may be said to have been completed. A view and plan of the edifice will be found in our volume for last year, pp. 466-467. Messrs. Pulljames, Walter, & Son, of Gloucester, executed the plans; and Messrs. King and Edwin are the contractors. The style is a mixture of the thirteenth century. On the basement-floor rooms are provided for the curator,

hat and cloak rooms and lavatories for the male art-students, and cellars. The ground-floor consists of a general entrance, with carved work, an inclosed porch, hall, and staircase. Entered from the hall, on the left-hand side is the museum and library, a room 60 ft. long by 20 ft. wide, and 16 ft. high. Immediately facing the main entrance is the door leading to the lecture theatre, a room 28 ft. by 26 ft., and 17 ft. high. This is to be used in common by science and art students; it is fitted with benches, and has separate entrances for each department. The remainder of the accommodation on this floor is devoted exclusively to the uses of the science school, and comprises a class-room, 19 ft. 8 in. by 21 ft.; a master's and preparation room, and a lavatory, 24 ft. by 24 ft., with an open-timbered roof. There is also a separate entrance-porch, with cloak-room, lavatories, &c., appropriated exclusively to the use of the science students. The laboratory is a low building on the north side of the main block. It is placed as near as may be to the other rooms connected with the science school, while it is made a detached building, to admit of its being easily ventilated when scientific experiments of certain kinds are being conducted. By means of the staircase from the hall the rooms on the first floor are approached. The whole of these are devoted to the use of the school of art. They consist of an elementary room, 34 ft. 3 in. by 20 ft.; and a modelling-room, 18 ft. by 12 ft.; each 20 ft. high to the collar-beams of the roof; a large painting and advanced class-room, 60 ft. by 20 ft., and 22 ft. 6 in. high to the apex of the open roof; and a master's room, 20 ft. by 12 ft. There are also cloak-rooms, lavatories, &c., for the use of the lately students. The roof of the large painting-room was suggested by the architect in order to obtain a perfectly unimpeded light, free from wall-platts and other impediments which cast shadows. The building has been fitted with warming and ventilating apparatus by Messrs. Hayden, of Trowbridge. The building is erected of stone of the district, lined with brick, with Bath stone dressings. The roofs are covered with Broseley tiles, and the timbers on the inside, where visible, are stained and varnished. At the top of the staircase is the Munich glass window which Mr. J. D. T. Niblett intended to present to the cathedral, but which could not be placed therein because a contemplated change in the tracery was objected to by Mr. Gilbert Scott. It is intended as a memorial of the founders and providers of Sunday schools in this neighbourhood.—Mrs. Bosvey, of Flaxley, and the Rev. T. Stock and Mr. R. Raikes, of Gloucester; and was executed by Chevalier Max Ammiller, superintendent of the Royal Glass Works at Munich, under the direction of Mr. Niblett. It is partly heraldic, and also contains representations, in the centre, of Christ blessing two kneeling boys; on the left, a matron with infant in arms, directing her little daughter to Christ; and, on the right, two of the disciples rebuked. Over the central canopy is a hand in glory, and dove below.

CHURCH-BUILDING NEWS.

Waterford.—The small church which has been erected at Waterford, at the sole cost of Mr. Robert Smith, of Goldings, has been consecrated by the Bishop of Winchester (in commission for the Bishop of Rochester). The hamlet of Waterford is an outlying portion of the parish of Bengoe. The building now erected in the hamlet will be the chapel-of-ease for the mother church of the parish. The new church is dedicated to St. Michael and All Angels, and the architecture is Early Geometrical. Mr. H. Wooller, of Graffham, near Guildford, was the architect. The edifice is in plan a parallelogram consisting of chancel and nave, and will seat 150 persons. Attached to the north aisle of the church is a vestry and organ-chamber, having communications with both the chancel and nave. There is also a south porch to the nave, framed with open tracery, turned shafts, &c. The steeple, porch, and fittings are of English oak. The walls are built of concrete, with Kentish rag facings and brick linings. The windows, doors, and dressings generally are of Bath stone, and the roof is covered with Broseley tiles. At the west end of the church is a stangled branch or steeple seventy feet high, to contain the bells. This steeple is supported upon cambered tie-beams, walls, posts, and arched braces, starting from solid stone-wall shafts below. The pavements are from Messrs.

Minton's. The four west windows and the chancel windows have temporary glazing, the painted glass ordered for them not being completed. The other windows are filled with uniform panel-flowered quarries. The church will be lighted with coronas by Messrs. Hardman, of Birmingham. The organ, with an illuminated front, was built by Messrs. Walker & Sons, of London. In the winter time the church will be heated by means of hot-air apparatus. The churchyard is surrounded by a boundary wall of stone, and at the entrance there is a lych gate, and porch with gabled roof surmounted by a cross. The contractor was Mr. C. Chappell, of Tring, and Mr. Davidson was clerk of the works. All the oak for the sittings, floors, porches, and other portions was found by Mr. R. Smith, and the additional cost of the structure has been about 2,800l. Mr. Smith has also built close by three houses for poor widows, specially designed for the health and comfort of the inmates. They are built with porches, gables, and timbered beams in the walls, and look in keeping with the lych gate at the entrance to the churchyard. Two of the rooms in one of these cottages are to be devoted to the purposes of a mission room and village library. Mr. Smith has also erected here two model labourers' cottages. Mr. Sheffield, of Bengoe, was the builder.

Bromsgrove.—The corner stone of a new church has been laid at Bromsgrove. The site is at the upper end of the Birmingham road. The ground plan of the church provides accommodation for upwards of 600 people, exclusive of the choir benches. The church will comprise nave and side aisles, tower at north-west corner, porch on south side, chancel with apsidal termination, and an organ-chamber and vestries for clergy and choristers. A basement will be sunk to accommodate the heating apparatus. The east window bay of aisles is slightly projected, and gabled in the transeptal form, which gives the church exteriorly, according to the perspective view, a cruciform appearance. The style is transitional. A spire with tower, rises at the north-west corner, its altitude being about 175 ft., the upper part of the tower containing the belfry, with ornamented double lantern lights, with louvres for the passage of sound; but it is not contemplated to execute this upper portion of the tower and spire at present, owing to limited funds. The church is intended to be built with the local sandstone, the walls being lined inside with buff-coloured bricks, relieved with stone strings and handings, the dressings, arches, window facings, &c., being executed partly in Bath, and part in local grey sandstone. The amount of the contract, which is undertaken by Mr. Estcourt, of Gloucester, is 3,920l. towards which a sum of about 3,300l. has been collected. The foundation has been raised to the plinth, and the corner stone forms the base of one of the buttresses at the west end. It is of Portland stone, and bears, incised, a Latin cross, and the letters "A.D., 1872." Mr. J. R. Horton is the architect, and Mr. Estcourt, the contractor.

Whittlesey.—St. Andrew's Church, Whittlesey, has been restored and reopened. The cost of the portions already restored is about 1,500l., and further restoration is contemplated as funds become available. After obtaining the major portion of the requisite funds, Mr. R. R. Rowe, architect, was directed to prepare plans for a restoration of part of the fabric; tenders were invited; and Mr. W. Elworthy, of Upwell and Wisbech, became the contractor. The first work was to clear every particle of wood fittings from the interior. Upon removing the boarded and paved floor, the church proved to be a great mausoleum; it was literally honeycombed with coffins, upon which the floors rested; as the coffins from time to time decayed, the floors sank, and the atmosphere within the building produced nauses. All the vaults have since been arched over, and the whole area of the church covered with concrete; holes have been cut through the walls so as to ensure a thorough ventilation of all boarded floors; the soil in the churchyard for 80 ft. in width from the church has been lowered, so that persons now step up into the building instead of stepping down as formerly; a new oak roof has been put upon the north aisle of the nave, and covered with lead; the walls generally have not been over-dipped, and the mutilated stonework re-set and restored; new stone parapets, with coping and gable crosses, have been fixed where needed; cast-iron pipes have been provided for conveying rain-water from the roofs, and underground drains laid in. The interior presents a very changed appearance: two of Gidney's underground stoves have been fixed; the passages,

chancel, and sanctuary paved with tiles, many being in ornate patterns; new boarded floors have been laid under all the seats; the old chancel stalls are re-arranged, and the whole of the nave and aisles filled with open seats of one uniform pattern, in which provision for kneeling has been made. The windows having a north aspect, are glazed with ordinary white glass, in lead quarries and coloured margins, those on the sunny sides of the church are filled with thick obscured glass in two tints, so as to obviate the necessity for blinds. A stained-glass window has been given by the vicar, Dr. Burgess. It is placed at the east end of the chancel, immediately over the Communion-table; it is nearly the width of the chancel, and is in five lights, the subjects illustrated being the five principal events in the life of our Lord; the figures are nearly life-size; they comprise the Nativity, Baptism, Crucifixion, Resurrection, and Ascension. Below each figure is a medallion; above is canopy-work. This window has been painted and made by Mr. Constable, of Cambridge, from the design of the architect. Mr. G. W. Johnson, of Peterborough, has presented painted-glass figures of two saints for the centre light of the west window in the tower, and other contributions of stained glass will be thankfully accepted by the vicar and churchwardens.

London.—The foundation-stone of a new church for St. Mark's district, Victoria Park, has been laid by Lord George Hamilton, M.P. The church will be built by Messrs. Brown & Robinson, from the designs of Mr. Blomfield, and will be in the Early English style, cruciform in plan, and consist of nave, side aisles, transepts, and chancel. The roof will be open, and the building, when completed, will accommodate 700. The new church will cost 4,000l.—The church of All Saints, Blenheim-grove, Rye-lane, Peckham, has been consecrated. The building is fitted with all the modern appliances. The roof is of stained pine, as are also the pews. The general character of the building is Gothic. A school-house has been provided. The building is detached, at a slight distance from the church.—A new church, dedicated to St. Luke, and situate in Evelyn-street, Lower-road, Deptford, has been consecrated by the Bishop of Rochester.

Birkdale.—St. Peter's Church has been consecrated by the Bishop of Chester. The church is in the Decorated style of Gothic architecture, and consists of nave, 81 ft. 6 in. by 21 ft. 8 in.; north and south aisles, 81 ft. 5 in. by 11 ft. 4 in.; chancel, 22 ft. 4 in. by 18 ft.; with organ at south-east, opening into chancel and aisles, and a vestry at the north-east. There is a tower 15 ft. square (externally) and 53 ft. high. The building will accommodate 600 persons, of which 295 sittings are free. The external stonework of the whole is of Cefn stone, the facings being of Upholland stone parpoint in courses. The contractor for the whole was Mr. Hugh Yates, of Liverpool, and the works were carried out by Messrs. T. D. Barry, also of Liverpool.

Welton.—The foundation-stone of a new church at Welton has been laid by the wife of the Bishop of Carlisle. The edifice will be small and unpretending, in the style of the latter part of the thirteenth century, modified to the requirements of the nineteenth; and will consist of a nave and chancel of one height, with a gabled projection for the vestry and organ chamber. The outside length will be 61 ft. 6 in., and the width 22 ft. A bell-cote is inserted in the west end; not, as usual, at the apex of the gable where the tines are carried up, but at the lower part of it. The church, when completed, will accommodate about a hundred. The architects are Messrs. Cory & Ferguson, of Carlisle; and the contractors are, Mr. James Wilson, of Gaitsgill, for the mason work, and Mr. Pearson, of Wigton, for the joiner's work. The material used will be the red stone from Chalk quarries in the neighbourhood.

Barnsley.—The foundation-stone of a new church about to be erected at Worsborough Common has been laid by the Archbishop of York. The architects are Messrs. Heeley, of Bradford. The church, to be dedicated to St. Luke, will be of Early Decorated Gothic character, and will consist of a nave, 53 ft. by 23½ ft.; and chancel 23½ ft. by 18 ft., and an organ-chamber and vestry on the north. The church will accommodate 212 adults, and the cost, exclusive of boundary walls, will be 1,300l.

Barnard Castle.—A meeting of the parishioners, duly convened, has been held to consider the plan and estimate furnished by Mr. Fowler, architect, for the restoration of the church tower. At the outset, Mr. W. Watson, jun. (Starforth

Hall) inquired why Mr. Haswell, who had so successfully restored the church, had not been engaged in the restoration of the tower? Mr. Watson (Spring Lodge), and Mr. Richardson contended that Mr. Haswell, in his former proposition for rebuilding the tower, had advanced vague estimates, ranging from 500l. to 1,250l. His restoration of the chancel also had not given general satisfaction. Ultimately the meeting was adjourned until the return of Mr. Holmes, the vicar's churchwarden, who, it was agreed, ought to be consulted.

Ashton-upon-Mersey.—The foundation-stone of the new church of St. Mary Magdalen, Ashton-upon-Mersey, has been laid. It is being built from the designs of Messrs. W. Wilson & Oldham, of Manchester, in the Early Decorated style. Its whole cost, including organ, the laying out of the grounds, &c., is estimated at 6,500l. The nave is 83 ft. by 43 ft., and has north and south transepts. The organ-chamber is on the north side of the chancel, which is 13 ft. by 19 ft.; and the vestry is under the tower on the south side. The entrances will be from the south porch and at each transept. The church will seat 650 persons. Mr. Brooks, who gave the land, and four others, gave each 500l. towards the building fund.

Hutton, near Kendal.—The works are in progress for a new church at Hutton, near Kendal, dedicated to St. John the Baptist, the old church being entirely removed as dangerous and beyond repair. Originally, the church was one of the most ancient in the diocese, but rebuilt about 100 years since, when all vestiges of the old structure disappeared. The new church will consist of a nave, 54 ft. by 26 ft., without side-aisles, an apsidal chancel, porch, vestry, and organ-chamber, and a bellry-spire at the south-west corner, 55 ft. high. The style is the thirteenth century. Materials—the dark blue stone of the locality, and white freestone dressings, open-timbered stained roofs throughout, seats and church furniture of pitch-pine and oak; sittings for about 200. The architects are Messrs. Brade & Smales, of Kendal; Mr. John Pawcett, of Hutton, is the contractor.

Bodmin (Cornwall).—At last there appears some hope that the long-contemplated restoration of this fine old church will be commenced. Plans have been prepared by Mr. Withers, of London, and a faculty is now being obtained. The estimated expenditure is about 6,000l.

Bridgnorth.—The battlements around the summit of the new tower of St. Leonard's Church have been completed, and when the pinnacles, with their carved crockets and finials, now just commenced, are completed and fixed, the tower will have assumed its true and full altitude, 110 ft. The carvers have chiselled on the gargoyles at the four angles of the parapet. These are each 4 ft. long. They are designed to carry 4-in. lead spouts. Upon the upper cornice, as well as around the turret and upon the string-course, lower down, a number of other animals, principally grotesque, will be carved; whilst the pinnacles of the tower and those around the turret will be decorated with crockets and finials, with human and other heads at the base. The label moulds of the bellry windows will also be stopped by sculptured heads and foliated corbels. The niche on the southern side and immediately over the doorway will be carved; the upper labyrinth of pinnacles, and surmounted by a helmet beneath by an angel with extended wings. The jambs of the doorway and adjacent parts will be ornamented with carving, in tracery, and pinnacles. Inside, in the groining beneath the bellry, all the intersection will be enriched by carved bosses. The style of ornament to be used throughout will be fifteenth-century in character, according to the architecture of the tower.

Saltburn-by-the-Sea.—The Church of Emmanuel, Saltburn-by-the-Sea, which stands on the Marsko high-road and adjoining Windsor-street, has been consecrated by the Archbishop of York. The Earl of Zetland presented the site, and Messrs. J. P. Pritchett & Sons, of Darlington, are the architects. The building is Early Decorated, and comprises nave, north and south aisles (each 89 ft. by 55 ft.), north and south transepts (each 24 ft. by 12 ft.), chancel (30 ft. by 24 ft.), with vestry, organ-chamber, and porch; together with a tower, 100 ft. high. To have carried out the whole of the plan would have involved an outlay of 7,500l., or thereabouts, and provided accommodation for a few short of 1,000 persons. The committee, however, decided for the present only to proceed

with the nave, north aisle, and north transept, which are now completed, and afford accommodation for 598 persons. This portion of the scheme was perfected at a cost of a little over 4,000l.

Chislehurst.—Christ Church, Chislehurst, was consecrated on the 29th ult. by the Archbishop of Canterbury. The building is placed on the summit of a site presented by Mr. N. Strode, of Camden Park. The church is Early Decorated after designs supplied by Messrs. W. G. Habeshon & Peto, of London, architects. Accommodation is provided for 525 adults, and care has been taken to give every facility for egress. The church consists of nave, with clearstory, aisle north and south transepts, and chancel, with vestry at north-east angle. Externally it is built of Kentish rag stone in regular courses with dressings and ornamental parts executed in Bath stone, and roofed with Whitland Abbey green slates and purple Bangor in alternate courses. A lofty tower with spire is placed at the western extremity of the nave, and utilised on the ground floor as one of the principal entrances, and in the next stage as an organ-gallery, approached by a turret staircase. The interior has a nave arcade, with carved capitals, and the Bath stone has been relieved with red Mansfield for the smaller columns which carry the roof principals in nave and chancel. The roofs throughout are open timber boarded and felted. The chancel has an apsidal end, with two-light windows in each compartment, and the floor is laid with ornamental tiles. The pulpit and reading-desk have been placed in the most convenient positions for commanding view of the whole congregation. The aisles are paved entirely with red and black tiles laid diagonally, with black margins, and the windows are filled with cathedral glass. The internal dimensions of the church, exclusive of the chancel, are 72 ft. by 53 ft. The general work have been carried out by Mr. Carey, of Highgate, builder; the tile floors by Mr. Colla, Victoria; the gas-chandeliers by Mr. Berry, Pimlico; and the ornamental ironwork boundary fences by Messrs. Hart, Son, Peard, Co., of Wych-street.

Derby.—The new Church of St. Anne, Derby, has been consecrated. Mr. W. Mundy, of Mat-eaton Hall, made a grant of the land for the site. The dimensions of the ground upon which the church is erected are approximate to the following:—The ground on which the schools will be built, 105 ft. from east to west, and 66 ft. from north to south. In arranging a plan for a church to accommodate 600 people on so small a plot of ground, it was necessary to occupy nearly the whole of the area; and accordingly the east, west, and north walls are placed close to the boundaries, with a passage on the south side access to the east end of the church. The church consists of nave, with north and south aisles, and chancel, with a north aisle for children, and on the south side an organ-chamber and two vestries for choir and clergy. The general internal dimensions of the building are as follows:—The nave and chancel are of uniform width and height, and are 95 ft. long by 50 ft.; and 30 ft. high to the wall-plat; the open timber roof will make the total height 50 ft.; the width of the aisles is nearly 10 ft. The principal entrances are at the west end in the street, and others are provided east of both for the vestry and the children's aisle. The body of the church is fitted with open seats, the chancel with stalls. The church is built entirely of red bricks, those for the interior for the windows and doorways being the best pressed bricks. Stone is introduced only for the pillars of the arcades, and for the tracery of the clearstory windows. In design the church is very simple, and has to depend upon the proportion of the several parts for its effect; but any future time, when funds are forthcoming there will be ample opportunity for painting wall-decorations, as well as for stained glass—similar embellishments. The architect is Mr. F. W. Hunt, of London; the builder, Mr. Robert Bridgatt, of Derby; and the office of clerical works has been jointly performed by several members of the committee as an honorary pointment. A bell, weighing nearly 6 cwt., been supplied by Messrs. Moors & Stainback, London. The carving has been executed by Mr. Tinkler, of Derby. The heating and ironwork and gates for the chancel-screen have been executed by the Derwent Foundry, and have also in hand the pulpit, which will be entirely of metal-work. The font is the workmanship and gift of Mr. Bateman. The rector

likewise a gift. The alabaster and the cross, and filling in of the panels, is the gift of Mr. C. P. Cart. The workmanship of the alabaster and marble is that of Mr. S. Keeling, a working man, done entirely in his overtime. The builder's contract was 2,750*l.*, but other expenses raised the cost of the building to 3,200*l.* Temporary day and Sunday schools, capable of accommodating 300 children, have been erected, but it is intended to proceed with the erection of permanent schools at present.

Swine.—The Church of St. Mary, at Swine, has been re-opened by the Archbishop of York, after restoration. The roof was flat and plastered, which entirely shut out from view the scenery of the upper part of the window. The roof is now of open woodwork, being supported by the side walls by means of footings. Three of the old oak beams have been retained, and have been varnished. The altar is reached by four broad steps and foot-piece round the communion-table. The body of the church is divided on the aisles by four bays. The arches rest upon low Norman pillars, surmounted by capitals bearing engrailed carving. The ancient choir-stalls have been preserved, and supplied with new frontals of stained deal. The floor, formerly brick, now consists of Minton's tiles. The seats were high-backed ones, but they are now open benches of stained deal. The gallery on the west end has been taken down, and in its place are the seats for the school children. The work of restoration was done by Messrs. G. J. Dury & Son, Selby.

SCHOOL-BUILDING NEWS.

Wood Green (London).—The foundation stone of new schools, to accommodate 300 children, in connexion with St. Michael's Church, Wood Green, has been laid in the Colney Hatch-road, by Mrs. Pearson, of Nightingale Hall, who presented the site. The schools are being erected by Messrs. Jackson & Shaw, whose foreman, Mr. Hey, arranged the preliminaries for the ceremonial. The building will be in the old English large-school style.

Camberwell.—New school buildings have been erected in Camberwell New-road, in connexion with the new Church of St. John the Divine, which is being erected in the Vassall-road, and have been formally opened, with some ceremony, in the presence of a large body of the clergy and laity. These schools, with spacious playgrounds, and gifts of an anonymous donor. The building, the north-west angle, has a tower and spire about 20 ft. in height above the main building. The buildings contain a boys' and girls' school, class-rooms, in addition to a master's house, a committee and board rooms. It is intended to use the boys' school for Divine service on Sunday evenings, in addition to strictly school purposes.

Hertford.—A meeting of the subscribers and friends of the Cowper Testimonial and Abel Smith Memorial School has been held at the Town-hall, to consider the necessary steps to be taken for the purpose of erecting school-rooms for 120 girls and infants, in connexion with the Andrew's Schools, on a site in the Hertingfordbury-road, which has been given by the Marquis of Salisbury, and is approved by the Government. The chair was taken by the Rev. N. Williams, rector of St. Andrew's. A committee was appointed to collect subscriptions to carry out the work, with power to add to their number.

Newcastle.—The foundation stone of Roman Catholic School-buildings in connexion with the church dedicated to St. Dominic, in course of erection at the Red Barns, Newcastle, has been laid by the (R. C.) Bishop of Hexham and Newcastle (Dr. Chadwick). When completed, the buildings will consist of three separate schools for boys, girls, and infants, and will accommodate about 800. The schools for boys and girls will each be 67 ft. by 30 ft., and will be placed end and end, so that the whole may be thrown into one by raising the revolving shutters which form the division. This arrangement will provide a hall 134 ft. by 30 ft., for meetings and social gatherings. Each of these schools will have a classroom, 22 ft. by 17 ft. The infant school will be 40 ft. by 25 ft. There will be entrances for boys and girls and infants in separate streets. The church of which the schools are an adjunct, advancing fast towards completion. Both church and schools are being reared by the Dominican Fathers.

Burslem.—The chief stone of Primitive

Methodist new schools has been laid at Burslem. The schools will be two stories in height, and will be erected from the plans of Mr. James Watkin, by Mr. John Grosvenor, of Tunstall. The building contract, exclusive of the land, is 257*l.*

FROM SCOTLAND.

Galashiels.—Operations have been commenced towards the completion of St. Andrew's Roman Catholic Church, Galashiels. The church was partly built in 1856, in the Gothic buttressed style, but was not then finished, owing to the want of funds, and also to the fact that at that period there was a comparatively small settled population in the district belonging to the R.C. Church. The present work is from plans by Messrs. Goldie & Child, architects, London, and adds 40 ft. to the length of the building, with an ornamental frontage to the river. The front elevation, according to the design, is 72 ft. high and 56 ft. wide, flanked with octagonal buttressed towers of the same height as the centre elevation. The principal feature in the front elevation is a Gothic window, 22 ft. by 11 ft. 6 in., with four mullions in the centre.

Miscellaneous.

Liverpool Architectural Society's Excursion.—On Saturday, the members of the Liverpool Architectural and Archaeological Society held their annual excursion. A party of about thirty gentlemen and two ladies assembled at the Royal Institution, Colquitt-street, and started thence. Under a glorious summer's sky they proceeded, via Walton, to Kirkby. At Kirkby the party visited the new church dedicated to St. Chad, where they were met by the Rev. Canon Hornby, who explained the various points of interest about the church. At Aughton, near Ormskirk, a visit was made to a new church on the crest of a rising ground, about midway between Aughton and Ormskirk, where it forms a conspicuous object in the landscape. The church was designed by, and has been erected under the superintendence of, the Messrs. Hay, who are members of the society. Considerable time was spent in examining this church and its decorations, after which the party proceeded to Halsall, where they were met by the Rev. Mr. Bindell, the rector, who conducted them over the church, which is undergoing a restoring process. The rector also conducted the party to some ruins, which are supposed to have been part of the residence of monks or friars who attended from Burscough to minister in the church. The rector then invited the party to lunch. A rather long drive brought them to Rufford, where the Old Hall, the residence of Sir Thomas and Lady Hesketh, was visited, and some quaint old carved oakwork was inspected; after which a small church, erected by another of the members of the society, Mr. Davies, was examined. About seven o'clock in the evening dinner was served in the Hesketh Arms Hotel. The return journey was commenced shortly after nine o'clock, and, at a quarter past twelve the vehicle pulled up in Lime-street.

Girls' Public Day School Company.—A company is being formed to establish and maintain in such parts of London and the provinces as may from time to time be decided on, superior day-schools, at a moderate cost, for girls of all classes above those provided for by the Elementary Education Act, and on the general model of the North London Collegiate Camden-street Schools for Girls. There are some excellent names on the council, and many shares have already been taken. It is intended to open the first school as near as suitable premises can be obtained to the South Kensington Museum as soon as a number of shares shall have been taken up sufficient in the opinion of the council to guarantee the success of the undertaking. The school system will be specially adapted to meet and correct the defects pointed out in the Report of the Schools Inquiry Commission:—"Want of thoroughness and foundation; want of system; slovenliness and showy superficiality; inattention to rudiments; undue time given to accomplishments, and these not taught intelligently or in any scientific manner; want of organisation." Serious endeavours will be made to train the pupils for the practical business and duties of life.

Sanitary Precautions.—The following sensible suggestions have been issued by the Hackney District Board of Works:—Clean out the water-butts or cistern frequently; boil the water before drinking it, and filter it through a charcoal filter. Keep the house, especially the bedrooms, clean and well ventilated, and use carbolic or other disinfecting soap for scrubbing the rooms. Keep the body clean by daily baths or washing the body all over with tepid or cold water, according to the state of health. As far as possible avoid excessive exercise and exposure to the mid-day sun. Do not eat unripe or stale fruit, stale fish, or tainted meat, and be especially careful to keep infants' food sweet. Be very temperate as regards porter, ale, or other fermented liquors. Two or three times a week pour down the water-closet and all the drain-traps water containing two table-spoonfuls of chloralum or carbolic acid in half a gallon of water. Be very careful to keep the trap on the sink and other drain-openings. Throw a little carbolic acid or chloralum, or, better still, chloralum-powder, into the dust-bin. The pipe, if any, in the cistern should have a leaden "S" trap placed on the top thereof to prevent contamination of the water with sewer-gases. If there be not a separate cistern for the water used for drinking or cooking, the air-pipe of the water-closet should be carried through a wall into the open air, and not open in the cistern. It should be remembered that plenty of fresh air, pure water, good and simple food, daily ablutions, and exercise in the open air, are the first necessities for perfect health. Give notice at the Town-hall of defective drainage, choked drains, accumulations of house-refuse or other offensive matter, and of the existence of offensive smells. Burn all vegetable refuse, such as cabbage-leaves, and do not throw any into the dust-bin.

Concealment of Disease.—The case of Best against Stapp, recently decided in the Court of Queen's Bench, is one full of importance to the public, and one with the particulars of which it behoves them to be fully acquainted. It appears, according to *Food, Water, and Air*, that Mrs. Stapp took apartments of Mrs. Best, at Eastbourne, for herself and children, one of whom had recently had scarlet fever, but she did not make known the fact to the landlady. Soon afterwards another of Mrs. Stapp's children was taken ill, and died; while Mrs. Best was herself prostrated with the fever, and two of her children actually died of the malady. This was an action, therefore, by Mr. Best to recover damages for the illness of his wife, the death of his children, and for his being prevented from letting his lodgings. The trial, we are happy to state, resulted in a verdict for the plaintiff, with a handsome pecuniary award, but which, however, after all, was but a very inadequate recompense to Mr. Best for the death of his children. Had the case been reversed, and had Mr. Best let lodgings in which persons had recently resided afflicted with epidemic disease, he no doubt would have been equally mulcted in a heavy pecuniary penalty. Cases similar to the one now noticed are unfortunately of daily occurrence: the moral wrong and guilt of parties so acting have of course been long recognised, but we believe it is only of late that the law has been made powerful enough to grapple with such cases.

The Deepest Well in the World.—Twenty miles from Berlin is situated the village of Sprenberg. Owing to the presence of gypsum in the locality, it occurred to the Government authorities in charge of the mines to attempt to obtain a supply of rock salt. With this end in view the sinking of a shaft or well 16 ft. in diameter was commenced some five years ago, and at a depth of 280 ft. the salt was reached. The boring was continued to a further depth of 960 ft., the diameter of this bore being reduced to about 13 in. The operations were subsequently prosecuted by the aid of steam until a depth of 4,194 ft. was attained. At this point the boring was discontinued, the borer or bit being still in the salt deposit, which thus exhibits the enormous thickness of 3,907 ft. There were mechanical difficulties connected with the further prosecution of the operations.—*Mining Journal*.

Arrival from Ephesus.—A drum of a column from the Temple of Ephesus,—the most massive specimen of that famous edifice which has yet been received in this country,—has arrived at the British Museum. The case had to be drawn by ten horses.

A Great Gas Well.—The Newton Well, on the Nelson Farm, six miles north of Titusville, Pa., found forth such a volume of gas that it was impossible to pump it, as the valves would not work. The tubing was pulled, and the well was cased in order to let the gas blow off, so that it might be pumped. After the casing was put in, the sand-pump was lowered for the purpose of agitating the well, and the gas raised a column of water, throwing a solid stream into the air 100 ft. The noise was terrific, and could be heard for a distance of more than two miles: it was something like the loud roar of thunder; and when the column burst at the top, it threw the water each way for fifteen rods from the well. The water was exhausted in about twenty-five minutes, and then a column of gas followed, rising with tremendous force 50 ft., from the derrick. The outpouring of the gas makes a roaring noise that could be distinctly heard for two miles from the well. From descriptions of eye-witnesses, this is probably the greatest gas well ever struck in the oil region.

Coal-cutting by Machinery.—One of the most interesting and practical papers read at the Liverpool meeting of the Institution of Mechanical Engineers, which has just been held, was that by Mr. Robert Winstanley, of Manchester, communicated through Mr. George H. Daglish. It contained a description of a coal-cutting machine, with a rotary cutter, worked by compressed air, and employed at the Platt-lane Colliery. It was stated that the man who works the machine by contract earns three times as much per day as he did with the pick, while there was the signal advantage in favour of the machine over hand-labour, that it did not "strike" for wages. It was stated that the risk of clogging and jamming, teeth getting loose, &c., was with moderate care very small, indeed, almost nil. It could easily be reversed, and cut its way out. During the discussion, the merits of the machine were freely admitted with respect to hard beds of coal; but it was said that in soft beds no machinery would have a superior advantage over the hand-pick.

The Prince Consort's Model Cottages at Windsor.—Some few years back the Prince Consort, with a desire to improve the welfare of the humbler classes, caused a society to be formed at Windsor for the purpose of erecting a number of model cottages. Upwards of fifty dwellings, constructed upon the best models, furnished with all kinds of conveniences likely to promote the home comforts of the inhabitants, were accordingly erected on the south side of the royal borough, and let to tenants at moderate rentals ranging from 4s. 6d. to 6s. per week. Since then these model cottages have served as examples for the erection of workmen's dwellings elsewhere. The Royal Society have just sold the "Prince Consort's cottages" to Mr. R. Richardson-Gardner, who is now the possessor of upwards of 150 model cottages, besides other cottage property at Windsor.

Building Accident.—At Halifax, three corporation labourers were employed building a wall in the cellar of the newly-added portion of the inland bonded warehouse, as an additional support to the arched roof and floor above, which was already supported by iron beams and pillars, when one of the pillars gave way and fell on to the workmen, along with the iron archway and stone floor, burying the men alive. Two of the men were got out of the debris within two hours quite dead, but the third was not recovered until nearly three hours after the occurrence. He was alive, but in a very precarious condition. The corporation had ordered the wall to be built in the cellar, because they did not consider the original supports sufficient, and the workmen had only just commenced operations.

Paper from Wood.—A letter from Berlin in the *Elberfeld Gazette* represents Prince Bismarck in a new light—that of a paper-maker. The paper manufactory established by the Imperial Chancellor on his estate at Varzin has proved so successful, says the writer, that it is impossible to meet the large orders which come from England. This paper is made of chips of fir—that, at least, is the chief element.

The Winchester Surveyorship.—It has been recommended to the local council to advertise for candidates to succeed Mr. H. Newman, whose past services were eulogised, and who, it was hoped, would be presented with some mark of appreciation of his long and ably discharged duties.

Middlesbrough.—The new dock is being rapidly got on with, and in about three months it seems that some portion of it will be available for shipping. The original dock was made by Mr. Joseph Pease at a cost of 160,000l., and the present one will cost above 100,000l. It is being made by the North-Eastern Railway Company. In the erection of the dock, with Mr. Harrison, the engineer-in-chief of the North-Eastern Railway, has been associated Mr. Chadworth and Mr. A. H. Whigham, of the Darlington Section. The latter has been the resident engineer in carrying out the work.—A second Middlesbrough is starting into life in North Lincolnshire between Doncaster and Gainsborough, on the estate of Mr. R. Winn, M.P. In a short time there will be within less than the radius of a mile no less than nineteen blast furnaces in work.

London and County Bank.—At the meeting of the London and County Bank, Mr. W. C. Jones in the chair, the usual dividend of 6 per cent., with a bonus of 4 per cent., for the half-year, was declared, being at the rate of 20 per cent. per annum, and leaving 10,634l. to be carried forward. At the corresponding date of last year, the total distribution was 9 per cent., or at the rate of 18 per cent. per annum, and 4,400l. were carried forward. The paid-up capital and reserve remain respectively at 1,000,000l. and 500,000l., the deposits held are 16,874,466l., an increase of 2,309,158l., and the acceptances are 2,453,011l., a decrease of 187,127l.

The High Price of Building Materials.—An influential meeting of gentlemen interested in the building trade, convened by circular, has been held at Parker's Temperance Hotel, Leeds, to consider the present high price of building materials. After the subject had been discussed, it was unanimously resolved "That a company be formed at once with the object of laying down the necessary plant and machinery for the manufacture of bricks on an extensive scale, in order that the present dearth of bricks may as far as possible be obviated." The building trade, we are informed, was largely represented at the meeting.

Contract for Silver Coins.—Messrs. Heaton & Son, of the Mint in Birmingham, have entered into a contract with the Government for the supply of silver blanks to the extent of one million sterling in value. The number of florins represents 600,000l., shillings 300,000l., sixpences 85,000, and threepences 15,000l.—a total of 16,600,000 coins. The weight of this mass is 110 tons of silver. The coins will be perfected at the Royal Mint, London. By the terms of the contract 10,000l. of blanks are to be produced daily.

Fleet Ditch.—A deputation has waited upon the Metropolitan Board of Works, urging that body to proceed with the construction of a subsidiary sewer to relieve the Fleet Ditch from the overflows which periodically occur and inundate the cellars and basement premises of the inhabitants of King's-cross and its neighbourhood. The chairman stated that delay arose in prosecuting the works owing to the hullers' strike. The memorial was referred to the Works Committee.

St. Michael's, Chester-square.—A new vicarage-house is being built in Ebury-square, on a site given by the Marquis of Westminster, from the designs of Mr. Withers, architect, by Messrs. Adamsons, of Putney, at an expenditure of about 3,000l. It is of red brick, with Park Spring stone sparingly used, and will be covered with Pennoyle slates. Mr. Laidler is clerk of works.

The Builders' Strike.—The disruption in the London building trade is increasing, every day matters are becoming more and more complicated, and the prospects of an early settlement of the dispute arc extremely gloomy, while the most favourable season of the year for building operations is rapidly passing away. Surely the time has arrived for a properly arranged arbitration?

Guy Faux at the Government Offices.—Some gun-cotton experiments have been carried out in a garden attached to the official residence of the First Lord of the Treasury in Downing-street. The shock was so violent as to break into pieces some scores of panes of glass in the windows of the Colonial and Foreign Offices. A rumour was spread that an attempt had been made to blow up the Treasury.

Westbury.—On Wednesday in last week the memorial stone of the new schools and library institution about to be erected by Mr. Abraham Laverton for the benefit of the town, and as a free gift, was laid by Miss Laverton. The building will contain the usual accommodation for a boys' school, reading and class rooms, committee room, and a large assembly-room. The architect is Mr. Stent, of Warmminster.

Opening of the Grand Aquarium Brighton.—A distinguished company of visitors, including, probably, one or two members of the royal family, is expected to be present at the opening ceremony of this marine aquarium at Brighton, on (this) Saturday. There will be a promenade concert in the grounds of the Royal Pavilion during the afternoon.

The Iron Stone at Clifton.—The *Bristol Times* says that the iron-ore, discovered on the site of Clifton House, Regent-place is of a remarkably rich character, returning more than 70 per cent. metallic yield, and worth on the spot from 21s. to 23s. or 24s. a ton. It is believed that there are some thousands of tons there.

Utilisation of Slag.—A paper was recently read before the American Institute of Mining Engineers, "On the Uses of Blast-Furnace Slag," by Mr. T. Eggleston. He gives a process by which good bricks may be made of it, and he states that a cement equal to the best Portland is to be manufactured from this slag, at small cost.

Electro-telegraphic Progress.— "It is a fact," says Mr. Scudamore, "that a telegraph clerk in London who was engaged on a visit to Berlin formed an acquaintance with and an attachment for a female clerk who worked at the same wire in Berlin, that he made a proposal to her, that she accepted him without having seen him, and that they were married."

Art-Union of London.—The private view of the works of art purchased by the prizeholders of 1872 will take place on Monday next at the Gallery of the Institute of Painters in Water Colours. The exhibition will be open to the subscribers and their friends on the next and following days.

The Model of Holborn Viaduct.—We saw in our notice of this work that it had been executed for the Corporation of London. This is not quite correct. It was made for the engineer, Mr. W. Haywood, and will be deposited by him in the Guildhall Library.

The Haymarket Theatre is being entirely redecorated by Messrs. Harland & Fisher, Southampton-street, Strand, under the direction of Mr. G. Somers Clarke. The same firm decorated Windsor Theatre some time back, and under Mr. Clark's direction.

Pre-Historic Monuments.—Sir J. Lubbock has notified that next session of Parliament he will bring in a Bill for the better protection of pre-historic monuments.

The Public Health Act has been read a third time and passed in the House of Commons, and, after making rapid progress in the House of Lords, has been there also passed.

TENDERS

For the erection of St. Luke's Church, Redcliffe-square South Kensington, for the Rev. W. Fraser Hancock, Messrs. G. & H. Godwin, architects. Quantities supplied by Messrs. Gardner, Son, & Theobald.

	Spire and Upper Part of Tower omitted	Total
Hibbins & Co.	£15,489	£15,489
Perry	14,965	11,613
Ayers & Sons	14,729	11,738
Nightingale	14,650	11,849
Atis & Co.	14,590	11,673
Adamson & Sons	14,355	11,345
Manley & Rogers	14,125	11,889
Cowland	13,808	11,473
Hill, Keddell, & Waldram	13,794	11,363
Dove, Brothers	13,626	11,078
Henshaw	13,595	11,129
Hill & Sons	13,234	10,911

Two late.

For erecting two villa residences for Lieut. Babbage Bromley. Mr. G. G. Stanham, architect. Quantities supplied:—

Newman & Mann	£4,836	0	0
Payne & Baldwin	4,426	0	0
Waters	4,234	0	0
Stimpson & Co.	4,209	0	0
Adamson & Son	4,133	0	0
Temple & Forster	4,175	0	0
Emmett	3,637	0	0

For rebuilding No. 35, Maiden-lane, Covent-garden, for Mr. Benjamin Rule. Mr. Alfred Cross, architect.—
 Putnam & Rothamstead £2,223 0 0
 Perry & Sons 2,391 0 0
 Hart 2,396 0 0
 Cole & Sons 2,333 0 0
 Newman & Mann 2,325 0 0
 Wilson, Bros. 2,257 0 0
 Howard 2,148 0 0

For fish-cooking apparatus, to be supplied and fired at No. 3, Arthur-street East, London Bridge, for Messrs. Lightfoot, Brothers.—
 Deane & Co. £111 12 10
 Lewis, Bros. 96 0 0
 Brown & Green 83 0 0

For the erection of a Gothic villa, at Park-hill, Croydon, for Mr. W. White. Mr. H. A. Alexander, architect. Quantities by Mr. Henry Laxton.—
 Waller £3,445 0 0
 Smith 3,142 0 0
 Mansbridge 3,000 0 0

For four houses, near Rutland-gate, Hyde Park, for Colonel and Mrs. Spencer Clifford, Messrs. Walker & Mann, architects. Quantities supplied:—
 Hiscope £10,560 0 0
 Brass (too late) 9,882 0 0
 Stimpson & Co. 8,835 0 0
 Thorne & Co. 8,739 0 0
 Adamson & Son 8,463 0 0

For repairs and decorations at 84, Highbury New Park. Mr. W. P. Griffith, architect.—
 Devereux £327 10 0
 Bamford 312 0 0
 Bamford 298 15 0

For the erection of vicarage house, St. Michael and All Angels, London Fields, Hackney, E. Mr. W. Wignott, architect.—
 Hill, Keddell & Waldram £3,107 0 0
 Hill & Sons 3,033 0 0
 Killy 3,015 0 0
 Kitch 2,915 0 0
 Falkner 2,898 0 0
 Merritt & Ashby 2,851 0 0

For master's residence and boarding-house, for the Rev. G. R. Green, M.A., Eastbourne. Mr. H. Eulan Umbre, architect. First contract.—
 Feeless £5,500 0 0

For pair of semi-detached villas, at Birkenhead. Mr. Charles Aldridge, architect. Quantities supplied by R. L. C. Riddell.—
 Burroughs £3,358 0 0
 Nicholson & Ayr 3,247 0 0
 Forde (accepted) 3,063 0 0

For alterations and additions to All Saints' Church, Oxford, for the churchwardens, Messrs. W. Wilds & Co., architects. Quantities supplied:—
 Parkins £745 0 0
 R. & W. Andrews 710 0 0
 Norris (accepted) 150 0 0

For building five houses, in Warner's-road, Ware. Messrs. W. Wilds & Son, architects.—
 Additional Bedroom.
 Elkins (too late) £1,108 £1,223
 Castle 1,050 1,200

For a double system of drainage, to exclude the rain & storm water from the sewer, and two rain-water pipes, at the Union Workhouse, Ware, for the Board of Guardians, Messrs. W. Wilds & Son, surveyors. Schedule of prices for the works.—
 Hitch (accepted).

For building English Church, Spa, Belgium. (Wallington provided.) Messrs. Habershon & Pice, architects.—
 Blackmore & Morley (accepted) £5,565 0 0

For alterations to St. John's Lodge, North End, for G. Drew, Esq. Mr. R. A. Cane, architect.—
 Pitts £2,404 0 0
 Furrell (accepted) 329 0 0

For rebuilding 79 and 80, Baker-street, and 51, George-street, Portman-square, for Mr. William Robinson. Messrs. New & Cummings, architects. Quantities supplied:—
 Foster £5,830 0 0
 Simpson & Son 5,648 0 0
 Brown 5,570 0 0
 Ebb & Sons 5,322 0 0
 Harris & Sons 5,286 0 0
 Thompson & Smith 5,187 0 0

For new class-rooms and superintendent's house, at Wesleyan Chapel. Mr. H. J. Faulk, architect. Quantities by Messrs. Thompson & Smith.—
 Fry £1,144 11 4
 Read 1,086 0 0
 Spackman 878 0 0
 Crook (accepted) 800 0 0

Remises, Nutford-place, Messrs. Atchison & Walker to that tender, and not that of Mr. Wignott, has been accepted, and that they are doing the work.

Messrs. Stimpson & Co.'s tender (revised) was accepted. Southend Mill, Lewisham. Mr. W. C. Banks, architect.

TO CORRESPONDENTS.

H. R.—Mr. S.—G.—H.—A.—T.—H. W.—M.—T.—H.—N.—A.—H.—F. J.—E.—B.—P.—R.—T.—J.—S.—Q.—J.—D.—S.—T.—D.—D.—G.—W.—B.—&—M.—W.—S.—J.—B.—E.—F.—M.—K.—W.—W.—A.—W.—F.—J.—R.—C.—R.—Y.—C.—W.—A.—C.—G.—Inquiries from correspondents charges for taking out quantities vary according to circumstances, and are usually the subject of pre-arrangement.—G. T. (we cannot give addresses).—G. W. (to advise as to the mode of ventilating a public hall, it should be seen and examined). Call in a proper address on the spot.—H. M. (must look to our advertising columns).—G. J. D. (report on the accident referred to was not enclosed).—H. W. R. (nothing is yet settled).—Coal Question (in type).

Erratum.—We are asked to mention, with reference to the Asylum at Virginia Water, that the names of the authors of the paper marked "Messrs" in our column, should have been Messrs. Mathew & Quiller, instead of Mr. J. S. Quiller.

We are compelled to decline printing out books and giving addresses.

All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

Not.—The responsibility of signed articles, and papers read at public meetings, rests of course with the authors.

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The Builder.

VOL. XXX.—No. 1541.

A Few Words to Wolverhampton.

OLVERHAMPTON is particularly interesting in the union which it presents of the past and the present,—ancient relics with evidence of modern progress. We have already said how important we believe it to be to such a town to preserve the landmarks of its early history. A very good feeling in this respect seems to prevail, we were glad to see; so that exhortation is scarcely necessary. The fine old church has been restored, and the ancient cross, or pillar, seems duly prized. Several creditable buildings have been lately erected. The Town-hall, Anglo-Italian in style, with Mansard roofs of the present period, is a handsome-enough building, and seems to meet the requirements, though the acoustic qualities of the council-chamber are diabolical, and should at once receive scientific attention, with a view to improvement. A good building has been put up for the purposes of the School of Art, though it is not made use of to the extent desired; and the streets display some excellent shops. The building trade is not particularly lively in the town: one of the leading builders discharged twenty of his joiners on the morning of our visit. The fact that recently there were 20,000 miners of the neighbourhood, and 30,000 hands dependent on coal, out of work, must necessarily affect expenditure. These violent disruptions in the course of labour necessarily damage everybody.

The suburbs of Wolverhampton show some very good houses in pleasant gardens, anything but black country,—the fringes of green of which Lord Dartmouth spoke at a recent meeting. The Agricultural Hall is worth looking at, and it is not an unsatisfactory indication to find one of the thoroughfares designated "Art-street." Thorneycroft's statue of the Prince Consort, like most of the bronze statues in this country, is in a filthy state: not merely covered with soot, black, and reflectionless, but with a number of white spots here and there of most disagreeable appearance. We sadly need some good preservative coating for metal. However, our present object is scarcely so much to describe the appearance of the town as to utter a protest against the system of arranging the streets which has been pursued there, and is apparently still acted on,—a system which results in the production of countless courts of the most unhealthy and objectionable character. In street after street, street after street, side by side with the house-doors, are seen narrow entrances to Court 1, Court 2, Court 3, and so on, which are filled with houses generally without any back-windows, low, ill-ventilated, and mostly overcrowded. Overcrowding, as we have often said before, means

dirt, degradation, disease, and death; and here proofs of the truth of the assertion may be easily found. We visited scores of these courts, and found them in the majority of cases with middens full, stinking, confined, and deadly. In Poel-street and its neighbourhood, behind Back-lane, and in what is called Carrice Island, the condition of things is frightful: if the latter were really the settlement of a tribe of wild Indians, it would be an object of wonder to the civilised upper classes of Wolverhampton. These are the places which fight against the general salubrity of the town, and out of which will one day come some frightful epidemic to dispel the secularity at present indulged in, and rouse to salutary action. These words are written with but one end in view,—the promotion of the general good,—and will, we trust, be received in the same spirit. If little else can be done, the authorities can at any rate make a resolute stand against any further extension of the abominable court system.

THE WOLVERHAMPTON CONGRESS.

THE archaeological crop of the week is more than we can gather or house. Any attempt to chronicle fully the proceedings of the British Archaeological Association, the Archaeological Institute, the Kent, Bedford, and Sussex Society (all which, to name no others, have been industriously at work), would fill our present Number. The Congress of the British Archaeological Association has been particularly satisfactory, and would give many points for notice. We must content ourselves with quotations from two or three of the papers read. We take the first from a memoir by Mr. J. C. Tildesley, on

The Early Industries of Staffordshire.

Locks.—The lock trade was a recognised industry in Wolverhampton and Willenhall at the commencement of the sixteenth century. During Elizabeth's reign, one Mark Scalliot is said to have constructed a lock "consisting of eleven pieces of iron, steel, and brass, all of which, with a piped key, weighed only two grains of gold." Early in the seventeenth century cranks were made in Wolverhampton for "brilles for brewing women." It is satisfactory to report that this branch of the lock trade is now entirely extinct. Dr. Plot, writing in 1686, says of Wolverhampton:—"The greatest excellency of the blacksmith profession lies in their making of locks, wherein the artizans of Wolverhampton seem to be preferred to all others. . . . These locks they make either with iron or brass boxes, so curiously polished, and with keys so finely wrought, that 'tis not reasonable to suppose they were ever exceeded except by Tubal Cain, the inspired artificer in brass and iron. . . . I was told of a very fine lock made in this town, sold for 20*l*., that had a set of chimies in it that could go at any hour the master should think fit." The object of chimies in a lock, unless it be to soften the heart of a hurglar, does not appear; but such music is certainly to be preferred to that of the lock on the wardrobe of fair Penelope, immortalised in Homer's *vers*o (*Odyssey* 21st). Pope thus translates the passage:—

"A brazen key she held, the handle turn'd,
With steel and polish'd ivory adorn'd;
The bolt, obedient to the silken string,
Forsakes the staple as she pulls the ring;
The words respondent to the key turn round,
The bars fly back, the flying valves resound;
Loud as a fall makes hill and valley ring,
So roar'd the lock when it released the spring."

Up to the end of the seventeenth century keys were usually ornamented by the insertion of a cross in the bow, and heads surrounded the shank.

Dr. Wilkes, of Willenhall, writing in 1750, pays a flattering tribute to the skill of the lock-smiths both in Wolverhampton and Willenhall. Referring to the latter town, he mentions that in the year 1776 one James Lees made a lock and key, the total weight of which did not exceed that of a silver twopence. The first of Chubb's well-known patents was obtained in the year 1818, a factory on a small scale having been established in Wolverhampton some years previously by the founder of the firm.

Wrought Nails.—Nail-making is mentioned as a thriving industry in Staffordshire, by Leland, in his "Itinerary" (A.D. 1538); and Dr. Plot,

in 1686, remarks that "for nail-making there are so prodigious numbers here, that in the parish of Sedgley there are thought to be no less than 2,000 of the trade, reckoning boys as well as men." Hutton, the Birmingham historian, riding on his gray nag through the nailing district, ingeniously records his surprise "at the number of female blacksmiths here about," until a buxom lass, leaning with bare arms over her smithy door, explained that they were nailers. Shaw says, that in 1798 nail-forging employed one-fourth of the population of Tipton. Until the introduction of steam machinery, nail-forging was a thriving industry, but since that era it has been gradually dropping under the weight of enormous competition, and its existence has only been prolonged at the cost of excessive labour on the part of men, women, and even children. It is most probable that the thousands of little nail smithies scattered throughout the district of which Dudley is the centre, will, in a few years, become the relics of a decayed and obsolete handicraft.

Iron Castings.—Ironfoundries were in operation in Staffordshire prior to the reign of Elizabeth, but the produce was on a small scale until after the close of the sixteenth century. Dud Dudley made "all sorts of cast-iron wares, as brewing cisterns, pots, mortars, &c.," and during the civil wars, cannon balls were cast at Foley's foundry, in Wolverhampton. Tipton, Bilston, Wednesbury, and West Bromwich were also among the earliest centres of the trade. The productions were, until the beginning of the present century, mostly confined to the heavier descriptions of castings, such as grates, boilers, pipes, and garden rolls. With the invention of cast hollowware in 1779, by Jonathan Taylor, a Birmingham artisan, ironfoundry in Staffordshire began to make strides of progress. The first hollowware foundry was established at West Bromwich in 1780, on a site which afforded ample water power. The manufacture was of the crudest and most primitive type until the present century had commenced. The annealing oven was invented in 1805, by Mr. Kendrick, of West Bromwich; and in 1839 Messrs. T. & C. Clark, of Wolverhampton, invented the process of enamelling hollowware now so generally employed.

Mr. Molyneux, F.G.S., in a paper on—

The Roman Roads of Staffordshire,

said, these are pretty well known to be three,—Walsing, Icknield, and Ryknield. The first entered the county from Shropshire, due east, at a place called Storyford. It passed near Stretton and Penkridge, leaving the latter place two miles to the north. It crossed Cannock-chase, and at Nuckley Manor diverged slightly to the south-east, and so on to the wall—Elocetum. Thence it again diverged, and left Staffordshire over the river Tame at Fazely, Icknield-street entered Staffordshire through Warwickshire, due north. It passed across Sutton Park, which was now in a state of nature. There it would be found to represent one of the most perfect portions of a Roman road to be found in this country. The author particularly noticed that in Sutton Park, on the north side, there was a footway, about 6 ft. wide, evidently intended for pedestrians, and that on the side of the hill, midway in the park there was a curious hollow excavation in the road, 12 ft. square, which was apparently intended as a place for watering the horses while the troops were on the march. From the ground of Little Aston Park Icknield likewise went on to Elocetum, and ultimately entered Derbyshire to the Dove, on Monk's Bridge. Ryknield entered Staffordshire across the Trent, in the parish of Burton, and was stated by Dr. Mason, in his history of Stoke-upon-Trent, to correspond to Chesterton, near Newcastle-under-Lyne, which the doctor identified as the *Mediolanum* of the Romans. There was some doubt whether this or another Roman road was the Roman street in question, because there were traces of a Roman road which crossed the Trent at Branston, the *Ad Trivonam* of the Romans, and that extended in the direction of Needwood Forest, where Roman remains had been found. After showing that the Roman roads were generally from 40 ft. to 60 ft. wide, and invariably ran across the country in a perfectly straight course, whatever might be the obstructions, the road-makers always using deposits of gravel wherever they could find them, and keeping ditches on both sides, for drainage purposes; Mr. Molyneux reminded his hearers that the Latin conquerors erected important stations

generally at twelve miles' distance, or a day's march.

Early Documents,

in the possession of Lord Wrottesley, were commented on by Mr. W. de Gray Birch, who spoke first of the great destruction of early documents that had occurred. He could tell how the beautiful miniatures and illuminations in the library at Durham Cathedral were cut from priceless manuscripts by a nursemaid of one of the members of the Chapter to amuse some fractious children;—how at Malmesbury Abbey, in Wiltshire, enough vellum MSS. were carted away from the library to serve the glovers of the town for ten years. But these, and innumerable instances, must be allowed to plead their eloquent tale to them and to posterity, and teach them to guard with jealous hand the little yet remaining, which must have been preserved by little short of miraculous intervention. One of the great values to be attached to ecclesiastical and religious deeds was, that they contained notices of national events not to be found in any other repository. Of this Lord Wrottesley's collection contained a very notable instance, where, in a roll which he had no hesitation in ascribing to the authorship of a literary member of the Abbey of Burton-on-Trent, in the county of Stafford, a statement of the settlement of Scottish affairs in the troubled times of Edward I. had been inserted by the scribe upon the back of what really was a synopsis of British history from the earliest period to the last decade of the thirteenth century. It was evident that the Wrottesley manuscripts were exceedingly valuable as containing much that would cast a new light upon the history, manners, and customs of England during a very extended period. The following were among some of the documents which Mr. Birch produced and explained:—1. A copy, made in the time of Henry VI. or thereabout, of a deed purporting to be dated in 1088, whereby Robert de Stafford, an ancient member of the House of Wrottesley, grants a certain land called "Wrotteslea and Lemintona" to the Abbey of Evesham, in frankalmoinage, or as a free almsgiving. In consideration of this he was probably admitted into the monastery as a monk, for the deed goes on to say, "I, Robert, having been made a monk in my infancy, in the same monastery, have confirmed this gift, by the sign of the cross with my own hands." Then follows his cross or mark, as well as those of his son Nicholas, and other witnesses. There were several points about this charter of donation which the author confessed he did not like, for it appeared to him to point to the fact that the venerable monks of Evesham, having persuaded the grantor to join their community when on his deathbed, as they thought, fabricated this deed in order to get possession of the estate. Mr. Birch based his opinion adverse to the strictly genuine nature of this document upon the defective grammatical structure of the sentences, and especially upon the fact that Peter, Bishop of Chester, who, it was stated in the document, ordered the deed to be drawn up, died three years before the date of the deed.

The reception at Patshall by the president, Lord Dartmouth, and the Countess,—a reception equally genial and elegant,—on which same day Mr. Planché and Mr. Harrison Ainsworth contributed valuable papers; the continuous labour of Mr. Gordon Hills and Mr. Edward Roberts, as officers of the society, in describing and commenting on buildings not illustrated by their natural protectors; the exertions of Mr. G. R. Wright in the arranging of excursions; and the brilliant conversation given in the town-hall by the Mayor of Wolverhampton as the wind-up of the week, all call for warmest acknowledgment in even the briefest record of the proceedings. We will add two superannumerary lines to give a word of hearty commendation to the Star and Garter Royal Hotel, which is kept by one bearing a name held in much esteem by archaeologists,—Britton.

What is an Inch of Rain.—An English acre consists of 6,272,640 square inches; and an inch deep of rain on an acre yields 6,272,640 cubic inches of water, which, at 277,274 cubic inches to the gallon, makes 22,622.5 gallons; and as a gallon of distilled water weighs 10 lb., the rainfall on an acre is 226,225 lb. avoirdupois. As 2,240 lb. are a ton, an inch deep of rain weighs 100,933 tons, or nearly 101 tons per acre. For every 100th of an inch a ton of water falls per acre.

REPORT OF THE JOINT COMMITTEE OF THE TWO HOUSES OF PARLIAMENT ON RAILWAY AMALGAMATION.

EARLY in the present session of Parliament a joint committee of peers and commoners was appointed to investigate the subject of railway amalgamation.

Joint committees, special committees, Royal commissions—such are our substitutes for the special discharge of scientific or political duties by trained men. The French revolutionary mode of sending a civilian deputy to control the operations of a military command, the sole qualification of the deputy being his republican virulence, is only one step beyond our own method. Professedly and habitually we subordinate all special studies—war, marine, everything but law—to non-professional control. We have another instance of the folly of this method of dealing with questions of national welfare, on the basis of party combination, in the history of our railway legislation. The Report before us at once shows how far we are fettered and cramped by the manner in which we have made laws about railways for some forty-four years, and contributes another stone to the pile of our embarrassment.

We are not to be understood as denying that much sound sense and patient inquiry are displayed by the framers of the Report, and that much valuable information is contained in its columns. As much as that may be predicated of many similar productions. But the mischief is, that most of the time of such commissions is occupied by the education of the commissioners. They collect a mass of facts, in the course of eliciting which they acquire, often for the first time, a second-hand acquaintance with the subject, such as to enable them to speak of it in Parliament or elsewhere, or to write upon it, in a manner that may seem creditable to persons less informed than themselves. But for the main points to be grasped and followed out—for time to be saved, irrelevant evidence checked or repressed, or any assurance to be obtained that a subject has been exhaustively treated, we must look to some other method of inquiry.

We shall see that this view is signally illustrated by the Report now under consideration. It has all the mixed character of that patchwork which invariably results from setting several men to do the work of one. With many of its conclusions we fully agree. Of the feebleness displayed in altogether blinking the main question, which a statesman, if such should arise among us, will one day have to face, we had better not express our opinion. But as to the actual omission of one of the main subjects of consideration, which, from the committees' own point of view, ought to have been brought into most prominent relief, we are sore of public assent to our condemnation, when the gap is once pointed out. This we will endeavour to do.

The upshot of all the work of the commission is contained in twenty-five paragraphs, the essence or gist of which is abstracted by the report. The committee acknowledge that they suggest nothing that will "have the effect of preventing the growth of railway monopoly"; the dangerous nature of which, however, they do not dispute. Nor do they offer any suggestion by way of benefiting the public, in the way of reduction of rates and fares, in the event of the increased prosperity of the great inland carrying corporations. They propose to give such support as is practicable (or as has occurred to them as practicable, which is a very different matter) to water-carriage, inland or seaborne, and to let the public know, more distinctly than at present, what they are charged, and why they are charged, while giving them improved means for getting unfair charges remedied. These two objects are real and important. But it is inconceivable how, in going even thus far, the committee should have entirely closed their eyes, or at least their mouths, as to one of the recent developments of a very old mechanical application, which promises to be of far more general application than any method of water-carriage. To hold railway companies in check by aiding the development of canals may be all very well. But have the committee never heard of such things as tramways? Have they no knowledge of light railways or narrow-gauge railways? If they know nothing of what is doing in these things, what is the character of their intelligence? If they know anything, and have not sought either to know more, or to tell their constituents what they do know, what are we to think of their judgment? It is clear that be-

tween the rigid horns of this dilemma the Report, so far from assuring the dignity of a State paper, sinks to a value but little above that of a schoolboy's theme,—a good theme, by a clever schoolboy,—but by one who has not borne in mind the axiom that the whole is equal to the sum of its parts.

As to the short-sighted character of the policy which has allowed our great canal property to fall to so great an extent into the power of the competing railway interest, no judicious mind can entertain any doubt. The history of civilization, so far as the means of internal communication are regarded, has witnessed the same sort of oscillation between the conduct of traffic by land and by water, that we are now watching between the predominance of the attack, or of the defence, in military and naval artillery and fortification.

At one period the chief centres of commerce are those that lie most seaward, and thence give the longest land, and the shortest water, transit. Such a port was Brundisium, at a time when the military roads of the Romans afforded a surer and better mode of military and commercial transit than did the marine of the period. Such a port is that Imperial harbour, under its present name of Brindisi, again becoming. We must say this, however, as a matter of faith rather than of fact, as far as the postal service is concerned, for letters landed at Brindisi by the Indian mails still take the greater part of a week to reach London. Thus, for example, we may cite the fact that the *Ponak* landed at Brindisi, on the evening of the 1st of August, the letters which were delivered at London on the 7th. That, however, is a question of the bad management of the Italian service, and the wilful delay which the French invariably oppose to anything that does not go by Marseilles. The fact of the possible superiority of the land route remains.

On the other hand, such a city as Bristol, and we may even add, London, owes the foundation of its prosperity to directly the opposite influence. In the choice of the sites of these cities, as of most of those of which we can trace the primitive foundation, the object was to allow the greatest amount of water-borne traffic to be carried for the furthest possible distance inland. As we trace this alternation in the main requisites of ports and of cities, so may we understand the causes of the change, from time to time, by studying the history of locomotion. Within times not very remote, in this country, we have witnessed the formation of macadamised roads, the introduction of an organised system of inland navigation, and the origin and rapid extension of the railway system.

As, in the early days of the Stephensons, the canal interests steadily opposed the passage of Railway Bills through Parliament; so have the railway companies, when they had established their own position, endeavoured to devour and cripple the canals. Out of nearly four thousand miles of inland water communication in Great Britain, we are told that more than a third is now under the control of railway companies. In some instances that control might have been wisely exerted, to the relief of the plethora of the choked lines, and to the increasing of the dividend of the proprietors, by facilitating the use of a cheap mode of transport for goods; in the transmission of which time was not an object of the first importance. Indeed, even as to time, we can remember that it is not so very long since, on the North-Western line, we were told that heavy goods could be sent to London from Birmingham more rapidly by canal than by railway. That of course was an entirely exceptional state of things, arising from the great pressure and block of business. But it was an instructive exception.

The mischief of allowing the water-carriage of the country to pass into the hands of the railway companies has been twofold. First, practically, it has led to the ruin of much of the canal property. We can point out, from personal knowledge, one great line, and we have no doubt that it is but one out of many, in which the works have been so neglected that the question, which cannot long be delayed, of repair or of demolition, will assume a very serious importance. We believe this policy to be as short-sighted for the railway interests as it is disastrous for those of the country. Instead of competing with the canal for the coal and other heavy traffic, which, in the instance to which we refer, could have been carried by water not only more cheaply, but with far greater public convenience, the managers of this line would have

acted far more wisely by keeping the heavy traffic in its old water-borne course, and using their line (when it was made) for passenger traffic alone. No doubt in this case it was judged more expedient to augment traffic returns than to keep an eye on the main issue of dividend. But similar political reasons are everywhere, more or less subterraneously, at work. The result is, the public are losers, the canal property is deteriorated, and ultimately the railway proprietors will find that an ugly amount has to be paid, as the result of a blind and aggressive policy.

The second evil which this artificial check upon water communication has produced has been, that it has diverted the attention of practical and scientific men from the improvement which is unquestionably possible in canal navigation. As it is, the present limit of speed is rather incidental than actual. It is not the difficulty of propulsion which keeps the barges to their slow pace, so much as the damage done to the banks of a canal by the wave caused by a rapid transit. We have travelled with the *ae plus ultra* of luxury of motion, and with a very reasonable rate of speed, on a canal, in a light boat drawn by a pony at a trot, or even at a gallop. Under these circumstances the boat rises from its usual immersion, and glides over the surface of the water. Boats may be constructed expressly for this purpose. The saving of traction that is effected by the increase of speed is one of those things which *no a priori* mechanical investigation has pointed out. But it is a known fact. It is analogous to those results which we are now obtaining, in fixed machinery, by driving a very light wire-rope at a very high speed. The limit at this moment, as we before hinted, is rather in the cost of maintenance than in the difficulty of traction. And this is one which it would not be impossible to confront, if a due share of traffic were encouraged on our inland navigations.

It is the part of wisdom never to run into extremes. On the one hand, we profess no sympathy with the engineer who saw in the rivers and streams of a country only possible feeders for canals. On the other hand we never heeded the prophecies in which the old canal worthies were wont to indulge, as to the impossibility of railways ultimately holding their own. Nor, in its turn, can we fail to condemn the murderous hug with which the latter have embraced their watery rivals. At a period which has witnessed one of the most famous triumphs of engineering skill that has been effected since the time of the Pharaohs—the canal by which French energy and perseverance has united the Red Sea and the Mediterranean—we are not among those who hold that canals are altogether the most ordinary consideration, that the possible effect of tramways and narrow-gauge railways, either as feeders of, or to some extent as competitors with, existing lines of railway, is a far more urgent and pressing question, even if not one of so much ultimate importance, than the development of water-borne carriage. We are not prejudging the question; we are not, for the moment, expressing a decided opinion on the advantages of what are called tramways. The subject is too important to be dismissed in one or two paragraphs. But we do say that a Report which only professes to palliate, and makes no attempt either to probe or to provide for future exigencies, is signally defective, in going into the question of canals, and ignoring that of tramways.

More may be said in defence of the failure of the committee to deal with the great national question of the ultimate proprietorship of the internal communications of the country. The members no doubt felt a just distrust of their own capacity for dealing with so important a subject. It is hardly one for amateur investigation: which is the form, to speak plainly, which almost all corporate or board inquiries naturally assume. Indeed, judging from the tone in which military and postal conveyance is spoken of, we think it is matter for congratulation that the committee did not contribute an additional quota of confusion to a subject which all European governments except our own have held to be one demanding the best attention of their statesmen. It is proposed that the fares to be paid by the War Office for the transport of troops should be reduced to such an amount as will give the companies a profit equal to that derived from either ordinary passenger, or excursion, traffic. This, we think, is not the light in which the subject should be viewed. It is a matter of good statesmanship to make the inci-

dence of all taxes as little onerous as possible. In all foreign States this maxim has been borne in mind as relates to the services which the railways render to the State. Great powers are entrusted to these corporations; to be used, primarily, for the pecuniary benefit of their members. The service of the public, or at least has been hitherto, a subordinate consideration. The rate of fares, the timing of trains, the condition of carriages, are matters on which a *laissez faire* policy has been to a great extent that of our legislation. No redress exists, in many cases, for extreme inconvenience inflicted on the public. The directors most respected are those who declare the best dividend. It is, therefore, but little to demand, in return, that railways should return to the State such a payment *in kind* as will best serve the latter at the least expense to the former. We do not see why the conveyance of troops should be regarded as a source of profit. At all events, we are disposed to maintain that, for State service, no railway company should receive more than the lowest rate of remuneration which, for its own ends, it voluntarily accepts. We may instance the coal traffic. The low rates at which minerals are borne, for competitive reasons, are notorious. To choke water carriage, coals and ore are taken at charges which differ immensely from those of passenger traffic. Now, allowance being made for the difference, if any, of the cost of the carrying stock, a ton of soldiers, which loads and unloads itself, ought to be carried by every railway company at least as cheaply as a ton of coals, which the company has to place in, and remove from, its premises or its wagons.

We have not space to go, item by item, through the joint Report. It will be seen from the above remarks how fragmentary and casual is its character; and how it entirely fails to look a great question in the face. Nor can we view with more favour its one substantive recommendation—the appointment of a special tribunal, entitled the Railway and Canal Commission, composed of one eminent lawyer, one member who should be thoroughly acquainted with the details and practice of railway management, and one who, as no special qualification is attributed to him, is, we suppose, to be of the fashionable political colour of the day. This attempt to create brand-new authorities is not an unnatural recommendation to a committee. Most things seek to perpetrate their own likeness; but judging from past experiences, we should only have a new obstacle thrown in the way of every really efficient improvement. That which all civilised nations, except ourselves, have done, has been to give the general control of public works, and the State supervision of all things of an engineering nature, to a minister holding equal rank with the secretaries of State for war, marine, commerce, law, and the other main branches of Government. With us, what the Government does with regard to these matters is intrusted to different functionaries, not of the highest rank, independent of one another, sometimes coming into mutual collision, and, as we have recently seen, more than sometimes coming into violent collision with all that we have that is most respectable either in science or in art. It is a misfortune to a Cabinet, no less than to the country, that such should be the case. We call attention to the fact that in the sanitary measures now in course of elaboration the head of the Local Government Office has to discharge some of the functions of a minister of public works. If such a ministry were permanently and efficiently organised, the gain to the country might be great; and so long as our present plan of giving the supreme command to a civilian unacquainted with the special requirements of his department is continued, the permanent staff of the ministry would form a sort of counsel to the temporary chief, so as to prevent him from making any very extraordinary blunders; or, at all events, so as to render him palpably inexcusable for so doing. If Government interferes at all with works, ports, harbours, river purification, river navigation, roads, railways, drainage, and sanitary engineering, it can only satisfactorily do so by a harmonious execution, and by systematic action. We must have done with referring everything to special Boards, whether of trade, of works, of sanitary measures, and of railways. What we do should be done seriously, and not by rule of thumb. The question of how far Government must, and must not, interfere with public engineering questions has yet to be stated, and to be settled. We have to commence, *ad oco*, a systematic study of the whole question; a study

such as Von Moltke made of the question of defence. With this leaf taken from a very instructive lesson-book, we shall find that public time and public money will be by and greatly economised. We should then not invite half a dozen gentlemen to quarrel for months, or even for years, on a question which the careful report of one eminent and responsible engineer would settle in the course of six, twelve, or eighteen months, but settle definitively and exhaustively. We should cease to render ourselves ridiculous by official reports, involving the extraction of coal at a temperature of 120° Fahrenheit, or the dealing with railway legislation without any reference to tramways.

LOADS AND DEFLECTIONS OF SOLID BEAMS.*

THE methods which have been in use for the last twenty years for calculating the strength of iron beams, have all been more or less based on the experiments and mathematical investigations made by the late Eaton Hodgkinson; and the author of the essay before us has not been able to discover anything more reliable than the recorded results obtained by that eminent experimenter; the chief novelty about his investigations consisting in the view he takes of those results in their bearing upon the strength of beams. He finds fault with the usual methods of calculation, because they give the breaking or ultimate strength instead of what is really wanted by the practical engineer, the proof strength or the utmost load that can be put upon a beam without permanently injuring its elasticity.

In cast-iron beams, Mr. Donaldson considers that experiments show that the modulus of elasticity, whether for tension or compression, can be taken as nearly the same, when the load is not sufficient to impair the elasticity of the material; but that in beams of wrought-iron the modulus for extension is to that for compression in the proportion of 14 to 11.

Mr. Donaldson's investigations differ therefore in this point from previous ones, in taking two moduli, one for compression, and another for extension, instead of an average modulus to include both strains. This is no doubt the correct method, but it involves more complicated formulas, and it may well be questioned whether such nicety is of much practical value in determining the strength of beams, since we seldom find that any two specimens have exactly the same modulus, and therefore after all only an average value can be taken.

There is one other important point in which our author differs from his predecessors, which consists in taking the ratio of tensile and compressive stresses as widely different when proof stress or ultimate stress is under consideration. The ultimate compressive strength of cast-iron, as determined by experiments on short cylinders, is about six times the ultimate tensile strength; and on this relation the form of section of what is called the Hodgkinson cast-iron beam is based, making the metal of the bottom flange, which suffers a tensile strain six times that of the upper one which is under compression. Mr. Donaldson, however, considers that this is a wrong conclusion to draw, and that the proof compressive strength being only three times the proof tensile strength, the form of the girder should be based on this principle, and not on the ultimate or breaking strength of the metal. He takes this view of the relations of proof and ultimate stress from a table of experiments given by Hodgkinson, in the Parliamentary Report for 1849, which were made on a number of cast-iron rods 10 ft. long and 1 in. square, in which it appears that a compressive force of 25,000 lb. was all that they would bear without injury, the tensile strain being 8,000 lb., without impairing the elasticity. If we refer, however, to the record of these experiments, we find it stated that the rods were enclosed in an iron frame, which prevented their getting out of a true form, which prevented their being broken in the right line; but, notwithstanding this precaution, some of the bars strained with 16 or 18 tons had become very perceptibly undulated. This might well be expected from their great length, as compared with the width, which would be of no consequence in tensile strain; but when a compressive force was applied, the resistance would vary according to

* New Formulas for the Loads and Deflections of Solid Beams and Girders. By W. Donaldson, M.A. London: Spott. 1872.

the ratio of breadth to length, the strength of very long pillars being shown by Hodgkinson's other experiments to be nearly inversely as the square of the length. It appears, therefore, to us that the experiments which Mr. Donaldson quotes are not of much value for the purpose of determining the resistance of the upper flange of loaded beams to compression, and that a proof stress for compression of one-fourth the ultimate strength is far too little to allow in beams of cast iron.

With regard to wrought iron, it is almost impossible to fix with any accuracy the average ultimate strength, whether compressive or tensile, since so very much depends on the quality and ductility of the metal, there being no exact point in good wrought iron at which crushing can be said to occur; while, on the other hand, it may generally be drawn out very considerably by a tensile force before fracture takes place. Mr. Donaldson takes as his authority some experiments of Hodgkinson's on bars 10 ft. long by 1 in. square, and from these he deduces the ratio of 3 to 2 as that of proof compressive to proof tensile stress in wrought iron. This, however, is an inference drawn from one set of experiments only, and very different results are shown by Hodgkinson in another set, on bars of larger diameter. In subjecting long bars of wrought iron to a compressive force in the direction of their length, although kept from bending by mechanical means, the same difficulty will arise as we mentioned in the case of those of cast iron, and they can only be considered as long pillars, whose strength depends on the ratio of diameter to length. For these reasons, we can hardly admit that Mr. Donaldson has proved the principle which he affirms, "that it would be wrong to use formulas with constants determined by ascertaining the experimental breaking-weights, to design beams intended to support proof and working loads."

But whatever difference of opinion there may be as to the conclusions to be drawn from experiments, there can be none as to those deduced by pure mathematical reasoning, in which Mr. Donaldson is certainly an adept, and has worked out, by means of the integral calculus, very exact formulas for finding the strength and deflection of beams in cast or wrought iron and timber. These formulas are quite independent of the results of experiments, and will be found of equal use whatever value of constants the engineer may deem it advisable to employ. It will only be those who have a good acquaintance with algebra that will be able to follow the author's arguments or to understand the application of the formulas deduced; but the following are some of the results obtained, and which will not be difficult of practical application.

In the case of solid rectangular beams of any material, let W be the load applied at the centre of the beam, w the weight per unit of length (l) of the beam itself, d the depth and b the breadth of the beam, f , f' the horizontal components of the stress per unit of area on the extreme bottom and top edges respectively actually exerted, E the modulus of elasticity in extension, E' the modulus in compression; then the relation between the applied forces and the resistances is expressed by the equations—

$$W + \frac{wl}{2} = \frac{4fd^2b}{3l \left(1 + \sqrt{\frac{E}{E'}}\right)}$$

or,

$$= \frac{4f'd^2b}{3l \left(1 + \sqrt{\frac{E'}{E}}\right)}$$

the upper or lower expression to be used according as E is less or greater than E' .

The deflection at the centre of a rectangular beam with a distributed load is,

$$\text{Deflection} = \frac{5f \left(1 + \sqrt{\frac{E}{E'}}\right)^2}{48E'd}$$

or,

$$= \frac{5f' \left(1 + \sqrt{\frac{E'}{E}}\right)^2}{48E'd}$$

The deflection produced by a central load is to that by a distributed one of equal amount in the proportion of 8 to 5.

In the case of flanged girders, let D be the

distance between the centres of gravity of the top and bottom flanges, A and A' their sectional areas; then we have the relation between the forces determined by the equations,

$$W + \frac{lw}{2} = 4fA.D$$

or,

$$= 4f'A'.D$$

If the areas of the flanges are proportioned so that

$$\frac{f}{f'} = \frac{E}{E'}$$

then the central deflection, with a central load, when f is constant, is,

$$\text{Deflection} = \frac{f l^2}{48E'd}$$

or,

$$= \frac{f l^2}{48E'd}$$

Mr. Donaldson has also devoted a few pages of his essay to the investigation of the ratio of depth to span in wrought-iron railway girders, for which a table is given with the ratios varying according to the spans.

SANITARY CONDITION OF PARTS OF BIRMINGHAM.

THREE or four years ago, on the occasion of the meeting of the Social Science Association in Birmingham, we received some abuse in return for the particulars we gave as to the evil condition of parts of that important town. Notwithstanding the time that has elapsed, similar statements have yet to be made. At the recent meeting of the British Medical Association in Birmingham, the president, Mr. A. Baker, said, in the course of his inaugural address—the area of the borough, 8,120 acres, when divided between 350,164 inhabitants (the estimate of the last census), gives upwards of 124 superficial square yards to each person,—an allowance that probably accounts for our freedom from typhus, as fully as the absence of marshes and bogs explains our immunity from ague. The distribution of this area, however, is not so equal as might be wished for sanitary purposes; the space per head varies in the different wards from 695 square yards in Edgbaston to 31 yards in St. Martin's Ward. Seven other wards yield a smaller superficial area than 100 square yards for each inhabitant. The density of population in the central and older parts of the town may be comprehended, but that districts which have been built since the importance of sanitary rules has been known, should have been allowed to exceed the limits of health in house accommodation, is only to be attributed to the anomalous position of a corporate body which, whilst endowed with powers to levy rates and govern the town, has no authority to curb the crude and ignorant designs of the building speculator, who, in order to secure a large immediate return for a small outlay, is at liberty to construct a court of scanty surface, approached by a narrow alley, with rows of sheds called houses, built back to back so as to support each other; defying through-ventilation, yielding scanty space for the admission of pure air, and as little for the escape of that which has been exhausted by respiration. From these courts, possessing not a single sanitary attribute, containing open middens of faulty construction, arise fetid exhalations that pollute such air as enters the still enclosure; the leakage from the ashpits through the soil into the wells from which water is drawn gives rise at times to an excessive mortality from scarlatina, typhoid, diptheria, diarrhoea, and other preventible diseases of a like type. Let contagion enter a space thus circumscribed, and the result may be safely predicted. For the tenants of these defective courts, the only airing-grounds are the streets, which fortunately present many open spaces in various parts. Well might Dr. Greenhow declare that "more than half our annual mortality results from diseases which prevail, with a very great range of difference, in proportion as the sanitary circumstances are had or good;" and that the mortality from preventible disease in certain districts "raises the death-rate of the whole country 33 per cent. above the death-rate of the healthiest part." The powers wanted to suppress this evil need not be vexatious. They are required only for the protection of the poor, embrace the simple questions of ventilation, space, and sewage, and might be safely dictated by a health-officer, aided by the borough surveyor.

On the subject of the sewage difficulty, Mr. Baker said,—

"Whilst sympathising with the Corporation in their efforts and their defeat on this question, there is one marked and culpable defect in the official appointments of this borough which demands severe animadversion. The imperfections that have been mentioned could not have existed unremedied had there been a well-qualified technical officer of health, possessing technical knowledge of hygienic rules; capable of guiding the deliberations of the Council on this subject, and of framing comprehensive plans for the prevention of disease and the promotion of health. Such an officer, rendered independent by an adequate salary, freed from the cares of medical practice, exclusively devoted to sanitary science, and armed with power to exact information and aid from all the executive officers of the borough, would secure to the inhabitants that skilled care which they have a right to expect, would represent faithfully the views of our profession, and would be competent to contribute to those discussions between the 'associated officers of health' which have materially advanced our knowledge of scientific hygiene. The cost of such a man would be more than compensated by a diminished rate of illness and pauperism, a more steady capacity for labour, and a smaller rate of crime."

OPENING OF THE PORTLAND BREAKWATER.

ON Saturday his Royal Highness the Prince of Wales laid the completion-stone of this great national structure. The Prince received a most enthusiastic reception. During the past two months preparations for the event had been in progress. An appeal made by the Mayor, Mr. James Robertson, had resulted in the townspeople subscribing some 700l. towards the fund for the decoration of the town alone. The little town was therefore bedecked in the most profuse manner. The Esplanade was rendered gay with flags, evergreens, and flowers, Venetian masts, with heraldic trophies, being fixed in this as also the other public thoroughfares.

The Portland Breakwater, now that it is finished, offers to the eye little more than a thin reef, stretching away almost till it fades. Its magnitude and strength are buried out of sight, but it is a vast Cyclopean wall, 100 ft. high and 100 yards thick at the base. It is heaped up by nearly 6,000,000 tons of stone, which, if built into a solid column 100 ft. in diameter, would overtop the highest Alp. The scaffolding, of which, of course, there now remains no trace, must be described as a wooden railway viaduct, of the most massive kind, built a mile and a half out from the shore, in from 50 ft. to 60 ft. of rough sea-water. Every timber had to be made waterproof and wormproof by the hydraulic forcing of creosote into the pores of the wood, and when this was done a huge pile was made of nine or ten timbers bolted together in one nightly spar of eight or nine tons, some 2 ft. or 3 ft. square. Tipped with an iron screw, this was lowered into the sea until it rested on the bottom, when it was worked round by a capstan till the screw had bitten 8 ft. into the clay. Three or four of these great piles were set at a time, and at once bolted together by many wrought-iron tie-rods and powerful cross-timbers and under-trusses, till the mass was strong enough to carry the trucks of stone for tipping-in. The top of the scaffolding was 30 ft. above the water, or 90 ft. above the ground.

In the construction of the North Fort, these piles were set in two great circles, of 112 ft. and 22 ft. in diameter, upon which, as on a huge dial, moved an immense wrought-iron radial "traveller" dragging the feeding-trains, each with from 60 tons to 80 tons of stone in tow, stopping them over the exact spot where more tipping was required, when, as by magic, the wagons rose on end, and poured their blocks into the sea. Thus,—and this shows the way in which the whole breakwater was built,—a mighty mound was heaped for the foundations of the North Fort, an island in the sea, of 140,000 tons of solid stone, and, with the fortifications, 100 ft. high, 400 ft. in diameter at the base, and 200 ft. at the summit. At every tide the divers went down to level, as well as they could, the masses tipped in, and to report that a little more stone was needed here or there, as the case might be.

This North Fort is in three stories,—one of magazines, two of casemated batteries; and the

ment will be sixty gins in all. The whole structure appears from above a ring, of granite, 100 ft. thick, enclosing a centre courtyard, into which look the officers' quarters and men's barrack-rooms.

Taking three fathoms' depth as the standard of low-water, Plymouth Breakwater encloses 741 acres, or 150 more than Portland.

CONCRETE AND THE METROPOLITAN BOARD OF WORKS.

At the last meeting of the Board it was agreed,—

"That the application of Mr. Philip Bramon, on behalf of Mr. J. R. Bell, for approval by the Board of a special mode of constructing monolithic concrete fire-proof buildings proposed to be erected on land near Edington-green, be granted, on condition that the concrete used in the construction be compounded according to the conditions in the form of licence now submitted; and further recommending that the said form of licence which has been prepared by the Superintending Architect, and is a modification of the form approved by the Board on the 14th of June, 1868 (No. 11), be approved by the Board, and issued to the applicant accordingly."

and that,—

"With reference to the two cases now before the committee, of the erection by Messrs. Hall & Co., of buildings in East-street, Bermondsey, and Overhill-road, Dulwich, with walls of Portland cement concrete, without having obtained the licence of the Board for the use of that material, Messrs. Hall & Co. be not permitted to accept of a licence for the buildings erected under their patent, and either recommending that a printed circular be forwarded to the district surveyors, informing them that the Board consider the buildings under this patent to be within the scope of the Building Act, and that they will be expected to take proceedings in the usual way in cases where the provisions of the Act are contravened."

A PAROCHIAL INSTITUTION.

A NEW parochial institution is being erected in George-street, Oxford-street, for the parish church of St. Mark's, North Audley-street, from designs by Mr. Withers, architect. It will comprise industrial and soup kitchens, workmen's club, mission-room, parish and committee rooms, model lodgings for parish officers, and school, &c. The front next George-street will be of red bricks, and will be six stories high. Messrs. M. Allen & Son have the contract, for 4,433l. Mr. Alder is clerk of works. The Marquis of Westminster gives the site.

RECONSTRUCTION OF THE HÔTEL-DE-VILLE, PARIS.

THE *Gazette des Architectes et du Bâtiment* No. 14, 1872, contains the conditions of the competition opened for the reconstruction of the Hôtel-de-Ville, Paris, together with a plan of the site and approaches. The jury of selection will consist of ten members, named by the Municipal Council, and taken from their own body: ten named by the Prefet, and taken from the Commission of Fine Arts and Historical Works, and named by the competitors. The designs will be publicly exhibited, and then the jury will select twenty, considered the best, which will be gain exhibited; and then from these the jury will name six. The author of No. 1 will be charged with the execution of the design; No. 2 will receive a premium of 600l.; No. 3, 450l.; No. 4, 400l.; No. 5, 320l.; and No. 6, 200l. The authors of the remainder of the twenty designs selected will each receive 100l.

THE BRIGHTON AQUARIUM.

The aquarium constructed at Brighton, and which promises to be a very interesting and instructive institution, was opened on Saturday last by Mr. J. Corly Burrows, the Mayor of Brighton. Mr. C. Soames, the chairman of the company, discharged the duties of president very efficiently at a dinner afterwards given under the well-known dragon chandelier in the pavilion, whereat were present the Lord Mayor of London, Sheriff Sir John Bennett, Sir James Duke, and other distinguished persons, including Mr. E. W. Cooke, R.A., R. G. A. Sala, Mr. Walter Thornbury, Mr. Carter, Mr. James Dredge, and others connected with art, literature, and journalism. The number, in the whole, of 200. Mr. Eugene Arch, the engineer, was complimented on his achievement, and Mr. H. Lee and Mr. Frank Auckland were thanked for good services. We propose presently to give some illustrations of

the establishment that may be useful, and reserve particulars, with such praise and blame as may seem due, till these appear. We wish the company the greatest possible success.

TAUNTON DRAINAGE WORKS.

A PUBLIC MEETING was held in Taunton on the 8th inst., convened by the Government Inspector, Mr. Arnold Taylor, to take into consideration the necessity and desirability of borrowing 4,000l. to complete the sewerage of the district. The scheme proposed consists of bringing the whole of the sewage to one outfall, in the Target field, about half a mile from the town, so that at some future time the sewage may be deodorised and utilised, a scheme for which is under the consideration of the Board.

The proposed arrangements will necessitate the bringing the sewage of the northern part of the town, under the river Tone, by means of an iron siphon, with a depression of about 3 ft. There will also be another iron siphon, under the mill-stream in Tangier, with a depression of 1 1/2 ft.

Also all the closets and drains that empty their filth into the river are to be destroyed. The plans of the joint schemes were prepared by, and the works are to be carried out under the superintendence of, Mr. James Henry Smith, the board's surveyor.

THE COAL QUESTION A SERIOUS SUBJECT.

SOME time ago we said, under the above head, "that there were many reasons to lead us to expect an immediate increase in the price of coal." How far this prediction has been carried out the readers of the *Builder* will be able to judge. It was also stated the quantity of coal on which we can with any prudence depend, must be far less than the 146,480 millions of tons which may be reasonably expected to be available for use. Since that time the demand for all kinds of fuel has greatly increased, and the means of meeting the demand are just now being considerably augmented, so that should the present state of trade exist for any great length of time, it cannot but be expected that the quantity of available coal will be consumed long before the time stated by Professor Jevons. It may, perhaps, be not uninteresting at the present time to notice the increased means which are being taken to keep pace with the request in which coal is held. Throughout the Yorkshire coal-field a large number of extensive collieries are being opened out; and in many cases old pits which have been abandoned for years are being turned to account in order that the neglected, and at that period valueless, fuel may be got. These results cannot be wondered at when it is stated that thousands of tons of pit slack were left in collieries in bygone times because it would not pay for the trouble of removing. A different state of things now exists, as what was worse than worthless then now sells readily at 8s. per ton at the pit mouth. But to return to the subject of the development of new collieries. At and near Pontefract, which a few years ago was only known as an agricultural district, a number of new pits have within the past few years been opened out, which may be said to be getting into fair working order; some of them producing from 500 to 600 tons per day. Last week experienced the winning of coal at one of the largest pits in this part of the district, viz., at the Prince of Wales Colliery, close to the Pontefract race-course. The sinking operations have been going on for over two years, having been commenced on the 21st June, 1870. The coal is known as the Haigh Moor seam, and was reached at a depth of 446 yards. It is the property of the trustees of the park, who leased it to Messrs. Rhodes & Dalby at 130l. per acre, for fifty years, at a minimum rent, for the first five years, of 300l. per annum from the acceptance of the offer, and 600l. per annum afterwards. A large quantity of the coal underlying the parish of Royston, between Barnsley and Wakefield, has just been secured by Messrs. Davy & Co., at 300l. per acre. The field, which is a very valuable one, belongs to a number of small holders, who are to receive 1l. per acre per year so long as their coal remains unworked;—this amount to be deducted from the sum stated. Sinking operations are to be commenced as early as possible; and as the royalty exceeds 1,000 acres, the colliery will be one of the largest in the district. Within a comparatively short space

of time the old Darley Main Colliery, where seventy-five lives were lost in 1819, has been re-started. In other parts of the district old pits have been, and are being, turned to account. Attention is also being paid to the winning of the thin coal seams which abound in the district, and which can be got at a comparatively trifling depth. Many large collieries which have been recently sunk are now getting into working order, and will shortly add to the output of coal to a considerable extent. Amongst others, the Queen's Colliery at Burton Bridge may be noticed. The pit is just being developed, and is now yielding a good quantity of coal. The same remarks will also apply to the New Oaks and the Manvers Main Collieries, which are doing a large stroke of business during the prosperous trade. The sinking operations at a large colliery at Aldam Junction, as well as those at Smithies, are being pushed forward with all speed. In the Durham Coalfield similar steps are being taken for adding to the output, and keeping pace with the large demand. The Bishop Middleham Colliery, which has been idle for several years, is now being put into working order, prior to being started again. What is known as the Old Cassop Royalty, once holding a conspicuous position in connexion with the Durham coalfield, is about to be turned to account. A new shaft is to be sunk between the villages of Cassop and Haugh Hall, at which point the royalty is still almost in its entirety. The Hutton seam, at the Coxhoe Colliery, is also to be worked, so that a great addition is likely to be made to the produce of that district. In Sutherlandshire, the Duke of Sutherland is said to be devoting his energy to the working of the coal measures, which, since the days of Queen Elizabeth, have been known to exist, and which, up to 1827, were regularly worked. It is reported that recent examinations of the Brora district have led to the discovery of an undeveloped coal basin, commencing at Helmsdale, and running parallel with the coast, in the direction of Inverness. Throughout the Derbyshire district, which now sends fully two-fifths of all the coal carried by railway to London, a number of new collieries are being opened out. In the Unstone district, where Messrs. J. Rhodes & Son have just sunk a large pit, the new shafts belonging to the Blackwell Colliery Company (Limited) have just been sunk down to the blackshale coal, which was met with at a depth of 300 yards. It will thus be seen that a large number of new collieries are being opened out in consequence of the brisk trade in coal; but whether they will all prove remunerative in times of quietness remains to be seen.

THE JOINERS' COMPANY AND TECHNICAL EDUCATION.

THE prizes awarded to the candidates in the competitions organised by the Joiners' Company were distributed at a court, held at Guildhall, on Thursday, the 1st inst. The master, Mr. J. Johnston, jun., presided; and the wardens present were Mr. Wrenker, jun., and Mr. H. L. Phillips. In presenting the first prize to Mr. W. Hodges, of the Spitalfields School of Art (for original design), the master said he had to express the gratitude of the court that such beautiful specimens had come before them. They had offered these prizes to induce those who were training for skilled trades to do all in their power, not simply to raise themselves to distinction in their own branch of art, but to raise the national character. The other prizes from this school were to Messrs. T. Russ and W. Shuter. The first prize, in building construction, was awarded to Mr. W. G. B. Lewis, student at the Charterhouse School of Art for two years and a half. These designs were sent by ten students. The other prize for this school was gained by Mr. F. Ansell. There were three prize-takers from the Birkbeck School of Art, Messrs. T. V. J. Bennett, W. H. Sweet, and E. C. Miller, the latter being for mouldings applicable to ceilings. The prizes consisted of books on architecture and cases of mathematical instruments.

The master addressed a few words of encouragement to the candidates on their leaving. He said it would be for them to show to all around that they were industrious and persevering, and would make the best of surrounding circumstances. Nothing good and nothing great could be achieved without these qualities. They should show they were determined not to "scamp" their work, but raise each one his branch of industry in the eyes of the world.

ORNAMENTAL TILES IN THE SOUTH OF HAMPSHIRE.

DURING the Southampton Congress of the Archaeological Institute, Mr. Greenfield read a paper on this subject. He said that pavements formed of encaustic tiles did not come into use until the end of the twelfth century, and although there appeared to be no natural or necessary connexion between this kind of pavement and Gothic architecture, yet, as a matter of fact, they came in together and went out together; he added this might be attributed to the reformation of religion, and the suppression of the monasteries. Then, alluding to the process of manufacturing inlaid tiles, he produced one found at Beaulieu which was precisely similar in pattern to a tile found at Winchester Cathedral, St. Cross, Christchurch, Romsey, and St. Deny's, but differed in the number of spots on it and in the borders. Ancient kilns for burning these tiles had been discovered in Worcestershire, Staffordshire, and other places. At present Beaulieu was renowned for the good quality of the brick earth or clay proper for making bricks and tiles, which was found in abundance in its neighbourhood. He was not aware that a monastic kiln for the burning of decorative tiles had been discovered in the southern part of this county. Most probably there were such at Beaulieu, and Quarve, in the Isle of Wight, if not at Netley and Romsey, and the neighbourhood of Winchester. But, in any case, from the similarity of the patterns of the tiles that were to be seen in the pavements of Winchester Cathedral, the Hospital of St. Cross, and the churches of Romsey and Christchurch, and of the tiles that had been discovered in the ruins of St. Deny's Priory, and Netley and Beaulieu Abbeys, more especially at the two latter, there was sufficient evidence to show that many of the tiles used at all these six places were made either from the same or precisely similar moulds. To illustrate this meaning he directed attention to specimens of tiles on the table before him, and drawing in fac-simile which his daughters had made from tracings they had taken of patterns still remaining at Netley, Beaulieu, Christchurch, Romsey, and Winchester, and likewise the set of fac-similes of patterns from Beaulieu, kindly lent him for the occasion by Lord Henry Scott, M.P., and the Rev. W. H. Lucas, vicar of Sopley. Of his own tracings of patterns from monasteries and churches in the south of this county, and from the Nunnery of Tarrant, in Dorsetshire, there were 105 fac-simile illustrations. Of these examples 43 were from Netley, 34 from Beaulieu, 39 from the Church of the Hospital of St. Cross, 57 from Winchester Cathedral, 33 from Romsey Abbey Church, 8 from the Priory Church of Christchurch, and 5 from Tarrant Nunnery. Besides these there were two examples from Netley in the plate which accompanied the Rev. E. Kell's excellent and exhaustive article on Netley Abbey, which formed part of the "Colledania Archaeologica," and four examples from Romsey and Winchester in Mr. Nicholl's series, which he had not taken. Mr. Greenfield then pointed out several examples and described their peculiarities at some length, including unique specimens from Netley, Beaulieu, Winchester, St. Deny's, St. Cross, Romsey, Sopley, and Tarrant (Dorset), pointing out their relationship, and, in many instances, great beauty. He spoke highly of the rare and excellent work of the Messrs. Skelton, of Southampton, of which only four copies were purchased, entitled "Patterns of Encaustic Tiles found at the Ruins of Priory to St. Dionisius, near Southampton," containing twenty different examples, admirably printed from blocks in the proper colours by the double process, one of which copies he was enabled to lay before them through the kindness of the Rev. E. Kell, and proceeded to say that he had made out that of the thirty-four different examples noted at Beaulieu twenty of the same identical patterns were found at Netley, and that out of the forty-three different examples noted at Netley only five were solitary, or without example elsewhere, while of the thirty-four at Beaulieu only four were solitary. There was enough to show that these two abbeys, as well as other monasteries in the neighbourhood, possessed decorated tiles of precisely the same pattern, if not made in the same moulds. It was not improbable that a closer connexion, and the interchange of kindly offices between the monks of Beaulieu and Netley, might have arisen from their being members of the same order, and governed by the same rules, and from the

fact that on completion of the foundation of Netley its first abbot and monks were chosen from Beaulieu. Both establishments were of the Cistercian order, which took its rise in about the year 1075, and was introduced into England in 1158, by William Giffard, bishop of Winchester, on his founding the Abbey of Waverley, in Surrey. Before the dissolution it had eighty-five houses in this country. Beaulieu Abbey was founded by King John in 1204, while Netley Abbey was said to have been founded by Henry III. in 1239, in fulfilment of the wishes of his former tutor, Peter de Rupibus, bishop of Winchester, who founded the Augustinian Priory of Selborne, in this county, in 1233, and who died in 1238, leaving a sufficiently large sum of money to found this abbey and another, and furnish them with whatever things were requisite. The Benedictine Nunnery and Monastery of Romsey were founded by King Edgar, A.D. 967; the Augustine Priory of St. Deny's, near Southampton, by Henry I., in 1124; and the Benedictine Monastery of Wherwell by Elfrida, queen of King Edgar, in 986. Attention was drawn to the heraldic insignia on a fragment of an encaustic tile found at Netley, now in the possession of the Rev. E. Kell, which there were grounds for believing was of Beaulieu design, and was made at that place. There was a remarkable similarity of design in the geometrical tracery and foliage to that on a tile in Warblington Church, at the south-east end of this county. But it was not from the same mould, and it differed essentially in the heraldic charges and emblems. Yet in both the armorial insignia related to the same family, though most probably not the same person.

THE TRADES MOVEMENT.

THE last monthly report of the Operative Carpenters' and Joiners' General Union of Great Britain and Ireland sums up its review of the position of affairs thus:—

"The Amalgamated Building Trades Committee are at a dead lock; but the deputations of the Central Council of the Carpenters and Joiners are systematically organising the whole kingdom, and funds are flowing in to such an extent that victory may safely be predicted. A general lock-out on the part of the masters is not feared, but rather courted, as it will test the earnestness of the men, who appear now to be united to a man."

On Saturday, the finance committee at the Brown Bear, presided over by Mr. Thomas Hall, the treasurer (Amalgamated Union of Carpenters and Joiners), and Mr. C. Matkin, the secretary (General Union of Carpenters and Joiners), stated that the dividend this week would certainly not be less, but most likely more than last week. According to the same report, there are sixty-six towns, including Liverpool, Manchester, Leeds, Sheffield, and Birmingham, where the employers and the men have agreed upon a code of working rules, one of the points for which the London men are now contending. It was also stated that last month, at Chorley, an agreement was come to with the masters to fix the week's working time at 49 hours, at 7d. per hour, with a code of working rules, while at Keighley the working time was reduced from 54 hours to 50½ hours, at the same rate of pay, with a code of rules, and that on and after the 1st of October next a similar regulation is to come into operation at Blackburn. Strikes are now on at Sheffield and Leicester, towards which the General Union has contributed, in the shape of strike pay, 308l. The General Union has seven branches in London. It was stated in the Central Committee of the Carpenters and Joiners, a few days since, that one of the interdicted employers was willing to set the example of conceding the nine hours pure and simple, at 8½d. the hour, with the understanding that he should a code of working rules be ultimately agreed to in any general settlement of the dispute it should be adopted in his shop. It was remarked, however, that the other masters might one by one follow suit, and in the end the code would come to be shelved. To keep up the dividend will require a good deal of pushing in the provinces, as the London levies are not all that could be wished. The distribution was made in round numbers to about 1,550 men, at the rate of 14s. 6d. per week to the men on strike from Jackson & Shaw's and Brass's, and 11s. 6d. to the rest, who, of course, constitute the vast majority of the whole. According to the latest inquiries, the masters, for the most part, have obtained sufficient hands to carry out all pressing contracts or orders. Neither the general committee nor the sub-committee of

their Central Association have any idea of holding a meeting until September, unless, in the meantime, the men express a desire to make terms. We do sincerely hope that this will be the case.

Newcastle and Gateshead.—The house carpenters and joiners have struck work for an advance of wages from 28s. to 30s. a week. A deputation from the Masters' Association and a deputation from the Workmen's Union have met, in order to try and bring about a settlement of the dispute. No definite result, however, was arrived at. The operative joiners have since accepted the terms of the masters, 7d. per hour, and have returned to work.

Halifax.—A meeting of the carpenters and joiners has been held on behalf of the London joiners now on strike. A deputation, consisting of Messrs. Sadler (chairman of the London delegates) and Wright, gave a full statement of the present position of the London men, and the history of the movement up to the present time, the determination to remain on strike being unanimous. A resolution was passed to "levy" the Halifax men at 6d. per week, in support of their London brethren.

Agitation in the Brick Trade.—At a well-attended meeting of the operative brick-makers of the Rowley, Old Hill, and Hales Owen Union, it was unanimously resolved that those men who had not obtained the reduction of hours should request their employers to reduce their working hours to fifty-four per week, and if not conceded, it was resolved to give fourteen days' notice.

Expected Lock-out of Engineers at Birkenhead.—An offer by the Liverpool and Birkenhead master engineers to their men having been declined, notice has been issued by the master engineers of a lock-out, to commence on the 22nd. Two crowded meetings of workmen have been held in Birkenhead, at which the masters' terms were unanimously rejected.

Strike and its Consequences.—The strike of the goods porters on the London and North-Western Railway has come to an end. The company having received a sufficient number of men from Scotland and the provinces, to take the places of those who had turned out, posted placards, "No more men wanted." Upon this many turnouts offered to go in unconditionally and a few of the most able were selected. The larger number, finding that all chance of regaining their employment was gone, tore the strike colours from their button-holes, and dispersed. At a meeting of the directors banks were voted to the clerks and men who had remained at their work, and double pay was ordered to be given them until the reorganisation of the stations was completed. It was also determined, that in filling vacancies in the higher classes, preference be given to the men who had remained faithful.

SMOKE PREVENTION.

Vicars's self-stoking apparatus has been fitted up to boilers employed in driving the machinery that prints the *North British Daily Mail*, in Glasgow. The most prominent external feature of the apparatus is a hopper for holding the fuel, and which may be of any size. At the bottom of this are two small receptacles, one at each side, which are made to contain a given charge of coal. These charges are forced into the furnace, one at a time, by two plungers or pushers, one of which is moved forward while the other is coming back. These plungers are worked by a shaft moved by a ratchet, so arranged that the rate of feed can be varied at pleasure, by causing the driving eccentric at each stroke to take a greater or lesser number of teeth. Once in the furnace, the fuel is carried onward by movable bars, which all move forward together about 3 in., and are brought back one by one. Movable furnace bars are not a novelty, but the mode of their application in Vicars's furnace is an important and original feature. Each bar is provided with a trough containing water, in which a centre rib cast on the bar is immersed, while the upper part of the bar forms a perfect cover to exclude cinders or ashes from the trough. By this device the burning of the fuel, or their getting blocked up, were constant causes of trouble, are said to be effectually avoided.

In Vicars's furnace a small and uniform amount of fuel, just what suffices to replace that consumed, is being constantly added to the fire, which is supplied with exactly as much air as is calculated to enable combustion to be carried on

in the most economical and effective manner. The result of this is, that not only is smoke prevented, but all waste of fuel is avoided, and an important saving in the quantity consumed is effected, in addition to which the finest dress can be burned with as much advantage as the coal of which it is the refuse. The apparatus can be applied to any kind of boiler, and to reverberatory furnaces of all descriptions. There are hundreds of these self-stokers at work throughout the midland and northern counties of England.

ST. CHAD'S COLLEGE, DENSTONE.

A MEETING has been held in the hall of St. Chad's College, or School, Denstone, of the friends of middle-class education. The gathering was summoned by the Rev. Canon Woodard, Provost of St. Nicholas's College, Lancing, in order that all interested in the education of the middle class should have an opportunity of seeing what has already been done in St. Chad's College, and what yet remains to be done, before the college can be opened. The company dined together at one o'clock in the great hall of the college, and afterwards, by the invitation of the Earl of Shrewsbury and Lady Shrewsbury, attended a garden party at Alton Towers. A view and plan of the school were given in the *Builder* of 29th June, and to the particulars therein given we may here refer. Denstone is in the very centre of the Midland districts of England. It is anticipated that this school at Denstone will before long be subordinate to some greater establishment, like Lancing, which will form a centre for the supply of the educational wants of the Midland counties. To this will be added a lower middle school, where boys will be boarded and educated for fourteen guineas a year. A middle school for girls must also be founded, similar to that at Bognor; and a large foundation has already been offered for each of these schools. These extended operations will entail colleges for the Midland counties in general relation with St. Nicholas's College, but otherwise independent of the Sussex schools. The works have been pushed on: the centre and one wing of the great quadrangle will soon be roofed in, and the head-master's house is in a forward state. It is hoped that in the course of another year such portions of the building will be complete as will enable the college to open with at least 200 boys.

The Bishop of Lincoln, in the course of a speech, announced that Sir T. Percival Heywood had subscribed 30,000*l.*, to found a chapel in Keble College, Oxford, and commended his example to other merchant princes in the district.

THE FATAL ACCIDENT AT HALIFAX.

THE INQUEST as to the cause of death in the accident, reported in our last, which occurred by the falling in of a portion of the flooring of the new part of the Bonding Warehouse in Gibbet-street, whereby two men were killed, and another severely injured, has been held.

After some evidence was heard, the jury retired to deliberate as to whether it was necessary to call further evidence, and after being in consultation for some time, the public were again admitted, when the foreman said the jury had decided not to call any scientific evidence as to the construction of the building; but there were one or two links in evidence that required clearing up. The first of these was when the deflection in the floor was first discovered; what means were taken to remedy it; and what precautions had been taken to protect those engaged in this remedy.

George Lister, employed at the bonding warehouse, said that when he was in the cellar on the 11th of July, there was no talk of there being any danger. He knew the foundation-stone was broken. The floor had been tested by the borough engineer, by placing heavy fine sets on it; and at that time the arch gave way. After that Mr. Henry and Mr. Thwaité ordered them not to place any goods upon that portion of the floor.

Mr. Peter Bovis, borough engineer, said that the testing by granite sets took place on the 11th of July. The weight of the test was about 25 tons, which was placed on the centre of one bay, between four columns, and over an area of 15 ft. by 9 ft. On the following morning one of the columns had sunk, and the floor had gone down in the centre. He saw no signs of any immediate further deflection. In the afternoon he saw one of the contractors, Mr. Denton (of the firm of Quarmbury & Denton), in whose hands the building was at that time. He pointed out to Mr. Denton the defective work found by the testing, and told them it arose from their defective workmanship. Denton replied that it was not the fault of the contractors at all, but that the stone at the base of the column was not big enough. Witness said that the contractors were responsible for the

damage that had arisen. Witness then waited a few days to see if the contractors intended to do anything. They did nothing, however, and on the 19th witness sent a man in with instructions to bare the top of the base of the column. This was done, and he found that the flange of the column was broken. He then gave instructions that the man should dig carefully down on each side of the stone, to see what was the matter with it. When this was done he found that the stone had split in two. Underneath the stone he found there was a space of 14 in. between the footings. That portion of the stone bearing the column was 2 in. lower than the other portion. He then wrote to Quarmbury & Denton, telling them of the state of matters, and requiring them as early as possible to remedy the defect of the foundation-stone, to build two brick pillars under the beam, and to relay the flagging over the arch. That letter was dated 30th of July, and to it he received a reply next day, in which they declined to do the work, as they considered the test excessive. On the 3rd of August, witness wrote again to Messrs. Denton & Quarmbury, informing them that, in accordance with their contract, he should employ other men to do the work, and deduct the amount from their account. Accordingly, he instructed his assistant, Mr. Richardson, to see Hancock about doing the work. Afterwards, in describing how the work was to be done, witness had ordered that the pillars should be erected before the foundation-stone was touched in any shape. In the way the work had been done it was absolutely necessary that the beam should be propped. He expected that those who undertook the work would have gone about it in a sensible and workmanlike manner. By the Jury: The reason why he tested the floors was because they were not done according to drawing or specifications. On the 16th of May, an interview took place between witness and the contractors, in consequence of the arches being built lower than the specification. The contractors said that arose from their joining having made a mistake in constructing the centres; and they agreed that the arches should stand a week, and then be tested, and that if they stood the test, the engineer should waive his right to have them rebuilt. Hence it was that the tests were applied.

Mr. Richardson, assistant borough engineer, corroborated this evidence. "The jury then retired, and after a deliberation of a little over half an hour they found as follows:—'We, the jurors, unanimously find that Samuel Thwaité and W. H. Halliday came to their deaths on the 6th day of August, by reason and in consequence of the fall, on the same day, of a portion of the floor of the Inland Bonding Warehouse, in Gibbet-street, in the township and borough of Halifax, which floor also formed underneath the arched roof cellar in the basement thereof; which floor and roof were supported by iron columns and girders; and we do unanimously find that the said floor and roof fell in consequence of the giving way of the foundation stone of one of the iron columns, and the fall of the same, and the iron girders resting thereon. That the immediate farther subsidence of the foundation stone was caused by the incursions digging on the westerly side of and removing the flag as an soil close to the said foundation, thereby giving it room to force itself and the column from their proper and erect position; and the jury is further unanimously of opinion that due precautions were not taken previously to the commencement of so important and dangerous an operation, by the proper supporting of the said roof and floor by means of props and timber, or otherwise.'"

The inquest, which commenced at ten in the morning, did not conclude until half-past nine at night.

SLAUGHTER-HOUSES IN THE METROPOLIS.

THE medical officer of health for Whitechapel, Mr. John Liddle, draws attention in his last report, just now issued, to the provisions of the Building Act of 1844, which makes it unlawful, after the lapse of thirty years from that date, to slaughter cattle in any building or vault, or in the open air, at a less distance than 40 ft. from a public way, or than 50 ft. from a domestic dwelling, and to the endeavor that was made to repeal this by the introduction of a Bill to amend that Act, so far as it relates to the slaughtering of cattle and sheep, and to render permissible the slaughtering of cattle in butchers' private slaughter-houses. The following reasons Mr. Liddle gives, why the provisions of the Act of 1844, relating to slaughter-houses, should be continued:—

1. Because slaughter-houses as now conducted are nuisances, and injurious to health, and although, theoretically, they may be kept as clean as any private wash-house, it would be found impracticable to do so; and it would be impossible to enact a law which should compel the owner of a slaughter-house to prevent offensive smells from issuing from his premises.
2. Because private slaughter-houses afford facilities for the slaughtering of diseased animals, and enable the owners of such diseased animals readily to dispose of the unwholesome meat. The improper use which is made of private slaughter-houses was pointed out in my quarterly report for December, 1869.
3. Because the driving of cattle through the crowded streets of London is not only a great annoyance to the inhabitants, but is a source of danger to life and limb.
4. Because the erection of a sufficient number of well-ventilated public slaughter-houses in suitable places, within reasonable distances from the centre of the metropolis, would be highly advantageous to the whole population, inasmuch as the animals intended for slaughter would be

inspected by qualified officers; and if found to be diseased, proper steps would be promptly taken to prevent the use of such meat for human food.

5. Because the flesh of the animals slaughtered in airy and well-ventilated public slaughter-houses, and under proper inspection, will keep longer in a fresh state than when animals are slaughtered in some of the ill-ventilated slaughter-houses in London.

If the City of Glasgow, with a population of 500,000, has thought it expedient, as a means of improving the public health, to prohibit the use of private slaughter-houses, and has erected three public slaughter-houses for the use of the butchers, it is surely quite possible, with the same object in view, for the local authorities in London to erect a sufficient number of public slaughter-houses for the slaughtering of all the cattle which are required for the use of the inhabitants of this vast city.

In the reign of Henry VII. a petition was presented to Parliament by the parishioners of the parish of St. Faith and St. Gregory, in London, setting forth that they had been greatly annoyed and distressed by the corrupt airs engendered in the said parishes by occasion of blood and other foul things by reason of the slaughter of beasts.

In consequence of this petition it was enacted, Anno Quarto Henrici VII. cap. iii. that no butcher or his servant should slay any beast within the walls of London. It was also enacted that half the penalty for committing the offence should go to the king, and the other half to every one of the king's lieges that would sue for the same by action of dcht."

SOFT FELTED FABRICS OF PAPER.

AMONGST the novelties of the International Exhibition at South Kensington, not the least remarkable are the new patent felted papers of Messrs. Pavy, Preto, & Co. All the windows and doors of the Exhibition are fitted up with curtains of this new material, into which a certain quantity of animal fibre has been felted, and which is said to give a remarkable toughness to the fabric, without any very great addition to the cost. Curtains, blinds, and bed-furniture, of various patterns, are produced at very low prices; and it is fully expected that the new material will replace leather in the covering of chairs, binding of books, &c. The feature to which special attention is drawn is its superiority over cotton and woollen materials for the curtains of sick-rooms. It is non-absorbent, easily brushed, and not likely to retain contagion.

Paper seems destined to vex the tailors and linendrapers, unless they take to it kindly themselves, and share the profits with the stationers. A paper suit of clothes for 2*s.* is the latest novelty, and it hails from New York. The tailors have not introduced it; but the drapers are selling the articles, which are of Japanese make. These paper dresses are said to be as tough as leather, and as pliant as linen. Rain will not reduce them to a pulp. Perhaps they will even wash.

SCHOOL BOARDS.

London.—It has finally been resolved by the Metropolitan Board of Works to lend the London School Board, 40,000*l.*, to be expended in the erection of permanent offices. In reference to the competition for the Board offices, the committee selected four architects to compete, and it was thought only fair that the unsuccessful competitors should be paid for preparing the plans to the extent of twenty-five guineas each, whilst the successful one would have charge of the building. As to the arrangement of the building the committee stated they would be glad of any suggestions by members before the specifications were sent out.

Ross.—The Educational Department will be ready to sanction schools for 120 boys, 120 girls, and 180 infants, arranged in accordance with instructions referred to. Mr. Pearson has been instructed to prepare plans and specifications for the erection of new schools; also of boundary walls, and the levelling of the Henry-street site. The building to be of native stone, and the proportions according to the letter received from the Education Department, and the resolution passed by the Board.

Batley.—The designs committee have drawn up a series of instructions to architects competing for the premiums offered for the best

designs for a school to be erected at Purlwell, to accommodate 700 children—300 boys, 250 girls, and 150 infants. One of the conditions is that the total cost, exclusive of boundary walls and internal fittings, is not to exceed 5,000l.

THE THUNDERSTORMS.

THESE storms have not yet ceased, but they seem to be on the wane. Their history during the last eight days resembles that of the week previous, but not quite to the same extent, although houses and persons, cattle, and so on, have been struck on many occasions. A curious mischance occurred at Forres, in the north of Scot. land. One of the chambers of the North of Scotland Chemical Works was struck by lightning, and destroyed. It was 8 ft. 6 in. in length, 16 ft. in width, and 16 ft. in height, and was built of thick sheet lead. It contained 70 tons of sulphuric acid, which, when the collapse took place, flooded the works and escaped. The loss is estimated at 1,000l.

In our last, we spoke of the storms of 1868 which preceded the great earthquake. It so happens that since our last a small earthquake has occurred in Scotland. The locality (Bridge of Allan) is one where a similar shock occurred in 1839, when the shock passed from Lisbon, through France and Great Britain, to the north-west of Scotland.

Now Lisbon, on the west coast of Europe, is where a great earthquake once occurred, and we know that in the case of the American coasts it is where great earthquakes have heretofore occurred that earthquakes seem to be liable to occur again, and that the great earthquake of 1868 happened. There has also been a recent earthquake in Algeria, near the Portuguese and Spanish peninsula; Antioch, not far off, has been half destroyed by earthquakes; and although there may be no greater earthquake anywhere this year than has already happened, the coincidence is curious; and, at all events, these physical and electrical commotions appear to be all connected in one way or another.

THE WORCESTER GUILDHALL QUESTION.

At a recent meeting of the Worcester Town Council, the report of the Survey, Building, and Property Committee, as to the Guildhall plans, was formally received.

Mr. Grainger said the question now occupying the attention of the council was one of the most important they had had to deal with for a long time. The plans signed *Fiat Justitia* and *Bahalun* appeared to be the best; but the council were left in the dark as to the cost of carrying out the buildings according to these plans. It might cost from 40,000l. to 50,000l. He thought the wisest course the council could take would be to defer the discussion of the subject for three months, and to instruct the committee either to advertise for further plans (no, no) or seek further information from those who had not afforded sufficient particulars respecting the plans sent in.

Mr. Smith said the estimate of cost of the building to which *Bahalun's* plans referred was 18,000l.; that of *Fiat Justitia*, 17,500l.

Mr. Lovey suggested that the question should be referred back to the committee for final settlement, and that they should have power to call in professional assistance if necessary. Supposing they took this course, and the committee found, when they had investigated the plans, that the expense of carrying them out would exceed the estimate of 18,000l., it would become a question whether the person sending in such a plan should receive the premium.

After some further discussion, Mr. F. Woodward submitted a proposition to the effect that the Survey Committee be instructed to employ a competent surveyor to assist them in their decision as to the best plan, and report thereon to the council. It was, however, ultimately moved by Mr. Lovey, seconded by Mr. Bozward, and carried, Mr. Woodward only dissenting, "that the plans be referred to the Survey, Buildings, and Property Committee, with instructions to select those they recommend to the council as entitled to the premiums offered by the instructions to architects."

At a subsequent period of the meeting, Mr. Airey presented a memorial from a public meeting held recently against the proposed rebuilding or reconstruction of the guildhall, and recommending the necessary repairs to be

effected. This memorial was received, and pursuant to notice, Mr. Airey then moved—

"That the memorial now read be received, and in complying with the prayer thereof, the Council instruct the Survey, Buildings, and Property Committee not to take any further steps at present for the re-building or reconstruction of the guildhall, but that they proceed to ascertain what repairs are necessary with a view to the same being executed with all convenient despatch, and report the result of such investigation to the next meeting of the Council."

At the close of another discussion, Mr. Airey replied on the whole question, and the vote was then taken, the names being recorded. There were against the amendment, 24; for, 5. The motion was therefore declared lost.

ARCHITECTURAL ASSOCIATION EXCURSIONS.

THE Northamptonshire excursion, under the guidance of Mr. Edmund Sharpe, will start from the 19th inst. to the 24th, on the former of which dates the party will leave the King's-cross Station, London, by the 7-50 train, and will arrive at Peterborough at 10.16; thence they will proceed by the Midland Railway, leaving Peterborough at 10.32, and arriving at Stamford at 10.52 a.m. The dinner will take place at the George Hotel, Stamford, where Mr. Sharpe will deliver an address. From eight to eleven buildings will be visited each day. The final dinner will take place at Northampton.

THE PRE-HISTORIC REMAINS ON ROMBALD'S MOOR.

THE members of the Leeds Naturalists' Field Club and Scientific Association have walked over Rombold's Moor* from Saltaire to Ilkley, under the guidance of Mr. John Holmes, of Methley, for the purpose of examining the rock markings and primitive structures discovered there.

On the top of the hill over Shipley Glen they found the first specimen, consisting of a circular elevation, along the inner and outer edge of which were placed, at intervals, slabs of grit-stone, set on edge. Between these two circles there was a sort of irregular pavement, made up of small fragments of the same kind of stone. Mr. Holmes pointed out the chief features of this circle, and called attention to many pieces of rock whose smoothly-planned surfaces indicated unmistakably the former presence of glaciers. The party passed through the village of Ilkley; and near the "Shooting-Box" a well-defined circular elevation, eleven or twelve yards in diameter, with a single row of stones, was come upon. Mr. Holmes explained that structures of the same kind had been found in Algeria, in Denmark, Sweden, and even in India; and Mr. Teesdale stated that he had often seen such circles in India, as well as in Palestine; but that there they were in a more perfect condition. Mr. Holmes further stated that they were supposed to have been erected by the Taramians, and exhibited a "flint flake," found in the circle under inspection, as confirmatory of such a supposition.

At that part of the moor which is immediately above Ilkley, circles of stones, more or less complete, were seen in abundance, many of them being of very large dimensions, and in some cases enclosing smaller ones. Other lines of stones there were in which curvature was scarcely, if at all, evident. Many of the circles contained a large boulder in the centre, and on the upper surface of this were ring and cup marks. In two or three instances some of the party cleared away the soil from the top of large boulders, and unearthed fine specimens. In some cases, as elsewhere, there was only a cup visible; in others, the cups were surrounded by one, two, or three rings. The abundance of these cup and ring marks was astonishing.

IRON AND THE IRONWORKS OF ROMAN BRITAIN.

FOR countless ages before iron came into the humblest use, mankind had passed through the toilsome periods of stone or flint cutlery; then of copper, pure, soft, and well-nigh useless, till, at a later time, hardened by tin, which the commercial enterprise of the Phœnicians transferred from Cornwall to Sinai.

* The western moorlands of Yorkshire are a part of that long range of mountains—the Pennine chain,—which stretch north from Stafford to Scotland.
† From a paper by Mr. Grover. Read at meeting of British Archaeological Association, at Wolverhampton.

In the comparatively civilised days when the Grecian chiefs wasted ten years in wrangling round the walls of Troy, bronze was the metal used for their offensive and defensive armour; and Pliny, in his *Natural History*, tells us that, by an express stipulation, the Roman people agreed with Porsenna that they should only use iron for implements of agriculture. This was about 400 years before the Christian era, and for nearly 300 years more they continued to use bronze weapons, with which they encountered Hannibal, in the second Punic war.

Yet we have allusion in the Scriptures to the somewhat extensive use of iron in the times of Moses; and we all remember that the great king of Basan, Og, boasted an iron bedstead, although we do not know what resemblance that article of furniture would have to the present Birmingham make.

Sisera, too, had 900 chariots of iron, which indicates an extensive iron rolling stock in his time, which was 1,300 years before the Christian era.

But as we pass further west, into the land of the Gauls and Britons, we find bronze weapons in almost universal use at the period of the Christian era.

From these dates we are enabled, in some measure, to note the high progress of civilisation which the nations of ancient Syria had attained at a very early period, as compared with that of the West of Europe. When Cæsar landed here, he found a limited use of native iron amongst the natives, as he states, in rings for money; but he must have been in some error here, for gold and silver coinage existed to a large extent in Britain before his arrival.

The tardy introduction of iron into the West can only be ascribed to the difficulties involved in generating the high heat required to smelt it.

The most productive method which appears to have been employed was to construct a small air "bloomery," or blast furnace, or chimney, of clay, in which alternate layers of ironstone and charcoal were placed, and through the bottom of which funnel-shaped holes entered from the side. This primeval structure stood on the top of high ground, and when the wind blew, a species of feeble blast was obtained, and the ore was sufficiently reduced to be capable of manipulation between heavy stones.

I need not state that this was a "cold blast" process, and I cannot find that the idea of a "hot blast" seems ever to have entered into the head of the primitive ironmaster. Yet we do find a rough conception of it in the furnaces of the ancient Persians for smelting silver, who employed furnaces such as those described, but with the addition of stone hearths outside the air-hole, on which burning charcoal was laid to heat the air before it entered the furnace: this is "hot blast."

The next improvement in the iron make, appears to have been the employment of bellows for creating an artificial blast: these seem to have originated in Central Asia, and consisted of goat-skins, worked by a woman or a boy, probably by the feet. This was a great step in the right direction. Those amongst us who take an interest in the iron trade, no doubt have read of a number of experiments conducted by Mr. Cramp-ton, of Woolwich Arsenal, on the proposed employment of coal-dust in reverberatory furnaces, yet we find that in India the charcoal used was frequently ground into dust, also the furnaces were charged from the top as the Staffordshire blast furnaces are now-a-days.

The iron masters of Roman Britain, appear to have worked on a very extensive scale, and seem to have made use of water-power for driving their blast or bellows; for the most extensive remains of cinder-heaps are generally found by the side of streams in Britain, and both in Sussex and in the Forest of Dean remains are found of ancient tanks in such situations as to point directly to their use as reservoirs of motive power. But the most remarkable invention for producing "blast" discovered in Roman Britain was found at Lanchester, the Ancient Epiacum, in Durlam, where extensive ironworks existed, and where, no doubt, the arms of the two legions on the wall were fabricated and repaired.

Dr. Bruce, describing the spot, says—"The method of producing the blast necessary to swell the metal was made apparent. Two tunnels had been formed in the side of a hill, they were wide at one extremity, but tapered off to a narrow bore at the other where they met in a point. The mouths of the channels, opened towards the west, from which quarter

a prevalent wind blows in this valley, and sometimes with great violence,—the blast received by them would, when the wind was high, be poured with considerable force and effect upon smelting furnaces at the extremity of the tunnels."

Now without venturing to approach technical ground too closely, I must ask you to follow me to its confines a little, while I endeavour to explain the leading changes which occurred in the iron make in consequence of the forms of the furnaces.

First, we have the "air bloomery," or air furnace of the high hill, driven by the wind, as it passed through little conical holes in the sides. This must have been a painful slow and fickle process, and the ore would become de-oxidised, and by long-continued low heat a "cementation" of the metal would take place. There would be no fusing, no melting of the ore, no cozing metal, or liquification as we get from our blast-furnaces, but the product would be a glowing mass of imperfectly malleable or wrought iron, mixed withinders, dirt, and un-reduced oxide. This lump would be drawn out of the top of the furnace, and put under heavy tilt-hammers, driven by water or animal power. At each successive blow the glowing mass would acquire purity as sparks flew from it. The Roman forgerman would keep on turning it round, and over and over, till at last a "bloom," or block of wrought iron would result.

The first great improvement in this process would be the addition of artificial blast in bellows. This was the furnace of Roman Britain, and would be called a "blast bloomery," in contradistinction to the air bloomery, which probably preceded the Roman times here.

The application of blast would offer great advantages—it would obviate the necessity of an elevated site, and render the whole process more equable and certain. Yet, although the method of reduction would remain the same, the result would be very different; for if the blast was strong enough the iron would be melted, and partial carbonisation taking place, a sort of Bessemer steel would result, totally useless to the Roman smith, as he could not forge it.

So it became necessary to invent another process—a primitive refining. The metal was sheathed with plenty of charcoal, and the bellows-pipe, being removed from the bottom of the furnace, would be put on the top, and direct the blast over the surface, charcoal being also at on from time to time till it was all burnt out, and the iron became tough and malleable. It is possible that the entire operation was conducted in the Catalan forge, in one heat or at one operation, and all conducted in one little furnace, i.e., the "blast bloomery."

I shall perhaps be travelling out of the subject if I give any more processes, for to this day only had the iron manufacture reached amongst the ironmasters of Roman Britain; yet the word on the subsequent great invention of cast-iron, which forms the staple of our modern industry, and which the Romans had not reached except perhaps incidentally.

The modern "blast furnace," such as we see in this Black Country, which turns out its many hundred tons of "cast-iron" or "pigs" a week, and sends flames and smoke to heaven, like some angry volcano in its wrath, is but the man full-grown from the child, the "blast bloomery."

As demand increased, the little bloomery raxed higher and higher, from the infantine 6 ft. or 4 ft. of the third and fourth century of Roman days, to (curious coincidence) 15 ft. or 16 ft. high in the sixteenth century. This is the sychod of the blast-furnace; but now we see it 40 ft. high, and even more, in his swarthy side of giant manhood.

His increased height, however, had caused a great change in his capabilities, and the result most surprising. As the ore descended from the top through a longer length, its contact with the charcoal would be prolonged, and a higher rate of carbonation ensuing, the product would be "cast iron."

This new era in Iron's story is supposed to date from the latter half of the sixteenth century. Mr. Mushet endeavours to fix the date of the first blast-furnace in the Forest of Dean at D. 1550, but he never saw a casting older than 20. The progress then became rapid; for in the seventeenth century iron was exported from England.

Mr. Grover next showed that, although the Romans had mineral coal at nearly all their stations, and it was not unfrequently met with

in their villas in Britain, yet only charcoal was used in smelting. In the Roman villas in Britain vast quantities of iron were used, much more than in an English modern house of similar dimensions. The number and variety of iron keys were truly surprising, and gave one an astonishing insight into the elaborate domestic economy and housekeeping arts of our early conquerors here. Chests, caskets, cupboards, pantries, sideboards, and dressers, though long perished, were indicated by their locks and keys, and must have been a goodly array. Besides, they found door-keys and locks, and bolts and hinges, and what was more curious, lifting-latch keys, such as were now used by late hacchlores in London houses. Then there were padlocks and cylindrical locks, and keys attached to rings to wear on the finger, though these were generally of bronze. Fire-dogs, of handsome make, in iron had been found, showing that fire-places had been partially in use in some of the apartments. In addition to the articles already named they found numerous hunting weapons, knives, scissors, and nails of all variety of sizes, not only for building purposes, but for the soles of the sandals of Roman farmers. At Ohedworth Villa, two large masses or blooms of iron were found, evidently brought to the villa to be worked up, and this was, perhaps, the explanation of the quantity of iron generally found. A resident smith was employed in the villa. He was always at it, and when the repairs of locks, keys, and farming implements did not keep him going, he no doubt employed his time in working out some of the little ingenious iron devices in rings and keys. The chief locations of the iron industry in Roman Britain were in Sussex, in the vast forests of Anderida, as the locality was then called, and the Forest of Dean. Pits from which the ore had been extracted were found in Sussex, together with great heaps of cinders, accompanied with Roman pottery and coins; but it was on the banks of the Wye that the most workings existed. Indeed, that district must have been the primeval "Black Country"—the dark, rich, centre of smoke, noise, and industry. For many miles together the ground was formed of a continuous bed of iron cinder. About Month and Ross must have been the Dudley and Birmingham of Roman Britain. The cinders contained of them 40 per cent of metal, and throughout the last 300 years numerous blast-furnaces in the Forest of Dean had been supplied solely with Roman scoria.

PRESTWICH UNION WORKHOUSE.

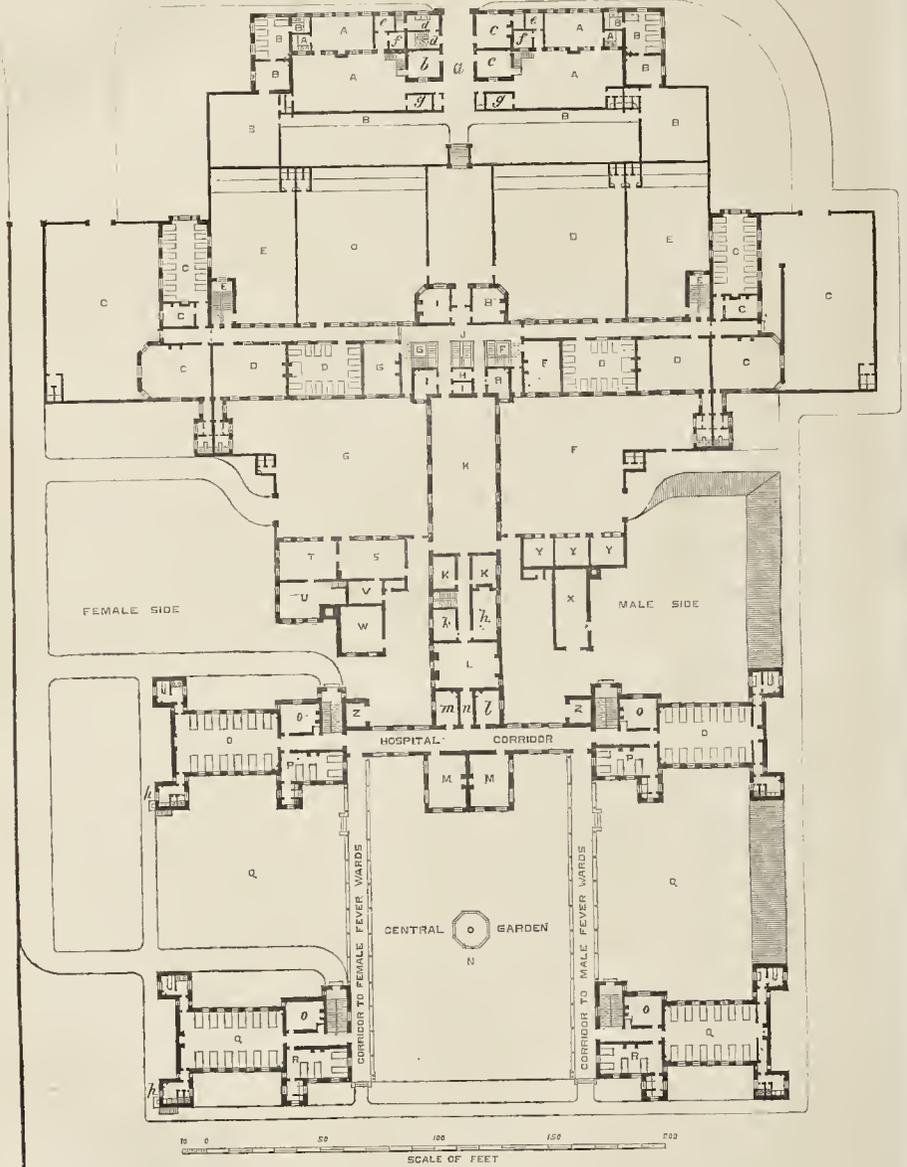
A NEW workhouse has recently been erected near Manchester for the guardians of the Prestwich Union. The site, which is approached by a road leading from Crumpsall-green to Blackley, forms a part of the Bongs estate, on another portion of which stands the new workhouse belonging to the township of Manchester, so that the property of the Prestwich Board of Guardians is immediately contiguous to that of the Manchester board, and separated by a boundary wall, erected at the joint expense of the two boards. The site of the proposed building being of a very irregular and uneven shape, has involved a great deal of levelling, and a portion of the ground being very hilly, there has necessarily been a considerable amount of excavation. Portions of the building are erected in a valley down to which the ground has been levelled. The approach road, passing through the grounds, sweeps up to the main entrance, passing on the right the farm belonging to the Manchester guardians. The main entrance is in the form of an arched gateway, on the right of which is the porter's lodge, and on the opposite side is his residence. On the first floor are committee and clerks' rooms, adjoining which is a reception-room for the accommodation of persons having business with the committee or clerk. Passages to the right and left lead to the probationers' ward, with fumigatories, clothing stores for male and female inmates, together with the usual lavatories, &c. Behind these are wards in which patients suffering from skin disease will be required to remain a certain time before being passed into the house. Passing up the central avenue, we come to a flight of steps leading to an elevated platform in front of the main building, which will serve as an airing-ground for the use of the aged and infirm of both sexes, as well as the harmless insane.

Entering the main building are the master's and matron's parlours, which occupy the central

front, the windows of their rooms commanding a view of the front part of the building and airing-ground. A central staircase, exclusively for the use of the officers, leads to the master's and matron's bedrooms, which are placed above their sitting-rooms. On the right and left of the central staircase are large stone staircases for the use of the male and female inmates, and adjoining these are wards for the able-bodied, whose sleeping-rooms occupy a corresponding position on the floor above. There are offices for the master and matron situated behind the main staircase, with projecting windows overlooking the rooms occupied by the able-bodied behind, and so arranged (by a small window looking into the dining-hall on each side) as to give the principal officers in charge a thorough inspection of the whole building. The able-bodied, in passing from the day-room to their separate wards, have to pass by the doors of these offices, thus again bringing them under the supervision of the master and matron. There is a door of separation right and left of the principal staircase for the aged and infirm, whose day-rooms and sleeping-rooms are placed side by side on the same level on each floor. The advantage of this arrangement is that probably more than half of this class who could not dine in the general dining-room may live entirely on the ground floor, whilst the more aged and infirm can live on the same level upstairs. The second door of separation at the further end of this passage leads to the wards appropriated to the epileptic inmates on the ground floor, and those for the harmless insane on the floor above. The room for the attendant is placed so that he can conveniently inspect from his window all the dormitories. Special care has been exercised in the arrangement of the water-closets, lavatories, &c., which are divided by a short ventilated passage from the ward itself, so as to admit of a thorough draught of air through the whole. Projecting behind the main building is the dining-hall, with the chapel above, the entrances to which are so arranged as to bring each person under the eye of the master or matron when passing into either of the above-named places. Provision is made for seating about 200 at meals, and this number might be increased if necessary. The kitchen, pantry, bread-store, and other necessary departments are placed behind, and are easy of access to the dining-hall, on the one hand, and to the hospital buildings on the other, the latter being situated in a group at the back. There is a workshop on the men's side, with boiler-house, stabling, cart-shed, and coal-shed. On the female side are washhouses, laundry, foul linen-shoot, butchery, coal-shed, &c. At the rear of the domestic offices is a cross corridor, separating the main building from the hospital buildings, which are so placed as to be completely detached from the general workhouse. The hospitals are built on the pavilion principle, there being four pavilions, containing male and female wards, easily accessible to the domestic offices and the surgery. Immediately in front of the kitchen and domestic offices is the convalescent day-room for inmates of both sexes. The wards are two stories high, and have each of them a small scullery, and sleeping-room for the nurse or ward attendant. Each hospital has a hoist, dust-shoot, water-closets, bath-rooms, and lavatories, arranged on a similar principle to those already referred to. Over each water-closet and bath-room is a tank for storing water.

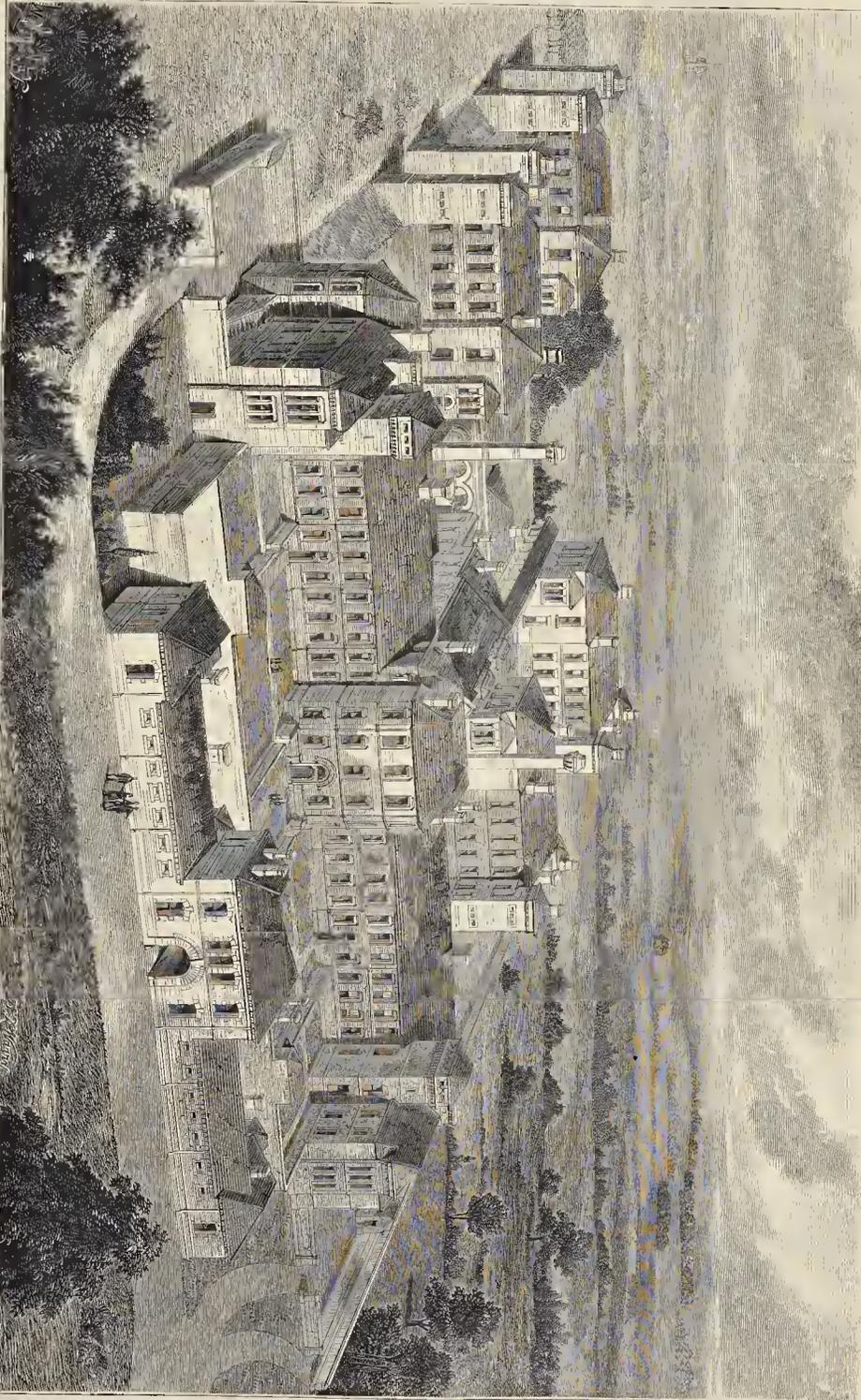
One great object of the architect has been to centralise the administrative department as far as practicable, so as to admit of distribution of food, and facility of supervision to those in charge. Another, and perhaps the principal object, has been to give a liberal allowance of cubical air-space, together with sufficient light and ventilation. As one means of accomplishing this, the pavilion principle has, to some extent, been carried out in the arrangements of the main building, or workhouse proper, in which the long, dark, and ill-ventilated passages usually found in such buildings have been substituted by light, airy corridors. Utility rather than appearance having been the aim of the guardians, the building is very simple in design.

The architect of the building was Mr. Thos. Worthington, of Manchester; and the general contract was let to Messrs. R. Neill & Sons, for 21,775l. The foundations formed a separate contract, for 3,250l.; and the cost of fittings, land and purchasing, commission to architect and surveyor, road-making, &c., increased the total amount to 37,775l.



PRESTWICH UNION WORKHOUSE.—Plan of Ground Floor.

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| <p>A. A. Probationers: ward, yard, bath, &c.; male and female.</p> <p>B. B. Skin diseases: bed-room, day-room, yard, bath, entrance; male and female.</p> <p>C. C. Epileptic: bed-room, day-room, yard, attendant; male and female.</p> <p>D. D. Aged and infirm: day-room, yard, bed-room; male and female.</p> <p>E. E. Harmless insane: yard, entrance; male and female.</p> <p>F. F. Able-bodied (males): day-room, yard, staircase.</p> <p>G. G. Ditto (fem.); day-room, nursery, yard, staircase.</p> <p>H. Master: office, parlour, closet.</p> | <p>I. Matron: office, parlour, closet.</p> <p>J. Staircase for master and matron.</p> <p>K. Dining-hall.</p> <p>L. Kitchen.</p> <p>M. Convalescent dining-rooms, male and female.</p> <p>N. Central garden.</p> <p>O. O. Sick wards: male and female.</p> <p>P. P. Children's ward: ditto.</p> <p>Q. Q. Convalescent wards, ditto, and airing-grounds.</p> <p>R. R. Special wards, ditto.</p> <p>S. Washhouse.</p> <p>L. Washhouse for infected linen.</p> <p>V. Drying chamber.</p> | <p>X. Boiler-house.</p> <p>Y. Workrooms: carpenters, tailors, corn-grinders.</p> <p>Z. Sheds.</p> <p>a. General entrance.</p> <p>b. Reception-rooms.</p> <p>c. c. Porter's living and bed-rooms.</p> <p>d. d. Guardians' lavatory and stairs to board-room.</p> <p>e. e. Padded rooms: male and female.</p> <p>f. f. Refractory ditto.</p> <p>g. g. Stove and fumigatory.</p> <p>h. Scullery.</p> <p>i. Surgery.</p> <p>j. Hospital stores.</p> <p>k. Serving-room.</p> <p>l. Ward sculleries.</p> <p>m. Hospital stores.</p> <p>n. Ward sculleries.</p> <p>o. Ward sculleries.</p> <p>p. p. Dust-shoots.</p> |
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PRESWICHE UNION WORKHOUSE, NEAR MANCHESTER.—MR. THOMAS WORTHINGTON, ARCHITECT.

ACCIDENTS.

St. Alban's Abbey.—An accident has occurred at St. Alban's Abbey, which is now in process of restoration, under the superintendence of Sir George Gilbert Scott. The great central tower has been shored up and strengthened, and the workmen are pointing the stonework of the exterior, for which several heights of scaffolding have been erected; and while the men were at work on the uppermost scaffolding a portion of it gave way, and four of them fell on to the roof of the nave of the abbey, between 40 ft. and 50 ft. One was severely injured in the pine, in addition to being much bruised. The other men were also much bruised and shaken.

The Wakefield and Barnsley Canal.—The commencement of this canal at Old Mill, near Barnsley, has given way, owing to the water getting through the bottom of the sides. The water flowed into the fields adjoining, and it had to be cut out for some distance, in order that the leakage might be repaired.

Dewsbury.—Some foot-passengers at Thornhill were observed a large crack in a new grocery establishment opened about a month since, and they gave the alarm. The family promptly left the place. They had hardly got into the street when the whole of the building came down. The lock-in-trade and the furniture were destroyed, and the building was rendered uninhabitable. It is supposed that the foundations had been badly constructed, and that an excavation made near caused the building to give way.

Oldham.—A fire has occurred at the mill of Messrs. Ogden, cotton manufacturers, near Oldham. The damage is estimated at 30,000*l.* Forty thousand spindles were destroyed. A weaving-shed and warehouse were saved by the women. The fire is supposed to have originated by the friction of the machinery.

CHURCH OF ST. JOHN THE BAPTIST, ISLINGTON.

This church, which stands at the meeting-point of Cleveland-road and Almorah-road, Bowham-road, was consecrated by the Lord Bishop of London on the 6th of August. The church consists of nave, aisles, chancel, chancel screen (comprising organ-chamber on the south side and vestry on the north), with bell-cotting above the chancel arch. There are three arches, one to the vestry, and one to each of the aisles. The style is Early Decorated, and the building is erected of brick, with stone dressings, and tracery. The interior is of brick, paneled with coloured work, with bands and ribs. The chancel is a semi-octagon, with north and south arcades to the vestry and organ-chamber. The nave is separated from the aisles by five bays, having stone shafts and capitals, and bays, and stone arches. The whole has been erected under the superintendence of the architect, Mr. Wm. Wigginton, save the temporary font, which was a gift. The whole cost, including fencing and lighting, will be under 6,000*l.*, and the accommodation is for between 600 and 800. Mr. Heath, of Hornsey-road, is the contractor. A bad foundation and an awkward site increased the architect's difficulties.

REIGATE.

Sir,—Permit me, as a Burgess of the borough of Reigate, and a resident there for more than thirty years, to thank you most heartily for your article in the *Builder* of the 10th inst. Several of your remarks are, they are but too well deserved. It is useless for any individual to call the attention of the authorities to the state of things; but I imagine, however much they may chafe under the strictures of the *Builder*, they will find they will be obliged to do "over on" now that your eye is upon them. I do not know, sir, of a more sickening punishment that I could give you than to make you out at the reports of the meetings of the Local Board for three or four years past. You are doubtless aware that Reigate is a rough that some time since was very properly franchised for its corruption, and those who are powerful under that régime still have great influence in the place, though time will bring in a better class of men, and after a while, I believe, greatly change matters. Unfortunately, present, few of those who are most fitted for serving in public offices will accept office. I am writing more particularly to the Western

Ward, not because they are insensible to their duties as citizens, but because of the strong personality which characterises the proceedings in all municipal matters.

The speculative builder has been allowed to do almost as he likes here, and the consequence is that in spite of stringent by-laws houses have been put up, both large and small, that are a disgrace to the place.

The purchase of a gold chain for the mayor, an address to the Prince of Wales, a squabble between two members of the council, bearding the mayor, or, indeed, any of "the little things that are only big to little men," get plenty of attention; but such a thing as a thoroughly satisfactory inspection of the sanitary arrangements of the houses in the place is out of the question, for who knows but that the first offender might be one of their own council? Heaven forbid that they who make the by-laws should be amenable to them. Under the Public Health Act I trust there will be a means of calling Government attention speedily to the shortcomings of local Boards.

I trust "Gargyle" will find an opportunity of visiting us again soon, and be able to report progress. I enclose my card.

SALUS POPULI.

THE DUBLIN TRAMWAYS COMPANY.

At the half-yearly meeting of this company on the 8th inst., a dividend was declared for the past six months at the rate of 10 per cent. per annum, a sum equal, with respect to the period during which the tramway had been opened, to a rate of upwards of 11 per cent. per annum. The report of the directors showed that the number of passengers carried from February to June inclusive reached 979,684, the receipts from which traffic amounted to 11,970*l.*, whilst unamortised accounts exhibited total receipts from all sources at 11,470*l.* working and other expenses leaving a balance of 4,571*l.* as net revenue available for division. The returns are the more satisfactory that up to June 7th only three miles were open, 2½ additional miles being at work from the 8th to the 30th of that month. That this extension will prove eminently profitable was shown by the increase of receipts from 2,681*l.* in May to 3,388*l.* in June. A statement made by the chairman disclosed a further progressive addition to income, the passengers carried in July increasing by 108,563, giving receipts of 1,874*l.* The shareholders seem to have every reason to be gratified with the prospect before them.

NEW MANSION AT THANCKES, IN CORNWALL.

For the last eighteen months or more workmen have been erecting a mansion for Lord Graves, and the works are now so far complete that the family have taken possession. The building has been erected close to where the old house stood, and is situated about half a mile from Torpoint. It is built in the Tudor style, and has been designed by Mr. A. Norman, J.P. The southern aspect commands a fine prospect. The sky-line of the building is broken up by three gables, each surmounted by quaintly-carved animals and birds, which stand out conspicuously against the sky. The carriage-porch is at the south-western end, and from it rises a high tower, which forms a main feature in the general grouping of the building. Upon one angle of this tower is a turret, and upon the one immediately overlooking the drive is carved a life-size figure of a soldier, in the costume of the Tudor period. The billiard-room is semi-attached to the rest of the building, and is situated at the north-west angle. In shape it is octagonal, each cant terminating with a gable, and each gable surmounted by carved figures of birds, squirrels, &c. Over the entrance-porch of the carriage-way are carved spandrels, in which the national emblems are introduced,—the rose, shamrock, and thistle, twisted and entwined together with the oak. The materials used in the building are all of a comparatively local character. The walls are built of native limestone, and the various dressings are in Portland stone, the stone having been selected at the quarries. The hall is wide and spacious, and the upper rooms are reached by a massive staircase, lighted by a large stained-glass window. The contract was taken by Mr. Trevena, of Plymouth, builder. Mr. W. Trevena, jun., has represented his father upon the spot throughout. The carving has been executed by

Mr. Harry Hems, of Exeter, and by artists from his atelier, under the immediate superintendence of the architect. Mr. Norman has been engaged in making extensive additions to Anthony House, which is situated about a mile from Thanckes. The style of the main building is Classical, and in the design for the extensions the architect has maintained the same character. Mr. John Pothick has carried out the contract.

THE BRIDGE IN ST. JAMES'S PARK.

Sir,—As there are at the present time a number of improvements on hand in the metropolis, perhaps it will not be out of place to notice a want that has long been felt in St. James's Park.

It is utterly impossible for rowers, with comfort, to go under the present bridge, and consequently stooping becomes necessary. Many severe knocks and bruises have been experienced by persons who select the water for an amusement, not a few of which the writer has witnessed.

Could not the bridge be raised at least a foot higher? The expense would not be great, and the gradient would not be so high as to interfere with much of the present surrounding paths.

This would be a great boon to many amateurs who patronise the water. A BUILDER.

PORTLAND CEMENT STAIRS.

Sir,—With regard to the suitability of Portland cement for stairs, the following fact may be interesting to the readers of the *Builder*. Several flights of stone stairs in the Central Station of this town (Newcastle-on-Tyne), by continual traffic, were worn quite hollow in the centre and the nose worn off, consequently each step was dangerously narrow. This was entirely rectified in the following manner:—The stone of each step was chipped over its face and Portland cement applied in the hollow part, running off to nothing at the ends of the stone, and a nose of cement moulded on; these were supported by a block of wood for a couple of days, then cleared away, and now each step is like a solid piece of stone. R.

HOMOEOPATHIC TREATMENT.

Sir,—Some years ago I wrote to the *Builder* to observe that a certain church tower was out of the perpendicular. The churchwardens thereupon, instead of rebuilding the tower, or having recourse to any expensive engineering process, to rectify the deformity, built two adjuncts, which served an economic purpose, and concealed the defect. Now, as the said tower is built on a site intercepted by numerous spires, one of these is probably the cause of its leaning, and I cannot see a cheaper or more certain remedy than to let down the side from which the tower leans to the level of the other side, and this by means of an artificial water-course under the side to be lowered. Suppose the tower to lean towards the west.—Bore some distance from the north and south ends of the east side to a depth lower than the foundation; connect the shafts by a narrow water-channel through the soil, without pipes; pour water in one shaft, and pump it out from the opposite shaft. A settlement will take place too gradually to cause any fear of danger. Of course the tower must be iron-bound during the process. When the tower has levelled itself, in case the water-course is not compressed, and to prevent further sinking, pour in fluid cement or asphaltic to fill it up. WALTER SCARLELL.

"UNFAIR COMPETITIONS: BRIGHOUSE."

Sir,—I was greatly surprised on perusing the letter published in the *Builder* of the 27th ult. as if Mr. Payton challenges me to publish my name, and the authority for my statements, which with pleasure I hasten to do, at the same time taking the opportunity of replying to his far from gentlemanly effusion.

The information I acted upon appeared in the *Halifax Courier* of the 28th ult., under the head "Brighouse," and I still fail to see how the statement can be anything but correct, as each lowest tender for the various artificers' works was given separately, and the total of the sums (nigh 6,000*l.*) collectively.

With regard to the rival statements in the *Courier* and the *Brighouse News* respectively, I will merely state that the *Courier* is edited by the mayor of Halifax, and is considered one of the best weekly newspapers in Yorkshire.

I still consider that Mr. P. has not at all freed the Brighouse competition from the stigma of unfairness. Even if the statement in the *Courier* (which I forwarded for your perusal) is not correct, which I by no means admit, the fact of the lowest tenders, as per Mr. P.'s letter, being almost one-half more than they ought to have been (as I will shortly prove), in my opinion stamps the competition as unfair.

What would Messrs. G. & P. have said had the lowest tender for the Bradford Town hall been 69,000*l.*, instead of 40,000*l.*, the amount given as the limit. But "comparisons are odious."

Now to prove that the cost is nearly one-half more than the sum stated as being the limit, I Mr. P. will reproduce the copy of the instructions issued by the Brighouse Local Board, he will find that the 2,000*l.* were to include the boundary-walls; so that Messrs. G. & P.'s estimate was "1,000*l.*" in accordance with the requirements of the Board." Of course, I take no cognizance of the reductions

afterwards effected, which must have affected the design as a premeditated one.

Your readers may form some idea of the cost of erecting Messrs. G. & P.'s design when I state that in addition to the ordinary cemetery chapels (with tower and spire) mortuary chapels were attached, which were almost as large as the others, and that the entrance-judge was, if I remember rightly, two stories in height and with bay windows; entrance-gates and 100 yards of boundary-walling were also included. For my own part, and, I may add, in the opinion of competent builders also, the 6,000 named in my first letter was about the sum that would be required to erect the premeditated design in its entirety.

I emphatically deny Mr. P.'s insinuations that we were competitors in the competition referred to, and with regard to the affronts Mr. P. pleases to heap upon me I will say nothing, trusting he will have the good sense to apologise for them. As before, "I leave your readers to draw their own conclusions."
J. LEECHING.
Habitax.

REMOVAL OF DUST AND TRADE REFUSE.

At Lambeth Police-court, Mr. Ellison has given his decision in the case of Messrs. Chubb, the locksmiths, against the Vestry of Camberwell parish as to the removal of ashes, &c., from their premises. Mr. Goddard was counsel for Messrs. Chubb, and Mr. E. Clarke for the Vestry. Counsel referred to the case of "Lindon v. Stanbridge" (20 *Law Journal*, Exchequer Reports). Mr. Ellison, after a discussion on some evidence, gave his opinion on the question raised. It was whether the substances were trade refuse, or such as the parish was bound to remove. Of course dust and ashes, the produce of domestic purposes, should be removed, and that which was produced by the forges, &c., used in manufacturing purposes, was to be considered "trade refuse," and the parties themselves to have them removed. The two substances should be kept distinct. He considered that the case in the *Law Journal* supported the view of the case he had arrived at. It was arranged that a special case should be submitted to the Superior Court for decision.

ROYAL AGRICULTURAL SOCIETY: CARDIFF MEETING.

It seems fifty-six sets of plans and detailed estimates were sent in competition for two prizes of 20*l.* and 10*l.* for the first and second best design for a pair of agricultural labourers' cottages, the cost not to exceed 220*l.*; and two similar prizes for the first and second best design for a pair of miners' cottages, to form part of a row, no single cottage in which was to cost more than 90*l.* The three land surveyors who were appointed judges pronounced them all devoid of merit, so no prize was awarded. As each set of plans was accompanied by an entrance-fee of 10*s.*, the society appears to have adopted a smart way of strengthening their funds. A SUBSCRIBER.

PROTECTION OF IRON.

Sir,—I am strongly urged by your correspondent "H. J. P." to make a trial of Astbury's oxide of iron paint for the protection of all kinds of ironwork. It lasts longer than any other composition, and has a good appearance for years. I trust these lines will be service to the manufacturers of the article in question. M. A.

THE BURSING OF TURNMILL-STREET SEWER.

CLERKENWELL VESTRY v. METROPOLITAN RAILWAY COMPANY.

The action brought by the Clerkenwell Vestry against the Metropolitan Railway Company to recover the sum of 1,854*l.* damages and costs already awarded by arbitration for injury done to the Turnmill-street sewer, by the company's works, came on for hearing before Baron Martin and a special jury, at Guildford, and the whole proceeding seems to have been gone into again as if no arbiters' award had ever been made.

Among the witnesses were Mr. S. Bevan, Chief Surveyor of the Vestry, and Mr. C. H. Gregory, C.E., who stated that in their opinion the formation of the railway works preceded the failure of the sewer. Mr. Moreton, C.E., under whose superintendence the railway works were done, maintained the contrary, or, at least, that the damage was not caused by the cutting of the railway; and Mr. B. Baker, Chief Assistant Engineer to Mr. Fowler, corroborated this view. Baron Martin, in summing up, said: The arbitrators were appointed in this case to ascertain to what extent the plaintiffs were injured, or whether they had been injured at all. As they did not agree, Mr. Clutton was appointed as umpire. I do not know him, but I have understood that he is one of the most eminent men in the kingdom, who has been employed in these things for many years. Mr. Clutton, in this document, after stating the appointment of arbitrators on either side, and stating that he had taken the oath before a Justice of the Peace, makes an award of 1,854*l.* as the amount to be paid by the Metropolitan Railway for injuriously affecting, by the execution of their works, the sewer of the plaintiffs. So that there is Mr. Clutton making this award, after having viewed the premises and seen all the witnesses. Therefore, it is as plain as the sun at noonday, notwithstanding all that the counsel says, that he decided that the Company had done the damage. I believe there was a mistake in this Act of Parliament, which meant that the money should be paid as a consequence of the award being given; but the lawyers found out that it was necessary to bring an action to get at the money, and they, therefore, come here to deny the very thing that Mr. Clutton has affirmed. They fling the whole of that away, and try the case over again, and tell you you are to listen to nothing but the evidence given to-day. In the first place the plaintiffs call the surveyor, who must of course be prejudiced, but who gave his evidence very well. Then, however, they call Mr. Gregory, an independent man, and one of the most eminent men in the kingdom, who tells you that the injury was caused by the works. Whom does the other counsel call? He calls all the servants of the company, who are bound to come here and swear it was their fault. Mr. Clutton heard it all, and decided against them. I have nothing more to add, except

that it is most extraordinary after the taxed costs are fixed at 250*l.* on one side, when they must be just as much on the other side, and when the costs altogether cannot be less than 500*l.*, that you should be called upon to try the thing over again, and enable this railway company to keep the money still longer from these people.

The jury at once returned a verdict for the plaintiff for the full amount.

Mr. Day handed in a bill of exceptions to the judge's ruling.

HINTS HOW TO USE A GRINDSTONE.

Mr. T. E. MITCHELL, in the *Journal of the Franklin Institute*, says,—

- 1st. Do not waste the stone by running it in water; but if so, do not allow it to stand in water when not in use, as this will cause a soft place.
- 2nd. Wet the stone by dropping water on it from a pot suspended above the stone, and stop off the water when not in use.
- 3rd. Do not allow the stone to get out of order, but keep it perfectly round by the use of gaspipe, or a hack.
- 4th. Clean off all greasy tools before sharpening, as grease or oil destroys the grit.
- 5th. Observe—when you get a stone that suits your purpose, send a sample of the grit to the dealer to select by: a half-ounce sample is enough.

CHURCH-BUILDING NEWS.

March.—The new church of St. John, in the town of March, and Isle of Ely, has been consecrated by the bishop of the diocese. The new church constitutes another, although, as yet, small,—landmark in the wide expanse of the Fen country, and at the same time adds a useful ornament to the town of "the avenue of elms." Until recent years, the township of March was comprised, for ecclesiastical purposes, within the rectory of Doddington. The Church of St. John consists of nave, small side aisles, and chancel,—provision being made at the chancel end for organ and vestry. The style belongs to the early part of the fourteenth century. It has not been thought necessary at present to build a tower, but there is a small turret surrounded by a flèche or bell-tower. The walls consist of Ancaster stone, with Bath stone dressings, and the roof is covered with Colly Weston slates. The building is erected on a tolerably good foundation for the district, although a good deal of concrete had to be employed under the walls. There are four arches on either side of the nave, supported by stout stone pillars, with carved capitals; the chancel-arch resting on short marble columns, and stone coriols. The roof is an open one, with timbers stained and varnished, and the seats which are open, are made of pine, also stained and varnished. The main entrance is the porch at the west end of the south aisle, but there is also a smaller doorway at the extreme west end of the north aisle. The chancel is paved with Maw's tiles, by Mr. Simpson, of London; and the aisles are laid with black and red Staffordshire tiles. The three-light window at the east end awaits stained glass, in memory of the late Sir Algernon Peyton, bart. The work is being executed by Messrs. Clayton & Bell. At the west end there are two two-light windows, which (in common with those in the aisles) are at present filled with cathedral glass. There are stalls in the chancel for the choir; and the pulpit is made of alabaster, with open arches. The chancel is raised three steps from the centre aisle, and that part within the communion-rail is raised a similar distance from the chancel-floor. The stone carving throughout has been executed by Mr. Sanson, of London. The heating apparatus was supplied by Mr. Haylen, of Newbridge. The church, which will accommodate 400 persons, will cost above 5,000*l.* The architect is Mr. T. H. Wyatt, of London, president of the Royal Institute of Architects. The work has been carried out by Messrs. Holland & Hannen, builders, under the supervision of Mr. Fowles, as clerk of the works.

Charlton.—This is a hamlet in Fladbury, and forms part of the living of Crophorne. Mr. Workman has purchased and considerably improved the Charlton Estate. Casting about him for a suitable site for a new church (now open), it occurred to him that a spacious hamlet on the estate, which, from its substantial character and style of building, seemed almost originally to have been intended for both purposes, would form the nucleus of a church such as the village required; and thereupon, acting on his own ideas, he proceeded, with the aid of Mr. Forsyth, of Worcester, to convert the

building into a church. The work of conversion commenced early in September, 1870, and has been steadily proceeded with up to the present time, the builders being guided by neither plan nor estimate. The large doorways of the barn, which gave room for the entrance of the grain crops off the estate, have been built up with masonry, and the building "rounded church-like" by the insertion of windows of the fourteenth-century style. There are eight of these windows, principally single-light; but in the east window something more elaborate has been attempted. This window has three lights, with tracery heads, and is filled in with stained glass, the principal subjects being "The Ascension," "The Good Shepherd," and "Christ Blessing the Children." Over this window is a quatrefoil light, geometrically traced, filled in with stained glass, bearing the sacred emblems of the four Evangelists. The side chancel windows are also filled in with stained glass, and bear the figures of the Evangelists. The eight single-light windows are filled in with plain glass, with coloured bordering and centres for relief. The roofing of the barn was found to be in such a state of repair that little was required to be done to it. On the gables, however, of the building, floriated crosses have been erected, and there is a bell-turret, with bell. The church consists of nave and chancel. Entrance to the building is obtained by a porch at the west end, which is an addition to the old building, and is built of the same material as the old walls, with Bath stone coping and dressings. The arch of the porch is wrought with coloured and Bath stone alternately, and there are carved capitals on each side of the doorway. The inner doorway is of Bath stone. The interior of the building has an open-timbered roof,—the original roof of the old structure, which has been rendered more in character with its new purpose by small spandrels having been brought down on each side to carved stone corbels on to the principals, and the whole being stained and varnished. These corbels are all alike, with the exception of the two showing the limit of the nave, which are carved figures representing angels. The others are conventional subjects. The chancel is decorated with a border of ornament and devices, on each side of the east window being a vine, the rest of the wall being decorated with a pattern of fleur-de-lys. The splay of the windows are filled in with devices of roses, lotuses, and other flowers. The stalls, altar-rails, and sedilia are of pitch-pine, with black columns for relief, with carved patterns and angles. The altar-rail has iron standards, picked out with gold and colour, and the floor of the sacrum is laid with encaustic tiles, supplied from the works of Mr. Godwin, at Lugwardine. The floor of the porch and part of the nave are laid with a plainer pattern of tile. The west gallery is constructed of pitch-pine, with carved capitals and dark columns, corresponding with the stonework of the porch. The pulpit is of Caen stone. The building will seat about 250.

York.—Mr. Street, the architect who has charge of the restoration of the Minster in this city, has visited York, and inspected the progress of the works. It was originally thought that the roof of the south transept would have to be bodily raised by hydraulic power, and towards this end the shoring of the lower roof was finished some time since. The outer roof is now being stripped of the large Westmoreland slates with which it has hitherto been covered, and it is found to be in good condition. The object of raising the roof would have been to have drawn it in; but it is found that the hulging outward has been slight, and that, as a consequence, there is little to do in this respect. As soon as the whole of the slates are off, boarding of the roof will commence, in readiness for covering it over with lead. The two turrets at each side of the south entrance will be taken down, and substituted by wooden ones, to try the effect, before rebuilding them.

Ashbocking.—All Saints' Church, Ashbocking, which in part of the present fabric is of the twelfth century, has been recently under repair at parish cost, to save the walls from falling in. A desire is strongly felt to complete the restoration on a very simple scale under Mr. E. C. Hals will, who has undertaken it. The stonework of the window, &c., which is of the thirteenth century, is much decayed. There are also other details much needing immediate care. The works are in the hands of Mr. H. Luff, builder Ipswich.

Boldon.—The ancient parish church of Boldon near Sunderland, having become very dilapidated

During the past few years, a movement has been getting set on foot to restore the interior. The old church is generally supposed to have been erected about the eleventh century. The edifices in the Early English style, though much of the beauty and simplicity has been defaced by the process of repairing and furnishing pursued by the church authorities of last century. It is intended to remove these deformities, and to this end it has been determined to clear away the recent galleries, and substitute open seats for the present square pews. To effect these and other improvements which it is proposed to make, it is estimated that a sum of 1,000l. or 2,000l. will be required.

Mortomley.—The Parkin Jeffcock Memorial church, at Mortomley, has been consecrated by the Archbishop of York, in the presence of a large assembly, including the principal families of the neighbourhood. With the circumstances attending the death of Mr. Parkin Jeffcock the public are familiar, and it need only be said that while heading a band of heroic men, after the explosion at the Oaks Colliery, in December, 1866, another explosion took place, and he and those who were with him perished. He had often desired the erection of a church at Mortomley, for the benefit, more particularly, of the miners, in whom he took a deep interest; and when a memorial to his memory was contemplated, it was decided to erect a church, according to his desire. A fund was opened, and in a short time over 2,000l. were raised. The Jeffcock family gave 1,000l., including the site, of the year 2000, and among the subscribers were the Earl of Fitzwilliam and Lord Wharfedale. The church, which is known as St. Saviour's, is situated close to Mortomley Hall, and is built in the style of architecture prevailing in the thirteenth century. The nave is 48 ft. by 20 ft., the chancel 25 ft. by 18 ft., and there is a north aisle, organ-chamber, and vestry. The roof is of open stained timber, and the height is 43 ft. The seats are open, and of stained wood. The church will accommodate 300 persons, and the total cost is about 1,900l. It will be heated by hot water. The pulpit is of polished marble, and that and the chancel-screen are the gift of Mrs. Jeffcock. The font is the gift of the Rev. G. Lewin, of Wortley. The very handsome altar is the work of Mrs. Gainsford. Miss Marriott, Mrs. Hutton, and Mrs. Burges have also contributed towards the decoration. At the north end of the church is a brass tablet, containing the following inscription:—

To the glory of God, and in pious remembrance of Miss Jeffcock, who lost her life with an exploring party on the 13th December, 1866, in the Oaks Colliery, near Ruseley, after the great explosion there on the previous day, this church, free to all, and dedicated in the name of St. Saviour of the world, is offered by his surviving parents, his brother, and many friends, on the 7th day of August, in the year of our Lord 1872.

The architect was Mr. James Brookes, and the contractors were Messrs. Longmire & Burgo. A part of the contract was carried out by Messrs. Deacon & Broadbent. Mr. Masters acted as clerk of the works.

Bromsgrove.—The architect of the new church is Mr. J. Cotton, of Birmingham. Mr. Barton, mentioned in our account last week as architect, is a member of the building committee only.

SENTING CHURCH-BUILDING NEWS.

Wellingborough.—The memorial-stone of a new Wesleyan chapel and school has been laid here. The total amount of subscriptions is nearly 1,000l. The site for the new chapel is on what is known as the Park Estate, and that part of the site is fast becoming one of the most important of the town. The proposed chapel is designed in the Italian style, freely treated. It will be entered from the front by an open arched porch, supported by columns with pedimented caps, and over the arches diaper-work will be introduced. On either side are two vestries, containing gallery staircases. The body of the chapel is divided by two wide aisles, and galleries are provided for 400 persons, and, with the seats in the galleries, makes a total of 700. A large rostrum will be used, and a recess in rear is placed to give room and effect. Behind the chapel are three vestries, two communicating, which can be made into one large room. The schoolroom is behind them, and is 26 ft. by 39 ft., well lighted and warmed, and has an open roof. To it is a kitchen, and in convenient position are lavatories. The architect is Mr. Daniel Bell, of London, under whose direction the building is being built by Messrs. Barton & Reach, of

Rothwell. Mr. Blunt, of Wellingborough, is clerk of the works. The estimated cost is a little over 1,800l., to which are to be added 500l. or thereabouts, for the purchase of the ground.

Lightcliffe.—A Congregational church has been erected here in the Geometrical Decorated style, from the designs of Messrs. Lockwood & Mawson, architects, Bradford. The cost has been 8,500l. The edifice stands on a gentle eminence at a short distance from the Lightcliffe Railway-station. The tower and spire, rising to a height of 150 ft. from the ground to the top of the spire, has just been completed. Sir Titus Salt has given the turret-clock and bells, which cost 750l.; Miss Salt has expended 130l. on the pulpit, communion-table, and choir-benches; and Mr. George Salt defrays the cost of the organ and case, 700l. The organ is to be built by Mr. Holt, of Wakefield, under the management of Mr. Samuel Smith, of Bradford, a musical amateur. Inclusive of the gifts of the Salt family, the amount expended on the church will exceed 10,000l.

Great Boughton, Chester.—The memorial-stone of a Congregational chapel has been laid here. The site is the corner of the new street between the Christleton and Tarvin roads, and near to the present chapel, which it is intended to utilise as a schoolroom. So soon as the amount given or promised towards the new chapel reached 1,000l. an architect, Mr. T. M. Lockwood, was appointed, and the contract of Mr. W. Andrews, another citizen, to build it for something less than 1,800l., was accepted. Probably with the cost of the land and extras, the total will be 2,300l., and it would have been at least 2,500l. had the first design, which included an open octagonal turret at the south-west corner, been adopted. The dimensions of the new chapel will be 68 ft. by 28 ft. 6 in. inside, and access will be had from the Christleton-road through a vestibule with inner porches 6 ft. in width. The height inside is 29 ft. to the ceiling, and to the ridge 42 ft., there being a triangular space left in the roof for ventilation. The roof is open for half its height, showing its construction internally. Accommodation is provided for 463 sittings, the seats being open, with sloping backs. The windows will be glazed with lead lights, filled in with tinted glass. The woodwork of the interior will be chiefly of pitch pine, the pulpit being placed on a raised dais under an arched recess. The general style of the building is Early English, the walls being of brick with stone dressings. The front is to have a large three-light window, with carved caps and columns, while below it will be the entrance to the building by means of two arched doorways, with carved capitals and granite shafts. In the upper part of the gable is a circular louvre, and the apex is surmounted by a bell-cot of simple design. The side windows consist of double lancet lights between the buttresses, finished internally with carved capitals and stone shafts. The heating will be effected by means of Porritt's patent hot-air apparatus, and ample provision is made for ventilation.

West Bromwich.—The opening services in connexion with the new Wesleyan Chapel, recently erected in the Beeches-road, have been performed. The new building is situated close to the Birmingham-road, and forms a conspicuous object in the most fashionable suburb of the town. The chapel is designed in the Grecian style of architecture. Exteriously it is faced with Kingswinford bricks, with Bath stone strings, quoins, cornices, pediments, &c., the stone being enriched with carving and incised decorations. The interior walls are relieved with ionic pilasters, and over each pilaster are acroteria ornaments, from which spring the moulded ribs dividing the coved ceiling panels. A gallery is provided at the entrance, and a rostrum and pulpit opposite. The arrangements for warming and ventilating are complete. The architect was Mr. Edward Pinches, of West Bromwich, and the builders were Messrs. Trow & Sons, of Wednesbury. The cost, including land, will be about 2,600l., of which 800l. remain to be raised.

Bensham, Gateshead.—The foundation-stone of a Wesleyan new chapel has been laid at Bensham. The site is near St. Edmund's Cemetery, Gateshead. The new chapel will immediately adjoin the schoolroom. The new edifice is situated on the west side of the road leading to the Redheugh Bridge. The dimensions of the building are as follows:—Length (including 20 ft. which will be set apart for the choir), 70 ft.; width, 46 ft.; and height, 32 ft. The new chapel will be built in the Italian style of architecture,

and will accommodate between 800 and 900 persons. The walls will be built of Low Law blocking and Prudham stone, and will, in the winter, be heated with hot water. The architect is Mr. F. R. N. Haswell, of North Shields, and the contractor is Mr. J. F. McMurtrie, of Gateshead. The site has been purchased from the Askew estate, and the total cost of the building is estimated at 6,000l.

Denton.—A new Wesleyan chapel has been opened here for divine service. The style of architecture is Gothic, and, together with the arrangement of the plan, is upon the model of another chapel recently erected from the designs of the architect (Mr. George B. Ford, of Burslem). The accommodation provided is for nearly 600 persons on the ground floor, and in the gallery across one end; and at the opposite end of the chapel is an orchestra, underneath which is a large class-room, and adjoining this is a minister's vestry and lavatory, with closet attached. In securing the site sufficient land was purchased for the erection of schools, which are to be built forthwith. The works have been carried out by Mr. Stringer, of Sandbach, from the designs and under the superintendence of Mr. Ford, the architect. The cost of the building and fittings is about 3,400l.

Wheelock.—The chief stones of a new Wesleyan chapel and school have been laid here. The site of the new chapel is in a central position, opposite the present chapel and school. The school will be underneath the chapel, which will seat 406 persons, the school and class-rooms affording accommodation for 500 scholars. The plan of the chapel is an oblong, with a gallery and orchestra, and the style of architecture is Gothic freely treated. Both the chapel and school will be well lighted and ventilated. The chapel roof will be in one span, to avoid obstructions to sight, and the floor of the chapel will be higher at the entrance than at the pulpit end, to prevent obstructions to sight when the congregation are seated, and this is obtained without steps. The vestibule will be laid with encaustic tiles, supplied by Messrs. Malkin, Edge, & Co., of Burslem, and the building is to be warmed with hot air. The contract for the buildings and fittings, which also includes railing, gates, and boundary-wall along the front of the site, but exclusive of warming, has been undertaken by Mr. William Martin, builder, Haslington, for 1,730l., and will be carried out under the superintendence of the architect, Mr. George B. Ford, of Burslem.

Hanley.—The memorial-stones of a new Wesleyan Chapel have been laid, with the customary formalities, at the corner of Rose-street and Keeling's-lane, opposite to the National Schools. Messrs. Serivener & Son, of Hanley, architects, prepared the plans. The design is Gothic, and the chapel, which will be 60 ft. long by 33 ft. broad, will accommodate 300 persons. There will be a school-room underneath of the same proportions. The building will be of blue and red brick, with stone dressings, and the roof will be of red and blue tiles, ornamentally arranged. The chapel will be seated throughout with open benching, stained and varnished. There will be an open timbered roof, and a gallery at one end. The windows will be filled with tinted glass. Two vestries and a porch-entrance will be provided. Mr. R. Hammersley, of Bucknall-road, has undertaken to erect the building for 1,355l., and towards this sum the committee had secured 938l. before the laying of the memorial-stones.

SCHOOL-BUILDING NEWS.

Charlton Kings.—Mr. Higgs having determined to build a school suitable to the growing requirements of this parish, the foundation-stone of a building capable of accommodating 200 children has just been laid. The site, which is given by Mr. Higgs, together with 1,000l. to the building-fund, is adjacent to the Church of the Holy Apostles, and the architectural character of the building will be in keeping with that structure. Messrs. Middleton & Goodman are the architects of the new building, and Mr. Daniel Hawkins is the builder.

Saltire Literary Institute.—We understand that this building, erected by Sir Titus Salt, bart., is closed, for the purpose of decoration. The style selected is Pompeian. The execution of the work is intrusted to Mr. Henry Briggs, of Bradford, from designs by Messrs. Lockwood & Mawson.

STAINED GLASS.

Doncaster Parish Church.—The west window of this church is to be filled with stained glass, by Sir Isaac Morley, of Beechfield, as a memorial of his late wife, Lady Morley. The execution of the work has been placed in the hands of Messrs. Ward & Hughes, but the design will be first submitted to Mr. Gilbert Scott.

Free Church, Sighthill, Glasgow.—A stained-glass window has been prepared for this newly-erected church. The window is a memorial of the late Mr. William Collins, the founder, in 1834, of the Glasgow Church Building Society. The leading incident in the life of the good centurion has been selected for illustration. The centurion said he was not worthy that Christ should come under his roof, but let Him speak the word and his servant would be healed; on which Christ said, "I have not found so great faith, no, not in Israel." The illustration occupies the three upright lights in the window. The dexter light contains three of the elders of the Jews accompanying Christ to see Him restore the sick servant to health; the centre lights represent Jesus met by two of the centurion's servants, and in the sinister light is seen the centurion tending his sick servant. Messrs. Ballantine, of Edinburgh, are the artists.

Stoke Fleming Church.—Painted glass has been placed in the east window of this church, to the memory of the late Mr. Samuel Juaniz-y-Echalarz Clark. The subject is the Ascension, a difficult one to treat successfully in so confined a space. The window has been made by Messrs. Ballantine, of Edinburgh.

Wellingborough Church.—The Decorated east window of this church has been filled in with stained glass.—"In commemoration of the thirty years' ministry of Canon Broughton as vicar, A.D. 1871." The window is one of five lights of varying width, with flowering tracery in the upper portion. The subject chosen for illustration is the "Crucifixion." The central light is filled with a life-size figure of the crucified Saviour, with the Virgin Mary and the Magdalen at the foot of the cross. The lights to the right and left of the central one are filled with pictures of the two thieves, the beloved disciple and others finding a place in the lower part of the design. In the extreme side lights, the centurion and soldiers with the Roman standard have been represented, some of the soldiers on horseback. The chief part of the tracery is filled with figures of angels. The window has been erected at the expense of the parishioners of Wellingborough, and is the work of Mr. A. Gibbs, of London.

Carlisle Cathedral.—A new window of stained glass has been inserted in the west end of the nave of this cathedral to the memory of the late Canon Harcourt. The style of the masonry is Gothic, and it consists of five lights. The subjects represented in the window are all Scriptural and religious, but so limited is the space that in only one case do they comprise more than two, or at most three figures, and in many instances they are simply portraits. This gives the design of the window some poverty of effect. The central and principal subject is a portrait of Jesus. The work has been executed by Messrs. Hardman, of Birmingham.

Bath Abbey Church.—Mr. Murch, says the local *Chronicle*, has every reason to congratulate himself on the success of his proposal for filling the east window of the Abbey in a manner worthy of the structure, the rest of the work of restoration, and the city. From a circular which he has just issued, we learn that in place of the fifty subscriptions of ten guineas each which he thought he might venture to ask, he has received besides a few larger and many smaller subscriptions no less than fifty-seven several sums of ten guineas, the entire amount promised to him up to this time being 930*l.* To carry out the plan of the committee with whom he is associated for the purpose a further sum of 220*l.* is required. Messrs. Clayton & Bell have the execution of the work, which it is intended shall represent, in a series of seventy-six pictures, the life of our Lord from the Annunciation to the Ascension. The arrangement has the sanction of Mr. G. G. Scott.

Bengeoerth New Church.—This church is progressing. The stained-glass east window, for which a special effort has been made, is being inserted. This window has been prepared by Mr. W. H. Constable, of Cambridge. It portrays Aaron, St. Paul, Christ, St. Peter, and Moses.

Minster Church, Thanet.—Two painted glass windows have recently been placed in the west-

lower end of this church, to the memory of the late Mr. William Rogers, of Sheriff's Court, in the parish of Minster. They have been executed from the design and under the superintendence of Mr. Seddon, of Westminster, the architect of Mrs. Tait's Orphanage and of St. Peter's Church, Thanet, by Mr. J. R. Thompson, of Southwark. They represent the figures of the Virgin Mary, with the infant Saviour and St. Joseph, standing under conventional canopy-work. The background of one of the windows is a ruby, and of the other a deep green, and the prevailing colours in the border are respectively counterchanged.

Halesworth Church.—A stained glass window has just been placed in the south aisle of this church, in memory of the late Mr. Patrick Stead, formerly a merchant of this town. His widow presents the memorial. Mr. H. Hughes was the artist. The principal figure is the Ascension of our Saviour.

St. James's, Gateshead.—A stained glass window has been erected in this church in memory of the late Colonel Henry C. Allhusen, of the 1st Newcastle Artillery Volunteers. The work was designed and executed by Mr. Henry M. Barnett, glass-stainer, Newcastle, and cost upwards of 160*l.* The window illustrates three Scriptural subjects. The centre and two southern lights are taken from Luke vii. 1—10, and the two lights in the north side are from the Acts of the Apostles x. 1—4. The upper rose of the window illustrates the Resurrection, and the two intervening roses the coats of arms of the family and the corps of which the deceased gentleman was the commanding officer.

PATENTS CONNECTED WITH BUILDING.

HASP OR LATCH.—*R. Dempster.* A communication. Dated 21st July, 1871.—This invention consists in constructing a hasp or latch, called "the safety hasp or latch," of a combination of three principal parts, first, a hasp or latch piece proper of the usual hook or other form; secondly, a bolt attached to that part of the hasp or latch which extends between the eye and the hook, or the equivalents of the eye and hook, or either of them; and, thirdly, a spiral or other spring, to act upon the above-mentioned bolt and keep it pushed out, but also allowing it, when pressure is applied, to recede. To facilitate the passing of the hook over the staple or fixed piece, the end of the bolt is formed with a curved lip.

WINDOW SASHES.—*S. Rogers.* Dated 22nd July, 1871.—Into the pulley stile is let a case containing a ratchet-wheel with a steel spring and a pawl working in the teeth of the said ratchet-wheel connected by a rod to a handle, around which rod is coiled a spiral spring, and projecting from the said ease and leading to the inside lining is an arm. Into the back of the sash is fixed a rod of iron or other material, with teeth thereon to correspond to the teeth of the ratchet-wheel. When the window is required to be opened, pull the said handle or knob, which releases the ratchet-wheel, and raises the sash upwards, the sash being stopped at any position by the handle or knob being let go. The sash is lowered by hand in the usual way.

PAVING OR FLOORING FOR THE STALLS OF STABLES.—*J. L. Norton.* Dated 22nd July, 1871.—According to this provisional specification metal frames are employed having cells in them to be filled up with asphalt, wood, moulded blocks, bricks, or tiles. Between the cells or through the blocks holes are formed for the passage of moisture or dirt.

LONGITUDINALLY CORRUGATED IRON BEAMS.—*R. Montgomery.* Dated 30th November.—This relates to improvements in the shape of the ingot to be used in the manufacture of longitudinally corrugated or folded beams. The invention consists in casting the ingot in a mould so fashioned as to form or produce longitudinal grooves in the ingot, corresponding in their number and relative position with those required in the finished beam or rail. To convert the ingot thus formed into a beam, bar, or rail, it is passed at a proper heat through a rolling-mill provided with a series of finishing grooves, the first of which correspond very nearly with those of the ingot. The invention also relates to the combination of bars of a peculiar shape in the formation of a "pile" for the production of a longitudinally corrugated beam or rail of iron, and consists in forming a "pile" having the same shape as the bar thereby produced, from which, with the same rolls and the same number of passes a perfect beam is manufactured.

Books Received.

"Work and Wages Practically Illustrated. By Thomas Brassey, M.P. Bell & Daldy." This interesting volume, which has a preface by Mr. Arthur Helps, and is dedicated to Mr. Thos. Hughes, M.P., will receive attention in due time.

"Specifications for Practical Architecture; a Guide to the Architect, Engineer, Surveyor, and Builder. With an Essay on Building, on the basis of the work by Alfred Bartholomew. Thoroughly revised, corrected, and greatly added to by F. Rogers. Sprigg, Atchley, & Co." We gladly welcome any republication of the late Alfred Bartholomew's Essay, now out of print in its original form, and hope this volume may in consequence be studied. But if we are called upon to express an opinion as to the way in which the present editor has done his work, it will not be very complimentary. Mr. Rogers claims in his preface to have adapted the book to modern science and requirements, and indicated the use of new materials. When we say that the specifications are described as for a "fourth-rate" house, a "third-rate" house, a "first-rate" house, a mode of description (belonging to an extinct Building Act), which is no longer recognised, and that the specifications do not contain a single word as to the use of Portland cement concrete, the extent of the trouble which has been taken to fit the book for the present day will be obvious to the meanest capacity.—We simply note, at all events for the present, the publication of "A Treatise on Mathematics, as applied to the Constructive Arts. By Francis Campin, C.E." (Sprigg); "Practical Plane Geometry, giving the simplest Modes of constructing Figures contained in One Plane. By J. F. Heather, M.A." (Lockwood & Co.); and "Perspective, or the Art of Drawing what one sees explained and adapted to the Use of those Sketching from Nature. By Lieut. W. H. Collins, R.E." (Longmans & Co.).

Railways or No Railways. By ROBERT F. FAIRLIE. London: Effingham Wilson. 1872.

The narrow-gauge Fairlie system is now well known both in Europe and in America; and the purpose of Mr. Fairlie's volume is, of course, to advocate that system as against the broader gauges. His narrow gauges, he maintains, combine economy with efficiency, while the broader gauges are both costly and extravagant. We have thus a revival of the old battle of the gauges under a new form; for what was formerly called the narrow gauge, which overcame the broad, is now ranked with the broad as against the still narrower Fairlie system. The British and other railways are like a tree which has not yet thrust forth its leaf-loading twigs; and what Mr. Fairlie wants, we presume, to do is to send the railway ramifications into every wealth-producing corner of the country to develop its multitudinous resources, and gather them all into the main branches and trunks of the railway system as already formed. And for such a purpose certainly narrow gauges and Fairlie engines and other vehicles seem better adapted than the present ponderous system, which is practically defective, and ever must be.

Miscellaneous.

Memorial Reredos in Dorrington Church.

This church has been improved by the addition of a reredos, executed in Caen stone, which extends across the east end of the chancel. The reredos, which is a memorial of Mr. T. H. Hope-Edwards, consists of a carved central subject, representing "The adoration of the Kings." On either side, in niches, are figures of St. Edward the Confessor and St. Andrew, in whose honour the churches of Dorrington and Conover are dedicated. Devonshire marble shafts, with carved capitals, also a carved cornice and diaper, help to further enrich the central part of the reredos, which is exactly the width of the east window—raised by the officers and rank and file of the 5th company Shropshire Rifle Volunteers, in memory of Mr. W. J. Hope-Edwards; the spaces north and south being filled up by arcades, having carved capitals, marble shafts, and carved panels. The sculptor was Mr. T. Earp, Lambeth, who executed the whole of the work. Mr. Edward Haycock was the architect.

Ferra-Cotta Works at Watcombe.—Having passed through the biscuit-oven the object is ready for the beautifully delicate colour which is given upon some of the ware: a result of the application, by hand, of glazes and enamel. Some of the figures, such as butterflies, are printed on copper-plates on thin paper, and applied in ordinary way to the object to be ornamented, which, being subjected to heat, the paper is destroyed, and the colour and markings remain, when the ornamentation is completed, the articles are again placed in the oven, with a heat sufficient to fix the glazes, and this perfects the details of operations necessary to the formation and embellishment of a Watcombe vase. Success so signal having been attained in the minor and utilitarian objects, attention is now chiefly directed to ornamental composition and detail; in respect to flower and foliage reproductions, nothing that has ever been produced is comparable with the really marvellous productions of Watcombe in this department. The *deux* of the manufacture, as yet, have been in baskets of flowers, and they claim this distinction as setting forth the infinite *finesse* with which the clay may be worked; results far surpassing anything, either ancient or modern, that has been attempted in this way. Each leaf is minutely modelled, and consigned to its place in an exactitude of form and precision of surface, strictly imitative of nature in its minutest details, and thus, with most perfect success, are called baskets of roses, passion-flowers, lilacs, &c., and indeed a variety embracing the entire of the picturesque Flora. Other remarkable works are statues of the Princess Louise, Marquis of Lorne, the late Charles Dickens, of which great numbers have been sold; conspicuously, a pair of vases, covered with glaze, and enriched with copies in gold of able sculptural works. We may also mention among the best reproductions of this establishment a bust of our Saviour by an eminent French sculptor.—*Art Journal.*

The People's Theatre, St. Peter's-square, Newport.—Some alterations have been made in this theatre. The whole of the work has been planned and executed by Mr. Peter Pierce. The ceiling and cornices were done by Mr. E. Es. One feature in the remodelling of the theatre is the lowering of the pit to the basement, by which the effect on the interior is similar to what would be produced by adding one story to the building. The proscenium is thus heightened. The semi-circular top of the opening is finished with mouldings to harmonise with the treatment of the walls generally. These will be contrasted with the spring of the front of the galleries, from which the gaseliers project. What was formerly a floor is now cut away, except a portion round all round, which will form a dress circle, of 400 chairs, terminating at the stage-end on one side and with private boxes. Instead of one gallery at the entrance-end, there will be one on each side, the whole of this portion now affording accommodation for 900 people. None of the Manchester theatres, it is said, have such wide passages, and there are three wide doors for the dress-rooms are provided for the managers under the stage and behind it, the latter itself being considerably larger than here.

Memorial.—The Cowper Memorial Committee of the Olney Mechanics' Institute, considering the present an appropriate time, have resolved, after securing the counsels and cooperation of the principal gentlemen of the town and neighbourhood, to proceed with the matter without further delay. It has been decided that the scheme shall include the purchase of a suitable site, the erection of a town-hall, with a library, a public library in Olney.—The monument in honour of Jahn, the founder of the societies for athletic exercises in Germany (the Verein) after the disasters in 1806-7, has been directed and unveiled on the Hohenstein, Berlin. A festive procession was formed, which passed through England, America, Austria, Hungary, and parts of Germany were represented by delegations, and the streets were gaily decorated with flags, and densely thronged. The Minister of Interior and the municipal authorities, in official robes, assisted at the ceremony.

George Gilbert Scott, R.A.—On the 9th inst., at Osborne, her Majesty conferred the honour of knighthood on our distinguished and esteemed colleague.

Bridges, Great Grimsby.—Two new bridges have been opened, connecting the new town with the old town, and both with the corporation land on the west side of the Old Dock. One of these is a foot-bridge, with a 6 ft. clear roadway, and a total length of 620 ft. It crosses the permanent way of the Manchester, Sheffield, and Lincolnshire Railway, and rests on thirty-two iron columns, each 16 ft. 6 in. long. It is approached by staircases rising from the foot-way at each end of the bridge, and it is the largest bridge yet constructed over any railway in this country. A swing bridge has been carried across the Old Dock, 283 ft. in length, with a roadway 16 ft. wide, and footpaths on each side, 4 ft. wide. It is in eight spans, one of which is movable, so as to allow vessels to pass to and fro in the dock and through a channel of 45 ft. clear width. It is formed of wrought-iron girders on cast-iron screw piles and cylinders. These bridges have cost about 12,000*l.* By the opening of the swing bridge over the dock, 240 acres of grass land, in close proximity to the town and docks, have been made available for a park, building, and other purposes. Excellent roads have been made through this land, and sites for above 200 new houses have already been bespoken.

Improved Dwellings for the Working Classes.—At the Mansion House, Alderman Sir Sydney Waterlow, the chairman, presided at the eighteenth half-yearly meeting of the Improved Industrial Dwellings Company. The report stated that the subscribed capital now amounted to 206,150*l.*, and the unallotted shares represented 43,850*l.* The loans from the Public Works Commissioners were to the amount of 81,000*l.* in all, of which 69,000*l.* had been received. The rents during the half-year had brought in 9,183*l.*, and the total expenditure was 5,291*l.*, leaving a profit of upwards of 4,000*l.* The directors recommended the payment of the usual dividend of 5 per cent., and that from the balance (5,332*l.*) a sum of 5,000*l.* should be placed to a reserve fund, and invested for the equalisation of dividends. The number of persons now occupying dwellings belonging to the company is 5,958,—viz., 2,675 above sixteen, and 2,281 children, while the number of different occupancies was no less than 337.

The Drainage of Barnes.—The pressure on the parish authorities by the Thames Conservators has induced the vestry to appoint a committee, who, after a careful consideration of all the circumstances, suggest the adoption by the vestry of the following resolutions, viz.:—
1. That the vestry of Barnes, recognising the necessity of providing, without further delay, for the proper and efficient drainage of the parish, adopts the system of sewers recommended by Messrs. Tress & Innes, subject to such modifications as may be found necessary when the position of the outfall is determined.
2. That the Special Drainage Committee be authorized to take such steps as may be necessary for obtaining the requisite permission from the Local Government Board for borrowing a sum not exceeding 8,000*l.* for the construction of the said system of sewers.
3. That the vestry are of opinion that it would not be desirable to establish local sewage works, and therefore request the Special Drainage Committee to take such steps as they may deem best in supporting and promoting a general scheme for providing an outfall for the sewage of the Thames Valley above the metropolitan district. These resolutions have since been adopted by the vestry.

Vienna Exhibition.—It is proposed to organise, during the period of the coming universal Exhibition at Vienna, but separate from it, a special exhibition illustrative of the history of the city of Vienna. According to the *Society of Arts Journal*, this collection is to be divided into two groups—the first to include plans and views of the city, and of its various quarters and most interesting edifices, prints recording the most remarkable events that have occurred there, portraits of notable persons, and engravings illustrative of the habits, customs, and fashions of various periods; the second division to include monuments and other objects in stone, wood, and metal, historical products of Viennese industry, and medals referring to historical facts and personages of interest in connexion with the Austrian capital.

The Salt Memorial at Stafford.—It has been decided by the committee to open out the front of St. Chad's Church, and restore this edifice as a memorial. The contemplated improvements will necessitate the pulling down of the premises occupied by Messrs. Deakin, as well as others. Sir Gilbert Scott has been, or is to be, requested to furnish designs for the work.

The Steam-Whistle.—By the new Act, to use a steam-whistle is forbidden, provided the purpose be to summon workmen to labour. A whistle may not be blown nor a trumpet sounded with this object under a less penalty than 5*l.*, and a further penalty of 40*s.* for every repetition of the offence. The nuisance on railway engines ought to have been dealt with also. It is a nuisance quite as unbearable as that for which Parliament has thought fit to legislate, and it is one which might be materially modified without Parliament's intervention. In the United States, the sound of railway whistles resembles the low note of a Chinese gong, and is neither unpleasant nor unmelodious. If our railway directors would only take a lesson from our American brethren in this matter they would merit the thanks of the community. If not, then the Act against fixed steam-whistles will be made to include movable ones also. The new law will be used as a precedent, and will furnish an argument of irresistible force.

A New Gas Igniter.—Various experiments of an effective and successful character, it is said, have been made in Preston, with the view of testing a new gas-igniter, discovered at the Royal Observatory of Gottingen, in Hanover, and adopted and successfully used in the principal street of that city since last Easter, and about to be applied to 10,000 street lamps in Berlin, by order of the Imperial Government. Mr. J. Billington Booth, of Preston, has patented the apparatus for England. The chief peculiarity of the invention is said to be this, that with the utmost ease, rapidity, and certainty it can (without the personal application of heat or flame) ignite gas simultaneously in any number of lamps, globes, or burners, at any distance or altitude, and simply by the gas-pressure laid on, and acting on a chemical material and apparatus easily applied beforehand to the burners.

The Science College for Birmingham.—The arrangements for carrying out Mr. Josiah Mason's munificent intention to found a science college in Birmingham, specially fitted to the wants of the town and of the district around it, are progressing. An excellent site for the college has been purchased by Mr. Mason, in Edmondestreet, at the back of the town-hall; and a provision has been made by way of endowment for the institution. Mr. Mason has now, we understand, completed the number of his trustees. The gentlemen upon whom this honour has been conferred are Dr. Blake and Mr. G. J. Johnson (the two trustees originally appointed), Mr. W. C. Aitkin and Mr. J. Thackeray Bunce (whose names were appended to the foundation deed as witnesses to Mr. Mason's signature), and Dr. Hicpol and Mr. George Shaw.

Carlisle Public Hall.—The prospectus of this new Public Hall Company (Limited), has appeared in the local *Journal*. The capital is 8,000*l.* in 1,600 shares of 5*l.* each. It is not purposed to expend the whole at once. The site is at the corner of Lowther-street and Chapel-street, and is 2,600 square yards in extent. The cost will be 10*s.* a yard. Steps will be taken towards the erection as soon as the conveyance is executed. The building will comprise a large public room, capable of seating from 1,500 to 2,000 people, a smaller room for sales and such like purposes, two shops, offices, outbuildings, custodian's room, &c. The committee estimate that if the hall be erected at a cost of 5,000*l.* or 6,000*l.*, it will realise a dividend of not less than 7½ per cent.

Instruction in Physics.—The Lords of the Committee of Council on Education have decided to transfer the instruction in physics, chemistry, and natural history from the Royal School of Mines in Jermyn-street, and the College of Chemistry in Oxford-street, to the new buildings in Exhibition-road, South Kensington. The following courses of lectures and practical laboratory instruction will be given at South Kensington:—Chemistry, by Professor Frankland; biology, by Professor Huxley; physics, by Professor Frederick Guthrie, with laboratory work.

Sussex Archeological Society's Meeting. The annual meeting of this society was held on Thursday last week, at Parham House, the residence of Lord Zouche. Notwithstanding the threatening appearance of the weather, there was a good attendance of members and their friends. The dinner took place in the society's marquee, in Parham Park.

Laying the Foundation-stone of a Leeds Board School.—The foundation-stone of the first of the Board schools to be erected by the Leeds School Board, under the Elementary Education Act, has been laid, on the site of the intended building, in Brewerley-street Dewsbury-road. Mr. G. Corson is the architect. The school will accommodate 854 children, allowing 10 superficial feet of floor space to each child. The cost of the main building will be 5,834*l.* 1*s.* 1*d.*; the covered playgrounds and fences, 2,693*l.* 1*s.* 6*d.*; and the contingent expenses,—such as architects' fees, &c., will amount to 457*l.*; making a total of 8,984*l.* 7*s.* 7*d.* The site has been purchased from Lord Houghton, at a cost, including the half of the streets, of 1,333*l.* 2*s.* 6*d.*

Bursting of the Lake, near Petersfield, Godalming.—During one of the recent extraordinary thunderstorms, it appears that a waterspout fell in the forest, and it rushed in an immense stream of 120 ft. to 150 ft. wide, and 6 ft. high, into the lake, making the water rebound over the embankment, and then away it went, from top to bottom, and one huge volume of water poured out, sweeping trees, stones, and everything before it. Independent of the waterspout, the rain has done incalculable damage, loads upon loads of earth having been washed out of the fields, and the roads being left like skeletons, earth and sand all gone, and only the bare stones left, large holes washed out, and banks thrown down. An express train had a very narrow escape.

The New Dock at North End, Liverpool.—A considerable addition has just been made to the Liverpool Dock Estate, by the construction of a new dock at Bootle, for steam purposes. It is situated immediately to the north of the Huskisson Branch Dock, and forms an integral portion of the Huskisson Dock. The new dock is 1,200 ft. in length by 300 ft. wide, and extends over 8 acres in area, having about 2,700 ft. of quay space. It will be seen from these dimensions that the Huskisson Branch Dock No. 2, which is its name, is peculiarly formed, being long and narrow, and therefore specially adapted for the use of steam vessels.

London Financial Association.—At the half-yearly meeting of shareholders in the London Financial Association, the chairman said one of the principal assets was the Muswell-hill property, and the directors had come to the conclusion that it would be useless to attempt to sell that palace and property to any company in an unfinished state, and therefore they had determined to complete it. Everything was now being pushed forward with vigour, and the board had determined to postpone the opening of the palace until next spring, by which time the short railway would be completed. Over this line would pass the whole of the traffic from the Metropolitan and other systems, and take visitors direct to the palace.

Offer of Paintings to Town Councils.—The Newport (Isle of Wight) Council have received a letter from Mr. Vivian Webber, of Ryde, offering to present the corporation with a painting,—a memorial picture, having reference to the recovery of the Prince of Wales. Mr. Webber has presented some pictures to the corporation of Ryde. The corporations have accepted with thanks his generous offer. The picture for Newport is 11 ft. by 7 ft., including the frame, and it is said to be a valuable artwork.

Masters and Workmen.—The Act to make further provision for arbitration between masters and servants (35 & 36 Vict., cap. 46) is issued. It recites the Act, 5 Gen. IV., cap. 96, in which provision was made for the arbitration, in a mode therein prescribed, of certain disputes between masters and workmen. Provisions are now made with reference to agreements under the Act. An agreement is to designate some Board, Council, or persons as arbitrators.

The Leeds Exchange and News Room.—Mr. Nussey, chairman of the Exchange and News Room Committee, has received a letter from Lieut. Colonel Sir Howard Elphinstone, stating that his Royal Highness Prince Arthur will have the pleasure of laying the foundation-stone on Friday, the 20th of September.

St. Peter's at Rome.—The *Fanfulla* states that the cupola of St. Peter's shows unmistakable signs of decay. A commission of Papal architects and engineers has, it is said, been appointed to examine it.

Proposed Testimonial.—A movement has been started for the purpose of presenting a testimonial to Mr. George Smith, of Coalville, near Leicester, who has laboured to ameliorate the condition of the women and children employed in brickfields. We were earlier in the (brick) field than even Mr. Smith, but, for all that, we shall be glad to hear of his receiving a testimonial, if he desires one.

Testimonial to Mr. H. G. Blagrove.—The printed record of subscriptions, &c., for behoof of Mr. Blagrove, the distinguished violinist, whose continued illness has disabled him from carrying on his profession, is a good example of what may be done in such a case. A sum of 1,500*l.* odd has been collected, and a Government annuity of 100*l.* thereby secured to Mr. Blagrove for life by an active committee of sympathisers.

Sunday Street Watering.—The Street Cleansing and Sanitary Committee of the Westminster District Board of Works have reported that they have directed the principal thoroughfares of the district to be watered on Sundays during the driest portion of the season, the contractor for the horse hire having agreed to supply horses at the contract price for such purpose.

The Camberwell New Vestry-hall.—The chief stone of this new edifice, a view and plan of which we gave on the 13th of April last, has at length been laid by the chairman of the vestry, Mr. Turney. The site chosen for the building is that formerly occupied by Havil House, at the corner of Havil-street, High-street, Peckham.

The Bristol City Surveyorship.—After a long discussion, the city council have at length resolved, by 32 to 17, to appoint a city surveyor and architect, but not to require him to give his whole services to the city; and the committee are to ascertain what terms can be made with Mr. Josiah Thomas.

Seats in Public Places.—Mr. W. H. Smith, M.P. for Westminster, has intimated to the Metropolitan Board of Works his willingness to be at the expense of placing twenty seats upon the Victoria Embankment for the public accommodation. It is to be hoped that this kindly act will be emulated by other generous persons.

Sherston, Wilts.—Messrs. J. Davenport & Co., of Derby, are about to erect a new silk factory, chimney-shaft, engine and boiler-house, &c., at Sherston, Wilts. It will be about 170 ft. long and about 70 ft. wide, and lighted by skylights. Mr. Charles Brown, of Tetbury, is the contractor.

Ventilation of Sewers.—The Limehouse Board of Works report the placing of twenty-six ventilating shafts in Poplar, and of thirteen in Limehouse and Ratcliff, in connexion also with apparatus for deodorising the effluvia from the sewers by means of sulphuric acid instead of charcoal.

New Theatre in Vienna.—A new theatre is to be built in Vienna for the Exhibition season of next year. There will be room for 5,000 spectators in the auditorium. The director is to be Baron Schwartz.

A New Theatre for Cardiff.—It is proposed to erect a theatre on the Circus site. The new edifice, drawings of which have been prepared, will also serve the purpose of a Philharmonic Hall.

The Wallace Fountains for Paris.—The first of the drinking-fountains due to the liberality of Sir Richard Wallace has just been erected on the Boulevard du Combat, at La Villette, near the Rue des Buttes Chaumont.

TENDERS

For taking down and rebuilding Nos. 43 and 44, Upper Berkeley-street, Portmans-square, for Mr. W. H. Hudson. Mr. Alfred Wright, architect. Quantities supplied:—	
Sharpington & Cole.....	£2,429 0 0
Brown.....	2,540 0 0
Temple & Forster.....	2,675 0 0
Harris & Sons.....	2,653 0 0

For the completion of two houses at Silverdale, Sycemau:—	
Parkes.....	£1,021 0 0
Winter.....	935 0 0
Croha.....	925 0 0
Huff.....	925 0 0
Bysh.....	925 0 0
Beach.....	599 0 0

For enlargement of Beulah-road Schools, for Croydon School Board. Mr. Charles Rutley, architect. Quantities by Mr. Ongli:—

Fantborne.....	£1,573 0 0
Holmes.....	1,354 0 0
Oskenden.....	1,330 0 0
Allen.....	1,275 0 0
Waines.....	1,270 0 0
Ward.....	1,245 0 0
Nightingale.....	1,177 0 0
Johnson.....	1,139 0 0
Wright & Co.....	1,138 0 0
Warr.....	1,138 0 0
Masters.....	1,147 0 0
Spearing.....	1,113 0 0
Holmes.....	1,093 0 0
Waterson & Co.....	1,080 0 0
Preskett & Taylor.....	1,082 0 0
Coles.....	978 0 0
Crook & Wall.....	975 0 0
Mason & Bristy.....	926 0 0

For Town-hall, Holywood, co. Down. Mr. William Batt, jun., architect:—

Nimick (accepted).....	£1,530 0 0
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For additions and alterations to Glebe House, Holywood, co. Down. Mr. William Batt, jun., architect:—

Colville.....	£1,795 0 0
J. & J. Gair.....	1,650 0 0
Lowry & Son.....	1,590 0 0
Moore.....	1,470 0 0
Bowley & Mansell.....	1,450 0 0
J. & R. Thompson.....	947 0 0
Nimick (accepted).....	1,248 0 0
Moore & Son.....	1,215 0 0

For new brewery and maltings at Orwell, near Roydon. Mr. George Semml, architect. Quantities by Messrs. Curtis & Son:—

Coles, Brothers.....	£10,550 0 0
Bell & Sons.....	9,833 0 0
Dove, Brothers.....	8,275 0 0
Brown (accepted).....	9,160 0 0

For new house and stables, Kingston-hill, Surrey. Messrs. F. & H. Francis, architects:—

Myers.....	£5,419 0 0
Dove.....	5,375 0 0
Colls & Son.....	5,170 0 0
Fish.....	5,159 0 0
Gibson.....	4,730 0 0
Harst.....	4,750 0 0

For St. Saviour's Church, Northumberland-street, Poplar. Messrs. F. & H. Francis, architects:—

Sheffield.....	£7,618 0 0
Myers.....	7,471 0 0
Kiddall.....	6,928 0 0
Abraham.....	6,798 0 0
Myers.....	6,729 0 0
Howard.....	6,705 0 0
Dove.....	6,455 0 0
Watts.....	5,993 0 0
Wicks, Bangs, & Co.....	5,795 0 0

For the erection of new school-buildings and teacher residence, at Marloes, Pembrokeshire. Cost of walls, stone and hauling not included. Mr. E. H. Ling Barker, architect:—

Davies & Eaton.....	£760 0 0
Davies.....	723 19 4
Morgan.....	677 9 0
Lewis.....	675 10 0
Edwards.....	670 0 0

For the erection of house and coalstore, Broadstairs, Gasworks:—

Harrison.....	£740 0 0
Ellis.....	739 0 0
Howlet.....	575 0 0
Home.....	575 0 0
Hayward.....	569 0 0
Stark (accepted).....	554 15 0
Hullier.....	525 7 6

For additions and alterations at 10, Moorgate-street for the Council of Foreign Bondholders. Mr. E. G. Goode, architect. Quantities supplied by Mr. C. Goode:—

Myers.....	£1,071 0 0
Thompson.....	3,987 0 0
Foster.....	3,898 0 0
Henshaw.....	3,882 0 0
Adamson.....	3,838 0 0
Oliver.....	3,773 0 0

For schools, Mary-street, Bromley, for the School Board for London. Mr. Laey W. Ridge, architect. Quantities supplied by Mr. L. C. Riddett:—

Nixon & Son.....	£6,700 0 0
Sheffield.....	6,590 0 0
Brass.....	6,359 0 0
Higgs.....	6,350 0 0
Kilby.....	6,183 0 0
Williams & Son.....	6,117 0 0
Scrivener & White.....	5,745 0 0
Cooke & Green.....	5,668 0 0
Nightingale.....	5,573 0 0

For building house at Barnsbury, for Mr. Bradsell. W. Smith, architect:—

Cooke & Groome (accepted).....	£4,335 0 0
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For building villa at Arkwright-road, Hampstead. Mr. J. Stuart. Mr. V. K. Green, architect:—

Cooke & Groome (accepted).....	£2,000 0 0
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For alterations and additions at the Cherry Orchard, Kent, for Mr. T. W. Powell, Mr. A. P. architect:—

Cooke & Groome (accepted).....	£1,760 0 0
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All *Saints', Hereford.*—It will be obvious that Norris's tender should be 68*l.*; not, as misprinted,

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The Builder.

VOL. XXX.—No. 1542.

Designs for the Proposed New Cathedral in Edinburgh.

It may be necessary to remind readers that six architects were invited to submit designs for a new cathedral to be erected in Edinburgh, from funds left for that purpose by the late Miss Walker, of Drumsheugh. The site is in the centre of the west termination of Melville-street, is open on all sides, and is admirably adapted for the display of an important public building. The sum set apart by the trustees to cover all charges is 65,000*l.*, and the competing architects were required to adapt their designs so as to keep the cost within that amount. The designs are exhibited in the rooms of the Royal Scottish Academy, under motto, but

any one who has a knowledge of architecture and is acquainted with the works of the competitors can easily penetrate the *incognito*; indeed, the names of the authors of the respective designs are openly spoken of and printed, and it needs no apology on our part to follow suit; adopting the description of names already published, although we shall not be surprised to find two of them misplaced.

Each competitor has accompanied his design with an explanatory memorandum, and the course we propose to follow is to allow each architect to explain his own design, and make our comments upon it thereafter.

Taking the drawings in the order in which they presented themselves to us, we find the first series to the left, twelve in number, under the motto "Fidelitas," and which are assigned to Mr. Burgess. The author says:—

Site.—The site being exposed on all sides, and as the west elevation can be well seen from Grosvenor-crescent, the architect has thought it desirable to keep in view the orientation of the building, and has shown it lying due east and west, and on a line forming the axis of Grosvenor-crescent and Melville-street. Should the trustees deem it desirable to show the principal facade to Melville-street, it could be arranged with equal ease; but as a departure from the ancient practice, and on other grounds, it would not perhaps be advisable. A slip has been fixed on No. 8 drawing, to show how the building may be adapted to either arrangement. Assuming that the true orientation as observed, the western entrance would front Palmerston-place and Grosvenor-crescent, while that to the chapter-house and entrance for the clergy would be from Manor-street, and being Melville-street.

Level.—It is proposed to raise the floor of the nave 4 ft. above the level of Melville-street, and thus give a broad, massive base to the building, as well as dignity to the entrances by a flight of steps to the doorway.

Choirs House.—With this house the plan does not in any desired by the trustees; but it does not appear to present sufficient merit, either architecturally or otherwise, to render its existence of great importance; and the residences quite apart from the present old building.

Dimensions.—Length of nave, 130 ft.; long by 30 ft. wide; length of aisle, 110 ft. long by 15 ft. wide; length across transepts, 100 ft. long by 30 ft. wide; length across choir, 65 ft. long by 30 ft. wide; chevet or circumambient aisle, 15 ft. wide; extreme length over all, 265 ft.; width across west tower, 32 ft.; width across transept, 110 ft.; height of interior to groin, 75 ft.; height to ridge, 107 ft.; height of west towers, 220 ft.; height of central dome, 285 ft.

Plan.—In arranging the plan, the convenience and comfort of the congregation have been carefully studied, and the architect has endeavoured to provide for this by the introduction of a large narthex at the west end of the nave, entered through a triple porch, and by a roomy south porch into the south aisle (the necessity for subse-

quent inside wooden porches to prevent cold draughts being thus avoided). The font is placed on the left of the south porch on entering; the pulpit at the north-east pier of nave, as being the best position for sound as well as sight. It is proposed to seat the nave only with benches, the transepts being left clear for temporary seating by chairs or other seats.

Accommodation.—The accommodation is as follows:—Sittings in nave and aisles, 1,082; sittings in transepts, 336; sittings in choir, 64; sittings in stalls, 24; total, 1,506.

Daily Service.—As before mentioned, the transepts and space under the lantern being kept clear, the daily services would be provided for by chairs placed in this part of the building, and by which nearly 600 persons could be accommodated; or by seating the central crossing only, 150. The architect has adopted the chevet, or mode of carrying the aisles quite round the choir, thus giving free access from the vestries and chapter-house to all parts of the building without crossing the choir or chancel, and also providing a very suitable space for mural monuments and brasses, while at the same time it would immensely improve the architectural effect of the building,—a mode of treatment happily enforced and illustrated in Mr. Beresford Hope's work, "The English Cathedral" (chap. vi.). The chapter-house opens off the north side of this circumambient aisle, and is approached through a wide corridor, lighted on the east side by a rich screening, and hooded on the west by the vestries for the clergy. The chapter-house is in the form of a parallelogram, 53 ft. by 26 ft., and capable of accommodating 150 people. A grand organ might be placed in the left or the narthex at the west end.

Style of Design.—A severe and comparatively early style of French Gothic has been selected, so as to avoid excessive detail and carving, and its approaching more nearly to the best period of Scottish Gothic, which, in much of its massive, severe character, is more nearly allied to the Early French than any other, and many details may be found identical in both. The side-walls have been kept perfectly plain, with the view of giving value to the richness of the clearestory, where the principal decoration has been concentrated, as being a leading feature outside and inside the building. It is contemplated to groan the ceilings throughout with stone ribs, and chalk or concrete filling, the latter presenting many very commendable features, both as to strength, economy, and lightness.

This is undoubtedly a very fine design, possessing much grandeur, harmony of proportion, and exquisite detail, and it improves upon one by familiarity. The grouping of the three spires would form a marked feature in a part of the city deficient in outline, and would unmistakably point out the church as the cathedral. As seen nearer at hand, too, either from east or west, the composition is unexceptionable; but to secure the finest possible architectural effect we would be inclined to adopt the author's suggestion of reversing the usual arrangement and place, what is usually the western feature at the east, so that the more important facade would be seen along the whole length of Melville-street. Several precedents, ancient and modern, can be found for such an arrangement both here and on the Continent, but there was always a good cause for it, and it may be contended that the mere securing of a better architectural effect is not a sufficient reason for breaking through an almost universally recognised practice, and one which is wound up with old associations and ideas.

The interior is even finer than the exterior. The relative proportions of aisle, triforium, and clearestory, are charming, as is also the distribution of the light, which is mainly from above.

Looking, however, to the matter of cost, we have grave doubts as to the accuracy of the architect's calculations. Probably, were the "wealth of images," and the spires left to be added in the future, the sum at command might be sufficed. But upon this subject the committee will doubtless be guided by the opinion of the professional man whom they are, we understand, to call to their assistance.

We do not agree with the author as to the worthlessness of the old manor-house which adjoins the site, and would stand close to its northern elevation. It is a very quaint and characteristic example of Scottish homial architecture, and its retention would enhance rather than detract from the effect of the new edifice.

Next in order we have a series of eleven sheets bearing the motto "Non ignote civitatis muni- ceps." The general arrangement is almost identical with that of the recently-erected cathedral at Inverness by Mr. Ross, and is thus described:—

* The author of the design bearing the motto, "Non ignote civitatis muni- ceps," submits the following remarks regarding his design for the proposed Cathedral of St. Mary:—The whole of the internal area, clear of columns, and excluding the choir, amounts to 11,061 square feet. This, divided by 7 ft. for each person,—the usual amount allowed (including passages) by the London Incorporated Society for the Enlargement and Building

of Churches, gives accommodation for 1,713 persons. Out of this must be deducted sundry spaces not available, so that the area may fairly be taken to give the required accommodation. Chairs in a building of this description are much to be preferred to fixed benches. For ordinary occasions, a space might be enclosed by temporary wooden barriers, as in Continental churches. As it is well known that it is more advantageous and more economical to keep the warming apparatus always in gentle use, there will be no difficulty in securing a proper temperature for week-day services. On Sundays the apparatus will be worked to its maximum. It is proposed to place the large organ, divided into two parts, in the western gallery, while a smaller instrument, to lead the choir, is placed on the floor near the stalls. The whole of the roof, except the aisles, are intended to be boarded, which will preclude any difficulty as to the preacher's voice being distinctly heard. The clock and peal of bells may be placed in the north-western tower. It is generally agreed that a complete cathedral should consist of three great divisions, arcade, triforium, and clearestory, and its parts should be nave and aisles, choir and aisles, transepts, and one or more towers. In the present instance the sum of money to be spent utterly precludes any central tower, and the author has consequently elected to put two towers at the west end, where they not only help the western facade, but perform the useful office of making the western ends of the aisles. The spires will be of wood, covered with lead, and the timber at the intersection of the nave and transepts will also be of the same materials. In view of the comparative smallness of the sum proposed (65,000*l.*), in relation to the accommodation required, it naturally follows that the fittings must be of the most simple character. In order to reduce the expenditure still more, the author would suggest, in case of necessity, the substitution of a continuous wooden barrel-roof for the stone vaulting in the nave and choir aisles. It should also be noticed that the figure sculpture could not be included in the sum, but would be a possible future extra.

The exterior of the design is wanting in dignity. There is, however, considerable beauty in the west elevation, with its two towers and leaded spires, which are quaint yet elegant. Were this design adopted, the call to reverse the orientation would be more imperative than in the preceding instance, the eastern elevation being somewhat monotonous and undignified. The interior is more impressive than the exterior, and would be much better without the meretricious colouring proposed to be introduced. We cannot say we like the effect of the slender shaft which runs up from the ground along the face of the cylindrical columns of the nave to meet the hammer-beams of the roof; nor do we much affect the tie-beams, which appear to be a necessary part of the construction. There is nothing national in the style adopted, unless it be the tartan costumes of the worshippers. The architect has conscientiously endeavoured to keep within the mark as regards cost, and we have no doubt that the design could be carried out in its entirety for the sum indicated.

Nine drawings, bearing the device of a white cross upon a circle of blue, are allocated to Messrs. Peddie & Kinnear. In the memorandum it is said that,—

"In preparing the accompanying design, it has been considered essential, in the first place, that there should be a grand central tower. Situated in the middle of an open space, and surrounded with houses of a classic character of architecture, the cathedral will harmonise best with the situation and the surrounding buildings if its leading feature be placed in the centre. Moreover, as the chief views of the cathedral, and the principal approaches to it, will be from the east, and as that end of the building will therefore be in some respects the most important, it is thought that this treatment of the design will give it a much grander and more imposing effect than if its main features were to consist of large western towers. At the same time, in order to mark more distinctly the cathedral character of the building, it has been thought that there should be two smaller towers at the west end. The general style of the architecture is Gothic of the best period, with as much as possible of the Scottish variety. Scottish Gothic is quite distinct from English Gothic. There are noble examples of it in the cathedrals of Elgin and Dunblane, the abbey of Sweetheart, &c., buildings which owe their effect to the grandeur of their general design and the simplicity of their details, rather than to elaborate ornamentation and minute carving. It has been sought to make the cathedral, which, from its position and size, will be the cathedral of Scotland, thoroughly Scottish in character. The accommodation provided is for 1,557 sitters exclusive, and 1,677 sitters inclusive, of the end gallery. As nothing is said in the instructions as to having a gallery, the design has been made of such dimensions as to give the required accommodation without it; and, accordingly, the gallery has not been included in the estimate of cost. It has been represented on the drawing, however, in order, to show how the design is capable of affording additional accommodation should it be required. The design has also been arranged so as to be adopted for a still farther extension of the accommodation, by introducing fixed seats or chairs in the large space under the great tower, between the choir-screen and the front of the pews. With the sittings in the gallery, and those for which this space has been left under the tower, the total accommodation would be 1,731. With no such provision for any extension of accommodation, the design might, of course, be reduced in size by about one-eighth, with a very material reduction in cost. The ground plan shows how the sittings may be arranged in pews, but in the internal view the pews are omitted, in order that the effect of the architecture may be better seen. Fixed pews are always destructive to architectural effect, and it is suggested that in the present case movable benches or

boyant type, with a strong suspicion of a German, apiky, element at the east end. The great central tower is here again surmounted by the open crown of St. Giles's carried up to rather a disproportionate height. The window tracery is somewhat monotonous and heavy throughout. The interior is pervaded by a feeling of flatness, which is not relieved by the commonplace panelling which takes the place of a triforium.

To sum up our remarks, this competition has brought out clearly that the local architects invited to compete are no match for their southern brethren in the production of a design for an ecclesiastical edifice. We have no hesitation in saying that there are younger men who have been kept out in the cold who would have been nearer the mark. Be that as it may, the trustees have got from each competitor good value for the retaining fee of 100*l.*, and they have secured at least two designs either of which if executed would provide a church of which any city might be proud, and which will greatly excel any yet existing in Edinburgh.

ON CHARACTER IN ART.

The word character, in ordinary language, has a meaning somewhat different from its original signification. It is one of the many words, in the English tongue, which have gradually assumed a conventional importance that is not their etymological inheritance. The original meaning is, a mark or incision. The old English word "ear-mark" is a good parallel. Hence the term was applied to those incised marks which designated vocal sounds, or numeral values, and which we usually call letters or figures. It is probably from the use of such terms as Greek characters, or Hebrew characters, that we became accustomed to convey by the word in question the idea, first of the entire form of an object, and then, of something more than its form, of its essential distinctions; or of the physiognomy, or outward indication by which such distinctive idiosyncrasy is expressed.

The word character, when correctly used in reference to art, has two distinct meanings, which may be traced to the gradual development of the import of the word. There is the character of the artist, and there is the character proper to the material in which he works. These two species of character are intimately related to, and react on, one another, but none the less do they convey two distinct ideas. Thus the character of the paintings of Greuze differs intelligibly from that of the paintings of Michelangelo. And thus, in the other sense of the word, the character of a relief modelled in wax differs from that of a relief modelled in clay.

The character of an artist is rarely to be grasped from a single example of his work, or rather it may be said that none but judgment of the most accomplished order can so detect it. But if numerous works of the same artist are collected together, the character that is common to them all may be observed at a glance. Here lies the secret of the value of such collections as contain numerous examples by the same master. Their instructive power, as illustrating the artist by himself, is very great. A remarkable instance of this is to be noted in the Hertford Collection, of which we some little time since gave an account. The visitor to that exhibition passed through a phase of positive education with reference to several of the artists there represented. Every one, for instance, is more or less acquainted with Greuze. Most of us have formed such a judgment of his works as to be able to recognise them at a glance. As to their ordinary motive, their style of handling, and the various qualities, good and bad, which are evinced in almost every example, there might seem not to be much that is left unsaid. But Sir Richard Wallace hangs side by side no less than twenty-two works by Greuze. Some of them exhibit as wide a difference in motive as is probably to be found between any of the productions of the artist. And yet the similarity of idea and of treatment,—in fact, the identity of character,—that pervades these twenty-two paintings, is such as to give the observer a peep, not only into the studio, but into the very mind, of the artist. Certain points are invariably evident. You gain such an insight into the mode in which Greuze looked at nature, no less than into that by which he represented it, that you can at once fix upon a subject that he would have chosen, and feel that it is the want, not of conception, but of manipulative power alone, that

prevents you from being able to show exactly how he would have painted it. Again, from the Murillos in the same collection, an idea may be formed of the character of that great master, at which it would have taken much time and much travelling to enable a student to arrive in the absence of so favourable an opportunity. Eleven paintings by Murillo illustrate so forcibly the main features both of his earlier and of his later style, that what, perhaps, you knew from authority you instinctively feel from observation. One sees the rare power and great breadth and grasp of subject which Murillo attained in his portraiture of rustic life. One sees the manner in which his ideas condensed and crystallised when, in his later days, he devoted his pencil to religious, imaginative pictures. Seven or eight Madonnas are hut repetitions of the same rather heavy, but no doubt very worthy, model. She is so impressed on the memory by repetition that she would be recognised again at a glance, under all circumstances and in any costume.

In fact, a study of this nature, of painter by painter, confining the attention for the time to the works of a single artist, leads the judgment to the unexpected conclusion that the great portrait-painters are the most imaginative of their profession. The view must be taken with reason, and expressed with due limitation. For, in the first place, it must be confined to that extremely rare class, great portrait-painters. In ordinary limners nothing can be less obvious than the display of imaginative power. Photography has no imagination; and persons who think that an accurate reflection or delineation of features constitutes a portrait, form, as is but too evident, the majority of those with whom we are acquainted. Again, when we rise from the very poorest to the second-rate portrait-painters, we find the individual character of the artist to be for the most part reflected, with inflexible fidelity, from his canvas. One English portrait-painter, of high rank, if we judge by fashion and by price, can be recognised in a moment by the polish he gives to the boots of his sitters. He ought to have been salaried by Day & Martin, or by Warren, whose famous cat, swearing at her reflection in a polished boot, was once to be seen on the walls of every European capital. Again, if we take an artist of much higher rank,—Sir Thomas Lawrence,—it is impossible to mistake the character which is reflected from himself over his subjects. It is, no doubt, a courtly and agreeable personality, but it is one which is so universally present in every portrait from his easel, that we are sure it must have been that of the artist, and not of his sitters.

But with the very greatest of all, the painter so grasped his subject that he projected it upon his canvas, untinged by his own personality. By the admirable skill, the art which conceals art, you may recognise the master; or, again, you may refer the portrait to one or two possible authors, but you can detect no treacherous mannerism, either of conception or of execution. This is eminently the case with the works of Titian. A judge may come to the conclusion that a given portrait can be by no other painter, because he can think of none who would rival it, but he might fail to be able to point out any distinct trait of the great Venetian. Thus the portrait of Julius II., in our National Gallery, by Raffaele, a well-known picture, repeatedly reproduced by the artist, might have been thought to be a work of Titian, if the history of the case had admitted of such an illustration. It may, indeed, be the case with reference to the portrait of the Pope, that the fiery character of the man so dominated the ordinary temperament of the painter, as to lead to the production of a picture of a peculiar style. But, speaking from memory, there is a portrait of Paul III., painted by Titian, which was in Lord Northwick's collection, which might well pass for a pendant to that of his successor to which we have referred. With Vandeyck, again, there is a variety in his finest portraits far greater than that which can be found in his Holy Families, saints, or other ideal compositions.

It follows from this view of the case that the characteristic style by which a painter may be almost certainly detected, by an accomplished critic, is something which is rather a defect than a virtue, and results from the limitation of the range of his ideas, the variety of his models, and the mastership of the procedures of his art. It is impossible to compare a number of paintings by the same artist without admitting that such is, to a certain extent, the case. Even in cases

of very high, if not of the highest excellence, the poverty of the human imitator becomes evident when we compare it with the rich variety of nature. In landscape, indeed, it might be supposed that nature would so fill and dominate the artist, that he would cease to originate, and would be content to reproduce. And so, no doubt, he thinks to do. But in his reproduction are ever present the two invariable elements of his taste and his method, or, at least, the special bent of his skill, when he attempts different methods.

Thus, Constable, Crowe, Birket Foster, Vicat Cole, to go no further than our own galleries, would each so represent the same scene that we should readily recognise from which easel it was brought. If we extend our limits, and compare a landscape by Claude with one by Salvator Rosa, or one by Doré with one by Turner, it will at once become evident how powerfully the idiosyncrasy of the artist is reflected in his delineation of nature. It would be a study worthy of the best care of the critic to ascertain, and to define in one or two appropriate words, the chief element of personal character in works of art. Thus, the landscape of Holbein may be characterised by one word—limpidity. The knotted branches of the trees in his work not only curve and bend with all the wild grace of nature herself, but their delineation seems to have floated from the brush. At times the artist is to be known by the mastery over, or the passion for, certain branches of his art. Thus we recognise Correggio by his magic chiaroscuro, combined with a skill in draughtsmanship that delights in what is most difficult to represent. In Rembrandt we have a chiaroscuro that is no less masterly than that of Correggio, but a taste that revels in effects of altogether a different tone. The broad Dutch build of the models of this artist is ever conspicuous, and at times is such as to pass the limits of good drawing. Again, in the great Venetian artists we are most struck by their sense of colour. The more the tell-tale characteristic of an artist is of a lofty and ideal character, as in the case of Raffaele and of Leonardo da Vinci, the higher is the grade in art. The more it partakes of sameness of conception or of truth of manner, the lower is the merit. As in the maxim *Summa ars est colere artem*, so is the highest character of an artist that which it is most difficult to define, and most impossible to imitate.

In character, regarded as impressed on a work of art by the material in which it is executed, we have a different subject of inquiry, and one as to which it is important that every student should make himself at home. It is connected with what we may call the personal character of a production in this natural and direct mode. Every artist, almost, if not altogether without exception, has his favourite or special medium. He may be able, indeed, to work in several or in many, to paint and to sculpture, to mould or to draw; but there will almost always be one method of production in which he will be most excellent. In that case, the material, or medium, will harmonise in its behaviour under the brush or the chisel with the special mode in which the artist most freely works, and the result will thus be characterised by a sort of intensified, or doubled, personality.

We may refer to wood as an art material which, more than many others, prescribes to the artist the character of his work. The soft and yielding nature of wood requires a certain breadth and holdness of touch, in the absence of which we have, not wood-carving, but upholstery. Mechanical means give a unity and finish of surface to wood which is excellent in its own place, but which, if called in to cover the imperfections of the carver, is simply odious. A wainscot-board, or a door, fresh from the plane, has a beauty of its own, consisting in exactitude and mechanical finish. But if we would adorn, let us say, a chimney-piece with fruit, foliage, or arabesque, the plane, the file, and the sand-paper become very dangerous implements. The true tool for wood is the chisel, and the chisel not used as a knife, but struck by the hammer. Hammer-wrought wood-carving, even if rough, has a certain form and breadth of a very high artistic value. In the finer details of work, such as the veins and the serrature of leaves, or even the limbs and hair of children, the true wood-carver never loses the essentially sculptural touch. But the inferior workman, unable to carry out the idea of the work by a blow, or a series of blows, uses his chisel to pare, adds the service of the file, and smooths all the life out of his work. If the material be ivory instead of wood,

the method of execution is very different. The chisel can then only be used with extreme care; and that for the sake of saving time, and not, as in the case of wood, as the effective and proper tool. For the hard and elastic material readily shivers under a blow, and unsightly black cracks are thus originated—hardly perceptible when the work is finished, but steadily increasing, probably by the growth of microscopic fungi, and seaming the surface with destructive blemishes. Again, the grain of ivory, while much finer than that of wood, is more tyrannical. It compels a certain method of treatment, and a certain degree, not only of finish, but of finish which must be produced by strokes given in a certain direction. Ivory agrees with wood in having the effect of any work executed in it destroyed by mechanical finish. That is one main reason why the work, which is now executed by Penton and other carvers, has not taken a higher rank in art. Ivory has an extraordinary tendency to form facets under the chisel or the burin, and these facets must be removed. The readiest way to do this is by the use of simple mechanical means. True artistic finish, in this material, consumes so great an amount of time after the work is apparently finished or all but finished, as to be entirely out of the question when price is at all an object. For this reason one of the most exquisite materials which nature has placed at the disposal of art has scarcely ever been worthily employed. Pure in colour, of a texture equal to that of onyx, and superior to that of alabaster, a perfect work in ivory has but one weak point, its comparative perishability. It requires to be kept from damp, from dust, and from darkness. It is easier to find carvers in wood to rival Grinling Gibbons, than carvers in ivory to equal H. Flammings.

Still directing our attention to plastic art, as that in which the character of the material employed by the artist is at once most varied and most pronounced, let us glance at the difference between clay and wax, as affecting the work of the modeller. It is well known to any one who has ever made essay of the modelling tool, how very different is the effect which the same amount of labour will produce in these two materials. The student instinctively would select one for works of a large size, or of a bold character, and the other for those requiring miniature delicacy of finish. For a rugged head of Jupiter or of Hercules the first would be appropriate, the second for the grace of a Psyche. Now we are told by Winkelmann that the Greek sculptors modelled in wax; and, indeed, the name of the sculptor of Sisyon, who first employed clay, is recorded. In this there must be an error, arising from the want of practical acquaintance on the part of the critic with the work of the sculptor. We have to inquire for what purpose the model was required. If it was for a sketch, or first outline of a conception, whether on a reduced size, or on a full scale, there can be no doubt that clay would not only be the most cheap, ready, and effective material for the sculptor, but that, from the evidence of the early antiquity of the art of the potter, modelling in clay must long have preceded modelling in wax. But for a statue to be cast in bronze, the case is altogether different. For that purpose wax was by far the most manageable material for the artist. It could be melted by a moderate heat, and would leave the matrix ready for the metal. The use of a clay core or model for a metal casting implies a more advanced state of art than the employment of a readily fusible material for that purpose. Now it is certain that the exquisite modelling of some of the finest Greek statues, more especially the delicacy of a wax model. At times this lovely modelling is absent, as in the trunk of the Belvidere Apollo. It is possible that this magnificent but unequal statue is a copy of a nobler original. But the grandeur of the head is opposed to that view. Again, the breadth and freedom of the drapery are strongly suggestive of the use of the true sketching material of the sculptor. If the Apollo was executed from a clay model, while works of more tenderly accentuated surface, such as the torso of Cupid in the Vatican, were copied from bronze figures, or from wax models designed for the work of the metallurgist, these anomalies might be more readily explained. The proportions of the Apollo are too exact to allow us to suppose that the statue is a Roman copy of a Greek work. Roman copyists, so far as our experience goes, were never precise in their adoption of those

definite laws of proportional girth which a modern writer on symmetry has shown to have been scrupulously obeyed by the great Greek sculptors. If the original Apollo was not intended to be a bronze, but a marble, statue, and was therefore modelled, not in wax, but in clay, the discrepancy between the grandeur of the head and the breadth of the drapery, on the one hand, and the comparatively rude modelling of the trunk, and want of exact symmetry in the limbs, on the other, may be readily explained.

The Apollo is a happy instance of the double signification of the term "character." We can, for instance, pronounce with certainty that the statue in the Vatican is not the work of Praxiteles. But whether it be owing to the special bent of the genius of the sculptor, or to the impress given to his work by the material on which he wrought, that we form our opinion, it is now hard to say. Thus, when an artist confines his operation to the medium most akin to the bent of his mind, and to the natural breadth or delicacy of his work, we have the result which, in a double sense, may be truly called characteristic.

THE NORTHAMPTONSHIRE EXCURSION.

On Monday morning, the 19th, were gathered at the rambling, roomy, old-fashioned George Inn, at Stamford, a party of some forty architects, mostly of the "younger persuasion" (as Artemus Ward might have put it), prepared for a week's sketching scramble among the churches of Northamptonshire, under the pleasant and trustworthy guidance (as on former similar expeditions) of Mr. E. Sharpe. The first day was occupied in sight-seeing and taking notes in the town of Stamford itself. With nothing so strikingly picturesque and antique as can be seen in Chester, Shrewsbury, and some others of our old towns, there is, nevertheless, about the streets of Stamford a quiet unobtrusive character and variety which is marked enough; gables and dormers break the line and come out from between the adjoining buildings, some higher, some lower, in a manner which is refreshing to eyes accustomed to the long dull lines of brick and horizontal cornice in our more modern towns; indeed, the sight of the low tiled building with its squat dormers, opposite the yard entrance of the inn, is enough at once to assure us that we have got away from the security of modern life for a little. The old life in Stamford must have been much brisker, though, when the place was one of the great coaching stages; now, the railway passes by the old town in a careless anticipatory manner, making it of little account; and, except for market-days, it would be difficult to guess how the large inns managed to keep it up, as in a lazy, easy-going way they seem to do.

A visit to

"Burleigh House, by Stamford town,"

(so Tennyson spells it, but it is "Burghley" here) formed the commencement of our inspections, by way of teaching the Gothic students what to avoid, perhaps. It is so consoling to see the smoke carried high above the roof, through classical columns, acting as flues, each couple carrying a small piece of architrave,—refreshing to the Gothic sense, too, to find the chapel marked externally by a spire, or something like it, a tribute to the "religious" prestige of Gothic architecture, combining, oddly enough, with the features of the Stuart period. It must be said, however, that this is the only incongruous feature in Burghley House, the rest being all quite in keeping, and some of the interior ornamental detail in the chapel and ante-chapel is really worthy of study and attention, as showing in the plaster diaper and the flat interlaced wood-carving a unity of effect and suitability to the materials employed with great beauty of execution.

As to the pictorial decorations, the walls and ceilings—

"Where sprawl the saints of Verrio and Laguerre"

(for many of the rooms are painted by these two worthies),—they are fearful and wonderful indeed,—wonderful for the time and industry spent upon an art into which so little of mind went, and fearful from other causes. But Verrio ought to have been a good scene-painter. His power of making painted architectural features look real is not contemptible; and there must be conceded a certain boldness (or impudence?) of conception in his treatment of the great room, with Heaven (Verrio's Heaven, save the mark!) on

the ceiling, and divers angels and others dropping therefrom, flying headlong from the cornice, and through the columns at the sides of the apartment. Then, on the staircase is Stothard's largest work, "Anthony and Cleopatra" (or "Intemperance"), far superior to Verrio, certainly, in refinement of conception and treatment, but marred by the artist's carelessness or want of study in drawing the figure, whose reputation, once supposed to give him a title to be called "the English Raffaele," does continually fade and decrease as knowledge of these things extends,—a consideration not without its lesson to us all. Touching the paintings at Burghley, it is not here we are to speak. Some of them are valuable and well known; but the impression left by the decorative treatment is that one has seen legs and arms enough to satisfy one for a long time to come. The masses of trees in the park, heavy and dark in the strong sunlight, were a relief, indeed, to look at after all this display of tawdry pseudo-art.

Afternoon was occupied mainly about the Stamford churches, two of which, at least, are not to be despised,—St. Mary's and All Saints'; the tower of the first named being Early English, and a very fine specimen. The rest of the church is not remarkable, except for a fine richly-decorated canopied tomb of late date. All Saints' Church affords an instance of the advantage of designing in reference to site and approach, for both the effect of this church is certainly owing to the fine and effective manner in which the tower, from its position, forms the background and culminating point of the composition as seen from the open square to the south of the church. In other respects this is a fine tower, though not equal to St. Mary's; and a highly-characteristic and individual feature in the external design is furnished by the wall arcading of lofty proportion and Early English date, which runs along the south wall, and forms the basement of the whole composition. It is unusual in Gothic work to find blank arcading occupying so much of the lower part of the wall usually devoted to windows, and carried out so continuously; and the breadth and solidity of expression thus gained might form a valuable hint for novelty of treatment in future buildings, ecclesiastical or secular. One of the most interesting buildings visited was Brown's Hospital, an almshouse or refuge providing accommodation for twelve aged persons, founded by one W. Brown, of happy memory, in the reign of Edward IV. This has recently been restored, and, in great measure, rebuilt, with additions, by Mr. Fowler, of Louth; and Mr. Sharpe bestowed decided and well-merited praise on the manner in which this had been effected, and especially on the care taken by the architect to leave incorporated, even in the rebuilt portions, enough of the old work to show clearly what had existed, and leave the architectural history of the building as little impaired as possible. The Dean of Stamford furnished some archaeological particulars as to the history of the foundation, and Mr. Fowler, who accompanied the party, gave some further information on the architectural side of the question. The present dining-hall is on the space formerly occupied by the small cells of the inmates, with the ambulatory between, leading to the chapel, which retains its old situation, and is shut off from the dining-hall only by sliding doors and fine wooden screens. The lines of the tiling on the hall floor have been so arranged as to mark the places where the cell partitions once stood, so that the floor is thus made an indelible record of the former arrangement. The stone is of the neighbourhood, with Ancaster dressings, and the grey roofing tiles so common in the district; the combination of these, with the delicate warm buff tint of the stone, forms a singularly pleasant and quiet harmony of tint. Looking at the grassed sunlit quadrangle, with these homelike-looking buildings surrounding it, those who had seen the Royal Academy this year could hardly escape an association with that other "Harbour of Refuge," which attracted so much attention; and the architecture, one is bound to add, is better than that of Mr. Walker's painting. In the audit-room above the dining-room, are to be seen some of the most beautiful hits of old stained glass that we have ever come across. Especially was to be noticed the delicate and beautiful execution of the heads, the hair, and beards etched on in thin lines, with the utmost lightness and transparency of effect. In St. John's Church is the memorial brass of the founder of the almshouses; the church, though with very good points, is not otherwise

specially noticeable, except it be for some better wall colouring in the chancel, in the present haphazard accidental style. St. George's, a poor little church, claims a word for the singular shape of the tower, oblong on plan (the longer axis north and south), and battering in the upper stage; another word, too, in recognition of a monument to Sir R. Cust, by Bacon; a female figure, life-size, with elegant pose, and remarkably effective handling of the drapery, leaning against an urn; a very good example of the work of a sculptor, in his day rated above, and in ours below his real merits. The font here, too, is worth attention for an unusual design, both simple and suitable. A walk of half a mile out of the town, along the course of the Welland, with long masses of wood in Burgley Park crowning the opposite bank, brings us to St. Leonard's chapel, now half dismantled, the existing portion being divided into a stable, &c. And here it is that we find the finest piece of architecture seen throughout the day, the beautified west front, of the finest type of early transitional work, with its noble recessed central portal of four orders, executed in that grey oolitic stone which is found often hard and sharp in buildings of this date, while edifices in the more perishable sandstones three centuries later have decayed beyond recognition. The party were detained long before this beautiful specimen of ancient architecture, and so home to dinner, "with what appetite we may," which happened to be a very good one. After dinner came some remarks from Mr. Sharpe, specially intended mostly for the benefit of the younger members of his flock, the "students" *par excellence*, and those who were not present at previous excursions; not, however, without observations having a wider tendency and hearing. After this nothing better could be wished for than a stroll up the street, to see St. Mary's tower transfigured under a cloudless moon, with a grey lustre on the broad surface of stone and black impenetrable shadow in the recesses, unless it were to lean over the bridge where the river rippled quietly in the moonlight, and study the dark reflections of the buildings and poplars on each side of the water. By daylight, it should be remarked, the view from this bridge either way is most picturesque, in a quiet way, in the irregular arrangement of the buildings on its banks; and might well attract the notice of one or other of our water-colour artists.

On the morning of Tuesday, the 20th, we set off early in carriages, after the old fashion, to go round some of the churches near Stamford. Of those thus visited, Offington, with its most well-kept churchyard, full of trees and shrubs, was the first: a small church of early transitional period; in general style and design quite a model for a small country church. Though we are specially on a Gothic expedition, we must give one word, however, to the gates and gate-pieces of the churchyard, and the larger and more elaborate gates, in the same style, of the grounds of a mansion opposite. These are in the English Renaissance style—what may be called the Jones period (or the ironwork may be later), and as good and admirable in their way as anything in the church. Tallington, a very small church not originally in our programme, need not detain us longer than just to record the existence of some bits of Norman work of some interest, and a good little transitional piscina, the headstone of which is formed by the sink-stone or cill of a former piscina, the inverted hollow of the old basin being visible on looking into the recess. West Deeping is like Offington, a model village church, but in the Geometrical style, with a tower and spire of the Perpendicular period—short, but remarkably well-proportioned and pleasing in composition. Adjoining this is a large new parsonage, in the most violent contrast of "patent compressed" red and black brick, with tuck-pointed joints. A stronger lesson on the value of tone in building material, and especially of having the tone naturally belonging to the district, could hardly be given than by the contrast between this staring abortion and the cool subdued grey tone of the church opposite. And throughout this district it is to be noticed how pleasing to the eye is the stone mostly used for ordinary building, and how thoroughly the constructors of these buildings have known how to use it. So picturesque is the arrangement of the masonry, that even the stone fence-walls of the fields and farms, with their thin courses of masonry, and delicately shadowed joints, innocent of pointing, are a

source of pleasure to the eye; and our party saw few pieces of work better and more truly architectural in its way than the park wall at Burgley, and some of the farm walls we passed in our drives. The system of coping most prevalent in the more carefully constructed walls of the district is so picturesque and effective as to be worth mentioning. It consists, over the ordinary masonry, of three or four courses of tiles, or very thin stones, each one set a little back from the one under it, and the whole crowned by a coping of semicircular bricks. One is surprised, at first, at noticing that all the stone-built cottages have brick chimney-stacks; but the stone, of course, is mostly limestone, and will not stand heat. A little bit of ornamentation seen in many of the roadside cottages is singular enough: the small gabled dormers have, as a finish, just under the apex, a crown-glass bull's-eye imbedded in the plaster or mortar. Some of our modern Goths are fond of using bull's-eyes in windows: here is another hint for them. But we must get on to the two Deepings; whereof the first, Market Deeping, is not a very remarkable church, but containing in the nave very good arcades, of different dates. St. James Deeping, on the contrary, is a very remarkable church indeed, both for beauty and peculiarity. The original church was part of a priory, founded in the reign of Henry II., and was evidently a church of three aisles, on the ordinary plan, and of unusual character. In its present condition, it offers the remarkable and unusual appearance of a church of two broad aisles of equal width, with a grand arcade up the centre. This is the south arcade of the original nave, the north arcade of which is replaced by a wall and lofty windows of the Perpendicular period; though a portion of the two eastern bays of the arcade is visible, built up in the later work. This north wall has settled and fallen outwards at least 15 in. out of the perpendicular, and so remains. In the centre wall, above the main arcade, is a remarkably fine triforium gallery, of late transitional date, originally forming the clearstory of the former church, the places where the windows were pierced being visible; but, now built up, as the new north aisle, of the Perpendicular period, is the same height as the other. The imposts of the main arcade present a most extraordinary and puzzling appearance, having, as the crowning member, the circular abacus, square on section, characteristic of late Transitional work, while beneath this the capital is arranged on the rectangular projections belonging to earlier work, and which, in such cases, the abacus usually follows. The appearance is, at first, as if pieces of an older capital had been worked up; but the fact that the member immediately below the circular abacus is in each case rounded to fit the curve of the latter, seems to indicate that the two parts were designed for the situation they occupy. If, so, a more odd instance of the confusion of style and manner through which Gothic architecture passed, in its struggle through the experimental Transition period, probably does not exist. The chancel contains some beautiful purely Early English work, and the exterior treatment of the north wall, both as to windows and buttresses, is remarkably fine, and unusual in manner, for English work. Altogether, St. James Deeping is a church to afford much, both for pleasure and instruction in the higher forms of architectural expression. The village cross at this place also should not escape notice.

Norththorpe, the next on the route, is also a highly interesting church, not in its main structure, but in regard to the noble and massive architecture of the south chapel, added in the Decorated period, and as notable for its beauty as for its individuality of treatment. Still more interesting is the old house and outbuildings a little way from the church; the portion towards the road, with its fine archway, long roofs and dormers, and small millioned windows inserted in the most desirable of masonry, should really be looked after by Mr. Boyce, whose masterly works in the Society of Watercolours' Exhibition have shown such a genius for handling this class of subject: he could make a very fine thing of it. We go from hence to Elton; the fine tower and spire of which, and the admirable and interesting detail, showing the transition from the Early English to the Decorated period, have been amply illustrated in published works. Helpston is a church of considerable interest and individuality, having an octagonal west tower with a small stunted spirelet by way of a finish, of the Late Decorated period. This is in reality old work, but has all been taken down and rebuilt,

on account of failure of some portions, within the last three or four years, and so carefully and judiciously has this been done, under the superintendence of Mr. Browning, architect, of Stamford, that there is really nothing to show, externally at least, that the tower has ever been meddled with. There are some remains of very good ancient tiling in the chancel floor, and two very singular bench-ends of stone, carved with grotesques, but almost exactly resembling what we are accustomed to see executed in wood in such a position. In taking down the tower, it was discovered that a good many tombstones had been used in the masonry, or stones shaped as tombstones; whether they had actually fulfilled that office before being converted into building stone cannot be ascertained. Bainton is a small church in very bad repair, with an exceedingly good tower and spire, with the mullions of the lucarne broken away, so that an unseasonably amount of daylight is seen through the spire. The most notable thing in the interior is a very pleasing memorial bust-relief, a single figure, by Westmacott: curious enough to meet this highly-wrought little specimen of modern art in the midst of the piled-up masonry and grotesque carving of the Gothic period, and in so primitive a little village as Bainton,—it seems to belong to another world. There is a good font, Early English, in the church. We finish up our day's circuit with Barnack, where, indeed, some of us wished we had come in the morning and remained all day. The nature of the main interest attaching to this remarkable church is pretty well known, and the Saxon tower has been engraved a good many times; but we question whether those who only know it by such means have a correct notion of the scale and mass of this tower, most of the published engravings being small and paltry, and the style of the architecture being very misleading as to scale, on paper. We do not know whether attention has been so much directed to the remarkable proportions of the nave arcade, especially on the north side (early transitional), which is carried by circular columns, not short and massive as we are accustomed to find them, but with a tenuity of proportion more like that of late Perpendicular work, and carrying great circular arches of so wide a span that the nave, though no small one, is included in three bays. The south arcade is considerably later, with excellent specimens of the beautiful stiff foliated carving of the later transition: and singular it is to contemplate the three types of capital collected together at the west end of the church; on the north the early transitional, with the square abacus and projections on each face, and still retaining the impress of Norman work; on the south, the circular abacus with its elegant foliage; and between these the so-called Saxon arch carrying the tower, with its strange abnormal plougings and furrowings in the stone, scarcely to be called mouldings, and producing on the fancy much the same effect as the contumplation of the bones of some mishapen extinct animal existing in a pre-historic period. What were the lives, what the notions concerning beauty and ugliness, of the men who have left us this strange travesty of architecture? We cannot get hold of this: we have before us the very stones on which they worked their fancies, almost as sharp and uninjured as if they had been put there only last year; and as to the men who did it, we can come no nearer than a conjectural belief that they were either Saxons or Danes,—words which to most of us are more names in themselves. One thing, however, we are sure of, that the men who left us this memorial of themselves were not a very kindly or affable race; for no stories of harsh semi-savage life could seem much out of keeping with the expression of these silent records, so intimately are artistic feeling and moral and mental temper connected.

The Proposed New Park for Ashton.

The committee have awarded the first prize, of 20l., for the best plan for laying out the Highfield estate as a public park for Ashton-under-Lyne and neighbourhood, to Mr. Alfred Lindley. The second prize, 10l., has been adjudged to Mr. G. Gill, Stalybridge. Great preparations are being made to secure the success of the show about to be held on the grounds. There is every prospect of an early laying out of the ground. The sum already collected amounts to about 7,000l., and no doubt is entertained as to the promoters obtaining the additional 3,000l. necessary.

NAMING.

Of course no one will insist on our endorsing all the complaints in the following communication. Any one custom in such a matter, too uniformly insisted upon, would no doubt give less pleasure on the whole than results from the use of fresh judgment in each case, and even from caprice, often the outcome of every way admirable instinctive feeling,—a better guide in delicate matters of taste than the coolest judgment. We, however, admit Mr. Pictorvaco's letter, though somewhat exceeding the space usually at command for the exposition of personal views, as it may lead to a proper confidence on some occasions where it would be usefully shown, and as the writer expostulates so good-humouredly with "his tyrants."

Sir,—Physiognomists, phrenologists, recognised character readers, and other professors of human nature, treat in the ordinary way of their professional occupations, of the qualities of the vile bodies submitted to their masterly analysis. They cannot, of course, do without eagle glances and quickly-formed conclusions; and one does not grudge them any of the glory pertaining thereto: who ever does envy or even underestimate the acts of his confessed superior? To what good purpose do cynics suggest that every such Sidrophel does his task more cleverly, if the sufferers are first interviewed by a Ralpho who, in the way of duty,

"seeks out

"And pumps 'em what they come about?"

Some people may, indeed, account thus for occasional surprises to patients and their friends, or for a want of correspondence with previous notions about well-known things or persons. Happily few of us are of that mind; the most being rather disposed in such event to augment their reverence, if only the operator sticks firmly to his tale; for has he not in such cases expounded what was previously unknown, and might but for his prestige and confidence have ever remained so?

Similarly the activities of funambulists, fortune-tellers, conjurers, prestidigitators, improvisators, and other like ready-witted or lissomed-bodied products of more (or less) civilisation, shall never find in me a depreciator nor smirking critic. Yet notwithstanding all this reverence and open-mouthed admiration,—notwithstanding a healthy willingness to achieve distinction or even worthy notoriety,—I have attained self-knowledge enough to readily confess that I am not anxious to exchange lots and depend for life on the sudden exertion of many supple muscles of brain or body.

Consider such accidents as failure of memory, as unguile wit—not to speak of undisciplined ignorance! Why, then—confessedly liable to such ills of flesh—and I nonchalantly puzzled by painters and sculptors (and architects, too, I suppose are to blame), with mysteries more mysterious than mere ozokeritis and agnosty columns,—to riddles readable, if at all, like Noystradamian and other prophecies, only by ingenuity most astonishing even to the interpreter himself? Why am I (and I suppose my experiences are shared by other lookers at art works) tortured by problems as distressing as ever racked the brain of a possible schoolboy—unknown to Macaulay,—in the shape of artfully draped queries hiding wild beasts of quadratics, or Sisyphian labours in deducing the present longitude of the schooner *Hum* from meagre data as to the personal history and state of the razors of her captain?

Why, in thirty-six words,—so that the patient reader may not in despair cease to listen for my grievance,—why are not the anathemas commonly pronounced against books without pronounceable and happy titles, and against books without indexes,—pronounced also against medallions, busts, statues and groups, pictures and portraits, public buildings and monuments without NAMES?

The walls of my church have recently been decorated in temper, in the best and most workmanlike manner, with the counterfeit presentments of (for the most part) venerable gentlemen in costly raiment. Here, however, all cavil is put out of the question. We are not content with the illumination afforded to the happy initiated by the emblems thrust into some hands and held loosely; and, for the sake of variety and character, clung to desperately by others, in order to restore balance to their dislocated martyred frames. These are supplemented throughout by labels,—scrolls, we call them, as

they are elevational perspectives of donhied (not rolled) strips of paper. And these are all inscribed as legibly as a writing-master's flourished frontispiece, or the grand starting-word of a bit of black letter. Can any one be astonished that the memory of this makes me indignant, when completely floored by the terrible child to whom I am explaining some unticketed modern masterpieces in stained-glass,—his nuttored mind leading his eyes, not to the features, or the Tyrian purple robes, but to the wonderful saw which has strayed from a museum into the figure's left hand; and this because I had foolishly forgotten the elaborate iconographical chart constructed with so much care and pains, and condensed for portability into the size of a Murray's "London." Not thus unfairly were spectators treated by the mosaic workers at Monreale or St. Sophia. They, though regrettably ignorant of English, and using characters to be found in no well-printed newspaper, seem to have done their best to give fair verbal descriptions of their works; albeit, if we are to believe the Ahhd Gravina, Salzenburg, and Texier, they indulged in a too uniform imitation of the vertical and erratic fashions of advertising tailors.

Do not let me be misunderstood as hinting that all pictures should be legibly labelled. No one would wish, for instance, that, in the great galleries of show-houses, the interpreting functions of the housekeeper or her handmaids should be in anywise superseded; especially when carefully made hand-charts of the pictures, that were correct when made, are to be found in every room. And the most perverse person would willingly forgive the Royal Academy for declining so heroic a task; seeing that, in that case, the rates of admission would of course have to be raised. It might, indeed, be objected that catalogues, even then, might possibly find a sale; but one knows that, in practice, the purchasing ceremony would be perversely omitted in too many cases,—with the additional evil consequence that visitors would be deprived of such ample memorial as they added to their stores in the last ("La Reine," of Vandyck) old master's catalogue. On the other hand, it would obviously be good policy to make it penal for print-sellers to exhibit in their windows prints before letters, etchings, or old engravings, without explanatory notices; and photographers or photo-sellers should be liable, at least, to forfeitures to respectable persons (claiming in proper form) if they omit to name legibly the portraits of eminent persons exposed for public observation and purchase.

Sculptors, also, are often the most merciless of my tyrants.

"Under hanging mountains,
Beside the falls of fountains,"

seated in pleasant gardens, by laurel hedges, the subject of a marble group, seen against the trees of the autumn, may form a tolerable subject for fanciful conjecture. Even here one craves the conviction that by custom there shall be a concealed name-bearing medallion discoverable by the initiated; but in a gallery to detect the special nature of each of these white-robed divinities, with their uniform perfect calm of soul! . . . The good Egyptian channelled and blacked letters of a name,—with a "sculptor" or "fac." after it, as a condescension to high art sentiments,—evidence one healthy habit; and perhaps, in caudor, the present custom of accompanying the Latin or Greek testimony to departed merit or to the existence of moral sentiment by the English original, ought not to be without its share of commendation. . . .

I wish, indeed, that this habit of sculptors could be considered to justify an architect's name, medallion or panel,—say on the eye-line in every modern building; or, if in the absence of special precedent the innovation should be deemed all.

* We are forced, by considerations of space, to omit Mr. P.'s remarks on painters' signatures, false warranties, the identification of portraits, the Gainsborough and Reynolds portraits of unknown ladies (4 and 6 in the Bedford-green collection), pointing the moral also on enigmatical titles, the difficulties of nomenclature, illustrated by the experience of Nathaniel Hawthorne, in the matter of "transformation,"—omitted in order not to overrule the authenticity of the communication, having in mind the experience of Dr. Livingstone, &c. From other practical suggestions, the following may, however, be selected.—In the national collections of pictures (for instance, at South Kensington) the dates of the deaths of painters should be filled in to the spaces prepared for them. Perhaps it might be better to omit the "D" till the year can also be supplied; otherwise, an extreme longevity is in some cases suggested for artists, that must be dubious, even to people not possessed of the systematic incredulity of Mr. Thoms. If the date, or even the approximate date, of the execution of a painting could be supplied, it would very frequently be valuable; this has been done,—"painted about,"—on different occasions."

too-violent, the allegorical fashion of Batrachus (frog) and Saurus (lizard) might be regarded with favour, as it has the prestige of many centuries; or initials; or rebuses, after the punning fashion of I (or eye)-slip, Bolt-tun, Ram-ridge, Wheat-hampstead (*locus frumentarius*), or before it if wit or fate (which, after all, has some share in a name), will allow. . . .

An inspection of a large, new, City-of-London building, not yet manifested internally to the vulgar world, affords me some very pertinent instances of the sort of anonymity I am deprecating. It has a big central nave, from which the recessed side chapels for study open by goodly ranges of pier-arches, and in the spandrels between these arches are carved heads of poets, other writers, architects, sculptors, painters, and what (*pace* of Mr. Gladstone and Mr. Ayrton) will probably always be known as men of science. Of course, these have all been copied from the best authorities, carefully modelled, and skilfully carved. I did, it is true, fancy that Shakspeare showed, what I called to myself, the conventional ideal, instead of either the homely sagacity of the Stratford bust, or the poetic elevation of the Chandos portrait. Also (as, for instance, in his case, and Michelangelo's, and Wren's) I fancied,—as, in fact, I often do elsewhere,—that my diminutive stature (under 6 ft.) unfitted me for seeing the works so fairly as I should have done before they were hoisted aloft; but this latter objection would, of course, lose its validity when the contemplated increase of physical dimension,—corresponding with the future intellectual height,—has been attained; and, indeed, in that still atmosphere, full of the (much diluted, let us hope) fragrances of Russia and vellum, with rows of Grainger, Lodge, and their congeners, and bulbous portfolios, with loose engravings by the thousand, placidly awaiting observers. Amid such company it might well bring a blush of shame to the cheek of an ingenuous, able-bodied, strong-wristed frequenter, if compelled to confess that any one of these faces was wholly unfamiliar, or anything short of perfectly identified at a first glance. Nevertheless, a stranger or occasional visitor of the existing dwarf humanity,—a weak-limbed innocent, to whose pitiless arms heroic grappling with many folios would be a task,—a born forgetter of faces with his untraversable eye,—might not these and others have their possible existence recognised, or not ignored? Would it not seem, in fact, that the few days which an alphabet-cutter would need to bestow on simple initials of letters might be a pleasing economy of human labour in the long-run?

I must, indeed, forbear to say positively that there would be a similar obvious advantage in pointing out in a readable way the companies,—from which the rampant animals have strayed, that stand guard at higher levels in this building over the corbels, lending support to the roof-tree. "Such ugly monstrous shapes elsewhere may no man read." Some may imagine that this menageric consists in seriousness of poetic conceptions,—Spenser-like warnings of possible transformations due to extreme devotion to apocian frenzies, appropriate here, as this hall is to serve as vestibule to the grand temple of that cultus,—

"Rearing fiercely their upstaring crests.

Sad and . . .
And mournful need of joyes delitious"
(Book II., Canto 12.)

We may thus conclude that some allegories might usefully be left to the interpretation of individual wit; but the omission of all legend round the numerous shields hereabouts seems not so well justified on similar grounds. Between the savage mockery of Lord Macaulay and the continuous exulting pean of an amateur herald, there must be in the country at large many gradations of sentiment;—one is, in truth, sometimes inclined to think that, as in many other things, a good deal of the variation in sentiment is due to the variation in degrees of ignorance. Letting that be as it may, many people (not, of course, everybody) would still maintain that carefully devised and arranged and carved shields, and indeed heraldry generally, might gain (as well as the onlookers) if some distinct idea were necessarily associated with the more or less graceful forms. A notion of this sort seems times and again to have occurred to actual builders, and as a consequence names and dates have been put on the grounds of the panels occupied by shields. But why should these freaks of subtle genius be so rare? Why should not,—in consideration here also of

human frailty,—every arms-bearing shield (and perhaps, after that, they are better than the blank ones that years ago seemed likely to become fashionable) he accompanied, as a matter of course, by the name of the lord who bears it (as his seal)? On occasion, why should not the quarterings be explained, in all the commonplace of readily decipherable inscription, thus:—

James Jones,
Member of the Committee,
A.D. 1888.

[Consider also the woes of future heralds, and the prodigious dimensions of a comprehensive Gwillim Edmondson, Burke, or Robinson of the year 2000; unless it shall be agreed that named and single blazons should not imperatively demand book perpetuation by the photo-chromo-instantaneous-printing of that period.]

I begin at this stage to fear that I have written myself into something like good temper and amity; and appear, in consequence, to find my grounds of grievance shifting away under me. In digging over the soil, I have seemingly made it less solid. My main personal complaint seems merely to be that guide-books, catalogues, and books of reference generally are sometimes big, occasionally of an awkward shape to carry, occasionally inaccurate, and frequently incomplete: not always at hand on a casual look into an exhibition, or at a public building or monument. Perhaps at any time one may be justified in repeating also the general complaint of the evil fate which, even in a real library, so often hides a wanted detail, and only yields it up as the reward of diligent hunting. On reflection, however, it becomes pretty evident that any one may, if he will take the trouble, provide himself with appropriate antidotes against a poisoned peace from these; except, indeed, in the last case,—of the revenge harboured in the frame of things,—which is beyond the reach of medicine. These antidotes would be in no wise outlandish or difficult to procure.—Artificial memory, unlimited patience and industry, streams of shillings, pockets of great hook-carrying capacity, and a sturdy muscular frame;—some strict limitation of subjects of interest.

This feeling of comparative indifference is, it may be, rendered all the more victorious by a sort of consciousness that so almost entirely virtuous and so prominent an example in these matters as the Prince Consort Memorial is likely to set a lasting fashion, and shortly prevent us (unless, indeed, we are forced thereby to turn our coats) from grumbling in the least at any hut the works of an older time. Ideal groups and single figures all named; the portrait subjects also; sculptors' names holdly put;—in cases, indeed, with the extra attention of crows' feet and lines to indicate the limits of sculptural responsibility: "Queen Victoria and her people" have shown in all a fair fellow-feeling for the forgetful, imaginative ordinary person. With the exception of names to arms, of which the omission is less wicked in this instance than ordinary, as their significance can hardly be misapprehended; harring also the want of a date or two to the portraits to make clear the chronological series,—though even this is not here indispensable, so obvious is the drift (and we owe it to the man who would dare to date some of them with firmness); the name of the architect is also wanting above the recognisable low-relief profile, so inseparably connected with the monument. With these exceptions, the most vehement vindicator of the value of naming could not ask for a better specimen of the rational following out of his theories.

Not of course that one wants to convey the impression that the right thing has not been done elsewhere as well. Dulwich School, with its range of terra-cotta portrait medallions above the one-pair story, all answering to names on the hollows above them, is another happy case in point; notwithstanding that keen youthful eyes or an opera-glass may be almost necessary to read some of the inscriptions around, and discern some of the lineaments of these heads of world-famous story, their height above the lower world doubtless being a few feet too philosophical.

The London University building in Burlington Gardens.— But why indulge in a sort of catalogue?

Having thus shown that naming is important, and should be uniformly attended to, unless certain effective substitutes are obtainable, and that good judgment in some new instances will be sure to influence the future, it only remains for me to say that no professional jealousy actuates

these criticisms, and to show that my works are most obviously not obnoxious to the complaints I have made against those of others by subscribing myself, sir,

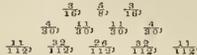
Your obedient servant,
JOHANNES PICTORVACCE,
Dairyman's Landscape and Animal Artist; Still-Life and Animal Painter for Public-house Signs; Herqueins for Oils and Colours; Mangles;—also Lettering to the same, in every style.

THE STRAINS IN TRUSSES.*

THE system of exhibiting by means of diagrams the relative strains to which the several parts of a piece of framework are subjected when the whole is loaded with a weight, was propounded some few years ago by Professor Clerk Maxwell, but has not been used by engineers and architects to the extent that it deserves. The work before us will greatly aid those who are still unacquainted with the method, in applying it to various kinds of structures, such as trussed roofs and bridges. The author has, however, omitted all mention of Professor Maxwell as the author of the system, and any one taking up the subject for the first time might suppose that Mr. Ranken was himself the inventor of it, although he really makes no claim to be so, but only "to set in a clear light the theory and method of computing by diagrams the strains in trusses bearing a constant load," so that "it may be found intelligible even by those who have no previous knowledge of statics." In order to do this, he commences his treatise with an explanation of the mode in which forces are considered in statics, the principle of resultants and components, together with the parallelogram of forces in which the diagonal represents the resultant of the two forces forming adjacent sides of the parallelogram. The triangle of forces is a simple deduction from the preceding, or rather "another way of stating it." If three forces keep a point at rest, three straight lines drawn parallel to their directions will form a triangle whose sides, taken in order, will be proportional to the magnitude of the said forces. By this principle, if the direction of three forces and the magnitude of one of them are known, that of the other two can be at once determined by the simple process of drawing a triangle. When there are more than three forces to be considered, we can first find the resultant of any two, and combine it with another of the forces, and so on for any number. We can thus extend the principle to that which is called the polygon of forces, and which is stated as follows:—If any number of forces acting in one plane keep a point at rest, then straight lines drawn parallel to the directions of those forces, taken in order, will form a polygon whose sides will be proportional to the magnitudes of the forces. The author has omitted to demonstrate the steps by which the principles above enunciated can be reduced to the system of stress diagrams for triangular or polygonal trusses; but the following is a brief explanation of their connexion:—Suppose A, B, C, to be the joints of a triangular frame acted on by a force at each of those joints, which keep it in equilibrium; then, by the "triangle of forces," the lines representing these three forces must meet at some one point, D,—and be proportional to the sides of another triangle,—E, Q, R,—which are respectively parallel to the lines A, D, B, D, C, D. Then the stresses in the sides of the frame,—B, C, &c.,—will be represented by lines drawn from P, Q, R, parallel to those sides, and meeting in a point,—X; the lines P, X, Q, X, R, X, representing proportionally the strains in B, C, C, A, A, B. If the figure A, B, C, represents the centre lines of the beams forming the truss or frame, it is called the frame diagram, and the figure P, Q, R, is the stress diagram.

After giving several examples of the balancing of three forces amongst themselves to familiarise the student with the method of forming diagrams, he proceeds with the application to the ordinary forms of roof trusses, beginning with the king-post truss, and proceeding with more elaborate combinations of framework. Taking 12 to represent the load sustained by each truss, he finds by means of the diagram what portion of that quantity is borne by each part, and whether the strain is tensile or compressive; he assumes, however, that if a continuous beam is loaded uniformly, and supported in the centre as well as at each end, the weight

borne by the middle prop is twice the weight supported by each of the abutments, and when there are two equidistant props that each has one-third of the load to carry, the two abutments carrying the other third between them, and so on. This is not, however, the mode of dividing the load which is adopted by the latest writers on the subject, the proportions which they give being for one, two, or three intermediate props as follows:—



In the examples given in the treatise the strain on the king or queen post from the weight of the tie-beam is omitted "for simplicity," but if there is a ceiling to be supported by the tie-beam this would produce one of the most important strains which the truss would have to bear, and ought not in any case to be neglected, the chief business of the king or queen post being to prevent the sagging of the tie-beam.

The effect of the wind is by far the most important of the strains which a roof-truss has to sustain, and this is taken by Mr. Ranken in all the examples as a dead weight acting equally on both sides of the roof at the same time; except, however, in roofs of very low pitch, this would lead to very inaccurate results, as the force of the wind is almost always sustained by one side much more than the other, so as to produce a racking strain upon the framework, to counteract which the timbers must be made much stronger than if they had only to sustain a uniform vertical weight acting on both sides alike. The stress diagrams ought, therefore, to be always drawn on the hypothesis of the wind being at right angles to one surface of the roof, and the figures will then have a very different appearance to those given by the author.

A considerable number of examples are fully worked out for the frameworks of girder-bridges as well as of roofs, by mastering which the student will find that he has acquired great facility in the application of the principle to practical purposes without having to trouble himself about algebraical or trigonometrical formulas; these latter, however, cannot be dispensed with in considering trusses exposed to the action of a travelling load, as in railway bridges, to which this system of diagrams is hardly applicable. In applying the method to practical uses, care should always be taken to ascertain the exact mode in which the strains to be supported are applied, as otherwise very erroneous results will be obtained, by which the system may get into disrepute, whereas the mode of using it is really in fault.

The system of computing strains in trusses by means of diagrams has hitherto been too little known or practised by English engineers, and the present work, although not so accurate as might have been desired, will do good service for the profession by showing how easy it is in application after a little practice. We therefore strongly recommend all students of architecture and engineering to work out carefully the examples given in this treatise, as well as others which may arise in the course of their practice. They will by this means become familiarised with the relative strains which the several parts of a truss sustain, and be able to detect at once any weak points in its design.

THE HARTLEPOOL EXCHANGE AND CLUB-HOUSE COMPETITION.

SOME three or four months since the directors of the projected exchange buildings at West Hartlepool invited twelve local architects to submit designs, and after deliberation the New Exchange Company have committed themselves to a definite scheme for the erection of a block to a definite scheme for "The Hartlepool Exchange." The selected design is that bearing the motto, "On 'Change," the author of which is Mr. C. G. Hoskins, of Darlington.

The building will have three principal frontages. The style is Italian Gothic, having a tower, with angle turrets breaking the line of the north façade. The materials proposed to be used are red pressed bricks, relieved with stone dressings.

The Post-office authorities have had copies of the plans submitted to them, and probably the same post-office buildings, much needed for West Hartlepool, will form a separate department. The North-Eastern Banking Company are also in treaty with the directors for suitable accommodation here, and most of the offices in the

* The Strains in Trusses computed by means of Diagrams. By F. A. Ranken, M.A. Longmans, London.

building are already secured, on promise, by private firms in the town.

The same architects also submitted designs for a club-house for the Exchange Company, to be erected on a site facing the Exchange, and in this case also Mr. Hoskins succeeded in carrying off the prize. The building is in the same style of architecture as the Exchange.

It is understood that the directors have assured themselves that both buildings can be carried out for the estimated cost, and operations are expected to commence without delay.

THE CONSTANT SERVICE OF WATER.

SIR,—During the past week very important regulations have been issued by the Board of Trade relative to the fittings required for a constant service of water under the provisions of the Metropolis Water Act, 1871, all of which are tolerably clear except the last (No. 33), which says:—"All existing fittings, which shall be sound and efficient, and are not required to be removed or altered under these regulations, shall be deemed to be prescribed fittings under the Metropolis Water Act, 1871." But, inasmuch as "these regulations" do not in any part require specifically any fittings to be removed or altered, I am at a loss to understand the meaning of the clause quoted. A careful perusal of the regulations, and a clear and succinct account of what is required of property owners under them, would repay a journal so largely devoted to sanitary science, and so widely read by property owners, more especially as in so complicated a matter the water companies will make every endeavour to stretch their powers to the utmost limit, and to withhold all possible information from the public.

BALL VALVE.

WASTE IN WARMING.

At the meeting of the British Association which has been held with remarkable success in Brighton, Mr. Bramwell, C.E., as president of the Mechanical Science Section, dilated on coal and the means of obtaining power without coal. After speaking of the amount of coal left buried in abandoned mines, the speaker said,—Next there came the question of the waste of coal when brought to the surface. This was of two kinds, the domestic and the manufacturing. The domestic waste was a highly important branch of the subject. It is believed, said Mr. Bramwell, that out of the total of 98 or 99 millions of tons of coal which in 1869 were retained for home use, 18½ millions of tons, about one-fifth of that quantity, were consumed for domestic purposes. We all of us know so intimately the way in which coals are burnt for domestic purposes that it will seem an idle waste of time to describe it. We put a grate immediately below and within a chimney, and, as this chimney is formed of brickwork, by no possibility can more than the most minute amount of heat be communicated from the chimney to the room. On this grate we make an open fire. Fire cannot burn without air, and we provide no means whatever for the air to come in to the fire. This is a provision that not one architect or builder in a thousand dreams of making. The consequence is that the unhappy fire has, as it were, to struggle for existence. In a well-built house especially has it to struggle, for the doors and windows shut tightly. The result is that the fire is always smoking, or is on the verge of smoking. We breathe the noxious gases, and we spoil our furniture and pictures; nevertheless, happily for us, the fire does succeed in getting supplies of air which, even although insufficient for the wants of the chimney draught, do renew the air of the room. If, to satisfy the demands of the chimney, and to stop its smoking, a window is left a little open or a door is set ajar, we complain of draughts and we complain of the unhomey look caused by sitting in a room with an open door, so that there we are, with an asphyxiated fire, our smoky rooms, and our draughty rooms. Moreover, the fire being immediately below the chimney, the main part of the conducted heat inevitably goes up it and is wasted, leaving the room to be warmed principally, if not entirely, by the radiated heat; and we do and suffer all this in order that we may see the fire, and be able to poke it. I must confess that if there were no cure for the evils I have described other than the close stoves of the Continent, with the invisible fire and with the want of circulation of air in the room, I would rather put up with the whole of our present domestic discomforts, and even with the loss of heat, than resort to the close stove as

a remedy. But there are modes by which freedom from smoke, freedom from draught, efficient ventilation, and utilisation of the heat may all be combined with the presence of the visible pokable fire. Some members of this Association may recollect the paper that was read before it at the Norwich meeting in 1868 by Captain Douglas Galton, in which he so clearly described his admirably simple invention of fire-grate. This consisted in putting a flue to the upper part of the fire-grate, which flue passed through a brick chamber formed in the ordinary chimney, which chamber was supplied with air from the exterior of the room by a proper channel, and then the air, after being heated in contact with the flue in the chamber, escaped into the room by openings near the ceiling, so that the room was supplied with a copious volume of warm fresh air, which did away with all tendency to draughts from the doors and windows, and, moreover, furnished an ample supply for the purposes of ventilation and combustion. These fireplaces, I regret to say, have been but little used in England, from a cause I shall have to advert to hereafter—a cause which, as I believe, stands in the way of adoption of improvement generally. The merits of these fireplaces were at once acknowledged by the French, who made the most careful and scientific investigation of their working; and they found that with such fireplaces three times the effect was obtained from a given weight of coal that could be got with those of the ordinary construction. No doubt there are many other plans by which the same end as that attained by Captain Galton may be arrived at, and yet we go on year after year building new houses, making no improvement, exposing ourselves to all the annoyances, and, worst of all, wasting the precious fuel. Assume that we were to set ourselves vigorously to work to cure this state of things, can it be doubted that in ten years' time we might halve the consumption per household, and do that not only without inflicting any discomfort, or depriving the household of any gratification, but with an absolute addition to warmth and an increase of cleanliness, a benefit to health, and a saving of expense? Moreover, it must be remembered that, with the imperfect combustion of domestic fires, large volumes of smoke are poured into the air. We know how much freer from smoke town atmosphere is in summer time than it is in winter time, and this simply on account of the smaller quantity of coal that is being burnt. Suppose that we could reduce the total consumption, both in summer and in winter, by 50 per cent., what an enormous boon that would be even in the one matter of a pure atmosphere.

THE DIMINUTION OF ORIGINAL RESEARCH.

At the British Association meeting already referred to, Dr. Hall Gladstone, F.R.S., as president of the Chemical Science Section, drew attention to the diminished activity of chemical discovery, and to the lamentable fewness of original papers communicated. This has been attributed chiefly to the "non-recognition of experimental research by our universities," and suggests that in the granting of science-degrees every candidate should be required, as in Germany, to prove his ability for original investigation. Concurring in this, I would remark that other causes have also been assigned, and other suggestions have been made. There is the small recognition of original research even by our learned societies—at least, such recognition as will come home to the understanding of the general public. It is true the fellowship of the Royal Society is awarded mainly for original discoveries, and there are two or three medals to be disposed of annually; but these distinctions fall to the lot of the seniors in science, often men who are beyond the need of encouragement; and though they doubtless are serviceable as incentives, there is many a beginner in the honourable contest of discovery who is too modest even to hope for the blue ribbon of science. While the Victoria Cross is awarded to few, every soldier who has borne part in a victory expects his clasp; and so might every man who has won victory over the secrets of nature, fairly look for some public recognition. It has been suggested, for instance, that the Royal Society, in addition to the F.R.S., might institute an Associateship, with the letters A.R.S., designed exclusively for those younger men who have shown zeal and ability in original research, but whose discoveries have not been

sufficient to entitle them already to the fellowship. It is suggested, too, that the Chemical Society might give some medal, or diploma, or some similar distinction to those who contribute papers of sufficient merit. But beyond this is the non-recognition of scientific research by society in general. We can scarcely expect the average enlightened Englishman to be anything but scared by a graphic formula, or a doubly sesquipedalian word containing two or three compound radicals; but he need not continue to talk of the four elements, or of acids being neutralised by sugar. But, indeed, the so-called educated classes in England are not only supremely ignorant of science, they have scarcely yet arrived at the first stage of improvement—the knowledge of their own ignorance. Then, again, there is the excessive preference of practical inventions over theoretical discoveries—or rather, perhaps, the inability to appreciate anything but tangible results. Thus, a new aniline compound is nothing unless it will dye a pretty colour; if we speak of the discovery of a new metal by the spectroscope, they simply ask, What is it useful for? and the rigorous determination of an atomic weight has for them no meaning, or interest, or beauty. The general appreciation of science must be of gradual growth; yet there are wealthy men who know its value, and who might well become the endowers of research. There are, indeed, at present, funds available for the purpose—such as the Government grant and the surplus funds of this association; but the money is given simply to cover actual outlay; and this, though very useful, scarcely meets the case of those young philosophers who have no balance at their bankers, and yet must live. Will not some of these wealthy men endow experimental scholarships, or professorships, in connexion with our colleges, institutions, or learned societies? As an instance of the good that may be effected in this way, may be cited the Fullerian professorships; and as a very recent example, worthy of all honour, may be mentioned the purpose of Mr. J. B. Lawes, not only to continue his elaborate experiments at Rothamstead throughout his lifetime, but to place his laboratory and experimental fields in trust, together with 100,000*l.*, so that investigations may be continued in the wider and more scientific questions which the progress of agriculture may suggest. The Government of our country, through the Science and Art Department, renders good assistance to the teaching of science; and if the recommendations of the Royal Commission on Scientific Instruction and the Advancement of Science be adopted, the introduction of practical examinations for the obtaining of certificates for a superior grade of science-master will certainly foster a spirit of research. I believe that this diminution of original research, which we deplore, is partly due to a cause in which we rejoice—the recent extension of science-teaching. The professorships of chemistry are scarcely more numerous now than they were twenty years ago, while the calls upon the professors' time in conducting classes or looking over examination-papers, have greatly augmented. Thus some of the most capable men have been drawn away from the investigation of nature; and in order to afford sufficient leisure for the purpose, means must be found to multiply the number of the professorships in our various colleges. While the rudiments of science are being infused into our primary education, now happily becoming national, while physical science is gradually gaining a footing in our secondary and our large public schools, and while it is winning for itself an honoured place at our universities, it is to be hoped that many new investigators will arise, and that British chemists will not fall behind in the upward march of discovery, but will continue hand in hand with their Continental brethren thus to serve their own and future generations.

OF THE ACTION OF SEWER GASES UPON LEAD.

At this season of the year nothing is so painfully persistent, so obnoxious, and so patent to our observation as the intolerable smells which proceed from defective water-closets. The nuisance needs no special medication from us, to any one who has given the least attention to the subject, or bestowed upon it the slightest scientific examination.

It is now generally allowed that much of the evil is due to defective soil-pipes; and on this topic we may say a few words explanatory.

Some time ago, as our readers will remember, Dr. Andrew Fergus drew attention to the very grave subject of the chemical action of sewer gases upon lead, and to the fatal consequences which often result from that somewhat recondite and unforeseen cause. It is hardly possible to overestimate its importance; and, indeed, we are rather surprised that the paper has provoked so little discussion hitherto. Of course this subject of the corroding and perforation of leaden soil-pipes through the chemical action of the sewer gases is, as our readers must know quite well, not new to us. We have long been aware of the evil; indeed, we have had painful experience of it in our professional practice. The disastrous circumstances attending a rotten soil-pipe are obvious; and we venture to assert that the evil is very much more widely distributed than most people are aware. Dr. Fergus deserves high commendation for his observations and researches; and we regard it as a most hopeful symptom of sanitary progress that intelligent physicians are every day becoming more alive to the evils which are wrought by defective construction.

The day is fast approaching when the physician will find it as necessary to examine, or, at least, cause to be examined, the house drains and the water-closet as regularly as he does his patient's pulse or the state of his tongue! What an important fact it must be, for example, to ascertain in a case of typhoid fever whether the soil-pipe communicates with a sewer or with a cesspool! How many cases of diarrhoea might be discovered to originate from the scandalous practice of connecting the waste-pipe of the cistern (having, of course, a close lid too) with the trap of the water-closet? We have known instances of a whole family of children being stricken down at one time with scarlatina in its very worst form in consequence of the nursery being placed in close contiguity to a foul and defective water-closet.

It may be alleged in such cases, with the highest probability, that the water-closet was imperfectly constructed, and it may easily be admitted that neither the water-closet itself nor the soil-pipe to which it was attached was made of good materials in the first instance, or properly fitted up in the second. Our whole building jurisprudence is unquestionably at fault in this matter, for it is absolutely left, as the law stands at present, at the option of any speculative proprietor, or any needy contractor, to do what seemeth just in his own eyes, in this most vital and important constructive detail.

The stoutest and best-made leaden soil-pipe in the world cannot long resist the action of sewer gas; and as supplementary to the statements already mentioned, we may briefly indicate how this curious yet dangerous consequence occurs. That which is popularly termed "sewer gas" consists in reality of a compound of different sorts of gases;—sulphuretted hydrogen, hydro-sulphuret of ammonia, carburetted hydrogen, carbonic acid of course, and minute traces of certain other gases, including arseniatted hydrogen, when the sewer becomes impregnated, as it often does underground, with coal gas. Of these highly noxious and dangerous gases, the two first mentioned constitute the greatest bulk of the compound; and of those two again, sulphuretted hydrogen chiefly predominates. Now this abominable gas, which the merest tyro in chemistry must be acquainted with from its disagreeable odour—that is simply of rotten eggs—has a well-known and specific action upon lead. Indeed, it is beyond all question the best analytical test for lead; a fact which signifies, in other words, the greatest chemical affinity. Although it occurs in nature associated with certain mineralogical groups, it is far more frequently produced by the decay and decomposition of organic substances, such as albumen, fibrine, caseine (e.g., as in eggs, flesh, or cheese), and in the rest of the so-called proximate principles of organic chemistry. Almost all decayed animal and vegetable matters evolve this gas. Indeed, it would seem to be a wise and salutary provision of nature to make the process of decomposition in all its phases offensive, and these decomposed principles our readers will be at no loss to account for, some of them at least, in the substances which (always speaking collectively) we term *sewage*. The residuum of sewage is that which goes to make up the contents of all soil-pipes, cesspools, and cesspits, of whatsoever description or denomination. Few people who are not well read in organic chemistry understand what a quantity of sulphur is necessary to the waste and reproduc-

tion of the tissues; and still fewer, we are afraid, that this sulphur, wholesome in the highest degree, and indispensable to our nutrition, when it occurs in our food, becomes by an inscrutable law of nature a deadly poison. The truth is, that this poisonous gas simply dissolves the metal (lead) and perforates the tube which constitutes the soil-pipe, and finally escapes itself, mixed with all its infernal death-producing congeners, into our bedrooms, our drawing-rooms, and even our very dining-rooms. It may be added that this is done continuously,—under certain circumstances irresistibly,—but, above all things, silently and unseen. The whole of these sewer gases are colorless and invisible; however dangerous, however poisonous, they may be, they are always unseen and insidious. It needs an acute and practical nostril, for the most part, to detect them; and, in point of fact, in many instances, where the house is properly and systematically ventilated (especially during the day), it is almost impracticable to detect them at all, even by their vile and noxious smell. When it is added to these remarks, that hardly such a thing as a perfectly sound and complete system of sewerage, far less of house drainage, exists in any of our large towns, it will at once be seen what a dangerous and wide-spread public enemy we have to contend with.

PROPOSED LUNATIC ASYLUM, ST. ANN'S HEATH, VIRGINIA WATER.

We have already spoken of Mr. Holloway's intention to erect a lunatic asylum for the unsuccessful of the middle classes, and to present it to the country, and of the designs for the building that had been submitted to him in competition, under certain conditions. We published a view of the design to which the second premium was given,* and we now illustrate, by view and plan, the design sent in by Messrs. Crossland, Salomons, & Jones, to which the first premium has been awarded. In this design the architects have avoided the ordinary gallery system, their experience being, they say, that it does not conduce to the comfort or general management of the building; and in this matter medical men and general managers of asylums consulted have confirmed them. The general form of the building is such that all day-rooms, dormitories, and single rooms have a south and south-western aspect, and the mode of communication is by corridors 7 ft. wide.

The patients are classified as follows, on the male side:—

There are four classes,—first-class patients, second-class patients, sick and feeble, and excited patients, in the following proportions. The female side similarly arranged:—First-class patients, 35; second-class, 30; third-class, 15; fourth-class, 20.

The proportion of single rooms to each class is as follows:—

First-class:	6	single rooms;	29	in dormitories.
Second-class:	5	"	25	"
Third-class:	6	"	9	"
Fourth-class:	8	"	12	"

All the feeble patients are to be on the ground and first floors. Provision is also made for fever or contagious cases on the upper floor, with separate stairs, with dormitories for five or more beds, spare rooms, separate kitchens, &c., for nurses, with cubical contents in dormitories of from 1,600 ft. to 2,000 ft. for each patient. The floors of these rooms are to be of oak, with fire-proof arching. The attendants are placed between the day-rooms and dormitories, with a glass window or doors of communication, and so arranged as to afford the means of overlooking the patients. There is also a bedroom for the night attendant in a quiet portion of the building, where he can sleep during the day. Extra rooms, both for attendants and patients, are provided on each side of the buildings. The associated bedrooms, as will be seen on the plans, are so constructed as not to contain less than four or more than ten, and all under the supervision of the several attendants.

All exuberance of ornament and expensive detail is avoided, and it is sought to obtain an effective building by a judicious arrangement of parts. The buildings are to be of red bricks, with stone arches and string-courses, small turrets carried up over the staircase, and made available for ventilation. A large tower carried up over the central staircase will contain a large tank for the supply of all the other cisterns, and

to be used by hydrant in case of fire. In the smaller towers are the cisterns for the supply of hot and cold water for the several baths, lavatories, and W.Cs. The arrangements will be understood on reference to the plans.

The buildings are approached from the south, with suitable lodge and gates. The general entrance to the building for patients, &c., to the porter's room, the committee-room, the visitor's room, the superintendent's office, the clerks' and steward's offices, storerooms, and other offices, is on the north side; there being one general entrance to all, with a road diverging to the stores.

The accommodation for the male and female patients is kept distinct on either side of the central entrance and grand hall. This central grand entrance and staircase is only used for visitors on state occasions, leading up to the entertainment hall. The building on each side is divided, as before mentioned, into wards, with four attendants to each ward.

The building consists of three stories; the upper story being exclusively devoted to sleeping accommodation.

There is provided in the basement, central on both sides, a series of rooms for a Turkish bath, hot-air and vapour bath.

The kitchen is placed central to the whole establishment, surrounded by the several stores. Attached to the kitchen is a large serving-room, with lifts to each floor.

On referring to the plan, it will be seen how convenient the arrangement is for the distribution of food to each department. Sleeping accommodation is provided for the servants over part of the stores, with separate stairs, and altogether distinct from the rest of the establishment.

A large hall is provided central to both sides, having service-rooms and lifts from the kitchen, so as to serve for public dinners if required; also cloak-rooms for ladies and gentlemen. The hall is fitted with a platform at the end, and a gallery is provided, which may be made available for an orchestra.

Provision is made for the following officers:—

Medical superintendent—Two sitting-rooms, library, five bedrooms, bath-room, kitchen, and necessary offices, and so arranged that the servants are barred from all communication with any part of the general buildings.

The assistant medical officer, the steward, and housekeeper have each one living-room, one bedroom, and bath-room; the chief attendant on each side, a bedroom, and separate room to be used as store or office. The steward's rooms and office are close to his stores, on the north side.

Wine, beer, and coal cellars in the basement. All coals are carried up to the several floors by lifts, and there is a shoot from each floor to the basement for ashes. Close to the kitchen on each side is a separate dining-room for the attendants.

Sleeping accommodation is provided for the domestic servants in the centre of the building, with a servants' hall and W.C. The day-rooms are so arranged as to have ready access to the airing-grounds; those for the aged and infirm are on the ground-floor. A billiard-room is provided on the third floor, close to the central tower.

On the ground floor on each side, near to the centre of the building, is a library for male, also separate one for female, patients.

The associated dormitories, for clean and healthy patients, have from 60 to 80 superficial feet for each. The separate sleeping-rooms for the first-class have 170 superficial feet; and second-class, 85 superficial feet. The water-closets in all parts of the establishment are to be arranged on the same system, each water-closet ventilated separately by a pipe passing to the outer air from below its trap, so that the sewer gas will pass away through it. This is extra to the special ventilation of the drains.

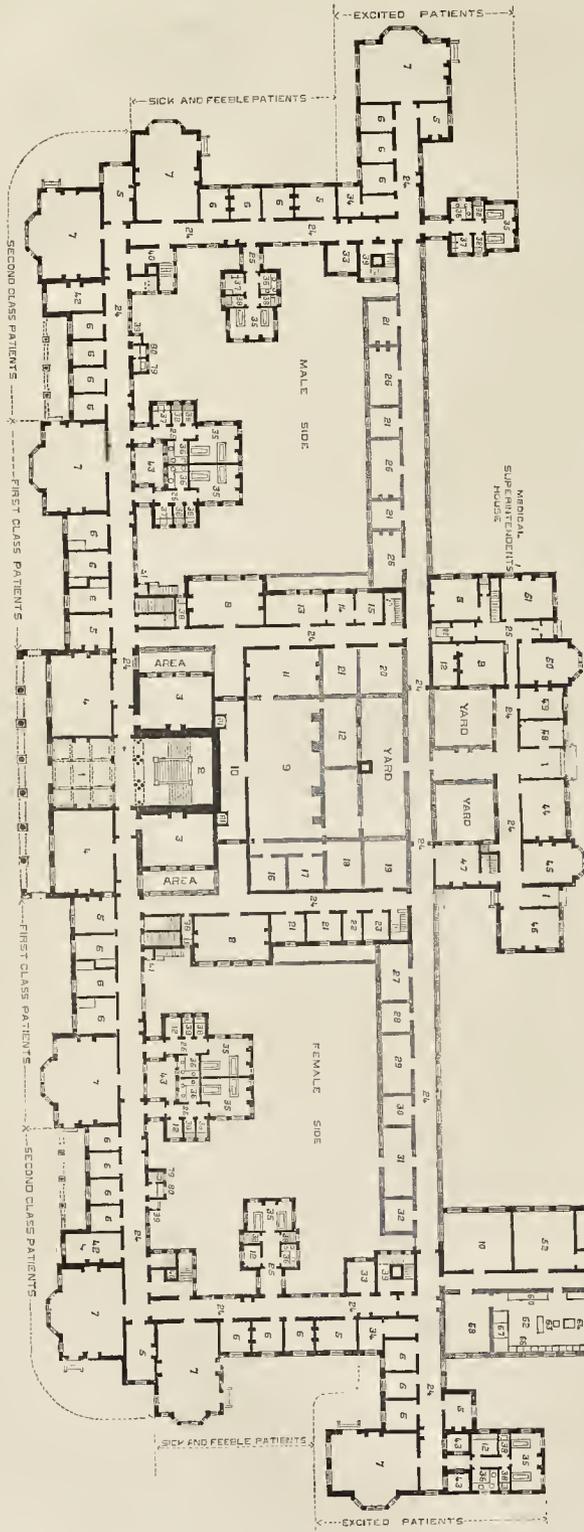
A special compartment is to be constructed in a large chimney to be used for extracting foul air from the drains.

The system of ventilation adopted is that used in other buildings of this class; foul-air flues from each of the single rooms and dormitories into a horizontal flue in the roof, leading into a ventilating shaft, and by means of rarefaction extracted. The fresh-air flues are from the basement, where the air is warmed. The ventilation of the dormitories is effected by gas-burners placed in the ceilings, and carried in flues in the walls. In the extracting or ventilating shaft in the towers, hot-water cisterns are placed, so as to rarify the air. All the flues are to be lined with glazed socket drain-pipes, and all the external walls are to be hollow, with 2 in. cavities.

* See pp. 607, 609, ante.

PROPOSED LUNATIC ASYLUM, ST. ANN'S HEATH.

GROUND FLOOR PLAN



- 1. Hall.
- 2. Principal stairs.
- 3. Dormitory.
- 4. Kitchen.
- 5. Attendant.
- 6. Single room.
- 7. Attendant's dining-hall.
- 8. Kitchen.
- 9. Bed-room.
- 10. Bed-room.
- 11. Bed-room.
- 12. Bed-room.
- 13. Bed-room.
- 14. Bed-room.
- 15. Bed-room.

- 16. Bread-store.
- 17. Bread-room.
- 18. Bread-room.
- 19. Bread-room.
- 20. Bread-room.
- 21. Bread-room.
- 22. Bread-room.
- 23. Bread-room.
- 24. Bread-room.
- 25. Bread-room.
- 26. Bread-room.
- 27. Bread-room.
- 28. Bread-room.
- 29. Bread-room.
- 30. Bread-room.

- 31. Fuel.
- 32. Fuel.
- 33. Fuel.
- 34. Fuel.
- 35. Fuel.
- 36. Fuel.
- 37. Fuel.
- 38. Fuel.
- 39. Fuel.
- 40. Fuel.
- 41. Fuel.
- 42. Fuel.
- 43. Fuel.
- 44. Fuel.
- 45. Fuel.

- 46. Medical office.
- 47. Medical office.
- 48. Medical office.
- 49. Medical office.
- 50. Medical office.
- 51. Medical office.
- 52. Medical office.
- 53. Medical office.
- 54. Medical office.
- 55. Medical office.
- 56. Medical office.
- 57. Medical office.
- 58. Medical office.
- 59. Medical office.
- 60. Medical office.

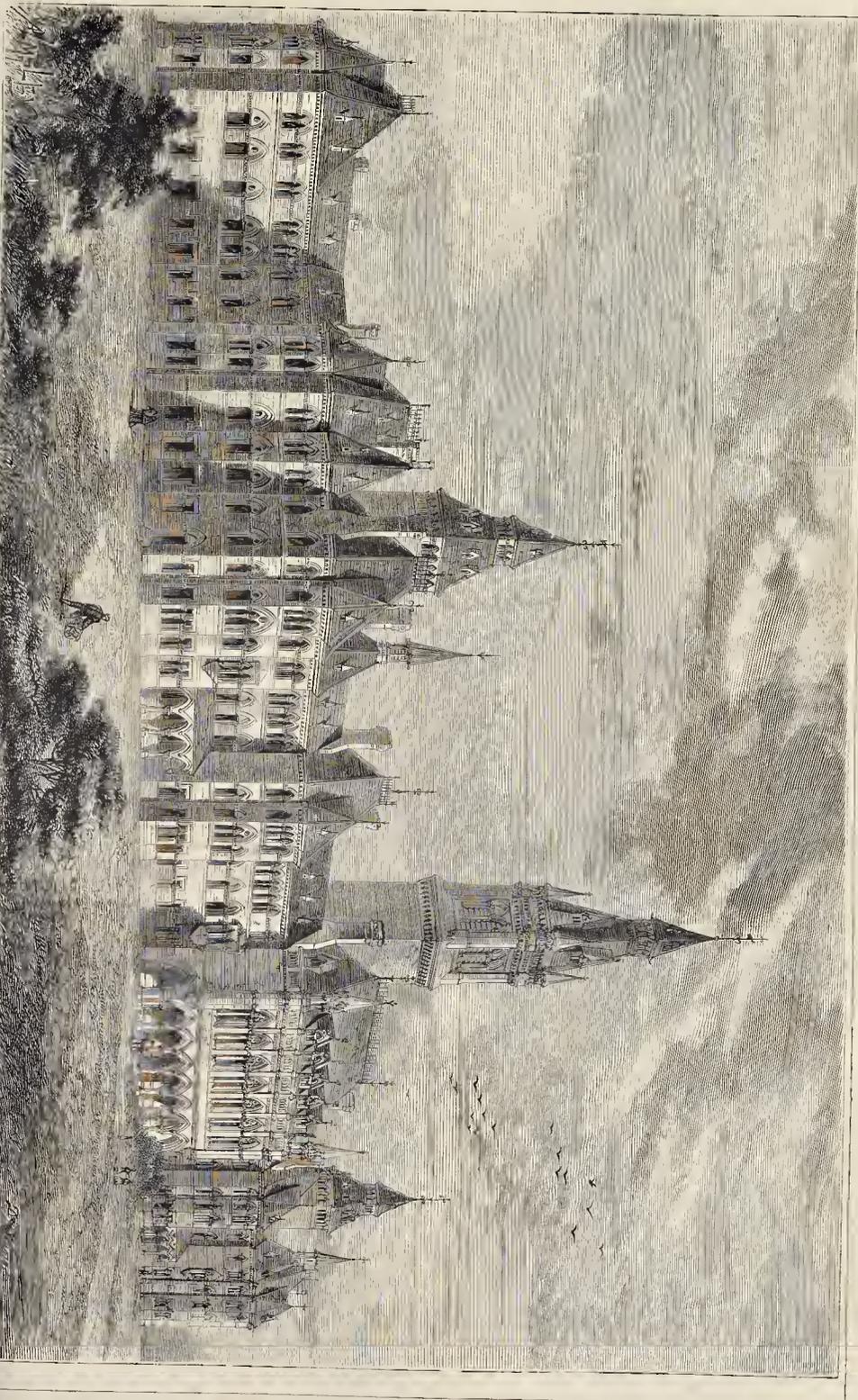
- 61. Ironing-store.
- 62. Table.
- 63. Washhouse.
- 64. Washing-machine.
- 65. Centrifugal drying-machine.
- 66. Centrifugal drying-machine.
- 67. Centrifugal drying-machine.
- 68. Centrifugal drying-machine.
- 69. Centrifugal drying-machine.
- 70. Centrifugal drying-machine.
- 71. Centrifugal drying-machine.
- 72. Centrifugal drying-machine.
- 73. Centrifugal drying-machine.
- 74. Centrifugal drying-machine.
- 75. Centrifugal drying-machine.

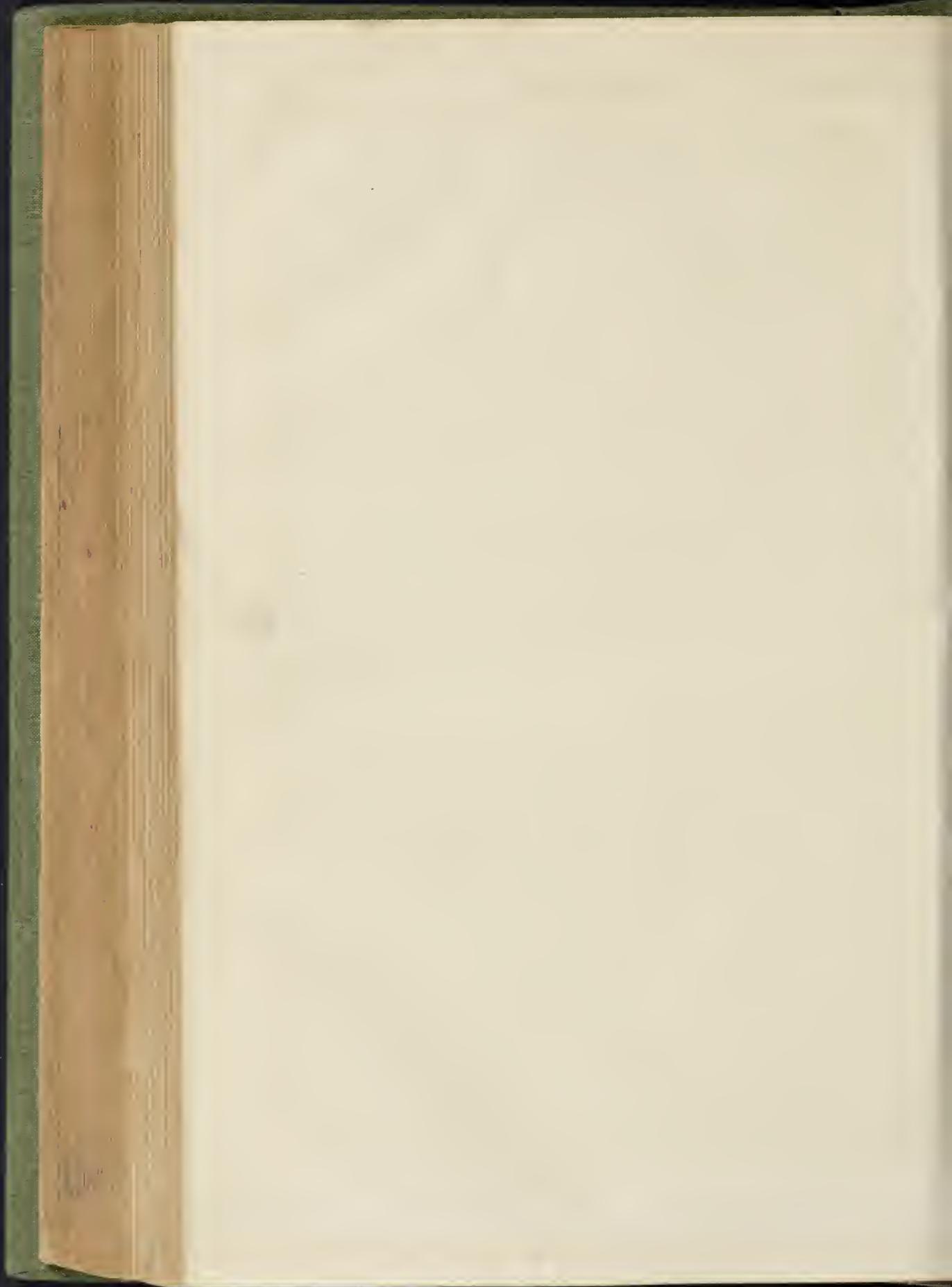
- 76. Steam engine for pump.
- 77. Engine for pump water to boiler.
- 78. Engine for pump water to boiler.
- 79. Engine for pump water to boiler.
- 80. Engine for pump water to boiler.
- 81. Engine for pump water to boiler.
- 82. Engine for pump water to boiler.
- 83. Engine for pump water to boiler.
- 84. Engine for pump water to boiler.
- 85. Engine for pump water to boiler.
- 86. Engine for pump water to boiler.
- 87. Engine for pump water to boiler.
- 88. Engine for pump water to boiler.
- 89. Engine for pump water to boiler.
- 90. Engine for pump water to boiler.

REFERENCES



PROPOSED LUNATIC ASYLUM, ST. ANN'S HEATH, VIRGINIA WATER, WINDSOR.—Design to which First Premium was awarded. Messrs. Crossland, Salomons, & Jones, Architects.





DR. CARPENTER ON NATURAL LAWS.

The address of Dr. Carpenter as president of the British Association must have taken a great many of his colleagues by surprise, and has opened up a fertile field for discussion. "I open," he says, "to satisfy you that those who set up their own conceptions of the orderly sequence which they discern in the phenomena of nature, as fixed and determinate laws, by which these phenomena not only are within all human experience, but always have been, and always must be, invariably governed, are really guilty of the intellectual arrogance they place in the systems of the ancients, and place themselves in diametrical antagonism to the real philosophers, by whose comprehensive grasp of penetrating insight that order has been so far disclosed."

The absolute infallibility of scientific deduction, accepted without careful comparison and analysis, has never been taught either by ancient or modern philosophy. That not an established fact in science which requires unshakable phenomena as natural law; it is her vocation not to create, but to discover; and the fallibility of man is shown by the practical application, and not by the revelation, of natural laws. Let us take, as an illustration, the principles upon which an iron girder or a bridge is constructed. I presume it will not be contended that the parabolic transmission of the strain can depart under any circumstances on the law of gravitation, and if a weak portion of such a girder exists, it is in the manufacture of the iron and not in the natural fibre of the material; or it arises from a formula misapplied, or an error of calculation, and consequently a false distribution of power. It has, therefore, in its creation, a conceivable element failure, which is a negative proof of the infallibility of natural laws, since the inferiority of a material or the insufficiency of sectional area is open to positive demonstration, either by the method of investigation of the formula, which was founded upon a series of practical experiments upon the tensile or compressive qualities of iron, occurring in that "orderly sequence" against the belief in which we have been warned by Dr. Carpenter. From the practical success that is the result of those formulas, may consider them to be "fixed and determinate laws."

The soundness of scientific inquiry is built on precedent by the faculty of deduction, which can only arrive at a faithful result by a series of comparisons: a multitude, as it were, converging lines to one common centre of elevation. This must establish the truth of any scientific inquiry before it can be tested by a practical trial. In speaking of the discoveries of Kepler, Dr. Carpenter says, "The first, that of the revolution of planets in elliptical orbits, was based on study of the observed places of Mars alone; night or might not be true of the other planets, so far as Kepler knew, there was no reason why the orbits of some of them might be the concentric circles which he had first proposed that of Mars to be." The contention by Dr. Carpenter is the answer to his objection: there was no reason in the absence of scientific evidence of "this application to other planets." Here was wanting that very crucial deduction without which no man of science would have been warranted in concluding that because a law was obviously governing the elements of one, it was equally controlling the elements of the planets. In my late articles on the Harmony and Application of Natural Laws, for which you were good enough to find space in your columns, I may, perhaps, have toned down some satisfaction (in agreeing in one respect where I have differed in many from some authority), that I dwell especially upon the necessity of the labour and patience of research, as the only means by which we could be liberated from the entanglements of falsehood and error; and, knowing the truth, by that knowledge to be made free.

In considering this question in its religious aspect, it cannot be said of the artist, of the philosopher, or the philosopher, that he is distinct from the others in his interpretation of nature; in the religious application and ethics of natural laws, the two former are distinct from the philosopher, as they are often the expounders of things which are unseen, and the basis of religious teaching is therefore that of faith. Science does not admit of anything like that which the artist knows to be sometimes essen-

tial, the accident of his picture, the shadow of a cloud which is not upon his canvas. She can raise no emotional feelings like the poet, from the source of ideality; she cannot draw from the beautiful well-spring of legendary lore. She must be true only to herself, or she will be false to the great principles she expounds. Her region is that of formula and fact; upon the former the latter must be built, and the deductions which are the result are the truths of science, and are in unison with natural laws. On one occasion I heard at a philosophical discussion this astounding statement from a clergyman of the Church of England, "that formula was only another name for going round about truth, and never arriving at it." Religion gains nothing by statements such as this, and she loses much,—she loses that tolerance which should exist between science and her own professors. It aggravates the antagonism already existing, and widens the breach which I believe it is within the province of science to surmount.

Science, by the application of natural laws, may not only achieve the purposes of the Creator, but it is fulfilling the very ordinance of religion by "the light which it causes to shine before men," but we cannot start with religion, and strive to reconcile the immutable laws of nature with every one's preconceived doctrine of theology, but must rather be led, by the comprehension of natural laws, from—

"Nature up to Nature's God."

BYNG GIRAUD.

LIGHTNING CONDUCTORS.

The electric peculiarities of this season have led to a discussion of the subject of lightning conductors in the Times. In a letter signed "E. B. Denison" the writer says,—

"When I was managing the fixing of the Westminster clock, I found that Sir W. Snow-Harris had actually embedded the conductors of the clock-tower,—flat copper bars,—in the walls, and he did much the same at Exeter Cathedral, and in the wooden masts of ships. In fact, glass collars are hardly less absurd than the glass flials which I remember an architect putting on a spire, with a view to keeping off the lightning, which repeated the insult by knocking over the spire in four years.

It must, however, add a warning in the opposite direction, as many people will be putting up conductors after all these thunderstorms. The conductors of spires should be fixed to the very bottom of the vane-rod, if there is one, and not above it, otherwise the electricity runs down to the end of the rod, and, finding no continuous metallic communication, leaps across to the spire, and either smashes it or sets it on fire. . . . The lead on a spire should be connected with the ground by a conductor, which may be a stout copper bar, or a conductor in another sense. The copper ropes are safer from damage inside the tower than outside.

As a cheap and efficient conductor for houses: Mr. Alfred Vandy recommends "gas barrel":—

"This can be bought at any ironmonger's in lengths varying from 1 ft. to 12 ft., each length being furnished with screws and sockets for connecting the barrel together. The gas-barrel has also the advantage of being stiff as well as cheap.

The first 12 ft. should be driven into the earth, and, where practicable, the barrel may be connected to the water-pipes.

The barrel should be led up the house, outside the walls in as straight a line as practicable, and attached to the house by iron staples driven into the walls, or by any other suitable way.

The top length, which should be carried to some height above the house,—say 15 ft. to 20 ft. (the higher the better),—may be terminated with a pointed copper rod attached to the interior of the top length of the barrel.

The retail price of gas-barrel is about 3d. per foot for 1/2-inch barrel, and about 6d. per foot for 3/4-inch barrel; to this must be added the cost of screwing the lengths together and attaching the pipe to the wall,—not an expensive operation."

In a compilation (for trade purposes) by Messrs. J. W. Gray & Son, whose system was patented under the cognizance of Sir W. Snow-Harris, and has been carried out in the Houses of Parliament, the Royal Navy, and many public buildings, the compilers remark that,—

"It is now well known that metallic substances have not in themselves any more attractive influence for the agency of lightning than any other kind of common matter; that, in short, all matter is equally indifferent to ordinary electricity in a free state, such as the electrical discharge. Lightning, in certain cases, only falls on metallic substance, rather than other substances, from the circumstance of these affording less resistance to its progress when occupying a certain position in space, aided, perhaps, by pointed terminations, which have a sort of mechanical action in further lessening the resistance in their immediate vicinity; but lightning will not so fall if less resisting path be open to it in any other direction, even though it may happen to be through worse conducting matter. If the metallic substance be not present, still lightning will strike on the next best conductor; hence it is found that, in a great variety of instances, lightning appears to avoid pointed or other metallic substances, passing them by altogether."

"We have to point out from experience that it is requisite to link into one great chain all parts of the building; the metallic bodies, chimney-stacks, &c., employed in the construction of the building; and provide, in connexion with these one or more continuous conducting channels between the highest points and the ground, regard being

had to the nature of the soil and the extent and disposition of the metallic bodies in the building, so that on any explosion of lightning falling on the general fabric, the electric matter could not move by disruptive discharge upon any circuit of which these main channels do not constitute a part."

The common methods of lightning-rods, they consider, are of too partial and precarious a character, and based upon principles too hypothetical, to be admissible as a complete (if any) security against the terrible agency of lightning. "It has been, for example, supposed that a common lightning-rod would influence the discharge of a cloud at a distance equal to two-thirds of the altitude of the rod, and would hence give protection to that extent, which is certainly not only an untrue assumption, but is contradicted by the positive facts, especially in the observed operation of lightning on ships of the Royal Navy, from the official journals of which a vast and most important series of observations relative to atmospheric electricity have been derived."

Mr. Latimer Clark thus describes a simple and inexpensive lightning conductor:—

"Take four similar lengths of ordinary galvanised No. 9 wire, which is the wire commonly used for telegraphic purposes, and is about an eighth of an inch in diameter. The four wires are, by means of a stout stick, to be twisted together into a rope of sufficient length to reach from the top of the highest chimney to the ground, and to extend 20 ft. or 30 ft. under-ground. This rope may project a few inches above the chimney, and the wires may spread out into forks and pointed, if several chimneys rise of the same height, the conductor should be slightly raised above them, so as to protect the whole. It may be fixed in any manner or direction, either within or without the house, as found most convenient, but if there be any leaden gutters or pipes near its path it is preferable that it should touch them. When the conductor reaches the ground a little more care is desirable. If it be buried for 10 ft. or 12 ft. in thoroughly wet ground, such as that afforded by a drain or well, it will be secure; or, if it be placed in full contact with any water-pipe or gas-pipe; but if damp earth be not obtainable, about 20 ft. or 30 ft. of its length should be buried in a straight or crooked direction, in the ordinary soil, at a depth of 2 ft. or more. The only remaining precaution is to take care that this conductor never becomes severed at the bottom either by decay or willful injury. For large or lofty buildings, and in all cases where expense is not an important consideration, and where great security and permanency are desired, it is better to resort to skilled advice and to the copper conductors. Most modern houses of good construction are unintentionally provided with efficient conductors; the eaves and ridges are covered with lead, and these communicate by metal spouts with each other and with the ground, and commonly also by cisterns and water-pipes with the iron mains of the town."

THE NEW GLOBE BRIDGE AT PECKHAM AND THE TRADESMEN.

FROM the statements made by a deputation of tradesmen and shopkeepers who waited on the Camberwell vestry, at their meeting last week, it would appear that serious injury is being inflicted by the delay now taking place in the construction of the new Globe Bridge at present in course of erection for the Camberwell vestry over the Surrey Canal in Commercial-road, Peckham. The vestry seem to have been singularly unfortunate as regards the contract for this undertaking. In the first instance, the original contractor, whose tender was remarkably low as compared with those of his competitors, was unable to complete his surties, the result of which was that the vestry had to advertise for fresh tenders, which was followed by the acceptance of the present contractor's tender. A few weeks ago, the latter intimated to the vestry that he could not go on with the contract unless certain relaxations in his favour were made, and he proposed throwing the contract over. A subsequent understanding, however, between the vestry and the contractor and his surties appeared to be a guarantee of the works being vigorously proceeded with, but there are still loud complaints of the delay in construction, and its injurious consequences to the tradesmen in the neighbourhood. They allege that after having had to endure, for an unreasonably long time, a stack of bricks deposited in front of their shops the construction of the bridge commenced, but that it proceeds so slowly as to give no promise of a termination, and that in the meantime their businesses are being ruined, one of the deputation stating that recently, on a day which he named, he only took 6d. in his shop during the whole of the day.

The statements of the deputation elicited considerable discussion, in the course of which several members of the vestry expressed much sympathy with them.

One vestryman stated that having paid a visit to the works, and finding they were not progressing satisfactorily, he had urged the committee to close with the contractor at once;

whereupon Mr. Dresser Rogers, the chairman of the committee, stated that steps to that effect had already been taken, the sureties having been called upon to perform the work.

Another member of the vestry suggested that the penalties should be rigidly imposed if the contractor did not complete the work within the stipulated time, and that the tradesmen who were suffering should be reimbursed out of those penalties.

It was ultimately decided to inform the contractor and sureties that the penalties will be enforced if the work is not completed within the specified period. The terms of the contract are that the contractor is to finish the work in six months from the 1st of April last, the penalties for non-fulfilment of the contract being 20% per week.

It is altogether improbable that the terms of the contract will be complied with. Nearly five months of the time have already expired, and the coffer-dams are still in the canal without any piers in sight.

OLD CHURCHES AND NEW.

If it were wished to adduce in a practical and familiar way any one subject which should carry conviction to the general public mind of the wide gulf of difference between the old system of putting a building together, and afterwards of "decorating" it, and the modern of to-day mode of doing such work, it would be to instance a good old-fashioned *unrestored* church of almost any date,—i.e., Middle-Age date. It may be useful at the present time to note some of these differences between the old and modern work, and to try to find out how to build a modern church that shall look like an old one, or, rather, so to build it as to follow the ancient method of design and work,—in short, to build artistically, like the men of past times. And, first, it is to be noted, if you visit an *unrestored* church, no matter of what date, it is truly surprising how little you find in it to specially talk about: the place seems almost empty: there is nothing in it or about it that one would naturally expect to find in a place which you are told is almost a museum of fine art. But go into a quite new modern church, of the ordinary type, built with but moderate funds; and there is almost no end of details. The floor is half-covered with smart and now encaustic tiles, sometimes not a little glaringly clean; the walls usually plastered, and thickly coated with drab-coloured wash, even if they be not painted with the usual coatings of common oil-colour. There is almost no end of *ornaments*, more or less elaborately filled in with tracery; so many on one side and so many on the other,—indeed, every bay between the buttresses has its window,—that is, where the doorways or porches do not come in. There is, of course, a large east window, and a large west window. If the church has aisles, there is the clearstory also, with its regularly-arranged series of lights. We know all this by heart: a new church of the usual Gothic type is as much a cut-and-dried affair as a ready-made coat, of which some thousands are cut out by a machine made expressly to do it. The roof-timbers may differ a little in actual disposal, but there they are, and the *dimensions* of them may be seen in any of the useful guide-books to church-building. And then there are the two porches, of course, and the tower and spire. What a curious thing is a modern church!

But as a contrast to all this regularity, and primness, and neatness, and ornament, it is not a little striking to examine a thoroughly neglected, *unrestored*, and almost disreputable old church, of almost any date and style of Gothic. The first thought about it is, how very plain and meagre it all looks and is. We well recollect seeing a church of this type in a somewhat out-of-the-way place, at some small distance from a town. The "side elevation" of this unpretending structure, fourteenth-century work, had but one solitary buttress in it, viz., the strut and merely constitutional one, put there not because a buttress is a Gothic feature of architecture, but for the sole purpose of resisting the thrust of the heavy chancel arch. It was long and it was broad, and without ornament of any kind, but it did its work well, and looked thoroughly useful. There were no side windows in the chancel, nothing but the plain rough stone walling. There were two very plain and simple-looking windows in the one side elevation of the church, and none in the other. No clearstory. The west window seemed to do all the lighting

of the church. A sombre place inside, shabby some might call it, dingy certainly; but in reality full of colour and light and shade of the true sort, something far of a picture of an old deserted church, and full of memories of the past. It would take too long to go into detail and to name every individual thing in the place, from the altar-table to the solitary four-light chandelier hanging from the dingy roof, but one or two things must be named to make our meaning and intention clear.

First, then, the floor: nothing but very rough and worn paving visible, except in the chancel, where there were some dozen or so of encaustic tiles, all of different patterns, much worn, and of no small interest, each tile quite a little study, full of drawing and colour in the true sense of that word. In the chancel window were a few fragments of painted glass, but few as they were, they had the effect of filling the eye with the pleasing sense of colour and even form, for the fragments were of great interest, and were enough in number to show what the window was when complete. Quite a picture in colour was seen. Amid the dimness of the dull chancel glass. This window, or rather fragment of it, quite satisfied the mind, and with the tiles filled the eye with the sense of colour, as we have said. Of the main body of the church itself it is almost needless to talk about in the art sense as now understood. There was not a single fragment of ornament anywhere to be found in it, not that it had been destroyed, but it never had any existence. The capitals of the nave columns supporting the nave wall and roof were composed of a few mouldings, hardly noticeable. The columns were round. We must not, however, forget the chancel arch, for although it had but one or two mouldings and no carving of any kind, its effect was singularly impressive from its mass, and depth, and look of solidity. We must repeat that the whole interior of this church did not contain, beyond the tiles and the glass fragments, one single bit of ornament; the whole effect was got out of solid architectural forms, useful construction, and real material. We do not propose to say anything on the fate of this particular church, if it passed through the same phase which all old churches have already passed through or are destined to pass through. There is as much ornament added to the ancient structure as would have served for the ornamenting of a dozen or two of such buildings in bygone times. Two things more unlike each other than a modern restoration church and one of them in a primitive state there cannot possibly be. It is the difference between art and art-manufacture. There is a gulf of difference between the two ideas.

But our main object in thus calling a passing attention to the almost extinct old church in its *bona fide* state is for the purpose of showing how independent to a great extent is architecture of sculpture and painting. These may come afterwards and decorate it, and make it more interesting and impressive, but architecture, *per se*, is a something. Here we have a building of excessive plainness, nay almost poverty, absent; but still as that word is now understood, absent; but still as we have said; but, it must be recollected, architecture with *individuality* stamped legibly on it. It was impossible to look on the walls even, *i.e.*, the bare walls, without interest; surely the men of past times, ignorant as they doubtless were of all that makes up modern science, were artistically more capable than we moderns. The mere wall builder must have been a thinking man, as well as a workman; for, if not, how is it that all old masonry, mere walling, is a something to look at. No ornament is necessary, the mere and simple wall is enough, and seems to invite the eye to look at it; you cannot help thinking that there must be something more in it than there really is, or well can be. Surely modern men have yet to do the walling of a church, as it ought to be done and has been done! There is another reason for our calling a moment's attention to these strange facts, interesting to a few minds certainly, and that is that having got architecture *per se*, *i.e.*, the useful building, and without as yet any ornament, even a fragment of it, it then becomes a task to add to the interest of such structure by the addition to it of sculpture and painting, or decoration, to use a word of somewhat wider meaning.

The problem arises, how to do this in the best and truest way, and sometimes in the cheapest?

Our answer would be, to call in the aid of the artist, or the artist-workman, to do a little, or a little at a time. Exclude altogether the system of art manufacture. Let us employ, if it be possible, the artist himself to do a little, a very little it may be, of decorative work. Suppose, for instance, the building be perfectly plain, like the church we have cited; let the artist come in and paint but one small panel as *bona fide* work: that is, real work, his own work. Will not this be of infinitely greater interest, little as it may be, than to have the whole building covered up and hidden away by the shop decorative system? Suppose it is sculpture that is wanted: a few heads or a few fragments of ornament, suppose it be only a row of ornament round the chancel arch done by artistic hands, and would not this be more impressive than the miles of "curlicue" we see everywhere, and but for which modern buildings would be entirely bare of "architecture," and would be called "buildings"? No subject can well be more suggestive than this at the present time, for it is impossible to deny that more money is expended on art nowadays than ever before. The picture which a few years back brought to its industrious painter some hundred pounds, now finds purchasers at the rate of three or four thousand. The cup and saucer painted by a clever artist-workman for a few shillings is now competed for, at our wonderful auction sales, with heavy bank-notes! What are our artists-workmen doing that they cannot bring their work, if not into the church or the palace, at least into the auction-room?

We must start *de novo*, and to build a new church, or new law courts, or to decorate a cathedral, or to really restore or add worthily to an old church, we must surely begin all over again,—not by expecting that such work can be accomplished by the hiring whole gangs of workmen to do the art-work "under superintendence," but by one man following another, as in the art manufacture of plates and dishes, but by the strict adherence to the one great principle on which all the old work was really done, *viz.*, by the employment of the human agency,—as human, *i.e.*, mind and hand, and not as in a machine, wherein each man, or agency, is as a wheel in such machine, and sometimes as a cog merely in each individual wheel. This is to weld the very soul out of a man, and to reduce him to the level of mere insensate matter, or little better; and it, of course, shows itself in the work he does. The real principle of work is not in truth for workman as well as for artist, same in truth for workman as an individual. The architect, the painter, the sculptor, the workman, are in reality as one, and their work is one, but it must be *bodily* as well as *mentally*, and mentally as well as *mentally*, and it is only in this way that nature has bestowed on man the power to create; but to do this he must not only create *mentally*, but he must realise manually. It is not either separately, but both together, that have produced the magnificent realities of the "old time before us."

"AN ECONOMICAL STOVE."

In answer to the appeal for an economical stove, allow me to draw your attention to a stove that has existed and been used with perfect success in Italy for some time. It involves the necessity of its being heated with charcoal instead of coal, which, in these times of dearth of coal, might prove a veritable boon.

I send you the description as advertised in the Italian papers, and will order the proprietor to communicate with the Council of the Society of Arts on the subject.

The use of this stove is extensively spread through France as well as Italy, and, when adopted by those studying economy, has proved of eminent service.

The apparatus is of iron; part is tinned, part galvanised; it weighs not more than 15 kilograms, or 33½ lb., and occupies about the space of a cube of half a metre. It requires a particular spot on which to be placed,—and either on the ground, in a chimney-place, on a table or chair, in the corner of a shop or room.

In addition to its moderate cost, it does away with all the expense of kitchen utensils, necessary recipients for the cooking of different dishes forming part of the apparatus itself.

The fire is made of charcoal, broken in small pieces, the size of a nut.

To cook a dinner for six or eight persons (in France and Italy), a half-penny worth of charcoal is sufficient. The receiver of the charcoal is placed in the midst of the water: this precludes danger. The water while boiling heats either *à bain-marie* or by steam the receivers, in which is placed the soup, meat, or vegetables. The receiver in which is placed the *roast* alone is in direct communication with the fire. Potatoes, or any other vegetable, by means of an especial receiver, can be cooked without water, and by steam only, thus preserving the taste in perfection. By means of an iron lid (like the country one) sweets and pastry are successfully cooked, lighted piece of charcoal being placed on the top of the lid; in fact, the charcoal once placed the receiver, the apparatus works itself without demanding any watching.

Left to itself, the fire will last five or six hours, the end of which the dinner is cooked, ready to be served.

There then remains in the apparatus the water the *bain-marie*, limpid and clear, to wash the tea, or for any other purpose.

It is very simple, without any complication, the mechanism lasts very long, is easy to arrange, brings no difficulties in the using to whom will, for the first two or three times only, attention to the minute and clear instructions which are sent with the stove.

The price of these stoves, ready packed for exportation, is 1l. 18s. 6d., at the present rate of exchange. Why cannot charcoal be more extensively utilised in the present coal panic? This domestic stove is manufactured at and exported from Turin. F. C.

OPENING OF THE CROSLAND MOOR WORKHOUSE, HUDDERSFIELD.

THE completion of the workhouse at Crosland Moor has been celebrated by a luncheon, to which the guardians and other gentlemen were invited. There are a few finishing strokes to be done to the building, and all the rooms are not furnished.

The buildings have been erected at a cost of £100,000, on an eminence which commands a fine view of beautiful scenery, and the situation is healthy and salubrious. The principal entrance is on the north side, abutting the highway. The building is 20 ft. wide, and on either side, to the extent of 150 yards, as far as the lodge gates, are to be planted, and thus the institution will be approached by an avenue. The facade of the building faces due east, and the premises are situated and designed as to admit of the sun, in every quarter, of the sun's beams. The building is erected of stone, procured from quarries in the locality, in the Domestic style of architecture, from designs prepared by Messrs. John Kirk & Sons, of Huddersfield and Dewsbury.

The centre building is 216 ft. long and 52 ft. high, and three stories high, arranged as follows, viz.:—In the centre is the principal entrance and staircase, and branching right and left is a corridor, 8 ft. wide on each floor, which is used for easy access to all the rooms, and ventilation. In the centre tower is placed a tank, containing 10,000 gallons of water, which supply all the closets, lavatories, baths, &c. Provision is also made to attach a plug and hose which landing in case of fire.

To the right of the principal entrance, on the ground floor, is the governor's office; on the left, the warden's room. Over the same is the visit-committee's room, the governor's private parlour, and bedrooms. On each side of the staircase is a room set apart for clothing-stores; also a room on each floor above for sundry stores. The remaining part of this building, on the right side, is divided into six day-rooms for the men; four airing-grounds; and, to the left, into six dormitories for the women, also with four staircases; making accommodation for 218 inmates. From the corridor under the principal staircase the dining-hall, 58 ft. long by 35 ft. wide, an open timber roof, and fitted up with tables and seats, and a reading desk, and will seat 200. To the left of the dining-hall is the paid staff's sitting-room, kitchen, scullery, and a cooking kitchen, fitted up with a steam boiler; also the bread-stores and general stores. The larders are under the bread-stores, and are arched over.

The bakehouse, coals, and out-offices for the

servants, with a closed yard, are all conveniently arranged: to the right of this is the refractory ward, and a large coal-store covered over with a slated roof; and to the left is the wash-house, drying-room, and laundry. The boiler-house is so placed as to be convenient both for cooking-kitchen and wash-house.

To the right of the main building is the hospital, a two-storied building, 131 ft. long, one half for males, and one half for females, each with separate entrances, staircases, and airing-grounds, and is divided into ten sick-rooms, two convalescent day-rooms, surgery, kitchen, scullery, and nurses' rooms, bath-rooms, and store-rooms. All the sick rooms are so arranged as to be well ventilated, having windows on three sides, all well supplied with water-closets, lavatories, with hot and cold water; and will accommodate 32 males and 43 females. The airing-grounds are large and open, being to the front, and will have a low wall and palisading. A little beyond this is the building for fever and infectious diseases, with similar arrangements to the large hospital, and will accommodate 10 males and 10 females.

To the left of the main building is the school, 140 ft. long, consisting of two day-rooms, two school-rooms, two class-rooms, and sitting-rooms for the teachers. The schools and class-rooms are fitted up with galleries. At the back are covered sheds, for the children to play under in bad weather. The dormitories are on the first floor. There are large playgrounds, with wall and palisading.

The total number provided for is as follows:—Main building, 218; hospital, 75; infectious ward, 20; children, 100—total, 413.

At the entrance is the porter's lodge, a two-storied building, with a weighing-machine. Attached behind the lodge are the receiving-wards for each sex, with day and night rooms, fitted up with bath-rooms. Near to the porter's lodge is the vagrant ward, the entrance being from Nah Croft-lane, and is so arranged in separate yards and day and night rooms that thirty males and fifteen females can have a night's lodging at the same time, each ward having bath-rooms, &c. Work-rooms are also provided.

The architects have confined the expenditure within the estimates. The contractors were:—Masons, Messrs. A. Graham & Sons; joiners, Messrs. W. Fawcett & Sons; plasterers, Messrs. T. Loughottom & Sons; plumber, Mr. H. Garton; painter, Mr. G. Brighouse; slaters, Messrs. W. Goodwin & Sons; and ironfounders, Messrs. T. A. Heaps & Co.

Mr. Kirk, in responding, at the luncheon, to the toast of "The Architects," said the entire measurement of the workhouse was 8,243 yards. The cost of erection was 2l. 15s. per yard, but it would be 3l. if they took in the boundary-walls and palisading. They could not build a cottage house for a less price than 2l. 10s. per yard, so that they had given the guardians a very cheap building. If they took the number of inmates at 450, 55l. per head would cover the whole cost.

BRISTOL CORN EXCHANGE.

This building was originally executed from the designs of Mr. Wood in 1745, and contained an inner quadrangle, surrounded by colonnades of the Corinthian order. In this quadrangle, one story in height, and open to the weather, the important business of the exchange has until now been carried on. Many complaints of the inconveniences of such an arrangement have, however, been made, and the corporation of Bristol at length determined that the quadrangle should be covered, and protected from the weather, by a roof of iron and glass. They accordingly consulted Mr. Edward M. Barry, R.A., and the work has been carried out from his designs, and has just been opened to the public. The quadrangle is 50 ft. square, within the columns of the colonnades, which latter are about 15 ft. wide and 16 ft. high. Over the colonnades, and below the springing of the roof, there has been constructed a story of offices, 10 ft. high, with semicircular arched windows, looking into the quadrangle, each office having also a direct opening to the external air for ventilation. Between the arched windows, and over each column, are carved figures, or caryatides, well executed by Mr. E. W. Wynn, sculptor. From these figures start the arched principals of the roof, which is of wrought-iron and glass, and rises to a height of 66 ft., in the centre, from the floor. A balcony or gallery runs all round the

building at the springing of the roof, to give access to the lower part of it, which is vertical, and made to open for ventilation. The central lantern at the apex of the roof is open for a similar reason. The main ribs and the purlins are arched in form, and are filled in with open ornamental tracery, arranged constructionally. The lower part of the roof forms a vertical story of iron and glass. Three arched openings occupy the space between each principal, and can be opened or closed as may be desired. The roof itself is pyramidal, and slightly curved in section. The work has been carried out in Bath stone by Mr. G. W. Booth, of Gosport, and the sub-contractor for the iron roof was Mr. Cornell, of Cheltenham. Mr. W. Long was the clerk of the works. The cost has been between 6,000l. and 7,000l.

The Corn Exchange Committee, in a report just made to the corporation, dwelt with satisfaction on the work, and state their opinion that the public of Bristol will share their sentiments. The completion of the building was celebrated by a public dinner of those interested in the corn trade, at Bristol, on the 15th inst., under the presidency of the mayor, Mr. W. Proctor Baker.

THE STREET IMPROVEMENTS AT ST. MARY-LE-STRAND.

THE improvement now going forward in the Strand, between Newcastle-street and Somerset House, consequent upon the absorption into the thoroughfare of a portion of St. Mary's Church-yard and boundary walls, which has already been briefly noticed in the *Builder*, is no doubt one that will be attended by a great public benefit, and an advantage to both pedestrians and carriage traffic. Within the last few days a numerous body of spectators have been attracted to the novel process of laying down the wooden pavement which has been completed during the present week. We have, however, heard one fault found with this otherwise valuable improvement, and the feeling in this particular seems to be general. It is well known that hitherto there has been no footpath whatever on that portion of the north side of the Strand, along St. Mary's Church, a defect in pedestrian locomotive agency which has not only been a source of inconvenience, but of danger. The demolition of the church-yard boundary-wall admitted of an opportunity for the construction of a footpath of reasonable width; this opportunity has not, however, been availed of in the work now in progress, but the improvement is being confined to the making of a passage for pedestrians under the church wall, of little more than 2 ft. in width, which will scarcely admit of two persons meeting and passing each other, thus rendering the new and contracted footpath almost valueless. It is suggested that the footpath might have been rendered far more useful by taking an additional foot or 18 in. from the carriage-way, without any appreciable difference being made in the latter, or causing the least inconvenience to vehicular traffic.

THE SOUTH LONDON WATER SUPPLY.

A SUPPLY of purer water than has ever yet been received from the Lambeth Company will now be poured into their cisterns. The company have spent in obtaining it about 50,000l., and they propose to expend 70,000l. more in completing the scheme. Anticipating Mr. Stansfeld's Act for the improvement of the metropolitan water-supply, the Lambeth Company resolved to move their intake higher up the river than the restricted ten miles from London. They selected a spot at Hampton Court, which had been pronounced by the Royal Commission of 1857 to furnish the purest Thames water. An intake was formed there, and three-and-a-half miles of conduit laid down to connect it with the existing reservoirs at Thames Ditton. The directors and officials of the company have just visited Hampton Court to witness the turning on of the new supply. The Lambeth district at present comprises an area of about fifty square miles, and contains 300 miles of piping. The consumption within that area averages 11 millions of gallons per day, its maximum being about 13 millions. The new intake will supply about double that quantity, Mr. Taylor, the engineer, estimating the maximum delivery of the conduit when full at 26 million gallons per day, and the average throughout the year at 20 millions. Between the new intake and the reservoirs at

Hampton Court there is a fall of about 6 ft., which gives the current a velocity of about two miles an hour. Ultimately the supply will be largely increased by forming reservoirs near the new intake, and converting those at Thames Ditton into filtering-beds.

THE LONDON BUILDING TRADES MOVEMENT.

THE central committee of the carpenters and joiners having determined to appoint a deputation with full power to arrange with the masters' committee, a communication to that effect was sent to the latter, requesting them to appoint a time for receiving the deputation of the men to treat for a settlement of the dispute. The secretary of the central committee has received a letter from the assistant secretary of the Masters' Association, stating that a special meeting will be held on Thursday (this day), after which the resolution of the delegates of the carpenters would be laid before it for consideration, and it was understood that at the general committee meeting of the masters a sub-committee would be appointed to meet the men's deputation and arrange the terms of settlement, and that it was possible that this meeting might take place on Friday, but that the probabilities were that it would not be held until Monday, as there were several preliminaries to arrange before the meeting could be called.

PORTLAND CEMENT STAIRS.

SIR.—Referring to the letters appearing in the *Builder*, I can fully endorse the experience of your correspondent respecting the suitability of Portland cement concrete for stairs.

I herewith have pleasure in handing you a photograph of a circular concrete staircase and landing at the Patent Concrete Building Works, Lawson-street, Great Dover-street, London. The materials used in the construction are four parts burnt clay, one part clean sharp sand, and one part Portland cement. Three weeks after the erection of this staircase and landing, it was tested by loading it with men, as shown in photograph. The traffic up and down the staircase for the last two years has been very considerable, yet no trace of wear is perceptible.

For further good examples of this class of stairs, two flights already finished, and one in progress, may be seen at the block of industrial dwellings now erecting for the Peabody trustees at East-lane, Bermondsey.

I may mention that the nosings are not run on, after the steps are finished, but moulded entire, with the treads and risers, giving the appearance of hand-worked Portland stone.

JOSEPH TALL.

EXCLUSION OF INSECTS.

A CORRESPONDENT writes from Florence:—Are you much plagued with flies? The best remedy I have seen is in the villa in which I am now staying. Every window is provided with sheets of wire gauze fixed in movable slight small window-frames. The gauze excludes neither the light nor air, is almost invisible, and the whole villa is free from flies, mosquitoes, or any similar nuisances.

There are many country houses in England where such an arrangement would conduce to comfort, especially in the wasp season.

"TREATMENT OF BUILDERS."

IN our issue of the 10th inst. we requested an explanation from the writer of the letter on this subject, inserted on the 3rd, and contradicted on the 10th. The explanation is as under:—

"TREATMENT OF BUILDERS.

I, the undersigned Charles Brown, of South Cave, in the county of York, having written a letter, and having procured the same to be inserted in the *Builder* of the 3rd instant, signed "A Lover of Straight Dealings," and having made statements therein reflecting upon the conduct of a firm of Hull architects, but which statements I have since discovered to be wholly unfounded, hereby, in consideration of their staying legal proceedings against me, express my sincere contrition and regret that such statements as appeared in the said letter should have been made.

Dated this twenty-first day of August, 1872.

CHARLES BROWN.

Witness, J. P. CRATHAM, Solicitor, Hull."

PITCH AS A PROTECTION AGAINST DAMP.

SIR,—I beg leave to offer the following suggestion regarding "T. H. W.'s" difficulty (*Builder*, p. 229):—On occasion of the unsatisfactory use of pitch inside the house, the outside was covered with Portland cement. May it not have been through the very impervious nature of the cement, that even the effluvia of the pitch was confined, while in the other instances it was absorbed by the damp of the walls, and then gradually perspired exteriorly?

NHIL.

ROMFORD SURVEYORSHIP.

"To Surveyors.—The Romford Local Board of Health will, at their meeting to be held on Monday, the 2nd day of September next, consider the applications of candidates desirous to be appointed Surveyor and Inspector of Nuisances for their district. Should a candidate be elected, he will be required to devote the whole of his time to the discharge of his duties, and must be prepared to enter into a bond, with two sufficient sureties, in a sum not exceeding 200*l.* Salary, 100*l.* per annum and house, the Board reserving the Board-room and Clerk's office. The Surveyor will have to provide gas and fuel for the use of the Board, and also for the use of the Romford Burial Board and the Romford School Board, and must attend to the Board-rooms and Clerk's office, for all which the yearly sum of 8*l.* will be allowed. Candidates are requested to send application to me, at my office, at Romford, on or before the 24th instant, stating age and qualifications, accompanied by testimonials.—By order of the Board, A. H. HUNT, Clerk.

Romford, 8th August, 1872."

SIR.—Seeing the above advertisement in the *Builder* of last week, a thought struck me that I should suit the situation admirably: I have therefore sent in an application, of which the following is a copy, and knowing the interest you take in these matters, I should like to hear what you think of my chance.

JOHN THOMAS.

[COPY.]

Al, Lowther Arcade, Strand, W.C.,

20th August, 1872.

The Chairman and Members of the Local Board of Health, Romford.

Gentlemen,—I have the honour to make application for the appointment of Surveyor and Inspector of Nuisances to your Board.

I am thoroughly acquainted with the duties of such an office, having been an office messenger to a London surveyor for a long period. I am quite prepared to give my whole time to the business of the office, and part of my bed-time in addition.

I am rather taken aback, I must confess, at having to supply gas to the three Boards enumerated. The fuel I could manage; but as to attending to the Board-room and clerk's office, I can do that first-rate; and should the gentlemen of the Board have an occasional quiet dinner or take tea in the building after some of their arduous duties, why I can wait at table very nicely.

I may add that I am married, without encumbrance; height, 5 ft. 11 in.; aged 35; of good appearance; wife a good washer and getter-up of fine linen.—I am, &c.,

JOHN THOMAS.

P.S.—Testimonials are not sent, as I have always found them looked upon with suspicion in gentlemen's families, personal character being always preferred. When I say that I am distantly related to the gentleman of the above article,—who is my wife's aunt's thirty-first cousin,—you will have no doubt about my giving you any number of personal references to noblemen and gentlemen.

EXPLOSION AND PREVENTION OF EXPLOSION BY MUSICAL TONES.

OBSERVATION that the gaslights in a drawing-room seemed to keep time with the music, showed that the vibrations excited by sound influenced the flame, which rises or sinks in proportion to the strokes it receives from the air. MM. Champion and Pellet have endeavoured to prove that heat alone would not be sufficient to cause an explosion, if it did not cause vibration. Starting from this proposition, they arrived at the conclusion that there must be some musical note able of itself to produce an explosion of certain explosive substances, without the assistance of heat. This deduction they have confirmed by fact. Iodide of nitrogen is a detonating substance, which may be handled freely so long as it is moist. The experimentalists put small portions of it in this state into little bags made of goldbeater's skin, which they hung to the strings of a bass-viol. When all was dry, the bow was applied to each chord in succession; and it was found that, while the low notes produced no effect whatever, the highest caused an explosion at the very outset. It was ascertained that at least sixty vibrations per second were necessary to lead to this result. Two parabolic mirrors being placed opposite to each other, at a distance of 8 ft., a drop of nitro-glycerine was put into one of the foci, and a bag of iodide in the other. The former being made to explode, the vibrations thus caused were reflected from one mirror to the other, and led to the explosion of the iodide. These curious facts may now help to explain the almost simultaneous explosions of sepa-

rated deposits or barrels of gunpowder in a magazine, when once a beginning of explosions takes place.

An interesting and useful application of the "musical flames" has been made by Dr. A. K. Irvine, and communicated to the Iron and Steel Institute, at Glasgow. This application takes the form of a minor's safety-lamp, indicating by sound the presence of explosive mixtures of gas and air, based on a new form of the singing flames. When a mixture of inflammable gas and air passes into the lamp, it is ignited on the surface of a disc of wire gauze, above which is placed a suitable chimney, in which is produced the musical sound, varying in pitch with the size of the flame and the dimensions of the chimney.

"PLACE AUX DAMES."

SIR,—I am aware that you have a leaning towards the support of authority, and that you have not joined in the crusade against Her Majesty's Chief Commissioner of Works so vigorously as some of us would like. You can scarcely, however, refuse to insert the following quotation from a leading article in the *Manchester Courier* of the 8th inst. After speaking of the dispute between Mr. Ayrton and Mr. E. M. Barry, as to the Houses of Parliament, the article proceeds,—

"But Mr. Ayrton had not done with Mr. Barry. He had to show him that a Chief Commissioner was not to be insulted with impunity, and that, above all things, he was never to be put in the wrong. As, however, Mr. Barry's relations with Mr. Ayrton were almost wholly at an end, it was difficult to see how the lesson was to be taught. But difficulty exists only for those who do not know how to take advantage of their opportunities, and this Mr. Ayrton most certainly does. The time soon came for revenge. Mr. Barry is carrying out certain rather extensive improvements at the National Gallery, but, contrary to ordinary custom, there has been no ceremony over the laying of the foundation-stone. The contractor for the work thought, however, that for his own gratification it would be pleasant to have a little entertainment on the occasion, and he therefore invited,—as is not uncommon under such circumstances,—the wife of the architect to officiate on the occasion. It will hardly be believed that a Minister of State could condescend to such a piece of petty and vulgar spite, but Mr. Ayrton actually interferred officially to prevent Mrs. Barry from taking the part in the proceedings to which she had been invited. After this, of course, all architects, market-gardeners, and other largely common people will understand their proper place and will refrain, when fate brings them into contact with an Ayrton, from doing or saying anything by which he could possibly be offended, lest in the abundance of his virtue he should make them suffer in the persons of their wives."

LOOKER-ON.

SCHOOL BOARDS.

Scarborough.—Tenders for executing the work required in erecting the proposed infant school at Falsgrave having been opened and examined, a sub-committee was appointed to examine and accept the tender most advantageous to the Board. The committee of the whole Board reported that they had inspected the designs, nineteen in number, submitted by competing architects for the proposed Central Board School, and expressed their opinion that the plans set in by the following architects were the best:—(1) Mr. Thomas Oliver, Newcastle-upon-Tyne, estimate, 5,500*l.*; (2) Messrs. Stewart & Bury, Scarborough, estimate, 3,850*l.*; (3) Mr. W. Watson, Wakefield and Doncaster, estimate, 4,650*l.* The design submitted by Messrs. Stewart & Bury was ultimately accepted, subject to the same being approved by the Education Department, and also subject to the condition that the tender from a respectable contractor for the execution of the works within 10 per cent. of the amount of the estimate accompanying the plans be obtained.

Loans.—By an Act of Parliament just printed the Public Works Loan Commissioners are authorised to make advances to School Boards in pursuance of the Elementary Education Act, 1870. Power is given to issue 1,000,000*l.* out of the Consolidated Fund for the purpose mentioned.

SAWING WOOD WITHOUT A SAW.

ELECTRICITY is by the present invention made to supersede a mechanical implement, threatens also to drive it into banishment; while the muscular and other forces which were largely expended in their use are replaced by the action of the galvanic battery in one of the most simple forms.

The invention, which is described by the *Scientific Review*, was patented in the United States on the 28th of last May, by Geo. Robinson, M.D., of New York.

tion, including the rebuilding of the chancel, will be about 3,000l.; but the expense of the new chancel and side chapels will be defrayed by Mr. Gere Langten, M.P., of Newton-parish, Bath, and Sir Greville Smyth. The work has been carried out from the design and under the superintendance of Mr. Ferrey, of London, who is engaged upon the work of restoration at Wells Cathedral. The builders are Messrs. Wall & Hook, of Brimscombe, near Stroud.

ROMAN CATHOLIC CHURCH BUILDING NEWS.

Camberwell.—A new church has been opened in Camberwell New-road, close to the London, Chatham, and Dover Railway-station. The church is in the Early English style, 98 ft. long and 47 ft. wide, and is intended to accommodate a congregation of 2,500, which is said to have grown up in this neighbourhood during the last ten years. The architect was Mr. C. A. Buckler, and the builder Mr. Panthorpe, of Notting-hill. The style of the structure, which is of white brick with stone corbels, is twelfth-century Gothic. The pillars dividing the centre from the side aisles are of Boxhill stone, and their caps are in process of being sculptured by Mr. Earp, of Kennington-road. The altar is of stone, and is carved. It is the gift of Mr. S. Knill, a gentleman residing at Blackheath. The sanctuary floor is laid with rich Minton tiles. That of the body of the church may be described as ordinary tessellated pavement. The organ is now being built by Mr. Richardson, of Camberwell, and will cost 500l. The entire cost of the edifice is 2,000l.

SCHOOL-BUILDING NEWS.

Kingston.—The foundation-stone of the new Church of England Schools at Kingston-on-Thames has been laid by the Princess Mary, in the presence of a large number of spectators. The committee paid 800l. for the site, and about 1,900l. had been raised towards the total cost; but at least 1,400l. more were required. Mr. C. J. Freake presented the mallet which is said to have been used by Sir Christopher Wren in laying the foundation-stone of St. Paul's Cathedral, June 21, 1673. The schools will accommodate, when completed, 264 boys and 262 girls, allowing, according to the Government standard, 8 ft. superficial for each child. The existing building will be repaired and made available for 200 infants.

Halifax.—The chief stone of St. Joseph's Roman Catholic Schools to be erected on a site near to Godley Bridge, in the field known as "Bloody Field," has been laid. The new buildings will occupy a situation close to the bridge by Godley cutting, and overlooking the town of Halifax. The ground plan is quadrangular, the style Gothic, and with two large school-rooms, class-rooms, and inclosed play-grounds, accommodation will be provided for 600 children. The total cost will exceed 2,000l.

York.—The foundation-stone of new national schools for the north-eastern district of York, has been laid in a street called Beidern. The area which the buildings will occupy is over 4,000 ft., and accommodation will be provided for more than 500 children. The schools will cost about 2,000l., and the works will be under the superintendance of Mr. Cane, architect, and clerk of the works at the Minster. The contractor for the works is Mr. Dennison, of Marygate.

Oxford.—The new boys' and girls' schools, which have recently been erected at the south end of Bridge-street, Osney, to meet the requirements of the rapidly-increasing population of this suburb of Oxford, have been opened by the bishop of the diocese. The schools are 72 ft. long, and 18 ft. wide. The ground-floor will be for boys, and the first story for girls, and out of each of these is a class-room, partitioned off, and measuring 20 ft. long by 18 ft. wide. The old building will, in future, be used as an infant school. The whole of the work has been done by subscription, and there is at present a debt of about 200l. remaining on the building, which was erected by Messrs. Honour & Castle.

Stockton Exchange Competition.—We have received complaints of want of information in this matter. The remedy is in the complainants' hands,—do not compete unless satisfied.

Books Received.

Patterns for Turning. By H. W. ELPHINSTONE. London: Murray, 1872.

This handsome volume is illustrated with seventy patterns, many of them elegant and curious elliptical and other figures cut on the lathe without the use of any ornamental chuck. All the patterns can be cut on a lathe furnished with a division plate, an ornamental slide rest, an eccentric cutting-frame, and an everhead motion. The reader is requested to peruse the volume by the side of his lathe as he performs the various operations indicated in the text, so as to obviate any serious difficulty in understanding the methods of cutting the patterns. Most of them can be cut by a person capable of performing simple addition or subtraction of numbers containing two figures, and the fractions $\frac{1}{2}$, $\frac{1}{3}$, and $\frac{2}{3}$. Some few require a knowledge of decimal fractions. Brief explanations of the geometry of the patterns have been inserted for behoof of mathematicians, and especially as to "envelope" patterns.

The Worshipful Company of Turners, we may here remark, is of practical service to the handicraft whose name it bears. The master, wardens, and court of assistants, in continuation of their good old custom of former years, propose to give, this year, their silver medal and the freedom of the company and of the City of London to any one workman or apprentice in England who may send in the best specimens of hand-turning. The material to be used will be varied in different years, so as to include wood, ivory, metals, stone, spar, &c. The competition for this year will be in turning in hardened and tempered steel. The subject of the competition will be horological turning, whether exhibited in the turning and finishing of pinions of chronometers and watches, or in any of the various escapements used in the same. Competitors will be at liberty to select their own subject for exhibition in turning and finishing, whether in wheel-work or the escapement; but the complete escapement or train of wheels planted in position, to show the truth and accuracy of the same, will be desirable. The successful candidate will be required to supply a satisfactory certificate of the work having been done by his hands only, and of its being done during the period of competition, and may be required to do, in the presence of the judges, a portion of work similar to the successful exhibit. In addition to this prize, the bronze medal of the company will be given to the competitor second in merit, and the company's certificate of merit to the third. The different objects must be delivered free at the Mansion House, London, during the week beginning Monday, October 21st, and ending Saturday, October 26th. Sir William George Armstrong, C.B., of Newcastle; Sir J. Brown, of Sheffield; Mr. John Jones, of the Strand, London; and Mr. S. Jackson, of Red Lion-street, Clerkenwell, are the judges for this year.

Miscellaneous.

Brighton Sewers Board.—At a special meeting of this body held last week for the purpose of accepting a tender for the completion of the unfinished sewer works, the General Purposes Committee reported that eleven had been sent in, namely, from Messrs. John Hall Clark, Warwick; John Aird & Sons, Belvidere-road, London; W. & J. Pickering, 21, New Bridge-street, Blackfriars; George Thomas Parnell, Gloucester Lodge, Dale-road, Kentish-town; H. A. Marshall, 68, Islingwood-road, Brighton; James Neave & Co., Edmonton, Middlesex; Matthew Jennings, 3, Adelaide-place, London Bridge; Thomas Pearson, Kennington-cross, Lambeth; A. W. Ritson, 4, Herne-hill-road, Camberwell; W. Webster, 8, St. Martin's-place, Trafalgar-square, London; and Crockett & Dickenson, King's-road, St. Pancras. Ultimately the tender of Messrs. Aird & Sons was accepted, for the sum of 58,472l., which was the lowest sent in.

Inigo Jones.—A correspondent of *Notes and Queries* asserts that Inigo Jones was baptised Ynyr, a common Welsh name, but corrupted into Inigo abroad; and that in Wales the architect was known as Inco, a name which still adheres to a house he is said to have built—"Tyddgn Inco," or Inigo's Farmhouse, near Bala.

Sir Christopher Wren's Mallet.—Some doubt is entertained as to whether the mallet which was used by her Royal Highness the Princess Mary in laying the foundation-stone of the Kingston Church Schools, was used by Sir Christopher Wren, as alleged, in laying the foundation-stone of St. Paul's Cathedral. *The Times* says, "The mallet itself bears the following inscription on a silver plate:—By order of the M. W. the Grand Master his Royal Highness the Duke of Sussex, &c., &c., and W. Master of the Lodge of Antiquity, and with the concurrence of the brethren of the Lodge, this plate has been engraved and affixed to this mallet, A.L. 5831, A.D. 1827, to commemorate that this being the same mallet with which His Majesty King Charles II. levelled the foundation-stone of St. Paul's Cathedral, 5677, A.D. 1673, was presented to the Old Lodge of St. Paul's, now the Lodge of Antiquity, acting by immemorial constitution, by Brother Sir Christopher Wren, R. W. D. G. M., Worshipful Master of this lodge, and architect of that Cathedral." It is not disputed that this is the identical mallet used on the occasion of laying the foundation-stone of St. Paul's, nor is it denied that it was subsequently in the possession of Sir Christopher Wren. The only question is whether the mallet was used by the architect himself, as stated by Dean Milman in his 'Annals of St. Paul's,' or whether the stone was laid of 'levelled' by Charles II., as alleged by the Lodge of Antiquity in the above-quoted inscription."

Sale of Land in Kent.—On the 13th inst. at Ashford, Mr. James Waterman, jun., conducted a large land and property sale, under an order of Vice-Chancellor Sir R. Malins in the cause of Whelan v. Whelan. The property, which is the outlying portion of the Herndon Hall Estate, comprised an area of 346 acres, and was put up in twenty-two lots. The room was crammed, and a spirited competition took place for some of the lots. Lot 1, farm known as "Hope Farm," having an extent of 14 a. 3 r. 7 p., realised 3,100l. Lot 3, a freehold estate of rich marsh and pasture land known as "Cote Farm," comprising 113 a. 2 r. 12 p., realised 11,400l. For lot 4, 1 a. 2 r. 12 p., of pasture land, 120l. were offered, not sold. Lot 6, realised more than 100 per acre; it was a piece of pasture fatting land containing 5 a. 0 r. 15 p. Lot 7, 27 a. 1 r. 34 p. of fresh marsh land, in Snargate and Brenzel in two pieces, sold for 2,880l., being over 100 per acre. Lot 8, 38 a. 3 r. 13 p. of pasture land situate in Shirley Moor, in the parish of Tenterden, fetched 3,100l. Lot 10, 2 a. 3 r. 35 p. pasture land, fetched 230l. Lots 11 to 18 were principally property situated in Tenterden Town, and they realised very fair prices. Lot 19, described as several parcels of accommodated pasture land, containing 16 a. 3 r. 18 p., fetched 1,390l. The seventeen lots sold realised close upon 25,000l.

Removing Slag from Blast Furnaces. The improvements of Mr. David Joy, of Middlesbrough, consist in receiving the slag as runs from the furnace into the recesses formed in the rim of a wheel or cylinder (either outside or inside or on the edge thereof), in which it is carried through a part of the revolution of the wheel or cylinder, and then discharged therefrom, the axis of revolution of such wheel or cylinder being either horizontal or inclined, suchwise that each part of the circumference shall alternately be raised and lowered during the revolution. And he makes the recesses such form, and places them in such position with regard to the centre of revolution, that the slag may be retained in them during a considerable part of the revolution of the wheel or cylinder. And if necessary he forms ridges in points at the bottoms of the recesses to mould the slag such form as to break easily in pieces.

The Adulteration Act.—The statute amend the law for the prevention of adulteration of food and drink, and of drugs, has just been issued. Every person who shall adulterate articles of food, or drink, or drugs shall, for first offence, pay a penalty not exceeding 5s. and for a second offence be guilty of a misdemeanour, and be liable to six months' imprisonment. The Pharmacy Act is to be incorporated with the present statute. The inspectors' nuisances may submit articles to be analysed. There is a provision that the purchasers of articles of food, &c., may require the same to be analysed. We may take the credit of blame amongst those who laboured to obtain legislation in this matter.

Asserted Poisoning by a Galvanised Iron Roof.—The *Benidry* Independent mentions that a man living in a hut with a galvanised iron roof, situated in close proximity to Koech's crushing-machine, in Long Gully, was on ill and removed to the hospital. He was re—the symptoms being slight, though the case appeared serious—treated tentatively, recovered sufficiently to be discharged, but had this been the case, when his mate was suffering from a precisely similar form of disease, was admitted into the same institution, and the coincidence at once attracted attention. An examination proved that the usual arsenical slow-poisoning was present,— writes him on the nail,—and Dr. Macgillivray Dr. Smart drove out to the hut, where they found, not only the roof coated with an arsenical powder, but an arsenical sediment in the tank water attached to the premises. The first signs again betrayed symptoms of poisoning, and examination proved, beyond doubt, that a slow poisoning had commenced. Under proper treatment both are out of danger.

Eccelesiastical Dilapidations.—An attempt of some importance has been made in the Act to amend the Eccelesiastical Dilapidations Act, 1871, with respect to fees to bishops' secretaries and others, on which complaints have been made. The Act alters the length of mortgage terms, and of the conditions of repayment to be advanced. It then provides that it shall be lawful for the Archbishop of Canterbury, the Chancellor, and the Archbishop of York, with the assistance of the two vicars-general of archbishops, with the consent of the Treasury, at any time during the year 1873, to revise the rates of the fees of the bishops' secretaries and registrars, and the rates of the fees of the surveyors for work done in pursuance of the Eccelesiastical Dilapidations Act, 1871, and establish thereof, one uniform table of fees and charges, to be binding throughout the whole of England and Wales, and that they shall have power from time to time to amend or alter such table of fees and charges.

The Atmospheric Disturbances.—Mr. J. Plant, writing at Birmingham to the local press, says,—“The remarkable frequency of storms this summer has been the subject of much surprise. Commencing with the 15th day, Birmingham and the district have had as many as thirteen distinct storms of terrific violence. . . . With nearly five months of the year unexpired, we have had upwards of 1 in. of rain already recorded, and which is at least 1 in. over our year's average value. It is also above the quantity which fell in the entire of 1870. This enormous depth of rain is, of course, quite unprecedented in my records, and is 13 in. above the average.”

Archaeological Congress at Brussels.—On Thursday the congress on pre-historic geology opens in Brussels, under the fitting presidency of one of the oldest savans in Europe, M. Omalius d'Halloy, who presides at the site of the congress, is in his 90th year. More than 600 names have been sent in to the committee of organisation. The Government, it is said, have given instructions for striking a medal commemorating of this meeting. Expenses will be undertaken to Namur, Spiez, and Fortoof. General Faidherbe, in a paper on the “Dolmens” of Algeria; a paper on the flint implements of Dutch Bourg; and M. Burmeister, director of the museum of Buenos Ayres, one on the pre-historic flints of La Plata.

Attershall Castle, Lincolnshire.—The designs by Mr. F. H. Reed illustrating this magnificent ruin of the fifteenth century, which was lately sent in for and obtained the silver medal, and 5l. 5s., offered by the Institute for red drawings, and an additional grant in consideration of the thoroughness of the illustration, will shortly be published. The original designs, fifteen in number, will be reproduced by photo-lithography.

Chelenge.—Sir John Lubbock writes to daily papers to communicate a fact which, as he says, will surprise and grieve archaeologists, and appears that the occupier of the farm near Chelenge is actually plunging up the well-known ‘curse.’ I have no means [he adds] of gaining here by whom this land is occupied, whom it belongs.” It is to be hoped this will put a stop to without loss of time.

The Paris Hotel de Ville.—If the Hotel-de-Ville of Paris does not rise speedily from its ruins, says *Galignani*, it will not be from a dearth of architects, as the number of those who have already inscribed their names to take part in the competition for the reconstruction of the building is 422.

The Price of Gas.—The rise in the price of coal is inducing the gas companies to increase the price of their gas. In some towns the advance has reached 1s. 8d. per 1,000 cubic feet.

TENDERS

For manufacturing premises, Bromley, Messrs. Hills & Fletcher, architects. Quantities supplied:—
 Shaftfield £3,575 0 0
 Grover 3,375 0 0
 Aldous 3,226 0 0
 Atherton & Latta 3,200 0 0
 Gregan 3,195 0 0
 Abraham 3,175 0 0
 Alexander 3,130 0 0
 Wicks, Bangs & Co. (accepted) 2,890 0 0

For the erection of villa residence, at Peckham-rye, for Mr. Wilson. Messrs. Toley & Dale, architects. Quantities by Mr. Birdseye:—
 Pollard £1,530 0 0
 Sabey & Son 1,514 0 0
 Blake & Ramplen 1,473 0 0
 Nutt & Co. 1,458 0 0
 Knight 1,373 0 0
 Thomas 1,300 0 0
 Nightingale 1,238 0 0
 Hiscock 1,230 0 0

For the erection of new farmhouse and stabling, Twinstead, Essex:—
 Rogers £1,150 11 8
 Grimwood & Sons 1,130 0 0
 Hawkins 897 0 0

For Primitive Methodist chapel, Coniston, near Swine, Holderness. Mr. Frank N. Pettigill, architect:—
 Pickering (accepted) £180 0 0

For main sewers, manholes, flushing-chambers, and other works, at Portmadoc. Messrs. Roberts & Morrow, engineers:—
 Lewis & Co. £1,053 0 0
 Scott (accepted) 850 0 0

For villa residence, for Captain Parry, Crystal Palace Park. Mr. John Norton, architect. Quantities by Mr. Thacker:—
 Aitchison & Walker £3,307 0 0
 Holmes 2,890 0 0
 Lyons 2,636 0 0
 Turrell 2,630 0 0
 Allen 2,622 10 0
 Wignam 2,610 0 0
 Stephenson 2,573 0 0
 Wagner 2,530 0 0
 Staines & Sons 2,497 0 0
 Elliott 2,415 0 0
 Hughson 2,400 0 0
 Gough 2,340 0 0
 Lord 2,293 0 0
 Warr 2,240 0 0
 Waterson & Co. 2,179 0 0

For the erection of a house and offices, at Manton, Kirkton in Lindsay, Lincolnshire, for Mr. M. W. Dallison. Mr. J. M. Hooker, architect. Quantities supplied:—
 Holt, Brothers £2,899 0 0
 Booth, Ellingsworth & Son 2,720 0 0
 Halliday & Cave 2,245 0 0
 Hobson & Taylor 2,275 0 0
 Huddleston & Son 2,025 0 0

For the erection of a cottage hospital, at Sevenoaks, Kent. Mr. John M. Hooker, architect:—
 Anscomb £925 0 0
 Wiltshire 854 0 0
 Wheatley 838 0 0
 Nutter & Warren 822 0 0

For sewers for the Sevenoaks Local Board of Health. Mr. John M. Hooker, architect:—
 Willis £283 10 0
 Wiltshire 245 15 0

For erecting house and offices, at Sevenoaks, Kent. Mr. John M. Hooker, architect. Quantities supplied:—
 Anscomb £2,723 0 0

For rebuilding the Colosseum Coffee-house, 291, Euston-road (exclusive of trade fittings). Mr. Henry Lovegrove, architect. Quantities supplied by Mr. W. H. Barber:—
 Bishop & Hooper £1,913 0 0
 Brighton 1,289 0 0
 Stimpson & Co. 1,245 0 0
 Nightingale 1,148 0 0
 Patman & Fotheringham 1,139 0 0
 Hibbins & Trasler 1,120 0 0
 Serviner & White 1,050 0 0

For rebuilding 135A, Tottenham-court-road (exclusive of trade fittings). Mr. H. Lovegrove, architect. Quantities supplied by Mr. W. H. Barber:—
 Bishop & Hooper £849 10 0
 Stimpson & Co. 575 0 0
 Patman & Fotheringham 545 0 0
 Nightingale 539 0 0
 Brighton 530 0 0
 Serviner & White 503 0 0
 Hibbins & Trasler 499 10 0

For entrance-ledge, at Wandsworth, for the Royal Commissioners of the Patriotic Fund. Mr. H. Saxon Shell, architect:—
 Chappell (as opted) £243 0 0

For rebuilding Quantoxhead Rectory, Somerset. Mr. J. Norton, architect. Quantities by Mr. Thacker:—
 Wall & Hook £2,980 0 0
 Diment 2,285 0 0
 Trask 2,168 0 0
 Davies 2,128 0 0
 Shewbrook 1,935 0 0

For the erection of detached villa, at Stanley-road, Sutton, for Mr. W. A. A. Reeve. Mr. H. A. Alexander, architect:—
 Eaton & Chapman £1,379 0 0
 Potter & Ferrige 1,245 0 0
 Garrud 1,183 0 0

For the erection of detached villa, at Denmark-road, Carshalton, for Mr. William M. Master. Mr. H. A. Alexander, architect:—
 Rabbits (accepted) £950 0 0

For new schools and master's residence, at Lancing, Sussex. Mr. R. Adolphus Came, architect:—
 Watson £750 0 0
 Miles (accepted) 765 0 0

For cottages and offices, in Meason Wharf-road, Stratford. Messrs. Hills & Fletcher, architects. Quantities supplied:—
 Gregor (accepted) £480 0 0

For the erection of a warehouse, in Commercial-road East, for Messrs. Williams & Davis. Mr. E. Ellis, architect. Quantities by Messrs. Curtis:—
 Ennor (accepted) £1,111 0 0

For additions, alterations, and repairs to Oaklands Hall, Killern, for Sir Chas. A. Murray. Mr. Robert Booth, architect. Quantities supplied:—
 Fish £3,476 0 0
 Stimpson & Co. 3,285 0 0
 Brywaters 3,243 0 0
 Watts 3,222 0 0

For repairs to White Lodge, Putney. Mr. Sancton Wood, architect:—
 Stimpson & Co. £295 0 0
 Godden 275 0 0

For additions and alterations to 14, Rutland-gate, for Mr. S. H. Godson. Messrs. Lee (Brothers) & Pain, architects:—
 Pain £230 0 0
 Stimpson & Co. (accepted) 835 0 0

For building new stable, at East Sheen, for Mr. R. W. Webb. Mr. E. Ingress Bell, architect. Quantities supplied:—
 Stimpson & Co. £698 0 0
 Hibbins & Trasler 691 0 0
 Sharpton & Cole 653 0 0
 Gibbs 630 0 0

For five cottages, at Lilford-street, Putney, for Mr. E. P. Charlewood. Mr. Sancton Wood, architect:—
 Aries £1,048 0 0
 Foster 1,035 0 0
 Stimpson & Co. (accepted) 955 0 0

For studio, The Priors, Hampstead, for Mr. W. S. Cookson. Mr. Horace Field, architect:—
 Nightingale £265 0 0

For works to St. Augustina's Church, Highbury. Messrs. E. Habershon & Brock, architects:—
 Carter & Son £736 0 0
 Nightingale 712 0 0
 Kindell 671 7 0
 Haynes 664 15 0

TO CORRESPONDENTS.

F. I. (thanks: we do not propose to engrave the plan now).—S. H. (architectural examinations would be held at the Institute, No. 8, Conduit-street).—S. D. (in type).—W. C. (generally must be adapted to the particular circumstances).—W. H. A.—E. W. T.—F. F.—K.—Sons.—A. P.—E. A.—C. B. A.—W. S.—W. H. E.—J. N.—E. T.—M. H. J.—L. F. & Co.—E. A. S.—G. & Co.—J. A.—E. G.—J. G. J.—A. B.—K.—J. B. V.—T. O.—S.—J. S. P.—F. D. P.—J. H. S.—G. T.—E. G.—W. A. M.—P. E.
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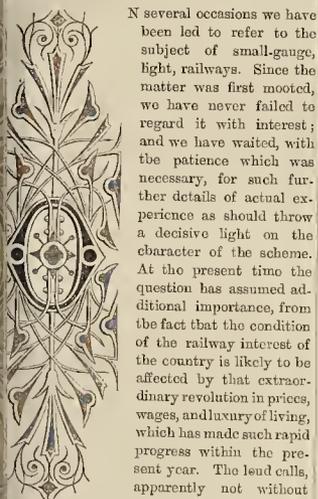
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The Builder.

VOL. XXX.—No. 1543.

The Effect of the Present Industrial Movement on the Value of Railway Property.



On several occasions we have been led to refer to the subject of small-gauge, light, railways. Since the matter was first mooted, we have never failed to regard it with interest; and we have waited, with the patience which was necessary, for such further details of actual experience as should throw a decisive light on the character of the scheme. At the present time the question has assumed additional importance, from the fact that the condition of the railway interest of the country is likely to be affected by that extraordinary revolution in prices, wages, and luxury of living, which has made such rapid progress within the present year. The lead calls, apparently not without success, for money for any possible and impossible purpose to which invested capital can be applied, are so numerous and repeated, that it is evident that it will not be from inability to collect capital that the want of any thoroughly good mode of investment is to be anticipated. It is, therefore, at a more appropriate time that we find ourselves in possession of further information as to what has been actually done, and as to what is the course of execution, for which we have more than once expressed a desire.

It is of considerable importance to the property of the country that the position of our railway interest, in face of the augmentation of prices and of the rate of wages, together with the general diminution in the hours of productive labour, should be steadily regarded. The total receipts of our railways, in 1869, were £41,595,661. Forty-seven and a half per cent. of this intake was absorbed in working expenses. For the sake of round numbers, we will assume the income of the year ending at summer last at forty-four millions sterling; of which, at the above-named rate of profit, something like twenty-one millions will have to be paid to pay working expenses, leaving twenty-three millions to remunerate the proprietors. The return thus made may be taken at an average of 3.6 per cent. (three and six-tenths) on the gross total outlay. Owing to the enforced increase of the capital accounts, and the steady decrease of traffic due to the commercial growth of the country, the actual income of the lines as a whole has reached a point beyond which its development is increasingly lucrative. The profit has begun to accrue, in the most tangible manner, to the holders of original stock, who have long been overweighed by the preferential guaranteed charges. Into this, however, we do not propose now to enter; our point being, that the broad general prospect was, but a little while ago, one of an unusually satisfactory character; a fact of which the public showed due appreciation by the sensitive barometer of the London Market.

In face of an increasing traffic which encouraged such brilliant anticipations, we have now to place the unprecedented movement in those items which form the main working expenses of railways. Coal, iron, and labour, as we have recently shown, are gaining upon gold. That is to say, a larger weight of gold has now to be given, than was the case a year or two ago, in order to purchase a given amount of either of these commodities. But it is exactly in these items of coal, iron, and labour that the main outlay of railway companies consists. We are not in possession of sufficient details to enable us to calculate with absolute precision the influence of this rise of price upon future dividend. Indeed, the calculations of one month may prove inapplicable in the next. But we may form some idea. To rate the extra cost of labour alone, arising, or likely to arise, from the short-time movement, and from the adjustment of wages in one employment to the advance obtained in others, at 10 per cent., will probably be far within the mark. To estimate the advance on the price of materials at 30 per cent. will also leave a margin. If, therefore, we roughly take the general augmentation of working expenses at 20 per cent., or one-fifth, of their recent amount, we shall find the division between the amount spent in earning and that applicable to dividend to be materially modified. We shall require twenty-five millions and a fifth to work our lines. We shall only have eighteen millions and four-fifths to distribute as interest and dividend. We thus find two-thirds per cent. struck off from the average rate of dividend at a blow; supposing, of course, that no great increase be effected in traffic returns.

There is not the slightest doubt that, by adopting such a wise system of mutual aid and forbearance as would be proper if all railway income made a common purse, very much might be done to counteract this probable deficiency. That we will not now discuss. Let us assume, if necessary, that such a union has taken place. The limits of the savings thus to be effected are definite. The limit of the rise in cost is indefinite. The obvious remedy will be the rise of fares. But rise of fares, so far as experience goes, means arrest of growth, and check to prosperity.

It is, therefore, only in such an extension of the railway system as shall direct fresh streams of traffic to the centre, as well as to the extremities, of our great network of iron, that we see a probable resource for the maintenance of our enormous railway property, in a state that shall combine the national advantages of the best service of the public, and the due payment of the proprietors of our 11,000 miles of railway. This development cannot take place by means of branches, such as we formerly attempted. A certain amount, not of prospective, but of actual, traffic must exist, in order to justify the construction of a branch. We have, long ago, exceeded the limits of a wise economy in the matter of branch lines; nor do we hold that delusive estimates of the great saving that can be effected, for example, by making the rails themselves lighter, can do anything but mischief. Looking at our normal gauge of 56½ in., we have long had materials for striking a balance between economy of construction and economy of working. Undue saving, in the first instance, is not economy. The very idea of a railway is, that by reducing friction and obviating all unnecessary work in the way of overcoming gravity, recurring cost may be proportionably reduced. We cut bills and embank valleys for the latter purpose; in fact, to save going up any hill that can be avoided, and thus lifting weight for no result; and we lay iron tracks for the former. We have found it worth while to lay out nearly 650 millions sterling for this end; and so far as lines of the ordinary gauge are concerned, those that we may make in future will probably cost

more per mile than those which we have already made.

On the other hand, no one can share in those distant excursions to which London has rushed, as if in one great exodus, on the close of the session; still less can reside for a few weeks in a village separated by only three or four miles of cross-country road from the nearest railway station; without seeing how commercial life is nipped and strangled by disconnection with the great network of traffic. The question of transshipment, or rather of change of vehicle, enters for something into this; but it is far from being the most important item. In our early "battles of the gauges," and in almost all disputes concerning railway extensions, canal development, and the like, we have attributed rather too much importance to this single item.

It is quite otherwise, however, with road-traffic. When we exchange the railway for the van of the carrier, or the cart of the farmer, we go into another order of things. Progress then has to be measured by yards, instead of by miles. Every hill is a separate difficulty, to be separately and painfully encountered. Instead of communication with the great circulation of the country by every train, intercourse is reduced to a daily, an alternate daily, or a twice-a-week, interchange. A moral effect is combined with that which is physical. It is more difficult to send, or to go, to the nearest station than to continue the course from that station to the market-town. In fact, on the railway-lines we have the England of the nineteenth century; of them, we have the England of the eighteenth.

The one assumption which lies at the base of this great national difficulty is, that a railway must have a track of 56½ in. in width between the rails. That granted, the *statu quo* must remain, or, at least, can only be gradually modified as the gradual growth of the country will warrant. But should that assumption be granted?

In the whole course of industrial art we may watch a sort of periodical oscillation between the two opposite (but not opposing) principles of strength and of lightness. They are the Jachin and Boaz of the mechanic, no less than of the mason. Our progress has been often alternate; as a man plants first one foot, and then the other, on the ground. But in the ultimate pattern of the engineer, the living organism, we find that these male and female principles are firmly wedded. From this union result the most astonishing mechanical triumphs of nature, — those displayed among the aerial tribes. In the megatherium or the deinosaur we may see a magnificent display of well-ordered strength, — a veritable broad-gauge animal. In the swift and in the dragon-fly we see that combination of material and of structural design which unites adequate strength with requisite lightness, and enables the animal to exert a velocity of movement that beats a firm and supporting path through the air itself.

Velocity, we learn from the phenomena of flight, as well as from some that are more within our present power of production, is an element of such importance that we are as yet far from having mastered the great subject of its relations. It is the feature which distinguishes dynamics from statics. The bicycle may be cited as an example of the manner in which a mechanical contrivance may be made to behave in a manner which was not anticipated, by the simple fact of being propelled at a given speed. Many things conduce to the conclusion that we are as yet only in the infancy of mechanics. If so, it is by the combination of strength with lightness, and by the rendering low power available for producing high velocity, that progress will be made. Ever since the steam-engine entered upon its Promethean existence, it has given indications of the direct

tion in which its development should be sought. Let any one compare one of the massive, stationary, heavily counter-balanced Cornish pumping-engines, with one of those handy and obedient little donkey-engines (far more tractable, as well as fifty times more strong, than their four-footed godfathers) which raised stones and pumped water for the service of the Thames Embankment; and he will form a very good idea of the kind of progress of which we speak.

Now if we look at the history of railway locomotion we shall find that the mechanical progress made, great as it has been, has been mainly in the opposite direction to that which we have thus indicated. Messrs. Braithwaite & Ericsson's "Novelty," which attained the highest speed in the famous competition of 1825 (though it did not obtain the prize, from want of duly distributed strength), weighed, with water and fuel in the tank, 3 tons 17 cwt. 14 lb. The "Rocket," of Messrs. George & Robert Stephenson, which did obtain the prize, weighed 4 tons 5 cwt., exclusive of a tender which, when filled, weighed 3 tons 4 cwt. In 1830 7-ton engines were considered heavy. In 1840 the weight had doubled. In 1850 we had 25-ton engines; in 1860 35-ton engines. There are goods engines now at work on the Continent that weigh, exclusive of tender, 45 tons; and a design by M. Meyer, which has been much commended, contemplates a weight of 60 tons, exclusive of tender. Now if we consider the velocity at which these enormous masses of iron are whirled along the rails, the blows struck by the revolution of the driving-wheel, the lateral stress caused by the conical tyre, and the rigid resistance which the whole surface of permanent way and substructure must present to the terrific force of impact, we shall find that a railway, according to M. Meyer, must be more than twelve times as strong as a railway, as it was contemplated by Captain Ericsson. We have made gigantic strides; but we have made them in a direction involving the most prodigious outlay. It is at least open to question whether we have not made them in a wrong direction.

One or two engineers think that we have. Not only so, but they have the courage of their opinions. They have not contented themselves with an abstract view of the subject. They have reduced their principle to practice; and they assert that the results of that practice justify their views. Thus far they have a *prima facie* case, they have been working in the direction indicated by the organic engineering of nature; while the gradually increasing weights piled upon the driving-wheels of the locomotive, from the time of Ericsson to our own, have been so many triumphs over reluctant and abhorrent nature. She has, perhaps, not been without her revenge.

From Portmadoc to Festiniog, in Merionethshire, there was constructed, about forty years ago, one of those small tramways, worked by horses, which are the lineal ancestors (we do not mean to pun) of the railways of Great Britain. We are told by Captain Tyler, formerly Government Inspector of Railways, that it was made by a gentleman, who ruined himself by the undertaking, to reclaim a large piece of waste land from the sea, and to carry down slates from the quarries in the Festiniog mountains for shipment in the latter port. The length of the main line is 12½ miles, and there is an additional mile of branch. The average rise to be overcome is 1 in 92, for 12½ miles. The steepest gradient over which passengers are carried is 1 in 80; but some portions of the lines, which radiate to the various quarries, are worked by locomotives over a gradient of 1 in 60. The country is exceedingly rough. Ravines are crossed by embankments of 60 ft. in height, with a breadth of 10 ft. at the top. One embankment, at Traeth-Mawr, is 900 yards long; the deepest cutting is 27 ft. The sharpest curve is one of 1¼ chain radius, and others vary from 2¼ to 8 chains in radius. The line is so sinuous that a moderately long train may lie on two or three curves at once. It was originally laid with rails of 16 lb. per yard, which were replaced by 30 lb. rails. These were in use for eighteen years, and were in their turn replaced by double-headed rails of 48 lb. to the yard. The joints are fished, and the cross sleepers, 3 ft. apart under centres, and 2 ft. under joints, are of larch, 4 ft. 6 in. by 9 in. by 4½ in.

The gauge of this little mountain line is, accurately measured, a little under 2 ft.; say 1 ft. 11¼ in. It is worked by specially-constructed locomotives, the speed having been limited by the Board of Trade to 12 miles per

hour. With the Fairlie engine, an experimental speed of 30 miles to 35 miles an hour is said, by Mr. Spooner, the engineer, to have been attained. The Festiniog line can hardly be considered as a fair criterion for a small gauge, as it was not originally constructed for locomotive power; and the capital account has been increased by the expenses of conversion and change of plant. Still the accounts given of its traffic show a limitation of working expenses to 35½ per cent. on the receipts, and a net profit of 12½ per cent., or more than three times the average net earnings of English railways.

The chief sources of information as yet at the disposal of the public, with reference to the important question of small-gauge railways, are the compilation by Mr. Spooner, of which we gave a notice some months since, and the little book by Mr. Fairlie, to which we referred in a recent number. The great literary defect of these books is, that they are argumentative rather than explanatory. The facts which they contain are so mixed up with the estimates of what is expected, that it is difficult for the ordinary reader, and all but impossible for the engineer, to get through the chaos of the ordinary reader, to winnow the chaff from the grain. Not that the chaff, as we call it, is by any means worthless. Arguments and estimates are both of a very sensible nature. But, after all, literary ability is a great desideratum, and the best cause may be stifled by advocacy which, while honest and intelligent, is not lucid and well arranged.

The opinions of foreign engineers of eminence are cited by Mr. Fairlie, and to some of them we attach great weight. M. Eugene Flachet, who must now be almost, if not quite, the *Doyen* of the profession in France, has reported on the small-gauge lines constructed up to 1867. Mr. Nordling, formerly chief engineer of the Orleans railway, and now one of the chief engineers of the Austrian railways, a gentleman of whom we had the opportunity of forming a high opinion when in his former post, has recently collected and published important information on the small-gauge railways at present being worked. These reports ought to be brought before the English public.

A line 14 miles in length is in operation in the Broelthal Valley which pays a dividend of 575 per cent., with a daily traffic of 40 tons per mile. A line of 8 miles long has been constructed from Tavauz to Ponsericourt, in France, at a cost per mile of 1,000l. for construction, and 1,920l. for rolling-stock. Between Antwerp and Ghent is a railway of 3 ft. 7 in. gauge, which pays between 7 and 8 per cent. on its capital. In Austria the Lambach-Gerundon Railway has been open for several years; the gauge is 3 ft. 6 in., but the stock is old-fashioned, and the speed slow. In Norway M. Carl Pihl has constructed lines on a 3 ft. 6 in. gauge, through very unfavourable country, at mileage cost of 5,300l. in one instance, of 4,600l. in a second, and of 3,142l. in a third; including rolling-stock, material, and workshops. A 3 ft. 6 in. gauge line has been constructed in Canada, under Sir Charles Fox & Sons as engineers, called the Toronto, Grey, and Bruce Railway, at a reduction of about 25 per cent. on the estimate for a 4 ft. 8½ in. line. From Denver, in Colorado, a line is now in course of construction to the city of Mexico, on a 3 ft. gauge, at a saving of 36 per cent. as compared with the Kansas Pacific Railway, of the ordinary gauge, which was constructed by the same engineers and the same contractors. Thus enough evidence is already in existence, if it were carefully collected and lucidly stated, to allow of the formation of a very definite judgment on the practical cost of small-gauge lines.

Assuming, however, that the contemplated economy of from 25 to 36 per cent. on cost of construction may be realised, this forms but one, and that by no means the most important, of the advantages claimed for the small-gauge system. For the mechanical reasons which we have above adduced, we are prepared to accept the statements of the great saving to be effected on the actual cost of carrying goods and passengers by light and well-designed rolling stock. The dead weight of the ordinary goods-trains, in proportion to the live, or paying weight (exclusive of mineral traffic), in the United Kingdom, was stated in a paper read before the British Association in 1870 at 7 to 1. In passengers it was actually 29 to 1. In France the proportion of dead to live weight is about 11 to 1 in goods, and 5 to 1 of passengers. Our French neighbours are noted for their tyranny over their passengers, whom they pack almost like sheep, and drive into pens with stern persecution. We see the economical result, as compared

to our own more independent habits. In the United States the average dead weight of passenger stock is to the paying weight as 8 to 1.

Now, on the Norwegian small-gauge lines, the dead weight, in passenger stock, is in one case 2½ to 1, and in another, 1.82 to 1. On the Norvord Railway it is as 2.7 to 1; on the Livny Railway as 2.5 to 1; on the Dunedin and Port Chalmers Railway, in New Zealand, as 1.75 to 1. In goods, on six separate lines on the small gauge, 3 tons of net weight are carried per ton of dead weight, or rolling stock. On the Montepone line 2½ tons, and on the Broelthal Valley 2 tons, of freight, are carried per ton of stock.

Thus, we find an economy which, if the figures stated are correct, is not one of estimate but of fact, of at least 4 to 1 in the carriage of passengers, and 3 to 1 in that of goods, is to be effected by the employment of the small gauge as compared with that in ordinary use. That this is not an advantage confined to very short lines may be inferred from the fact that the length of the line in construction from Denver to Mexico, above mentioned, is a thousand miles.

We call serious attention to the above statements. We make no pretence to the power of prophecy. Still, that the adequate investigation of a great industrial question may enable an engineer to estimate with some certitude the course of its proximate development, we think our recent articles on the coal question have demonstrated. We now think it pretty clear that an unfavourable change is at hand, unless some measures be taken to avert it, in the value of our railway property. And we invite those most deeply interested to investigate that method of turning seven years of death into seven years of plenty, which is offered by the development of the small gauge.

GLEANINGS AT THE BRIGHTON MEETING.

Storage and Sewer Gases.

In a paper on this subject,—
Mr. W. J. Cooper pointed out that the noxious exhalations rising from the drains of large cities are daily increasing in quantity, and that they threaten serious damage to the public health. Cases of drain-poisoning are not uncommon, and it is difficult to find a thoroughfare in the metropolis that is free from the foul and sickening odour which ascends through every grating communicating with the sewers. This is in spite of the millions that have been spent upon London drainage, and the sewer gases are still the greatest difficulty in the way of the sanitarian engineer. It has even been suggested that the only way to treat them is to provide for their free escape into the atmosphere; and a letter recently published in the *Times* gives advice that the sewer gas should simply be diluted with air in every direction, and that tall chimneys should be sent above the houses, so as to afford outlets for it in regions above the heads of the inhabitants. So desperate a remedy could scarcely have been proposed, except in recognition of a really imminent danger. At a time when strenuous efforts are being made to secure purity of atmosphere, when Smoke Acts, and others of a similar tendency, are being rigidly enforced, the idea of building tall chimneys to distribute sewer gases over our dwellings seems distinctly retrogressive. We should rather look to chemical agency for effectual and prompt assistance; and it is perfectly practicable to arrest the fermentation of sewage during its passage through the conduits and to prevent the formation of gas. While watering the roads and streets of towns during the last four years with a solution of mixed deliquescent chlorides the author had found that the waste solution running into the drains had exerted a marked effect in preventing the unpleasant smell formerly proceeding from them; and he had thereby led to insinuate experiments which had convinced him that the drains of London and other large towns could be kept perfectly free from gas at an annual cost of about 1s. per head of the population. He proposed to introduce chloride of calcium, either in powder or solution directly into the drains and sewers at times when they were nearly empty, and especially, times of drought. The effect of chloride of calcium upon carbonate of ammonia was to decompose it, and to form neutral chloride ammonium and carbonate of lime; but treating the sewers with a chloride of calcium preparation at proper times the generation

monia and its accompanying products of decomposition will be prevented. Anomonia is generated in sewers by the decomposition of organic matter in the presence of water. The progress of its decomposition consists in the fermentation of the organic matter, which produces a gas, called carbonic acid gas, and water, which is equivalent to carbonate of anomonia.

Mr. Longstaff, speaking on the paper just read, said the evil of sewage fermentation was very great, and it would be well to consider what remedies there were for them. He stated that he had factories in Yorkshire, and had sought a remedy for these evils in making such connexions between the sewers and large factories, that the gases passed through the furnaces and thus lost their noxious character. He believed that this plan had been effective, and thought that the same course should be adopted wherever there were high shafts in the neighbourhood of sewers. He regarded the object dealt with in the report as of twofold importance,—in its sanitary bearings and in its relation to the fertilisation question. He believed that the soil of England would bring forth threefold more wheat if the sewage were applied generally, but it was the misfortune of this country that the agricultural mind was slow to move from the habits of previous ages, and another thing, the country suffered from so much engaged in farming not possessing sufficient capital to carry on their business properly. He considered that in dealing practically with the question of the utilisation of sewage,—in giving what the country now greatly needed, he means whereby the sewage, now a nuisance to our towns, might be profitably employed by the agriculturists,—the committee had done nothing. Experiment after experiment had been carried on, but no practical results had been given such as would be of value to the country. He expressed a desire to know whether this want of practical information was attributable to any of the gentlemen whose names were on the committee not attending. Professor Williamson, in answer to Mr. Longstaff, said that practical value was to be in the fact of its having been ascertained in the use on a farm of 100 parts of common nitrogen, about 40 parts were found in the soil grown,—that was nearly one-half, and 10 per cent. went off in the effluent water, in the generally of nitrates, but in a small degree according to soil over which it passed. He believed 50 to be accounted for, and he believed 50 parts would be found in the soil, which is to that degree enriched. The 10 per cent. passed off in water was not sufficient to poison.

He also said the value of sewage in the growing of crops could be easily estimated from the report statement of facts. In Cheshire the sewage was made of 3 acres to keep each cow house—on some good farms 2 acres. Now, the use of sewage as a manure, he would think to grow sufficient rye-grass to keep cows to the 1 acre, and he could go to five to an acre. He could grow 80 tons of a rye-grass to the acre, and could go to 100 tons an acre.

Scott referred to the difficulties which had been created by refusing completion upon this subject, and pointed out Birmingham, by the vote on Sir Robert's objection to the utilisation of the sewage had been thrust out of existence in that town was ready to undertake. He said that the Public Loans Commissioners refused to grant loans to our towns, by their might undertake to work out the question of the sewage. He pointed, as another example of the difficulties of towns in this respect, to the case of East Ham, which stood upon two rivers—the Lea and the Thames, and the drainage of both which had refused to connect with the drainage to the waters under them. The Government proposed to have a sewage treatment works, who was appointed the local authorities the necessary permission to undertake this means of ridding the town of their sewage.

With regard to the proposed system, for the purposes of ventilation, of the chimneys shafts, reminded those who had said that some gases from sewers were evolved, and that explosions had actually occurred through such connexions. He added that he did not believe typhoid fever was caused by sewer gases, but he said he believed this disease was caused by the waste pipe in the cistern

being directly in connexion with the soil of the closet, and thus contamination of the domestic water ensued, leading to disease and death.

A Common Migration from the East, shown by Archaic Remains in America and Britain.

In a paper on this subject, Mr. Phené drew attention to a paper read by him last year at the meeting at Edinburgh, in which he had referred to some remarkable mounds in North Britain, which he considered were identical with the Serpent and Alligator mounds of America. He stated that since that meeting he had opened the most perfect of these British mounds, and with very satisfactory and interesting results; but as the investigation had been published, he should pass on to other matters. He pointed out various difficulties he had met with in coming to an accurate decision about the mound, but how, finally, he found, on reducing it to scale, and taking the various levels, that it agreed almost entirely with the Egyptian Ureus and the Phœnician serpent deity, each of which is represented in relics now extant as in the precise position of the form of the mound, and each with the solar disk at its head, which is found to correspond exactly with the cairn formerly described as the head, but which is now found to be in the position of resting upon it, assuming the figure was placed vertically, instead of horizontally. The author next proceeded to show that his observations on this point also explained the only ambiguity in the case of the Great American Serpent Mound at Ohio, which, he also argued, is surmounted by the solar orb, thereby agreeing with the Egyptian, Phœnician, and, as he claims, British representations also. He quoted a number of authorities to show that the words O B, meaning Serpent, and O N, meaning Sun, represented the Sun and Serpent deity, commonly worshipped in Egypt and Phœnicia; that the same word, with the addition of the letter I, is found in Africa, OBION and OBONI; both represented serpent and solar deities which were worshipped by some tribes in a visible and sensual manner, and by some in a spiritual sense. He showed how rare places with these component names are: one only in Europe; four or five in Asia, where the worship of the Sun and Serpent still continues; those already quoted in Africa; and one only in America directly: but he proceeded to show that some of the American names in the districts of the ancient mounds assimilated very nearly to these, making allowances for no greater variation than had taken place in the form of names in their transmission from Greece to Rome, and concluded his argument by claiming for Oban (the town near where the Argyleshire mound is) the name of "the place of the Serpent and Solar Deity"—ABON or OB-AN, which he quoted authorities to show were used indifferently, as EBOE and OBOE are in Africa, each having also that meaning.

The Moabite Expedition.

Dr. Tristram, in the course of his paper on this subject, spoke of the "Antonine Itinerary" as another centre for exploration, from which the most remarkable and important discovery was made. The ruins of a magnificent palace, far more perfect than anything yet found in Moab of so early a date, were discovered on the borders of the desert, east-south-east of Hesibon, and form a new problem for our antiquaries at home. A quadrangle of freestone encloses a palace of brick. The quadrangle is 170 yards on each side, and furnished with semicircular bastions. On either side of the only entrance is a facade of carved work, 180 ft. in length and 17 ft. in height. Animals, birds, flowers, fruit, and even men, are chiselled with great thoroughness and delicacy of touch. The whole is in a marvellous state of preservation. The vaulted roofs of eight chambers of the palace yet remain. The plan and details have led Mr. Fergusson to conjecture the Persian conqueror Chosroes to be its author. Sir Henry Rawlinson questions the soundness of this opinion, on the ground that a military invader who merely crossed this tract on his way to Egypt never had sufficient hold upon the country to attempt such a work. Be this as it may, A.D. 600 must be somewhere about its date. The Arabic name, Umm Shittah, gives no clue to the history of this remarkable place. West of the direct route referred to above, the gorge of the Kallirrhoe, with its hot baths, where Herod the Great tried for a cure, was most thoroughly explored, though not unknown before; but Makaur, which must surely from its modern name and its similarity of position to the descrip-

tion of Josephus, answer to Machœrus, was reached for the first time.

The Brighton Intercepting Sewer.

This was fully described by Mr. J. G. Gamble. He said,—“A portion of the Intercepting Sewer has now been in use for about a year, at Cliftonville: that is to say, the drainage of Cliftonville runs along it for a short distance. Although the gradients of the road at this end of Brighton are by no means steep, and the gully-traps are said to be good, yet the quantity of silt-like material and large flints that come in is quite incredible. This has to be removed by hand. At Hastings there is a very fair system of flushing by aid of the tide in operation, and the gullies are better constructed than usual, having a special catchpit beside the actual water-trap of the gully. Nevertheless, sand collects at every junction, and has to be taken out by hand. . . . But not only does the road-drift create an obstruction which collects other and more noxious materials, but it often sets hard like concrete, and has to be dug out with pickaxes, with no small damage to the brick lining. Whenever possible, road-gullies ought not to go into the sewers: in front of Brighton they might, and some do, go on to the beach. No objection could be taken to this being done, if a good system of scavenging for horse-droppings, like that in use in some parts of London, were in practice.” Upon the subject of ventilating shafts, which are to be placed at intervals of about 200 yards in the town, and 400 yards in the country, Mr. Gamble said,—“The position of the intercepting sewer precludes us from using what is, perhaps, the best way of ventilating sewers,—viz., by tall shafts taken up by the side of houses and above the levels of the roofs. . . . It has been suggested to move fans by aid of the current below, but, apart from the liability of any such arrangement to get choked, the worst smells are given off when there is least water.” “An objection has,” says Mr. Gamble, “been made to the intercepting sewer, that it is an elongated cesspool. But it is surely worse to have the sewers as they are at present than to have a cesspool long enough and so placed that the sewage will run right away out of the limits of the town. As pointed out, even if 300,000 cubic feet were backed up in the sewer at high water, it would not reach within a mile of Kemp Town, and all the gases would pass up the air-shafts on the Newhaven-road. The outfalls under the present system are equally blocked at high water, but the gases have nowhere to escape except back into the town.” In reply to questions, Mr. Gamble said he could not say what would be the cost of the sewer, as only about one-third was now finished. The engineer's estimate was 80,000*l.* The works were stopped at present, in consequence of a change of contractor; otherwise, Mr. Hawkshaw would have been happy to conduct members over them.

The Barrows of the Yorkshire Wolds.

The Rev. W. Greenwell read a description of the round barrows and their contents. In general form these barrows are either conical or bowl-shaped. It is probable that many had originally an encircling moat or a ditch, or both, at the base; but if such were the case, all traces of these enclosures have been destroyed. The barrows were commonly of earth than of chalk. They are usually associated in groups, but a single barrow is not uncommon. As a rule they have been erected on high ground. The bodies buried under the mounds occur at various levels, the centre burial being usually in a grave elevated in the chalk. Generally, there is nothing to protect the body from the pressure of the overlying soil, interments in cists being almost entirely unknown in the wolds. Rarely the body has been protected by a coffin formed of a hollowed tree-trunk. The remains of the body, when burned, are sometimes enclosed in an urn. Secondary interments are common, and the bodies previously buried have been thereby disturbed, and the bones scattered. In some instances the burials were by inhumation, in others after cremation, the former practice being far the more common in the wolds. In cases of burial by inhumation, the inhumed body is always found lying on the side in a contracted position, with the knees drawn up towards the head. This was evidently not due to the requirements of space, but must have originated in some settled principle, the meaning of which is not understood, but which appears to have been common

to all mankind at a certain stage of development. Perhaps it was in imitation of the natural posture assumed in sleep when the individual sought warmth. The direction of the body seems to follow no rule.

The barrows contain numerous weapons and implements of stone (including flint), of bronze, and rarely of bone or horn. The catalogue of stone implements includes almost all those which occur elsewhere, but the bronze articles are very limited. In 218 burials by inhumation and after cremation thirty-nine had articles of flint or other stone, ten of bronze, and three of horn. From the evidence afforded by the barrows it appears that the early inhabitants of the Yorkshire wolds must have lived in an organised state of society; that they possessed domesticated animals, and cultivated grain; that they manufactured woollen and perhaps linen fabrics; and that they had attained considerable skill in metallurgy, and were acquainted with the manufacture of pottery, though ignorant of the potter's wheel. It is believed that it was their custom to bury with the dead the wives and children of the deceased, and perhaps their slaves. The round barrows yield both dolichocephalic and brachycephalic skulls. The short-headed race were taller, more strongly built, and harsher in features than were the long-headed people. With regard to the age of the round barrows, the author feels safe in not attributing to them too high an antiquity by referring them to a period which centres more or less in B.C. 1000.

THE NORTHAMPTONSHIRE EXCURSION.*

AN early train from Stamford brought our party to Elton, on Wednesday, the 21st, to commence a round of churches in the district adjoining Oundle. Of these Fotheringay, the first visited, is a very fine example of a large spacious church entirely in the Perpendicular style, with a tower crowned by an octagon lantern of very stately character, and forming an exceedingly fine object as seen from the south-east and north-east. The large deep buttresses externally, and the peculiar thin flying buttresses to the clear-story, are well worth attention as a piece of good and effective building; and the west doorway is one of the best specimens of the style. The church has no chancel, an omission which gives a very peculiar character to the interior. The broad walk up the church, overshadowed by a complete continuous "pointed vault" of foliage, through which the sunlight made an intricate diaper on the path, was not the least pleasant feature in connexion with Fotheringay. The tower and spire of Warrington, our next halting-place, are well known as one of the finest specimens of the Early English period: the scale is small, however, and the proportion of the spire somewhat broader and shorter than most of the said illustrations would lead one to suppose. The inspection of this and some other well-known spires will confirm the opinion we have expressed on a previous occasion as to the inaccuracy, especially in regard to general proportion and outline, of Wickes's illustrations, from which many students have taken their idea of the structures they were unable to visit. The roof-shafts at Warrington (which carry a wooden vault of simple design) have remarkably beautiful carved capitals, which have not yet been illustrated. Tansor, with its short tower covered thickly with ivy, is a small unpromising-looking structure externally, possessing, however, no small interest, and comprising specimens of nearly every period of English architecture. The older part of the nave-arcades, towards the west is Early Transitional of a very good type; the church was remodelled in the Early English period, and the nave lengthened in that style. The most singular point in the church is the continuous rise of the floor from west to east, making a difference of nearly 2 ft. or thereabouts in the levels; the capitals of the nave arcade, though very irregular, diminish in height, in the main, in the same direction. Was this one of those odd attempts at artificial perspective, specimens of which are to be found here and there on the Continent? More likely it was accident, or carelessness. Proceedings were diversified here by some organ-playing by a member of the party, on a small but remarkably pleasing instrument by Walker, of London; winding up with a certain prelude and fugue of Bach, dear to musicians as "the little E minor" (as distinguished from the "big"

ditto). Cottesstock, to which we next find our way, is a small church, notable chiefly for a fine east window; also for a bit of flat *flieu-de-lis* cusping in one of the tower windows, unusual and very modern-looking in appearance, though evidently old. Here we lunch under an avenue evidently old. Here we lunch under an avenue of trees, assisted in our operations by the hospitality of a genial old farmer of the place, who insists upon bringing out to us mighty flagons of "home-brewed" from his own stores—such material as is not to be had from the degenerate taps of town inns, large or small. We give our hearty old friend three cheers, and drive off in a state of mind to do justice to the beauties of Polebrook. This small out-of-the-way church is one of the finest and most interesting of our series. The church is Transitional and Early English, of the finest types; it is nearly square on plan, being only three bays long, and having nave and aisles, and a north transept of considerable depth, the width of the eastern bay. The arcade of the north side is rich, but comparatively Early Transitional work; the south side later, approaching to the fully-developed Early English style (to which the tower and spire belong). The north transept contains one of the most beautiful and artistic specimens of an Early English wall arcade that could be seen. The beauty and variety of the nave capitals is also remarkable. No one coming to the neighbourhood should omit a visit to this church (about two miles eastward of Oundle), on account equally of its detail and general plan and arrangement, which are alike most suggestive. Barnewell St. Andrew, two miles farther south (for we are progressing down the eastern side of the county now), is a small church, the chancel at present under "restoration," which, in this case, nearly includes rebuilding; style, mostly Early English, remarkable for the profuse use of the "dog-tooth" ornament; also for a door in the west tower, calculated to puzzle archaeologists, and which was set down by some of the party, our leader included, as a seventeenth-century attempt to imitate "Decorated" work. Are we quite in a position, by the way, to say, whenever we had and clumsy piece of work is found, that it belongs to the modern period? There might have been clumsy masons even in the fourteenth century,—exceptions to the rule,—or perhaps amateur architects. From hence to our next rendezvous, Tichmarsh, is a beautiful drive of about four miles; and perhaps it would be difficult to find anything more pleasant or more thoroughly English in character than the main road at this point, with a wide border of turf on each side, lofty thickset hedges, and over them an almost unbroken row of fine tall trees overshadowing the road, and screening the sunlight just enough to make the effect perfect. The church at Tichmarsh is altogether modern internally, and good work, containing also an organ by Mr. Lewis, which, so far as it is finished, fully confirms the reputation which this rising builder is already establishing. Architecturally the point of interest is the tower, of late date, the lower portion of which, with its deep buttresses and rich profusion of quatrefoil panning, in excellent preservation, is a remarkably fine piece of work. Here we are entertained with tea and coffee, and the rectory lawn, under the shade of a great cedar-tree, celebrated for its size and beauty, and opposite to the garden front of the new rectory, a most pleasant bit of domestic building by Mr. Browning, of Stamford, whose good work and true feeling for his art we have had several times occasion to recognise in the course of our excursion. From hence we take train to Oundle, find our way over the long bridge which forms the approach to the town, and charge the Talbot Inn in great force. This is a picturesque old house, worth a note in itself, particularly the solid old staircase leading up to the dining-room, and lighted by mullioned windows, looking out into the courtyard, and the long, low room, with its two large, fine stone fireplaces, belonging, like the staircase, to the Jacobean Renaissance period; and it is only justice to add that the fare and the attendance were equally of the good old-fashioned kind, and that plenteousness and civility went together. After dinner arrangements were entered into for obtaining photographs of some of the places visited during the day, the objects to be photographed being put to the vote by a show of hands. Then came a turn-out to the church, obligingly lighted up for our inspection. More organ-playing here, to an extensive congregation, winding up with a general hymn-singing. As to the church, the interior has been well restored, but is not re-

markable, except for size. The upper stage of the tower is one of the finest bits to be found in the kingdom, very unusual in design, and was one of the objects almost unanimously selected for photographic illustration.

Half-past seven the next morning found us, by train, at Thorpe Station, five or six miles south of Oundle, whence (after first losing our way and being deposited in a *cul-de-sac* in the churchyard of Lilford-cum-Wigthorpe *) we found our way to Aldwinckle, of which the older church, St. Peter's, is well known, from illustrations, for its beautiful simple tower and spire of Late Decorated date. The later tower of All Saints, less known, deserves to be more so, as a remarkably good example of Early Perpendicular work, unusually artistic in design in the upper stage, and notable for a treatment of mouldings and details in which a good deal of the richness and well-rounded relief characteristic of the Decorated period is combined with the forms and general treatment of the later period. As a specimen of masonry this tower is admirable. In this village Dryden was born; tradition says, in the house now the Parsonage, but this, as the spectator said, "wants confirmation." The name of the author of "Absalom and Ahithophel" certainly suggests associations curiously at variance with the aspect of this quiet, retired country village. A drive of a mile brings us to Lowick, a church entirely in the Perpendicular style, and with a tower and lantern not without merit, but the whole thing is weak and unworthy. In the church are the chapel and some monuments of the Sackville (Lord Dorset) family, and a rather singular monument, having two recumbent effigies with canopies at their heads placed horizontally; the back of the canopies decorated with small and delicate panel-work. Islip also, is a late Perpendicular church, small, with a pretty spire, but not otherwise interesting; but our next stage, Woodford, is a somewhat notable church. There is here what may be termed a double chancel arch, one in the usual position and one three bays to the westward; both arches of the same date in regard to mouldings, &c., and apparently built together. At the point where the western arch occurs are two transverse arches across the aisles, balancing the thrust of the centre one; the south aisle has three such cross arches from pier to south wall. The chancel, even beyond the eastern arch, is a unusually long one. The north arcade of the nave is Transitional work, of unusual interest, the capitals mostly advanced to a tolerably high state of ornamental elaboration, but the arches, with having perfectly plain semicircular arches, with a square soffit. The south doorway is exceedingly rich in decoration, and contains in the arch-mould an under-cut stem-and-leaf ornament curling from one member to another over a deep hollow, the tenacity of the stem being seeming more like what would be suitable for ironwork; that it should have remained, since the fourteenth century, almost unbroken and perfect, shows that the stone must have been very carefully selected in the first instance. The whole, Woodford is a church which will repay study, both as to detail and general treatment. Ringstead is a church with a fine spire. Early English date, remarkable for its breadth and simplicity of treatment; there is a fine arcade of the same date, with the singular that the capitals (moulded only, without carving) are of different heights, some shallower than others. It is a small church with nave and north aisle only. But Ringstead is noticeable as the first church in our series, as we go southward in which we find the suggestion of a construction in polychromy, very largely used in many churches in the southern part of the county, by the introduction of hands of the dark reddish brown iron-stone which forms a large part of the geological formation of this large part of Northamptonshire. In the present instance the use of red stone is oddly partial and irregular; but there is a vaneer, or a band in the middle of a pier, in another place a whole pier composed of it, &c. But as we proceed, and come into the centre of the iron-stone district, we find the introduction of the iron-stone in contrast with the grey oolitic limestone, more and more common, and carried out with increasing regularity forming the keynote, too, of several modern restorations. One cannot help noticing, indeed when going rapidly in this way from one group of churches to another, the manner in which design of the buildings is coloured, so to speak, the nature of the formation on which they are built; a relation between circumstances and results of course much more pronounced

* See p. 660, ante.

times when transit was slow and difficult than in these railway days. Indeed, the remarkable range of fine churches which runs through Lincolnshire and Northamptonshire might almost be described as the outgrowth of the lias and great oolite deposits which are laid bare at this part of England, and furnish the main portion of the magnificent building stone which enabled the Medieval builders of this neighbourhood to construct such beautiful and enduring works. Where these formations crop out there are the best churches; where they disappear the churches, as a rule, decrease in interest. This connexion of works of art which are comparatively only the productions of to-day, with the formation of deposits of clay and minute shells countless ages ago, suggests matter for many reflections, which yet we will not follow out here, but go on to Denford Church, only noticeable for its picturesque situation, a pretty spire, and the existence of some of those pots built into the wall in the chancel, the discovery of which gave rise to much speculation some years ago, and which were said to have some acoustic object, a suggestion pretty generally given over to contempt by our party. Indeed, it is not easy to see what acoustic object they could fulfil; though it is credible that the Medieval builders may have had some unobtrusive fancy of that kind. We next proceed to Raunds, with its famous tower and spire, grandly situated at the crown of a steep field, from which an excellent view of it is obtained. This tower has been a good deal illustrated, but is mostly very inadequately, and must be seen to be properly appreciated. It is worth noting how fine is the contrast between the rich tating of the tower, with its multiplication of buttresses and set-offs, and the plain masonry and long lines of the spire, broken only by comparatively small lucarnes. The disproportion between the size of the church and its tower is remarkable even now, and must have been much more so before the present late clearstory was added, and when the church was comprised within the limits shown by the weather-mark visible on the east wall of the tower, within the church. Clearly utilitarian theories of building were not predominant when this tower was built. With this feature the interior of Raunds is tame and poor in design, and in wretched condition; dirty, dilapidated, fitted with wretched worm-eaten purlins, and in extent from the spreading of the roof: unless something is speedily done the building will be unsafe. The manners of the natives, who, in a dirty disorderly crowd, followed our party into the church, seemed to match only too well with the state of the village sanctuary. We do not pretend to say whose fault it is, or whether there is any fault in the matter, but certainly Raunds leaves a melancholy impression, or depression, on the spirits, as of a place morally and materially neglected. The little church of Staunwick, with its octagonal tower almost unique in design, is the last on our day's route. The situation of the church on the side of a descent, and surrounded with trees, is most picturesque, and would make an excellent subject for an artist; the only particularly noteworthy thing in the interior (which has one aisle only, on the south side) is the singular niche just within the chancel, behind the north front of the chancel arch, and facing to the east, the use or origin of which it is difficult to conjecture. A drive of six or seven miles brings us to Wellingborough, where we are to stay the night; a place soon to become, probably, the centre of an active ironworking district. We come here fairly on to the iron-stone formation; instead of the grey limestone road, we have a dark red dusty highway, unpleasant to the eye, and the inevitable disfigurement of the face of the country by excavations, furnaces, chimneys, and other such defilers of the landscape, has already made some progress. The strange point, indeed, is that the richness of this district in iron should not earlier have been noticed and turned to account; and that stone should have been used for building in the churches of the district nearly 500 years ago, with the iron seams actually cropping out from the worked face of the stone (as may be noticed in the external walls of many of the churches, in the south of the country), so that it can be fled off; and yet that it should only have occurred to people within a few years back that it might be put to a more remunerative use than building with it. Whether the "wealth" of a district, in every sense of the word, is promoted by this kind of tillage of the soil, may be questioned;

but the fat has gone forth, and the iron industry will, no doubt, be more and more actively cultivated in Wellingborough and the neighbourhood for some time to come. The town itself, never, we should fancy, a very interesting one, has already begun, in its newer portions, to put on that look of unutterable ugliness and grimness which appears the inevitable aspect to which towns come that take to iron manufacture,—an industry before which, under whatever form, beauty seems to fly from the face of the earth. It must have been of the ironfounders that the prophet said, "The land is as a Garden of Eden before them, and behind them a desolate wilderness." Let us hope there is solid good enough to compensate for these inevitable evils, but one is sometimes tempted to doubt it.

The church at Wellingborough, of which we saw the interior by gas-light only, is a fine, spacious building, mostly of late date, and well and carefully restored recently by Mr. Law, of Northampton. Some remarks on what was noticed in the churches in the immediate neighbourhood of Wellingborough and Northampton we defer.

THE VIENNA UNIVERSAL EXHIBITION AND THE WORKING ARTIST.

ACCORDING to all report, what has hitherto been done in the way of exhibitions will be far excelled by that which is to fill the world's eye in the forthcoming year. We, of course, refer to the "Vienna Universal Exhibition," now in active course of maturing itself, both here and everywhere else. A few words about it in time may, we think, be useful. We have before us the general and very comprehensive programme, almost a comfort to see; for so much has been thought of, and methodically put together and arranged. The whole idea is under the highest possible patronage,—that of his Imperial and Royal Apostolic Majesty, the Emperor Francis Joseph; its president is the Archduke Regnier; and its general manager, the Baron William de Schwarz-Seuborn. It would seem impossible for things to be more promising. The city of Vienna occupies a commanding, and in some respects a unique, position in Europe; and is, in itself, not a little remarkable in many ways. The building will be about four times the size of the Exhibition of 1851, and is situated in the "Prater," or Imperial Park, and close to the Prater or Northern Railway Station, and almost on the banks of the Danube, which runs through the city. Nothing can be better. It is impossible to speak of Vienna without noticing the singular way in which these modern days have added to the old Middle-age city which stands in the very centre of it. It is about three-quarters of a mile across, and in it is the Imperial palace, and the renowned church of St. Stephen. This inner town is entirely surrounded by a broad garden or park, in which no building has very properly been suffered to be built. It was the ancient moat of the city in its old and fortified state, so that you must cross this ancient moat site and present garden to pass from the new city into the old, or garden-surrounded city. Old Vienna is thus completely surrounded with a ring or circle of trees and flower-beds! The new or modern city has another or larger ring surrounding or encircling this. It is a singularly happy idea, though an accidental one, and says much for those who would not allow of its green spots being built on. A good deal more might be said about this city and its "improvements," for improvements are not confined to London or Westminster, but our present business is to hint at a thing or two concerning the artistic part of the coming Exhibition: as we take it, a not a little important part of it.

In the first place, it will be seen by referring to the programme, that the classification adopted for the objects to be exhibited are separated into twenty-six classes or groups, as mining, agriculture, chemicals, and so on, for raw produce. Then metal industry, wood industry, stone, earthenware, and glass, and so on; for manufactures and art-manufactures. There is also under this heading, art as applied to religion, i.e., works of fine art which are employed in public worship. There are also to be the arts of the past, and fine arts of the present. There is also "education," as a matter of course, and teaching and instruction, so that there is as it would seem really nothing left out. We say nothing of trials of machinery, history of industry, conversion of "waste into use," history of prices, and a perfect host of other things

sufficiently puzzling to the curious, however curious they may be; but one thing certainly has been left out of the programme, at least, which has always seemed to us to be all-important; and it is this—in a single phrase: artistic hand-work, as applied to common things. We do not here mean pictures, or even statuary, or expensive engraving, but simply that sort of work of which the old Etruscan, or the old Greek, has left us specimens in his wonderful vases and wine-cups, and of which old Rome and Pompeii have shown us examples in their wall paintings, and which the dark Middle Ages managed to accomplish without the aid of machinery or apparatus, in almost every fragment of wood carving, or stone-cutting, which time has spared to us. Do not let us be misunderstood. We are not at present complaining of art-manufactures, though it is a painful subject to contemplate, for we all know before hand who they are, and must be, who will carry off all the prizes of this great show; but we are simply again asking attention to the fact of the existence of those artistic hands which are, however things are done, destined to do the real and actual work. What we want and are pleading for then is, a small space, in this gigantic show, for the modern successors,—for some few, at any rate, actually do exist, though at present unknown,—of the old Etruscan, the fine Greek, and the workman, and the working artist, of the Middle Ages. We all know well what it is that we shall see: the huge and well-filled glass cases elaborately fitted, and lined, and labelled in full with the name and antecedents of the exhibiting firm, names and addresses, and all complete, triumphs of energy, and organisation, and capital! But of the very names of the men who, in some obscure corners, garrets, or cellars, who have painted, or even helped to paint, or to mould the costly tea-cup, or fruit-plate, or drinking-cup, or anything else you like to name, who is there who expects for a moment to see them either stuck on to the objects made or adorned, or anywhere else? On very many of the antique vases there is the name of the executive workman, or artist, and we almost seem to see the man as we look on his work. It is rude work enough, some of it, it must be confessed, but how expressive of the country in which it was done, of the race of men who so wrought, and, what is even more, of the individuality of the executive workman. It is something of this that we want to see in the Vienna Imperial Exhibition of next year. We want to see exhibited in it, not merely the cases full of goods, the produce of organisation, and capital, or miles of designs in artificial stone, but at least a corner of the great building filled with the works and names of individual artist-workmen. Each country from Scandinavia to Italy, and from Russia to France, having its representative workmen. We must repeat, do not let us be misunderstood. Of course, the workman or workmen must always be seen in some way or other, nothing comes into being of itself, and a modern painted and drawn and designed tea-cup, or cheese-plate, is the produce of some one set of men or machines. It is impossible to get entirely rid of the personality of the workman, and this, of course, a something; but as we have said, but must repeat, what we desire to see is,—the man, not as a mere workman, or even as an artist, and as producing a result with others, but as an individual artist-workman. It would be impossible to over-estimate the importance of this mode of exhibiting to the world the capacity and skill of the modern workman, no matter what may be the range and power of his artistic capacity and skill. If he have the very highest, as that of a painter, then we must see it, if it be only to wonder at it. If it be the lowest, it must possess the same interest as is always to be found in a man's handwriting, however rough that may be.

We have said there are twenty-six distinct groups of classified objects comprehending almost everything, might not there be yet another, an artist-workman's group, for the express purpose of exhibiting the artistic power of Europe as embodied in its individual workmen? Such a division would be of surpassing interest, not only to general visitors, but more than all to those who are given to think of the future of the workman; and certainly to all those who really care and know anything of the "education" of the working man: for the best and most productive of education must be that which adds to the mental and bodily powers and producing capacities of the workmen of the time. It is not surely as a mere show of novelties, and as a

The Lord Mayor requests us to correct the following paragraph, as being calculated to mislead the public:

"The Alexandra Palace.—Mr. Gilbert Redgrave, R.A., is moving in the matter of the Alexandra Palace, and the design is to make the building a science and art museum, similar to those at South Kensington and Bethnal Green, with the addition of a concert hall and theatre. The undertaking, to be successful, would require to have a constant succession of novelties; and it is feared that, if opened under the plan of the metropolitan authorities, as at present framed, such would not be provided."

"The movement recently inaugurated at the Mansion House," says his lordship, "has for its object the acquisition of the entire park of 500 acres and its preservation for ever for the people, as a fountain of health and a grand arena of wholesome recreation. If only 192 acres are reserved for the park, and the remaining 308 acres are covered with buildings, as is contemplated by the owners, these objects will be frustrated. The larger area of land would not only not detract from the efficiency of the Palace for amusements, but, on the contrary, would give greater facilities for the 'constant succession of novelties' which Mr. Redgrave is moved to declare as necessary for the success of the undertaking. . . . If the plans which have been placed before the Lord Mayor are carried out, they will be not only attractive, but will confer vast moral and physical benefits on the mass of the people,—a matter of infinitely more consequence than the provision of a 'constant succession of novelties.'"

THE HARTLEPOOLS EXCHANGE AND CLUB-HOUSE COMPETITION.

Str.—For the following two reasons your report and description of the successful design in this competition has caused us some surprise. Firstly, we have not received any official notice of the final decision of the directors; and, secondly, the directors to whom we have spoken upon the subject are not aware that a final decision has been arrived at.

Hoping you will in a future issue insert some further account of this competition,

ONE OF THE PREMIAED.

THE DESIGNS FOR THE WORCESTER GUILDHALL.

The Survey Committee of the Corporation, to whom it was referred to pronounce as to the award of premiums for the designs for rebuilding or reconstructing the Worcester Guildhall, have decided on recommending to the Council that the first premium of 100*l.* should be awarded to the design marked "Bakalum," subject to his giving a guarantee that he can carry out the work for the specified sum of 18,000*l.*, exclusive of the tower, sculpture, and carvings shown in the exterior perspective; the second, of 50*l.*, to the one marked "Fiat Justitia," subject to the architect's guarantee that the expenditure shall not exceed the aforesaid limit. There are only two plans for reconstruction, and the committee state that, having previously reported that "Convenience" had not complied with the stipulations as to outlay, they therefore presume that the premium of 60*l.* must be awarded to "Vindex." The second premium for reconstruction (30*l.*) remains unawarded.

ABOUT REIGATE.

A RESIDENT in Reigate sends us a reply to some statements as to the condition of Reigate made recently through our pages. The general correctness of "Gargoyls'" letter has been affirmed by several other correspondents, and we are not disposed to print mere assertions in denial. We print the greater part, however, of the resident's letter:—

"Where did 'Gargoyls' find 'the rows of ill-built, draughty tenements,' in which 'the great unwashed' dwell? There are very few rows of buildings in the place, except in the two main streets, and these are occupied chiefly as business premises. . . . Draughty, a number of the small houses may be, but not more so than usual, nor more so in comparison with the larger ones; neither do 'fevers frequently recur'; and though small-pox paid the town a visit in the early part of the year, I do not know what the mark is that it has left behind. It is the same here as everywhere else,—the lower class of people, the more they crowd together in the houses for economy of rent, and the more careless they are in sanitary matters. When typhoid fever and small-pox were prevalent in

London and other places, it made its appearance here, but it was chiefly confined to a few places where sanitary requirements were most likely to be neglected by the people; the other cases were suspected of being brought from thence to other parts of the place. The Local Board did not find a man for building a house of ten-chests (which would be rather *shaky* even for very speculative builders), but for erecting a store-shed without having given the required notice, or deposited plans for the same; and I believe the ten-chests merely supplied the weather-boarding, &c.; and even this was at Red Hill, and not at Reigate.

"Many are asking how it is that for three or four years there has been no migration to Reigate, and that building operations have entirely ceased. Some attribute it to the heavy rates that the new drainage will make necessary, but it is not because the town has been left undrained until its fair reputation has been damaged? There are several tenanted villas, which have evidently been occupied; perhaps their late occupants have fled to a place less obnoxious to the olfactory organs."

Had there been 'many asking,' it is very likely I should have heard of it, but I have not; and I think the stoppage of building operations (that is, other than for the owner's own occupation or investment, which still goes on) is rather due to the increase of the cost of labour and materials than to the reason assigned. There are other places around London where houses do not let readily, though the drainage and locality may be everything that could be wished for.

The Castle Grounds are a vast improvement on the old state of the place,—thanks to the liberality of the trustees,—and though 'Gargoyls' says more evergreens are wanted, perhaps if he waits until the present shrubs are grown up, he may see sufficient of them. There are plenty of seats, under large and shady trees and elsewhere, and although on one side more trees might be an improvement, these are not grown in a year. The trustees have spent more money than the subscriptions amounted to, and 'if the public would be drawn thither more than it is if 10*l.* or 1*l.* a week were spent in music,' I should think it is only fair that the 'public' should furnish the means by more of them becoming annual subscribers.

As to the letter of 'Salus Populi,' although some of its statements are unfortunately true, generally speaking it is apart from the subject. I believe there are fewer houses than usual in Reigate in which the 'speculating builder' has scamped his work to any great extent.

R. J. W."

The *Survey Advertiser* has taken up the cudgels for the authorities, and terms the statements of "Gargoyls" and "Salus Populi" "calumnies" and "utterly unfounded." Our usually well-conducted contemporary will better fulfil its mission by helping to obtain for the town the attention and improvements that are needed. Reigate has many attractions and capabilities, and deserves to be cared for.

BEDS AND BEDSTEADS.

WHEN the Hebrew writer wished to convey an idea of the might and prowess of Og, king of Bashan, the last of the giants, he said his bedstead was a bedstead of iron. In like manner, when Amos was inveighing against the wantonness of Israel, and desired to depict the height of slothful sumptuousness indulged in by those "who took their ease in Zion," he declared they lay upon beds of ivory. Again, nothing gave a better insight into the Spartan habits of the great Duke of Wellington than the small, uncarved iron bedstead in his bed-chamber, in Walmer Castle. Thus, it will be seen, a man's bed has often been closely associated with his character, as well as with his fortune, from the earliest times to our own. This piece of furniture has, moreover, further interest.

Judging from Egyptian, Greek, and Roman bas-reliefs, beds appear to have been always furnished with mattresses and pillows, sheets, and counterpanes; but they have differed exceedingly in form and materials. The form was probably first affected by the discontinuance of the custom of reclining on couches at meals, which took place towards the close of the fifth century. Among the materials used in their construction from the earliest times, have been bronze, silver, ivory, horn, and rare woods.

M. Viollet-le-Duc, in his recent work on Merovingian and Carolingian furniture, gives some interesting particulars concerning ancient French beds. Before the thirteenth century, there were so many cushions piled up at the heads of beds that persons sleeping in them

reposed almost in a sitting position. In the vignettes of manuscripts of this period, we may see that people undressed before lying down, and draped themselves only in the ample sheets. Over them, as they lay propped up with pillows, was thrown a heavy counterpane, probably of tapestry. Sometimes another piece of tapestry was placed under the mattress, and allowed to hang down on either side of the bedstead till it touched the floor. M. le Duc gives a fac-simile of a *vignette* in a manuscript in the Strasbourg library, in which this arrangement is represented. A king reclines in bed, conventionally crowned and robed. The bedstead is of metal. At the head of it are two standards, one on either side, which support bars extending from one to the other, upon which one end of the mattress is raised. Thus the number of pillows in this instance is reduced to one, which is very small, and covered with rich stuffs. A carpet, or piece of tapestry, is spread over the bedstead and hangs down to the floor; upon the mattress is another; and a third is thrown over the regal figure. Curtains are suspended from the ceiling, and exactly over the bed depends a lamp.

A night-lamp was an indispensable accompaniment of the bed of persons of rank and means, during the twelfth, thirteenth, and fourteenth centuries. It was, at first, swung from the ceiling, but when curtains came into use it was swung from a rod in the centre of the supports, and thus hung down over the middle of the bed. When everybody believed in evil spirits and supernatural visitations of all kinds, darkness was a season of terror not to be encountered if it could be avoided.

Before canopies came into use, curtains were suspended from beams, either in the ceiling or below it, or they were festooned from one ornamental hook, or bracket, in the wall, to another. The earliest canopies appear to have been fixed into the walls at the heads of beds at one end, and to have been supported at the other by rods descending from the ceiling. The four posts that now uphold them are, comparatively, late inventions. In the chamber of Isabelle de Bourbon, wife of Charles le Téméraire, there was a grand green damask canopy which extended over two beds and a wide passage between them. This lady, like all the French kings and queens, had a chamber of parade, as well as a bedchamber, in which there was also a handsome bed. Both are minutely described by Aliénor de Poitiers.

In their 'chambers of parade,' the French monarchs received those courtiers who were entitled to greater privileges than the rest of the court, or court officers, but yet were not on sufficiently intimate terms to be received in their bed-chambers. The distinction thus drawn constituted the difference between the *grand lever* and the *petit lever*.

Oriental canopies must have been of great magnificence in very early times. Holofernes, we are told, rested upon his bed under a canopy, which was woven with purple, and gold, and emeralds, and other precious stones. And when the beautiful Hebrew woman smote off his head, she pulled down this canopy from the pillars, and carried it to the elders of her own people. "Behold," she cried, "the head of Holofernes, the chief captain of the army of Assur, and behold the canopy wherein he did lie in his drunkenness; and the Lord hath smitten him by the hand of a woman."

The State beds at Holyrood Palace and Hampton Court are, it will be remembered, all four-posters. They are only of Tudor, or sixteenth century, antiquity.

In the fifteenth century there was a form of bedstead in use which is still ordinarily used in the cottages of the north-country peasantry. It was inclosed with panelling about 8 ft. high, on three sides, leaving the fourth open, or on four sides, except in the centre of one of them, where there was sufficient space left for the occupants to get in and out. A foot-stool, covered with tapestry, or other rich material, assisted the apparently difficult processes of entrance and exit. The panelling was elaborately carved, and it was finished off with a handsome open-work cresting. Within, there were curtains, pillows, and a counterpane of precious stuffs. Divested of all this ornamentation and colour, hard, indeed, into mere deal panelling, painted brown or drab, and rightly abhorred by sanitary reformers, this piece of furniture is now known as a "box bed."

But the rudest bed-place of which we have written account is that of the inhabitants of St. Kilda. Writing of these primitive people in 1764, and describing their abodes, the Rev.

Kenneth Macaulay observes:—"The walls of these habitations are made of a rough gritty kind of stones, huddled up together in haste, without either lime or mortar, from 8 ft. to 9 ft. high. In the heart of the walls are the beds, which are overlaid with flags, and large enough to contain three persons. In the side of every bed is an opening by way of door, which is much too narrow and low to answer that purpose. All their dwelling-houses are divided into two apartments by partition walls. In the division next the door, which is much the largest, they have their cattle stalled during the whole winter season: the other serves for kitchen, hall, and bedroom." Worse than this follows. So much manure is made in every house by spreading the ashes of the peat fires all over the floor and treading them into a compost, that the walls which are 8 ft. or 9 ft. high to begin with are reduced to 4 ft. or 5 ft. on the inside, when it is time to use it and sow the barley.

From this picture of discomfort it is pleasant to turn and remember that many beds were so stately as to be extremely valuable legacies, in the Middle Ages. Many were, of course, heirlooms. Shakespeare, we call to mind, wrote in his will, "I give unto my wife my second-best bed, with the furniture." Inventories also afford us many curious particulars concerning them; and they are incidentally mentioned in some of the early statutes.

Henry VII. enacted that no one should expose for sale in any fair or market in his realm any feather beds, bolsters, or pillows, stuffed with any other material than dry pulled feathers or clean down, or any quilts, mattresses, or cushions that were stuffed with anything but clean wool or clean docks. Scalded feathers, fen-down, moose-hair, neat's hair, and goats' hair were unlawful stuffing in the eyes of legislators in those days. Edward VI. endeavoured to meet a new contingency,—that of adulteration. He enacted that no one should offer for sale the articles above mentioned, though stuffed with dry pulled feathers and clean down, if these were mingled with scalded feathers, fen-down, thistle-down, sand, lime, and gravel.

Among celebrated beds, every one remembers the great bed of Ware. Mrs. Montagu's feather hangings, that Cowper admired so much, are also of world-wide reputation. Nextly every one is as familiar with his lines upon them as with Dame Dimmock's sheets, "washed with fairly-well water, and bleached on the honny white gowans;" but either of these curiosities would be dingy by the side of the Oriental magnificence indicated in King Solomon's word-picture,—"I have decked my bed with coverings of tapestry, with carved works, with fine linen of Egypt. I have perfumed my bed with myrrh, aloes, and cinnamon."

Now, ought we to be content that our characters should be judged by posterity by our lumbering and most unhealthy four-posters; or will our anatomical iron bedsteads properly represent us in time to come? Surely there is great room for improvement in these items in our household effects.

THE PROPOSED ALTERNATIVE PRISON SYSTEM.

At the International Prison Congress, the sittings of which were lately held in the Hall of the Middle Temple, a number of foreign gentlemen, some delegates from their Governments, took part in the deliberations under the auspices of the Council of the Social Science Association. Questions relating to criminal law, criminal procedure, preventive police, punishment, treatment of discharged prisoners, and penitentiary systems, were discussed for about a week and a half; and among the more prominent members may be mentioned Dr. Wines, Major Du Cane, M. Stevens, Dr. Eyre, Count Sokoluh, Count de Foresta, Mr. G. W. Hastings, Mrs. Howe, the Right Hon. Sir Walter Crofton, and the secretary, Mr. Edwin Pears.

The time allotted for the above questions, or rather the minutes that could be spared for questions under the above heads, were not many, and it cannot hence be said that one single question was exhausted or even thoroughly gone into. Nevertheless, the fact of the congress's sitting brought together from all parts of the world a considerable and valuable amount of information on the prevention and repression of crime, including penal and reformatory treatment. In connexion with this may be mentioned the system of occupying prisons by intermittent see-

tions proposed by M. Ed. Schmidt, of Petersburg, to which allusion has been made before in this paper, on the occasion of a lecture delivered in the meeting-room of the Social Science Association on the subject. With the aid of the annexed plans and diagrams, the reader will be able to follow the description and criticism here given.

It must be acknowledged at the outset that, whatever the merits or defects in M. Schmidt's scheme may prove to be, it is the only one which in a rounded and, to its details, finished form, has been presented to the public in general and to the members of the International Prison Congress in particular on the recent occasion. Its novel and principal feature is the constant use of all available space. Thus, instead of having a workshop and a sleeping-place, each capable of accommodating a number of prisoners used alternately,—say the workshop by day and the dormitory at night,—he uses the rooms constantly by bringing twice the number into them at the same time. That is, while one party fills the workshop he is unwilling that the space of the dormitory should remain unoccupied, and *vice versa*. Having mastered this principle, there appear to spring up at once objections sufficient to make one close one's eyes; one almost refuses, on the plea of common sense, to entertain the idea any further. But that is not fair to a man who has creditably devoted years of thought and labour to his scheme, and who pleads for it "economy," which, if it be based on a sound basis, demands attention, or at least a full hearing of the case.

There crops up, for instance, the question of the night-work. To have one set of prisoners work their sentence out in night labour while another set work by day, or, in fact, to have night-work at all, is considered unjust, inhumane, and killing. However that may be, there are some among us who nevertheless have to give many a night to our callings. Police, railway guards, the staff of newspapers, members of Parliament, and not a few besides, are compelled to yield their nights at times, and with them often their rest, leave alone the number of brewers and forgers who would fain turn night into day. But M. Schmidt has no such intentions. He does not propose to deprive the prisoner of his rest, nor that he shall work at night during the whole of his sentence, nor even, after the fashion of our hospital nurses, be on night duty for so many weeks and on day duty for so many. In almost imperceptible stages the prisoner works gradually later and later into the night, until at last he is gradually leaves the night work. Ten minutes, in fact, is to be the difference each day, so that a man who to-day turns to his work at midnight, to-morrow turns to it at ten minutes past twelve a.m., and after twenty-four days sleeps until four o'clock in the morning. In six times twenty-four the whole term is completed; that is, in 144 days each man begins again at the same moment at which he started. Out of this number of 144 he passes from ten minutes to four hours of his time between midnight and four a.m. in the workshop. Suppose one looked upon these hours as the critical night hours, it then becomes at once evident that of those he spends only 24 in 124, or one-sixth of his nights, and that only once for four full hours in the workshop. In the year consequently he has sixty nights of more or less disturbed sleep between midnight and four a.m., or a little more than the loss of one night per week. For those who consider the margin too small, and who consider eight hours of the night as necessary for repose, the figure is doubled, so that at the worst the prisoner would have to sacrifice two and one-third of a night per week. It may be added for those unacquainted with modern sentences that incarceration for life hardly exists anywhere now; that the longest sentences probably fall short of fifteen years on an average, and that ten years may be considered, on the whole, the longest term actually passed in a prison. The system of remission of sentence and pardons is extended to every deserving prisoner, and if he or she be detained longer than just indicated, it is not the fault of the authorities.

In the lower plan the dining-room is marked by the figure 1. The other rooms on that floor are kitchens, bath and wash-houses, offices, &c. In the upper plan the figure 3 indicates the class-room; 4, the dormitory; 5, the workshop. SS are special portions of these, for such prisoners as deserve a preference. The cells, C C, are disciplinary cells; V V, the ventilating shafts.

A complement of 300 persons would be divided into, say, ten sections of thirty persons each. There are consequently five sets of conjugate sections, each set sharing a dormitory and an atelier, and never in conflict. They always avoid each other. There can be no conflict either with any other set, because they, again, have their dormitory and workshop portions between themselves.

Before going into the points which are less clear than those hitherto explained, we will allude to a pamphlet published by Grunert, Bros., Berlin, on M. Schmidt's system. The author says that, having provided a wholesome and proper dwelling, suitable clothes, substantial food, time for rest, walking, and instruction, the country ought to reap the benefit derived from the prisoners' work. This might do more than cover the current expenses, if the waste space of prisons is utilised as above described. In ordinary goals of, say 300 prisoners, there are 300 cells, ateliers for 300, kitchens for 300, dining-halls for 300, &c. That, the author argues, is twice as much room as is required. Where sections follow one another in successive order into the dining-room, yard, and class-room common to all, only one kitchen is required, and one dining and class room for thirty persons each; and cells and workshops for 150, instead of for 300 persons. Each prisoner has eleven hours' labour, nine hours' rest, four hours for meals, dress, walking, and intellectual pursuits. Hence, each of the five ateliers will be occupied for twenty-two hours; the five dormitories, eighteen hours; the dining-room, twenty hours; the yard ten hours; and the class-room, ten hours.

The following are the advantages propounded:

- As regards economy:—

 1. A saving of 50 per cent. on the outlay in erecting and arranging the prisons.
 2. With a reduction to half the original number of buildings, the annual cost of repairs will be reduced in proportion.
 3. Similarly much waste of capital spent on sundry requisites, utensils, &c., would be avoided.
 4. The atelier system is productive, and capable of improved industry.

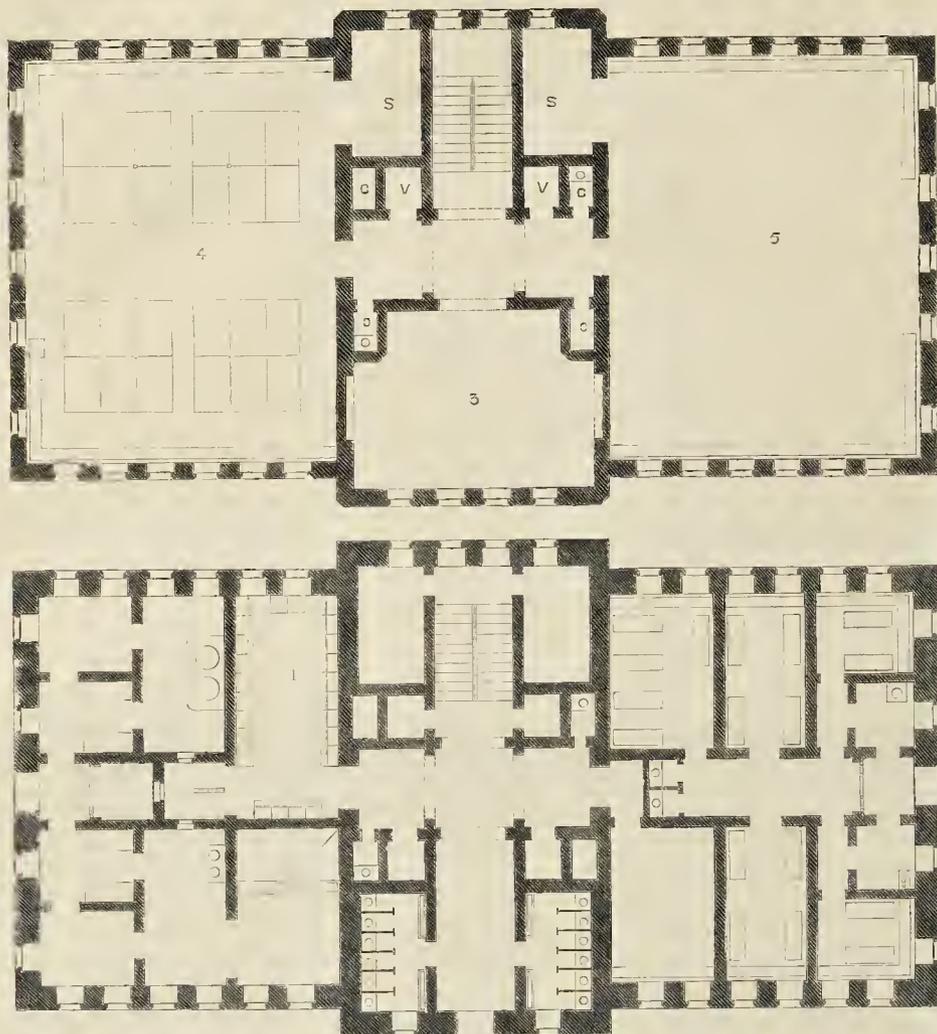
As regards the prisoner's reformation:—

1. The small number enables the sectional officers to exercise a direct influence on each individual prisoner.
2. The mechanism of the routine inculcates notions of order, obedience, and industry.
3. The remuneration of the prisoner on the value of his work would be a guide to an estimate of his reformation.
4. The erection of a prison on the proposed system, by way of experiment, can on no account be attended with any useless waste of funds; for, granting even the possibility of failure, there will always be room in a prison constructed on this principle to accommodate, instead of the two or three hundred prisoners, as here anticipated, half that number, thus performing anyhow as much as is ordinarily required.

There are some points of interest which might be overlooked, but which, nevertheless, deserve a careful scrutiny. The saving of 50 per cent., for instance, does not extend to the current expenses. It is impossible to have the same staff as in ordinary prisons. Take a manager or cook, for example. He cannot be supposed to go on for twenty-four hours; and besides this, it is doubtful if suitable persons could be found who would submit to join in the routine of the prisoners. It seems as if M. Schmidt intended superintendents of sections to stick by their flocks through day and night work for periods probably longer than any convict's sentence, before becoming entitled to a pension. To perambulate the dormitory, workshop, dining-room and yard, without feeling as much prisoners as those under their charge, would be a difficult matter to the officers.

We have once before touched upon the difficulty regarding Sunday. In countries where that day is kept as it is in this country, no work can be required at the hands of any prisoner. Supposing that the periods in the dormitories, yard, dining-room, and class-room remain the same, and that the workshops for the nonce are turned into places of worship, how shall the ten hours he passed in those workshops? M. Schmidt will be best able to answer these and similar questions, and he will have to do so satisfactorily before a practical trial would be contemplated by anybody, despite his explanations.

We afford him, as a foreigner, the opportunity to set forth his proposals, but we are not at present disposed to advocate them.



PLANS ILLUSTRATING THE PROPOSED ALTERNATIVE PRISON SYSTEM.

ST. PAUL'S COLLEGE, STONY STRATFORD.

THE chapel recently erected in connexion with the College of St. Paul, at Stony Stratford, promises to become an object of interest. The college itself, which has already 120 resident pupils, was founded about two years ago to provide for the sons of clergy and others of limited incomes a public school education upon the principles of the Church of England; and it is for the exclusive use of these pupils, with the masters and friends, that the chapel has been built.

The foundation stone of the edifice was laid in October, 1870. The plan of the building consists of an atrium, or enlarged porch, extending across the whole western gable of the chapel; a choir-proper for the members of the college; transepts, which combine organ-chamber, vestry, and accommodation for the servants of the college; and a deep sacristy terminating apsidally. The total length is 111 ft. by 35 ft. across the choir. The style adopted is a treatment of Pointed architecture, adapted to the peculiar local materials, a greenish sandstone for the walls with red brick dressings; a very sparing use of cut stone being made. The contrast of

colour between the local stone and brick, relieved by the lighter-tinted Bath stone, and carried out by the tiled roof, is harmonious and agreeable. In the interior, brickwork is used for architectural features with considerable success. Window tracery, cornices, wall shafts, piers, &c., are all carried out in this material. Stone, in the shape of sculptured corbels and capitals, and the introduction of some monolithic shafts of polished grey granite, add to the effect. The ceiling is arched and ribbed with tie-beams and shafted king-posts. The apse is unimpiered by windows, but has a high roof-light from a spirelet, which rises just over the centre of the sacristy, and which will afford light for the frescoes which are intended to adorn the walls, showing scenes from the life of St. Paul, the patron saint of the college. The floor all over is laid with tessellated patterns, the richer design being reserved for the sacristy. The choir is fitted up with panelled and carved seats in oak and pine, arranged choir-wise, with a projecting canopy over the upper seats, and canopied stalls for the warden and chaplains.

Later on it is intended to erect an altar of marble and alabaster combined; and also a pulpit and screen in keeping with the style of the chapel. Some designs for filling two of the

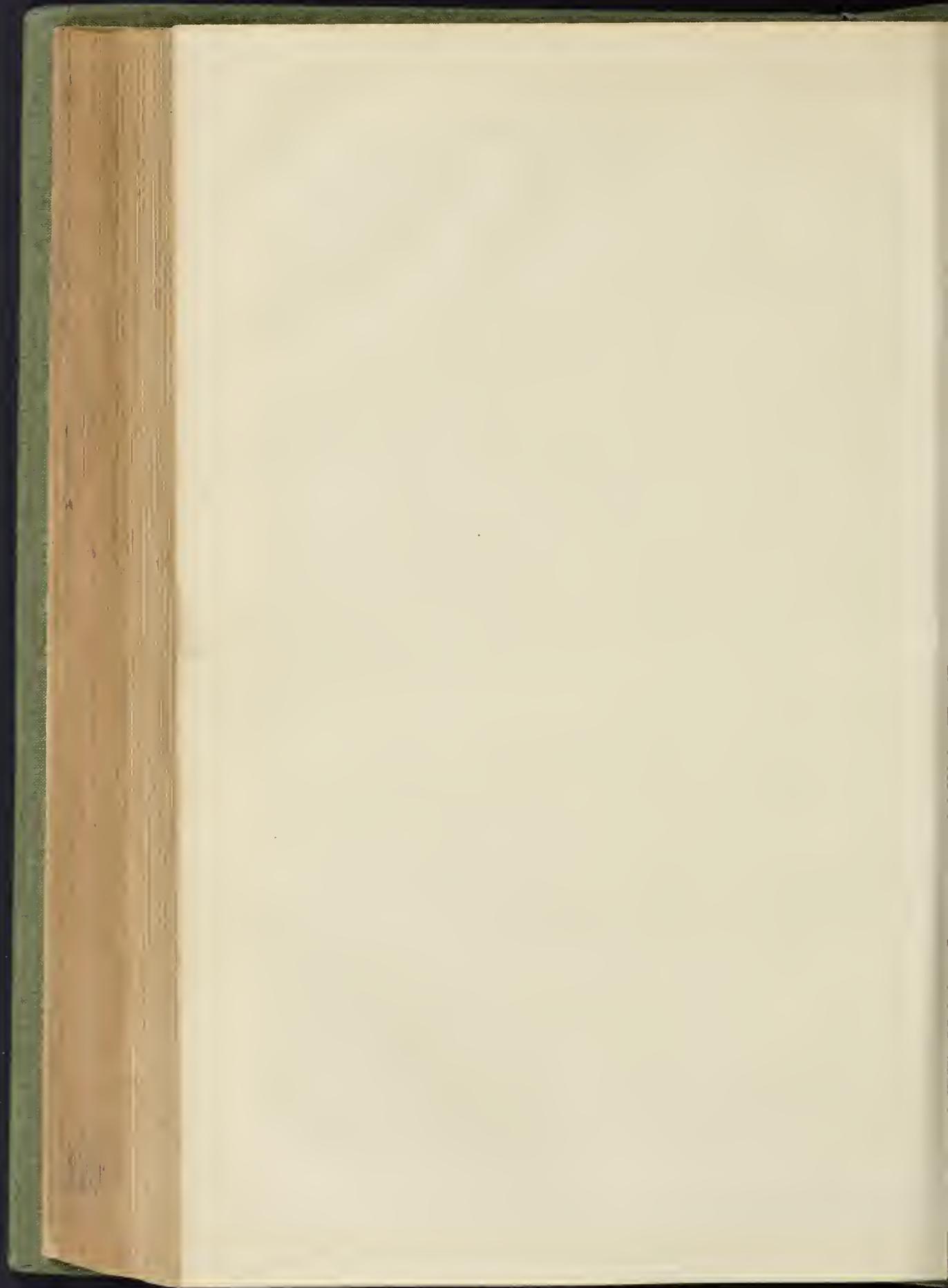
windows with stained glass will be carried out immediately; and it is hoped that early next spring the walls will admit of the intended decorations.

We have now only to add that Messrs. Goldie & Child were the architects under whose care the work was carried out. Mr. Frederick Aveline, of Stony Stratford, was the builder. The designs for the gas standards were executed by Messrs. Hart & Peard. Mr. Earp, the sculptor, of London; Messrs. Hargraves & Craven, who supplied the tiles; Mr. Hayball, of Sheffield, who executed the stalls, should also be named, as well as the clerk of the works, Mr. West. An eagle has just been executed for the chapel by Messrs. Margetts, of Oxford. The candlesticks and the wrought crucifix upon the altar are from the well-known atelier of M. Alexandre Chartier, of Paris.

The cost of the chapel is over 5,000l., but almost as much again seems still to be required to complete the design. This expense is defrayed entirely by the warden of the college, the Rev. Walter M. Hatch, who is one of the fellows of New College, Oxford. The chapel is licensed for the performance of divine service and the administration of the sacraments under the Private Chapels Act.



CHAPEL OF ST. PAUL'S COLLEGE, STONY STRATFORD.—MESSRS. GOLDIE & CHILDS, ARCHITECTS.



THE METROPOLITAN BUILDING TRADES MOVEMENT.

It is gratifying to be able to state before going to press this week that there is now every prospect of a speedy termination to the unfortunate misunderstanding between the employers and employed in the metropolitan building trades. A conference between the sub-committee of the Master Builders' Association and the deputation from the carpenters and joiners, for the purpose of arranging the points in dispute, was held on Tuesday, at the offices of the Association, No. 2, Westminster Chambers. The sub-committee of the masters consisted of Messrs. Hanmon, Brass, Shaw, Macey, Trollope, and Bird; and the deputation from the carpenters were Messrs. Greedy, Mitchley, Mortimer, Whaley, and Burgess. The following document has been furnished as the result of the proceedings, which lasted about four hours:—

"2, Westminster-chambers, Aug. 27.
The working hours to be 52 1/2 per week all the year round for joiners, 52 hours per week for 40 weeks in summer and 48 per week in winter for outdoor work, leaving off work at 1 o'clock on Saturday during winter.
Wages to be 8s. per hour all the year round, sometimes beyond the above hours, when worked at the request of the employer, to be paid for at the following rates:—For the first hour at 9s. per hour, and from the end of the first extra hour until 8 o'clock p.m. at the rate of 1s. 6d. per hour; after 8 o'clock at the rate of 1s. 3d. per hour. This scale not to apply to the case of men working over-time at their own request or to make up time lost by them during the week. Extra time on Saturday to be paid for at the rate of time and a quarter up to 8 o'clock, and after that time at the rate of time and a half.

Moved by Mr. Hanmon, seconded by Mr. Matkin, and carried unanimously:—
In the opinion of the sub-committee of the Masters' Association and the deputation of the carpenters and joiners now met together, it is desirable that an endeavour should be made to settle all future questions which may arise on trade matters by conference or by arbitration.

On Wednesday morning, the bricklayers' deputation met the same sub-committee of masters. The deputation consisted of six members. Very little discussion took place. The deputation stated that they had not come fully empowered to settle the dispute, but were willing to enter into a discussion as to the terms of a settlement. The masters declined to enter into any discussion in these circumstances, and the deputation then retired to report to their committee the result of their interview.

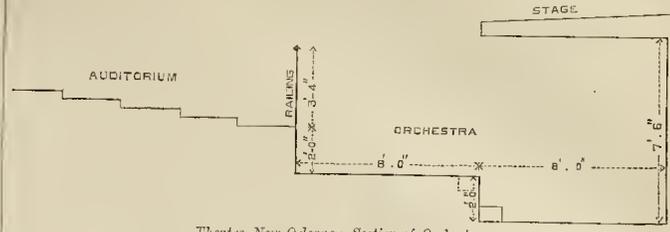
In the evening, a crowded meeting of the carpenters' and joiners' nine-hour delegation was held at the Brown Bear, Broad-street, Bloomsbury, to receive the report of the deputation who had waited upon the masters' committee. About 60 delegates were present, and the following resolution was carried:—

"That this meeting of delegates of the carpenters and joiners of London, having heard the report of their deputation elected to confer with the master builders' committee on the existing points of the dispute, hereby agree to commend that work be resumed upon the terms agreed on between the deputation and the committee of masters. In the same time, we further recommend the continuance of this organization, with the view of obtaining terms more satisfactory to the trade at the earliest opportunity, and also for the purpose of establishing the terms now agreed upon throughout the London trade."

It was understood that the great body of the men out on strike will forthwith resume work on the new terms.

SHOPS WITHOUT BUSINESS, AND SHARPING AGENTS.

SIR,—I often notice with sadness many retail shops opened for a few weeks, then up go the shutters. These shops are mines of wealth to the modern business agents, who combine other operations—loan office, debt collecting, and edit *Dupers' Gazette*, or *Sharpers' Advertiser*, at six per cent! They ruin all that "walk into parlour." These deluders pluck their victims like sheep. When broken down in heart and purse, they know they are powerless to sue them for false representations. To expose them individually is a libel. Let us throw these fellows their bread-crumbs by honest opposition. A few teetotal surveyors would for a small fee survey premises and locality before a venture. I recently bought a brush at a shop kept by a low left with five children. Tears came into my eyes as she told me of taking only sevenpence in two days, notwithstanding representations made to her by the agent. Genuine business shops seldom get into their hands; the other sort pays them best; for, as soon as one party is stamped out, they rig it up again. They believe in quick returns. They buy and sell all that rely on them. R. T.



Theatre, New Orleans: Section of Orchestra.

HERR WAGNER'S THEATRE.

SIR,—In your issue of June 15th, I notice a section of Wagner's proposed National German Theatre. In the accompanying remarks it is stated, that "the idea of an invisible orchestra will now, for the first time, be carried out."

Now, sir, I claim to have built a theatre in this city, which was opened on the 4th of December last, the orchestra of which was constructed in accordance with the enclosed section.

The orchestra it is intended to accommodate is only proportioned to dramatic performances, and composed, say, of fourteen or sixteen pieces. Still the principle involved is the same.

A carefully-constructed sounding-board encloses the space under the stage. By this arrangement the effect is in no degree impaired.

B. M. HARRD, Architect.
New Orleans, Louisiana, U.S.

It is to me surprising that for every species of good church-work it is not used. It has every possible advantage over oak, and in old cathedrals requiring new stall-work its rich brown colour would give it a great advantage over the pale brownish yellow hue of new oak,—which to my own taste is most offensive. After great experience, I know not one drawback to the use of black American walnut; and want of knowledge of its many excellent qualities has, I am sure, alone prevented its more general use.

SWIMMING FROM ENGLAND TO FRANCE.

Mr. J. B. JOHNSON, who imposed on the inhabitants of the metropolis some time ago by a pre-arranged act of *extempore* daring, seems to have been playing another trick of a similar kind. He started with much pomp and circumstance, and "for a large wager," to swim from Dover to Calais,—a work of at least twelve hours, as was calculated,—and before he had been in the water one hour it was found that the circulation was failing, and he was taken on board a steamer that had been hired by Mr. Strange to accompany him. If it was an honest affair he ought to be ashamed of himself for not having first assured himself that he could, at any rate, approximate success. But the whole thing looks like a well-greased advertisement-trap, into which all the newspapers seem to have slidden easily. In the interest of good-faith Mr. Johnson and his backers should be made to answer a few questions.

THE PREHISTORIC CONGRESS AT BRUSSELS.

THE Congress of Prehistoric Archaeology opened in the Ducal Palace, Brussels, on Thursday last week. At noon the members met in the Gothic Saloon of the Hôtel de Ville, where M. Orts, on behalf of the Bourgmestre, M. Ansapach, welcomed the Congress and thanked the distinguished *swains* who had come to throw light on the historic problems of obscure and distant periods. M. Hagemans replied on behalf of the Congress, and M. Worsae, the Danish archaeologist, in the name of the foreign members, returned thanks to the town of Brussels for the hospitality extended to them. A *déjeuner* was then served, and at two p.m. the Congress met in the Ducal Palace, M. d'Omalus d'Halloy presiding. The king honoured this first sitting with his presence; M. Delcours, Minister of the Interior, and General Guillaume, Minister of War, being in attendance on his Majesty.

On Saturday an excursion to the Valley of the Lesse took place. The excursionists went to Dinant by rail. All along its course the Lesse runs between ranges of high hills of varied shapes, presenting alternately huge mountain ribs of bare rock and of woods. Along the river banks are numerous caverns where the cave-men had their dwellings. Nearly all these caverns have been investigated by M. Dupont, the director of the Brussels Museum of Natural History, who acted as interpreter. His disquisitions were followed by lively discussions among the archaeologists and geologists present. He commenced with the *Trou Magritte*, where multifarious objects of the age of the Mammoth have been found, some of them showing beginnings of the art of sculpture. A long and steep mountain-path leads up to this cavern, where there are four superposed ossiferous layers. After this, however, troubles of the day commenced. Lesse has many windings and few bridges, and to carry out the programme it had to be forded four times. Cars sank in the water, and only after great trouble was the company brought to

AMERICAN BLACK WALNUT.

SIR,—Permit me, through the medium of your journal, to direct the attention of architects and cabinet-makers to the great value and beauty of black American walnut-wood. My attention was first directed to its use by an accident; and during now a period of seventeen years I have tested its durability and adaptability for almost every kind of woodwork. I have had it used for the largest and most costly kinds of furniture, with carvings of the most elaborate kind. I have had it used for doors exposed to the full action of the weather; for conservatory-doors, exposed to constant damp, and considerable changes of temperature; for a large and costly staircase, the whole of the walls being covered with the same wood, and the floors of the same; for internal doors and casement windows, of rather large and costly construction, and carved, and for every kind of smaller cabinet-work, exhibiting the highest taste and good workmanship; and for all these purposes I have found the wood answer most admirably. It appears to bear rough external wear quite as well as oak. It does not warp or crack like oak, and bears the greatest transition of heat and cold without any visible change. The colour of the wood, when eiled, is perfect,—that natural rich brown colour, which three centuries of wear will alone give to oak; it has a close grain, without much figure; is thoroughly well adapted for every kind of carving; and its cost now is not higher than oak.

the other side. One car, containing five ladies, was nearly upset. After luncheon on a romantic spot, the Lesse, to reach the Trou-de-la-Nailette and the Trou-de-Challeux, had to be crossed again. As the side of the mountain reaches down close to the opposite bank, the river was to be traversed in boats. Several hundreds crossed over, and the crowding in the boats was great. On the return from the caverns the boats were even more crowded, and one of them went down, and eighteen persons were thrown into the water, among whom were Mr. Franks, of the British Museum; Madame Royer, the interpreter of Darwin's theories in France; and M. d'Omalins d'Halloy, the president of the Congress. All got to the shore, however, and returned to Dinant without further accident. Shortly before midnight the party arrived at Brussels, after a day of useful research for many and enjoyment for all who had taken part in the excursion.

BORING IN THE WEALDEN.

We shall watch this important experiment with great interest, and trust there will be no lack of funds to carry it through successfully. The place where the boring has been commenced is known as Councillor's Wood, near Battle, on the estate of Mr. J. C. Mappin. Mr. Bosworth, who is conducting the boring, drives by steam a cutting tube, a sort of closed auger, at the end of an iron rod, weighted on the top, and fresh joints of rod are screwed on between the auger and the weight as they are required. The auger itself is about 2 ft. long; and it produces a perfect cone of the strata through which it has passed. Mr. Bosworth has elsewhere carried boring to a depth of 2,000 ft. When great depths are attained, the revolution of the rod at the top of the bore is not immediately communicated to the auger, but may be said to take time to reach it, so that the rod twists. Theoretically, each 20 ft. of rod make a three-quarter turn before communicating the rotation to the portion below; so that every 100 ft. require six complete revolutions at the top before the auger feels the movement. The workmen soon learn to tell, by the sensation communicated by the rod to the hand, whether the auger bites, and at a depth of 100 ft., if it did not bite on the completion of six, or at most seven or eight, revolutions, it would be pulled up, and a faulty joint of the rod looked for and removed. In theory, of course, the six turns would be distributed over the whole length of the rod; but the iron is not perfectly homogeneous, and so, in practice, it is the weakest or softest part of the rod that receives all, or nearly all, the twist, and that would break if the twist were carried too far. For the surface soil the auger is 9 in. in diameter, but in deep borings is replaced by one of 2 in., or of only 1 in., in diameter.

LINCOLN ARBORETUM.

This public park, designed by Mr. Milner, was on the 26th inst. opened with much ceremony. It covers 12 to 13 acres of the southern escarpment of the table-land on which the upper part of the city stands, has two entrances on the summit and two on the lower level, one of the latter being the lodge, which has a tea-room attached to accommodate 200 people.

The chief feature is a broad terrace running from east to west, approached by three wide flights of steps, and having trees along its edges; a glazed pavilion is placed in the centre, and at each end a fountain. Drinking-fountains are also fitted up; two retaining walls are built—one to support the embankment, the other forming the northern boundary, and surmounted by a neat iron fence.

The grounds are tastefully laid out and planted; a maze is constructed with briar bushes, and a miniature serpentine lake, with two bridges; a number of casts of statuary are dotted about the grounds, the most prominent being a lion mounted on a pedestal.

The work has been some two years and a half in hand, and having been done chiefly by day work, will cost with the approaches upwards of 8,000l.,—something like double the contemplated outlay. The land belonged to the freemen, who in consideration of a payment on their behalf of 200l. a year from the corporation, sanctioned the scheme, for which an Act of Parliament was obtained. A series of several acres along the summit was sold for villa sites, and the remainder appropriated for the arboretum.

RESULTS OF THE EXAMINATIONS OF SCIENCE SCHOOLS AND CLASSES.

The following is from the list of Queen's Medallists,—science examination, May, 1872:—

Subject 3: Building Construction.

Name.	Age.	Occupation.	School.	Teacher.	Medal.
Painter, Edwin T....	26	Clerk	Portsmouth School of Art	Carter, J. L.	Gold
Souhey, H. J.	29	Carpenter	Taunton School of Science and Art	Rowe, J.	Silver
Harper, Earen	18	Clerk	Birmingham, Bloomsbury Institute	Smith, A. F.	Bronze
Lewis, Wm. G. B....	19	Architect's Clerk	Charterhouse, St. Thomas's School	Mills, S. F.	Bronze

THE NEW INFIRMARY FOR CHELSEA.

On the day appointed by the Local Board of Guardians for opening the tenders, Mr. Gough, representing Mr. Giles, the architect, being present, the following tenders were received:—

Neave	£19,862	0	0
Heath	19,331	0	0
Fish	18,983	0	0
Stephenson	18,450	0	0
Elliott	17,967	0	0
Messrs. Leathby	17,655	0	0
Gough	17,609	0	0
Sawyer	16,885	0	0
Manley & Rogers	16,797	0	0
Thorne & Co.	15,740	0	0
Rankin	16,135	0	0
Turrell	15,857	0	0

Mr. Birch moved that the tender of Mr. Turrell be accepted, as it was the lowest.

Mr. Sydney, contending that it was a wrong time to embark in building speculations, moved the postponement of the question for six months, and after some discussion this was carried by a majority of 8 to 6.

NEW HOSPITAL FOR SOUTHAMPTON.

The Sanitary Committee of the town council at the last meeting of the council, reported that Mr. Lemon, the borough surveyor, had informed them that, having made an approximate estimate of the cost of the proposed hospital at West Quay, he found that it would much exceed the amount which he thought the town council were prepared to spend. As far as he was able to judge, without making an estimate in detail, the hospital would cost upwards of 7,000l. The surveyor also submitted detailed plans and drawings; after which the committee resolved that Mr. Lemon's report be submitted to the council, and they approved of the plans, and recommended the Local Board to adopt them, and carry out the works. At the same meeting Mr. Lemon submitted a reserved estimate for reclaiming the foreshore, building quay walls, and putting in foundations for the proposed hospital, amounting to 1,167l., and the following tenders were submitted for the work:—Messrs. J. Ball & Sons, 1,139l., and Mr. John Tate, 1,180l. The committee recommended the Board to accept the former.

The council appeared, from the ensuing discussion, to be taken by surprise at these calculations, and in the end an amendment on the motion for adopting the report, to the effect that its consideration be adjourned, was passed by a majority of 21 to 11.

SCHOOL BOARDS.

London.—The Works Committee have reported as follows:—

"On the 28th of June the committee were instructed by the Board to take the necessary steps to invite a competition of four architects for the Board offices to be erected on the Thames Embankment. They now beg to submit the conditions and particulars which have been drawn up for the guidance of the competing architects."

The conditions stated that the offices are to be erected on the Thames Embankment, near the Temple Station, the accommodation to include, besides the offices for the staff, a board-room for forty-eight members and accommodation for the Press, together with a public gallery for about 100, with separate entrance. The report was approved. On the recommendation of the Works Committee, it was resolved to appoint to the architect's department a chief draughtsman at 200l. a year, six efficient assistant draughtsmen at salaries not exceeding 120l. a year, and a "practical man," at a salary of 2l. 2s. a week, to take charge of the structural drawings and specifications.

Mr. F. W. Roper and Messrs. Leo Bros. & Pain were appointed architects respectively for schools to be erected in Hunter-street, New North-road, and Gloucester-street, Stepney. The tender of Mr. W. E. Nightingale, amounting to 5,578l., for the erection of a school on the site in Mary-street, Bromley, was accepted.

Leicester.—A report from the Architects' Com-

mittee as to the tenders for building the Syston-street schools, has been adopted by the Board. There were thirteen tenders, and that of Mr. T. Duxbury, for 4,913l., was recommended by the committee. The subject of sites for other schools has been engaging the attention of the Architects' Committee. Mr. Hollingworth inquired if it was not time for the Architects' Committee to take some steps for obtaining a clerk of works. As soon as the contracts were signed the work would be commenced, and they would want some one responsible to see to it. It was agreed to call the attention of the committee to this subject.

Rochester.—The clerk stated that the plan of the Board's new schools had been sent to the Educational Department. He further said it was considered necessary, that adjoining property should be purchased, in order to furnish proper ventilation, good drainage, and a playground for the boys. It was agreed that advertisements inviting tenders for the erection of the school should be issued. Mr. Walker, the architect for the new schools, said he had received communication as yet from the Education Department respecting the plans, but he believed they would be adopted. There would then be plenty of time to proceed with the work; the builders' strike being expected to terminate every day, while the price of iron was falling. Mr. Belsey said Mr. Barrell, the owner of the property adjoining the proposed new schools, had told him that he would not allow the Board to open any windows or doors at the new school near his premises. Mr. Hayward said no one could prevent the opening of doors or windows on a public road.

THE LATE HECTOR HOREAU, ARCHITECT.

We hear with regret of the death of M. Hector Horeau, of Paris, at the age of 71. He has received more medals than commissions, and was the author of plans which brought fame and fortune to other men of his profession. One of these medals was obtained in London, in 1856, for a plan for an Exhibition building in Hyde Park. M. Horeau believed to the end of his days that had he not been a Frenchman the Exhibition Committee would have preferred him to Sir Joseph Paxton. He was one of the earliest projectors of a submarine tunnel between England and France. During a short residence in England he designed and superintended the erection of an odd house in Avenue-road, Regent's Park, a view of which will be found in our early volumes. Years ago the writer, then a boy of his first tour, breakfasting with Hector Horeau in Paris, found him attired in a close-fitting red dress, à la Mephistophiles. He was a man of considerable ability, but his success was scarcely commensurate.

THE NEW GREEN-COAT SCHOOLS AT CAMBERWELL.

ABOUT twelve months ago the Bishop of Winchester laid the foundation stone of the above-named schools, facing Camberwell-green, which have just been completed and opened, with the exception of the infant school, which will be ready for occupation in the course of a few weeks. Some time ago it was determined to take down the old building and erect the larger and more convenient structure now finished. The style of architecture adopted is the Gothic, the material used being Kentish rag-stone, with Bath stone dressings. The main elevation, which consists of three stories, is 8½ ft. in length and 54 ft. in height, there being a handsome spirelet or bell-cot, at the south end, 24 ft. in height. The building extends 168 ft. backwards, and on a portion of this area stand the boys' and girls' schools and class-rooms, the remaining space being set apart as a playground. The central portion of the front block contains the masters' and teachers' residences, and at the

out-west corner is the board-room. The principal boys' school-room, which is on the ground-floor, in the rear of the building, is 70 ft. by 6 ft., and attached to it are two class-rooms, 18 ft. by 20 ft. each. On the first floor above here is also another boys' school-room, 38 ft. by 10 ft., with two class-rooms, 18 ft. square. The girls' schoolrooms are on the ground and first floors, and are T-shaped, their extreme length being 53 ft. by 20 ft., and their extreme width, 49 ft. by 20 ft., each school having two class-rooms 20 ft. square. There is also an infants' school of the same dimensions as those for the girls. The cost of the building is estimated at a little over 4,000l. Messrs. Payne & Clarke, of Buckingham-street, Strand, are the architects, the contractor being Mr. Crabb, of Kingsland-road.

CONCRETE AND THE METROPOLITAN BOARD OF WORKS.

Sir,—Surely some of your more able correspondents will not let the strange notice appearing under the above heads, in your last week's paper, pass without some comment. Am I to understand a concrete wall, built between Tall's stent panels, is according to the Act of Parliament, and that one built in the same way with the same kind of materials, between planks fitted together, does not come within the rules? I rely this cannot be fair to those who do not go to purchase an expensive apparatus. I have dealt with them extensively, and am doing so in King-street, Borough, but I also find it is equally good walls between planks. If it is considered to come within the rules of the Act, why not the other?

It has been several times summoned by the Metropolitan Board for this system of building contrary to the Act, and each time the complaint has been withdrawn or lushed up.

H. GOODWIN.

THE LONDON INTERNATIONAL EXHIBITION OF 1873.

Her Majesty's Commissioners for the Exhibition of 1873 announce the third of the series of annual International Exhibitions of selected works of art (including music), industrial art, and the most scientific inventions and discoveries. It will be opened at South Kensington, in April, 1873, and closed in October, 1873. The exhibition will take place in the permanent buildings erected for the purpose, adjoining the Royal Botanic Gardens. It will consist of three sections—Fine Arts, Manufactures, and the most Scientific Inventions and New Discoveries of all kinds. The productions of all nations will be admitted, subject to the decision of competent judges as to their being worthy of exhibition, and provided they have not been exhibited in the previous International Exhibitions of this series.

A RESERVOIR INJURED BY A WATERSPOUT.

On examination of the chief reservoir supplying the Fyde Water Works, in Grizedale, above Garstang, and an inquiry in the district constituting the "gathering-ground," it tended to reveal a state of things showing damage to the extent of many thousands of pounds has been done by a waterspout, and that works have been thrown completely out of repair. During the late heavy rains a waterspout burst upon the Fells of Bleasdale, above water works, and this was so tremendous it washed down vast quantities of peaty soil, lig, &c. into the reservoir. The rush of converging currents was terrific, the reservoir was swollen 2 ft. above the ordinary overflow, and it was feared by the man in charge of the whole place was going to be swept away. Luckily, the principal embankment, some time ago showed signs of weakness, was afterwards repaired, fully as the water pressure put upon it, else the valley below would have been inundated, and sad havoc would have been caused. The reservoir was, however, with all kinds of refuse; its water (many thousands of gallons) was totally spoiled; and it took about five months to clean it out. It is calculated that the work of emptying the reservoir, and of repairing it, will cost about 10,000l.; and that the total damage in loss of water, derangement of works, &c., may reach

20,000l. Fresh supply-pipes to feeders adjoining the reservoir will have to be laid, to partially provide for the extensive district hitherto using the water. The supply for the vessels at Fleet-wood, and for the streets of that town, and of Blackpool, &c., has been stopped, and it is thought that the general supply will have to be cut off every night, or at intervals during each day, till the work of reparation is accomplished.

A GERMAN BOARD OF HEALTH.

The Chancellor of the German Empire has proposed to the Federal Council, states the *German Correspondent*, to create a board of health for the empire, composed of ordinary and extraordinary members. The duties of the former, who must be resident in Berlin, would consist in aiding the Government to exercise a supervision over matters in the province of the medical and veterinary police, to take cognisance of all analogous institutions existing in the different Federal States, to prepare and submit legislative measures to the empire, to observe the practical working of laws enacted in the interest of the public health, and in particular cases to report on them to the State and local authorities, to follow the progress of medical legislation in foreign countries, and to organise a satisfactory system of medical statistics for Germany. The extraordinary members would have to be selected from persons who do not reside in Berlin, and from the municipal officers of the larger German towns, professors of medicine, Government medical officers, or practical chemists and architects. They would be required to express an opinion on certain questions when summoned to do so by the president; to watch everything likely to affect the public health in the neighbourhood of their respective residences, and to report on it to the president; and, finally, to take part in the general conferences to be held from time to time at Berlin. These proposals of the Chancellor will, in the first place, be laid before a committee for examination, and afterwards submitted to the Federal Council.

"SPECIFICATIONS."

Sir,—I have seen your critique on my edition of "Bartholomew's Specifications," and shall be much obliged if you will make public my reasons for the omissions you mention in the work.

I still preserved the old names of first, second, &c., class of houses, although after an obsolete Act, as it has always seemed to me the best way of describing a house. But you will find that this refers only to the first four specifications, and not at all in the new ones I have inserted.

With regard to my omission of concrete construction, I should like it to be known that it did not arise from ignorance or carelessness; I had even written a paper upon the subject, but omitted it because at present it is so much a matter of patent right that it seemed to me that I must advertise one or other of the companies now established, which is scarcely a proper thing to do in a work of reference. Besides which, any person wishing to build in any one of the patent systems need only obtain the full particulars which is scarcely a proper thing to do in a work of reference.

In studying the matter, I find that you were personally so early in the field in advocating this system of building that I am sure you cannot be pleased to find that some of the companies refuse to work under architects.

F. ROBERTS.

INTERNATIONAL PATENT SYSTEM.

A recent deputation, which included Mr. Macfie, M.P., Mr. Webster, Q.C., Mr. Johnston, M.P., Dr. Haselme, and Mr. Wise, C.E., have by invitation presented to the Government a written statement of their views on this subject.

It is suggested that negotiations should at once be initiated in accordance with the last resolution of the Select Committee of the House of Commons, who recommended

"an assimilation in the law and practice with respect to inventions among the various civilised countries of the world, and that Her Majesty's Government be requested to inquire of foreign and colonial Governments whether they are ready to concur in international arrangements in relation thereto."

Three modes of procedure are presented for consideration:—(1.) An international conference; (2.) Correspondence between the Ministries of the various States and colonies; (3.) Communications between heads of the different patent offices. Some of the desired objects, it is thought, may be obtained by an assimilation of the official rules, as the patent laws in many States are similar in principle, though legislation may be requisite to secure a substantial uniformity in the practice under the various systems.

The deputation are of opinion that the grant of Letters Patent should be confined, as recommended in the ninth resolution of the Select

Committee, to "original inventors, their assignees, or authorised agents;" and they regard the recognition of the rights of the authors of inventions as indispensable to an international system. They state that an organised practice of "pirating" inventions exists, whereby foreign inventors are often deprived of their rights by "first importers," who anticipate them in their applications for English patents. The deputation submit these suggestions, which accord, they state, with the recommendations of the Select Committee, and they respectfully ask that early action may be taken by the Government calculated to secure uniformity in the various systems of granting patents for new inventions.

EDINBURGH CATHEDRAL COMPETITION.

Sir,—Will you allow me to disclaim any connexion with the design marked "Fidelitas" in the Edinburgh competition?

W. BEZGOS.

UNFAIR COMPETITIONS: BRIGHOUSE.

Sir,—Your correspondent displays an amazing audacity in maintaining the mis-statements he propounded to your readers as to the amount of the original tender for the Brigbous Cemetery buildings; but no one will entertain a doubt as to where the better means of information lie. It might have been expected that he would have accepted my statement; but since he is pleased to doubt it, I hardly know whether I am justified in believing it myself. Since my authority is insufficient, and that of the *Brigbous News* also, the only newspaper represented at the meeting of the Board on the occasion of the opening of the tenders, let us turn to his own authority, the *Italy Courier*. This very highly-esteemed journal equally contradicts his statements, for although the total of the lowest tender is, probably by a misprint, stated to be 5,922. 6s., the separate items only add up to 2,928. 10s. On this error, which must have been patent to an unprejudiced eye, your correspondent has based his charges against us.

With regard to the *Instructions* I read (pages 16 and 17) that "the estimate of the cost of the building shall in no case exceed 2,000l." The document does not refer to the cost of the entrance-gates and boundary wall, of which the length is only given approximately, and of which the cost could not therefore be definitely estimated.

The board compared the working drawings with the competition drawings in lengths, widths, and height, and being satisfied that they remained substantially unaltered, they passed a resolution approving of them. So far as I know, your correspondent has not seen the working drawings at all, and I am sure that he has not compared them with the sketches. Where, then, are the grounds on which he has based his charge of unfairness? What is the value of his estimate?

With regard to the real discrepancy between our estimate and the tenders, it is, as I have already admitted, excessive; I have, also, fully accounted for it. The well-known rise of prices which has taken place since our estimate was made, exemplified as it is in the report which you publish (*ante*, p. 590) of a meeting of the Bradford School Board, must be familiar also to your correspondent if he knows anything of building, and will amply satisfy the judgment of your readers. Further, I endeavoured to fulfil the work internally in a superior manner.

E. BARHAM PARSONS.

NEW GLOBE BRIDGE, PECKHAM.

Sir,—I beg to draw your attention to an article in the *Builder* of the 24th inst., headed "The New Globe Bridge, at Peckham and the Tradesmen" (p. 689), the particulars of which are false and groundless, thereby seriously injurious to my character as a contractor. In the first place not a single brick, or materials of any kind, has ever been placed in front of any tradesman's premises, but upon the banks of the canal, and on my own service ground. With reference to the piers, or rather (technically speaking) the abutments, I am happy to say they can be plainly seen above the water line by those who wish to see them. The statement, too, referring to my surceits is so far groundless, that they have nothing whatever to do with the work beyond that which is usual with surceits.

The deputation mentioned was composed partly of speculators, semi-impooverished previous to the commencement of this work, who, like many others, are looking out for an opportunity to plunge their hands into their neighbour's pocket.

I must add that no bursting of the dam has ever taken place, although considerable trouble and expense have been occasioned, owing to entirely unforeseen difficulties in the location of the canal and the traffic thereon, no claim for which has ever been made upon the vestry, or certified by the engineer; therefore I must beg you to give this letter a place in your next issue, in order that the subject may appear fairly and truthfully before your readers.

S. S. PRACK.

THE DARLINGTON FEVER HOSPITAL.

In our paper of March 30th we inserted a letter under this head reflecting on the conduct of the Mayor of Darlington and other members of the Hospital Committee of the Darlington Town Council. The mayor having commenced an action against the publisher of this journal in respect of such letter, the statements therein made being denied, and having offered to stay proceedings on our giving up the name of the writer of the letter, and paying the costs incurred in the action, we express our regret that the letter was allowed to appear, and withdraw all imputations the letter may be supposed to reflect on the character of the Mayor of Darlington and other members of the Committee.

WHAT IS A SPONGE?*

THEN comes the question, What is a sponge? Down here, in this wet hollow, we are sure to find some; in dark places, where the water is of some depth, almost every fragment of seaweed has attached to it some living species of sponges, and they vary in size and structure, from mere specks to large and substantial masses. Now and then we may find them on the shells of oysters and crabs; and once, in our aquarium, a fine hermit came out of his shell to die, and was found to have a sponge as large as a hazel-nut attached to his soft body, just below the insertion of the last pair of legs.

Animal life may be said to begin or end in the sponges; they are the very lowest in the scale of animated nature; but it is quite certain they are not members of the vegetable kingdom. Take a piece of sponge, such as is commonly used on the toilet-table, and dip it into a thin solution of size, and you have a fair resemblance of the skeleton, the gelatinous coating is organised and animal; and the best proof of the fact is afforded by the microscope, which reveals ciliary motion, and there is an end of the difficulty as to what place it should occupy. The openings in the sponge are chambers, interlaced with silicated fibres, and, by the play of the cilia on the gelatinous surface, the water is made to circulate from chamber to chamber, so that the sponges obtain their food by the same process as a vorticella or rotifer—namely, by creating currents through the agency of cilia. The exterior film is the life of the sponge; the skeleton is a deposit. But the film must be understood as pervading the inner as well as the exterior chambers, so that the currents of water pass through the entire mass, and carry nourishment to all the mouths for which the cilia work so incessantly. A very dead sort of creatura is a living sponge. It has none of the organs of sense which distinguish terrestrial animals, and not even the irritability which makes a sea-anemone of so peevish or spasmodic a temper. But it has its history, however brief, like others of the great class of zoophytes. The sponges increase by gemmation. Little buds appear within the openings of the reticulated mass, and these at last detach themselves, and exhibit the same play of cilia as their parents.

CHURCH-BUILDING NEWS.

Holme-on-Spalding-Moor.—Bursca Chapel, which stands a little distance from the Market Weighton and Howden turnpike-road, has been opened for divine worship, without the usual ceremony of consecration. The Right Hon. Sotherton-Estcourt, Tetbury, Gloucestershire, presented to the promoters an eligible site, and, in addition, paid for the cost of building, as a memorial of the late Mrs. Estcourt. The architectural design is a modified form of the Early English, worked brick, with stone facings, and with bell-cote at the west end. Its dimensions are 54 ft. long by 18 ft. wide; to accommodate about 100, and with chair seatings. The architect was Mr. Wm. Butterfield, of London; and the contractors were Messrs. Castles, of Goole. There is no pulpit: a portable stand is placed along the side of the reading-desk, as a substitute, without the emblem of the eagle.

Chineley.—The chief corner stone of the new nave of the church, now being rebuilt, has been laid by Mrs. Robinson, the vicar's wife. Mr. J. West Huggall, of Oxford, F.R.I.B.A., is the architect directing the execution of the works; and Messrs. Wall & Hoek, builders, of Brimscomb, Gloucestershire, are the contractors, for the sum of 2,168*l.* The walls of the new building are already 8 ft. or 9 ft. above the soil, and there is every prospect of the new church being completed and ready for divine service before next Easter. The new church will consist of nave, north aisle, vestry, and south porch, the present chancel and tower remaining. The walls will be built of brick, faced with Bath stone dressing; the roof open-timbered, wrought, varnished, ceiled between the rafters, and covered with plain tiles from the neighbourhood. Godwin's encaustic tiles will be used for the aisles. The seats will be of deal, varnished, open and low, and the pulpit, with prayer-desk, &c., of oak. The organ will be placed at the entrance from the north aisle to vestry.

Darlington.—The parish church of Darlington, which, with the exception of the tower and spire, has been rebuilt as a memorial of the late vicar, the Rev. Mr. White, has been reopened. The style is Pointed Gothic, and the building comprises chancel, north and south transept, and nave, and north and south aisles, accommodation being provided for between 1,300 and 1,400 persons, allowing more space to each than was afforded in the old church, and the aisle seats are all free and unappropriated. The exterior walls are cased with Codsall stone, with Greenshill stone dressings, and the roof covered with Broseley tiles, the ridge being surmounted with red crests. For the present the tower remains unrestored. It is intended to open a doorway through the lower part, to form the principal or western entrance. The roof is open, the timber being of pitch pine, stained and varnished. The nave is separated from the aisles by pointed arches, carried by decorated cast-iron pillars, and the chancel aisle is supported by carved corbels and Purbeck marble columns, with carved capitals. Light is supplied by means of clerestory windows of circular shape, and gallery and nave windows, two-light, with canopied heads, surmounted by trefoils; while in the chancel is a four-light stained-glass window, produced by Messrs. Wailes, of Newcastle-upon-Tyne, and given by Mrs. Brevitt. The subject is the four Evangelists. In the nave is another stained-glass window, given by Miss Huggill. Another stained-glass window, the gift of the Rev. C. B. Walton, curate, is situate in the gable over the chancel arch. Artificial light will, when necessary, be afforded by means of coronas, supplied, as was all the ironwork, by Messrs. Broad & Dowling, of Birmingham. The pulpit is the gift of Miss Dorsett, of Edgbaston. It is octagonal in shape, the materials used being Painswick stone and Devonshire marble. The organ has been transferred from the north aisle of the chancel to the south transept, which also serves the purpose of a vestry. The old seats have been scraped and cleaned, and made to match the gallery front and other new work, all of which is stained and varnished. The floor is laid with Maw's encaustic tiles. The architect gives an oak reading-desk. The whole building is heated by means of a hot-water apparatus, supplied by Mr. Blakemore, of Wednesbury. Mr. A. P. Brevitt, Darlington, is the architect; Mr. Lovatt, of Wolverhampton, the builder. The erection of the edifice has been superintended by Mr. Taylor. The total cost will be about 3,800*l.*, including outlay upon fittings, heating apparatus, and all other appliances, but not taking into account the value of the gifts.

St. Peter-le-Bailey (Oxford).—The foundation stone of the new church, which is about to be erected in New Inn Hall-street, has been laid by the Bishop of Oxford. The present church is situated at the corner of Queen-street and the New-road, and is about to be taken down to allow of the widening of the street at this place. The new church is to be erected about two hundred yards distant from the old one, on the west side of New Inn Hall-street, and adjoining New Inn Hall. It will consist of nave, chancel, and two side aisles. The body of the church will be 70 ft. long and 55 ft. wide, and the chancel 30 ft. long and 20 ft. wide. The organ chamber will be on the north side of the chancel, and also some seats for children. A square tower, with octagon turret for stone staircase, will be erected on the south side of this portion of the edifice, and underneath it will be the warming apparatus. The tower will be 77 ft. high from the ground to the battlements. A vestry will also be erected on the south side of the chancel. The style is to be Decorated. The ashlar work will be of Bath stone, Box ground, intermixed with stone from the old church and tower, and the window dressings and tracery will also be of the same kind of material. The interior of the building will be plastered. There will be four arches on each side dividing the aisles from the nave, and two smaller ones dividing the organ chamber from the chancel. At the west end there will be a five-light window, with a tracery of the period of Henry III., and also a five-light window at the east end, and tracery windows on each side. The chancel will be paved with Milton tiles, and the seated portion of the body of the church will be a boarded floor. The remaining portion, however, will also be paved with tiles. The interior of the roof, which will be a high-pitched one, will be open timber, and covered with Stonesfield slates. The height of the roof from the floor to the ridge will be 52 ft., and that of the chancel, 45 ft. Mr. Basil

Champnes, of London, is the architect; and Messrs. Honour & Castle, of Oxford, are the builders.

Bradfield.—The restoration of Bradfield Church, which was commenced several months since, is making progress. The work comprises the cleansing and repairing of the stonework in the nave and tower, and removing the galleries; re-warming, and re-seating the nave and chancel. It has been undertaken by Mr. Sampson, of Bolsterstone, and Mr. A. Hayball, joiner, &c., of Sheffield. There was accommodation, including the galleries, for 456 adults, but owing to the arrangement of the pews only a much smaller number could see and hear the clergyman. By the new plan 980 adults and 135 children, or 450 adults without children, will be seated on the ground floor. The chancel has already undergone considerable alteration and improvement, by cleaning and repairing the walls and removing the temporary vestries, and by the erection of a memorial east window by the Wilson family, of Brincliffe Tower.

Knutton.—The foundation-stone of a new church has been laid at Knutton. The new church is intended to accommodate nearly 400. The site is near Knutton House. The edifice is to be built by Mr. Bennett, of Burslem, from the designs of Messrs. T. Lewis & Son, architects, Newcastle. The design is Early Decorated, and the plan consists of a nave, 64 ft. by 25 ft.; with north aisle, 51 ft. by 13 ft. 3 in.; chancel, 30 ft. by 20 ft.; organ-chamber and vestry, each 12 ft. by 10 ft.; the nave will be 23 ft. 6 in. high to the spring of the roof, and 42 ft. to the under side of the ridge, and with the chancel, aisles, &c. will have open-timbered roofs. The seats will be open benches of pitch pine, the walling will be of red Alton stone, and the roofs of tiles of ornamental patterns. Although at present only a north aisle will be built, provision is made so that a south aisle may be added at some future time should the requirements of the district necessitate the enlargement of the church which, as at present arranged, will accommodate 383 persons. The cost of the building will be about 4,000*l.*

Stroud.—The screen has been removed from before the reredos, with which the parish church has been enriched by the Stanton family. The reredos has been erected as a memorial to their father, the late Mr. William Stanton. It was designed by Sir Gilbert Scott, in the Southwestern style of Gothic architecture, and is in harmony with the general design of the church. It extends the whole length of the chancel. On both sides there are niches surmounted by canopies, intended to receive figures of the Evangelists or some other fitting subject. This is not yet decided, and the niches are at present blank. The reredos, as seen at present, consists of a canopied panel, in which are carved in relief scenes in our Lord's life. The group of the left represents the taking down of the bed of Jesus. The centre group appropriately represents the resurrection. The canopies are carved. The groups have been designed and executed by Mr. E. E. Gejowski, of London at Rome, to whom the contract for the work was given by the architect. The architectural carving has been carried out by Mr. Morr, Gejowski. It is estimated that when the work is completed the cost will be from 700*l.* to 800*l.*

Wolverhampton.—Considerable alterations are commenced at St. Paul's Church, a building erected about thirty-five years back, according to the then-prevailing type, having a chancel 4 ft. or 5 ft. deep, with a vestry at the back over which latter is placed the organ. It is intended to remove the organ and wall-screen below, thus increasing the depth of chancel, taking in the present vestry, and erecting a new one on the north side of the church. On the south side will be built a new organ-chamber with open archways towards the chancel aisle, the lower portion being filled in with wire screens. Amongst other alterations, the font and pulpit are to be removed from their present situations in front of the chancel, and the former raised at the west end of the nave. The present lath-and-plaster gallery front is to be taken down, and a lower one constructed in wood. The tender of Mr. P. Horsman, at 600*l.*, for the general works, is accepted by the committee. Mr. J. V. Veall is the architect.

Thornton.—The new church of St. James, Thornton, has been consecrated by the Bishop of Ripon. The chief stone was laid in October 1870, with Masonic honours, by the Marquis of Ripon, as grand master of the Freemasons of England. The site, which is by the side

* From the *Gardener's Magazine*.

the highway leading from Bradford, at the adford end of the village, was given by Mr. Foster, of Queensbury and Hornby Castle, the building has been erected from the designs of Messrs. T. H. & F. Healey, of Bradford, at a cost of 5,060*l.* The style of architecture is Early English. There is a chancel, nave, south aisle, and organ-cess. The roof of the church is an open-timbered one, and the roof of the chancel is circular. The nave is 85 ft. in length by 27 ft. 6 in. wide. The dimensions of the chancel are 33 ft. by 23 ft., and the aisle is 14 ft. long by 14 ft. wide. The height of the chancel is 51 ft. At the east end, over the altar, there is a three-light window, surmounted by a pediment, both of which have been filled in with stained glass by Mr. John Foster, jun., at a cost of upwards of 300*l.* The subject represented is the *Te Deum*. It is the work of Messrs. G. & J. G. G. of London. The west end of the building is lighted by a two-light window, the chancel is lighted by a lancet-shaped window on the north side, and above the latter are rose-shaped clearstory windows. There are in the aisle two-light lancet-shaped windows. The principal entrance to the church is by a porch, above which it is intended to build a tower and spire. This part of the building has already reached the tower-base, which is at a height of 24 ft. The interior affords accommodation for about 600 people. The seats are of oak and are of pitch-pine, and the choristers' seats in the chancel are of oak. There are three pendants, to light the church at night. These have been designed by Messrs. Brown & Downey, of London. Mr. Wallace, of Gillington, has been clerk of the works, and the following are the contractors:—For the masonry, Messrs. T. & Sons, Thornton; for the woodwork, Messrs. P. & Sons, Thornton; the plumbing, Mr. Jones, Thornton; painting, Mr. E. Barstow, Thornton; slating, Mr. Smithies, Thornton. When the work has been added, and it is hoped that before the building committee will be in a position to complete it, the total cost of the edifice will amount to 6,000*l.* Upwards of 4,000*l.* have already been obtained towards the outlay intended.

Gvernafield Church.—This church has been erected on the site of an ancient building, stood on the site of the present church, close to the village. The ecclesiastical district of Gvernafield is but a small area, and contains a population, according to the last census, of 975, the greater part of which are at Gvernafield, Pantymawn, and along the back of the limestone hills stretching from Rhydydd to the vicinity of the Loggerbed. It was better to pull down the old edifice altogether, and build a new one. The architect of the new church is Mr. D. Walker, of Liverpool, and it is built in the Gothic style, and consists of nave and chancel. The framing of the roof is of stained wood. The aisle runs through the centre, and there are seats in the body of the church for about 250. Several of the donations were gifts. The cost of the edifice is 5,000*l.*

St. Peter's Church, St. Alban's.—The foundation-stone of the new church, which is in course of erection in the parish of Morton, has been laid by Miss Leigh, of Sweeney Hall, near Oswestry. The new church, which is dedicated to St. Philip and St. James, stands in a convenient situation on the site of the old building, and immediately adjoins the turnpike-road leading to Oswestry. It will be in the Early Decorated style, and will consist of a nave and chancel, with north and south aisles, severally appropriated to the purposes of an organ-chamber and vestry-room.

The external elevation of the nave will be 42 ft. All the seats will be free and the building will be constructed to contain 300 persons, the internal dimensions of the nave being 54 ft. by 21 ft.; south aisle, 14 ft. by 12 ft.; chancel, 26 ft. by 18 ft.; transept, 12 ft. by 9 ft.; and vestry-room, 12 ft. by 10 ft. The principal entrance will be on the north side, facing the turnpike-road, and the building will be supplied from local sources, chiefly from Sweeney Mountain and the lake. The roof will be covered with blue tiles, and the terminals of the gables will be surmounted with small statues. The walls will be 2 ft. 9 in. to 3 ft. in thickness. There will be a bell gable at the west end, which will be filled in with a four-light window; a three-light window will be in the chancel, and light will also be supplied by two other windows of two and three lights each. The roof is to be a varnished

one, open, and with open principals, and all of the arcades and interior openings will be of dressed Shelvoke stone. In the chancel, which will be laid with Maw's encaustic tiles, will be placed the sedilia, credence, and other adjuncts. The pulpit, as at present proposed, will be a stone one. The nave and aisles are level throughout, the chancel being raised by two steps, and the sacrum by three. The warming apparatus of the old church,—a floor stove, by Dodwell, of Shrewsbury,—will be utilised for the purposes of the new structure. The works are being carried out from the designs of Mr. S. Pountney Smith, of Shrewsbury, architect, Messrs. Morris & Chaplin, of Oswestry, being the contractors. The outlay upon the work is estimated at between 1,600*l.* and 1,700*l.*, towards which nearly 1,500*l.* have been already subscribed or promised.

Sandford Rectory.—Having been enlarged, restored, renovated, re-fitted, and decorated, the parish church of St. Nicholas has been reopened. The whole of the church has undergone a restoration, and a new north aisle has been added. The chancel is of the fourteenth century, and has been preserved. Attention has been paid in preserving the ancient character of the external masonry. The new work is in the Perpendicular style. The paving of the chancel and manor aisle is of Maw's encaustic tiles. The roofs are of pitch pine, with curved ribs springing from picked pitch corbels. The seats are new, of the pulpit and reading-desk are carved and rest on Ham stone bases. Under the tower-arch is an old oak screen, of the Perpendicular period, which has been restored. The manor aisle contains two stained-glass windows by Messrs. Clayton & Bell. A new window by the same artists has been placed in the chancel. The warming apparatus is by Messrs. Hatien, of Trobridge. The organ, which cost 50*l.*, is a small instrument, inclosed in a pine-wood case, with pipes of "best spotted metal." It was built by Mr. Hallett, of Kington Magna, and is placed at the western end of the new aisle. The tower has five bells, which are chimed by a new and simple arrangement. The work has cost about 2,000*l.*, and has been executed under the superintendence of Mr. Henry Hall, of London, architect, by Mr. A. Reynolds, builder, of Milborne Port. The funds have been chiefly provided by the lord of the manor, Mr. Hubert Hatchings, and the rector, the Rev. Urquhart Cookworthy.

Clifton, Manchester.—The first stone of a new church at Clifton, near Manchester, has been laid by the Hon. Mrs. R. Cotton. The building will consist of nave and aisles, transepts, with a spacious chancel, and chancel aisles. The style is Gothic, of the fourteenth century, and the church will accommodate 500 persons. The work is being carried out at the expense of Mr. and Mrs. Cotton, who have also given the site. The architect is Mr. Edward M. Barry, R.A., and Mr. Booth, of Gosport and London, is the contractor.

Dorking.—The contractors for St. Martin's Church are Messrs. Goddard & Son; not "Goddard & Terry," as stated.

STAINED GLASS.

St. Peter's Church, St. Alban's.—The series of stained glass windows in this church has just been completed by the addition of two on the south side of the nave. The whole of the windows in the chancel are of coloured glass, that on the north side representing the Annunciation of the Virgin Mary, and the one on the south side the Ascension of Christ. The east window represents a series of Scriptural emblem worked in detail. The two new windows in the nave have been executed in Brussels, by Mr. J. B. Capronier. The subject of the one nearest the western porch is the Parable of the Sower; the centre figure representing Christ, with the sower on the right, and three of the disciples on the left. Underneath the centre figure is a cherub hearing a scroll, and above are two figures of angels. The subject of the other window is the Parable of the Vineyard, representing the hire of the labourers. There is also on this window a scroll. The subjects of the other three windows in the nave are the Good Samaritan, the Good Shepherd, and the Prodigal Son, the former of which is a memorial window, as well as that on the south side of the chancel. The stonework of the two new windows has been restored by Mr. Haselgrove, of St. Alban's. The

whole of the fourteenth-century glass on the north side of the nave has been collected and preserved. It is hoped that other stained windows, having for their subjects a continuation of the Parables, will eventually be placed in the church.

Great Berkhamstead Church.—The memorial window has been placed in this church by the high sheriff, Mr. Thomas Curtis, of the Hall, Berkhamstead. The window is by Messrs. Clayton & Bell, and cost upwards of 300*l.* Its subject is the Resurrection of the Blessed.

St. Mary's, Newmarket.—Stained glass has been placed in the east window of this church. The new glass, the cost of which has been defrayed by subscription amongst the parishioners, is the work of Messrs. Heaton, Butler, & Bayne, of Covent Garden. The three principal lights are filled with representations of the Nativity, the Crucifixion, and the Resurrection, and the smaller compartments in the heading of the window contain angels bearing shields, on which are represented emblems of our Lord's Passion,—the scourge, the hammer and nails, the reed and sponge, and the spear, &c.; the two uppermost shields display the crown of thorns, while two others, bearing a lantern and censer, typify Him who is the Light of the World and our Intercessor in heaven.

St. Matthew's, Rastrick.—Stained glass, by Messrs. Hardman & Co., Birmingham, has been placed in the first window on the south-east side of this church. The subject is Our Lord sitting at the feast in Levi's house. The work is the result of a subscription raised amongst the congregation of St. Matthew's Church, and in memory of the late Rev. Thomas Haines. The window is square, and is so treated as to occupy the entire space; and the architectural details are in accordance with the Palladian character of the church. Some one has been employed in the work of erection whose care has not been sufficient to prevent the breakage of one of the largest pieces of glass which the window contains, and it is difficult to see how such a breakage can be satisfactorily repaired.

Seale Church.—A further addition to the stained glass of this church has just been made by the rector and his brother, in remembrance of their parents. A window, of two lights, in the south wall of the nave, nearest the tower arch, has been furnished with full-length pedestal figures of Simeon and Anna. In harmony with the gospel narrative (St. Luke ii. 25-38). The general treatment of the subject is in the Perpendicular style, with some details in the borders, from the Fairfield windows. The artists were Messrs. Burbison & Grylls, who executed the stained-glass windows in the church of Hartley Wessell. The other windows in the church are mostly of the Decorated period, by Willenot, Wells, Clayton & Bell, Baillie, and Mayer.

Miscellaneous.

Subsidence of Land at Old Trafford.—Alarm has recently prevailed, owing to the condition of some house property situated near the toll-bar at Old Trafford. The back portions of the premises occupy a rather elevated position above the side of the bed of the old canal. Apparently in consequence of the soil not being sufficiently solid and firm, it yielded slightly, and appearances were presented in the way of cracks in some of the buildings, that gave rise to uneasiness, which increased on account of farther changes perceived. About six months ago the canal water was drawn off, and the subsequent effect of that seems to have been to take away the water from the surrounding soil, and cause the latter to sink. The Cheshire Railway Lines Committee, who own the bed of the old canal, have been constructing a 15-in. pipe drain below it, and the work is now progressing towards completion. It is found that four houses in Dalton-place are affected, and especially two of the buildings, where the cracks are more extensive, and the threatened consequences alarming. The inmates of the two houses have removed their furniture. The main parts of the line of buildings are built upon good foundations, and the danger is apprehended chiefly at the back.

The Great St. Gothard Tunnel.—The Swiss Federal Council has ratified the agreement with the contractor for the construction of this tunnel.

The Operative Bricklayers' Society have issued their second "London Strike Report," to be read at their various branch meetings. The number of men on strike during the four weeks ending the 10th of August was 119, of whom eighty-one belonged to the society, thirty of them being newly-enrolled members. In the fourth week the number was seventy-one, of whom only twelve were non-unionists. A sum of 98l. 11s. from the society funds was paid to eighty-four, including the above eighty-one, members on strike, being at the rate of 2s. per day per man, the time varying from one to eighteen days. The cost of administering this sum was 20l. 18s. 7d., of which the committee received 18l. 3s. In the seven preceding weeks ending the same date the total charge to the society for the strike amounted to 229l. 18s. 11d. During the three weeks ending the 5th of August, 111l. 8s. 4d. were collected in the way of subscriptions, and 47l. 13s. 7d. were obtained from trade levies, making together 159l. 1s. 11d., of which 142l. 8s. 4d. were distributed amongst the above 119 men, the cost of collecting and administration being 17l. 13s. 7d. Altogether, during a period of seven weeks, 264l. 13s. 3d. were contributed to this general fund, and on the 5th of August, 28l. 3s. 9d. remained in hand. For the last three of the four weeks covered by this report members of the society received strike pay at the rate of 1l. 3s., and non-members 11s., per week. The gross cost of the strike up to the 10th instant was 466l. 3s. 5d.

School Desks.—Mr. J. F. Moss, the clerk to the Sheffield School Board, has devised two new school-desks. The "Sheffield School Board Desk" is the title of one design; the other is to be distinguished as the "National School Board Desk," and both are arranged to seat the pupils in pairs. The latter can be constructed so as to have a separate locker for each boy or girl, and in this form it has, we believe, already been supplied by the makers (Messrs. Colman & Glendenning, of Norwich, and 23, Warwick-lane, London) to a large proprietary school just erected at Plymouth. A space of about 15 in. is left between each series of double desks in a group, but this space is more than counterbalanced by the saving effected in placing the desks closely one behind the other, and a very comfortable back is thus provided for each scholar. Additional writing-space is also afforded, the tops of the desks being wider than most of those hitherto used, and each pair of desks is provided with a footboard. The great advantage claimed for seating the children in pairs is that the teacher has more perfect and ready supervision of the members of his class, as he is enabled to reach any pupil in the least possible amount of time, instead of having to walk round the long desks, as under the old system. Some good opinions of these desks have been expressed. The question of space will probably arise.

A Proposed Livingstone Monument in New York.—The *New York Herald*, referring to the proposal to erect a statue of Dr. Livingstone in the Central Park, New York, makes the following remarks:—"We have a bust of Humboldt in the park and a statue of Morse, and it is eminently fitting that Livingstone, with whose history America is now so closely and pleasingly identified, should take his place by the side of the renowned naturalist and the famous electrician. The statue of Sir Walter Scott, by Steell, the well-known Scottish sculptor, from the original model which adorns the Scott monument in Edinburgh, will in a few months be placed in position, and the idea of the original projectors of the park, who desired that it should in time be a gallery of art as well as a place of natural beauty, is in a fair way of being realised. The statue of Dr. Livingstone is already made. It is the work of Mrs. Amelia R. Hill, the widow of D. O. Hill, member of the Royal Scottish Academy. It is to be erected in England in the honour of Livingstone as soon as he returns home. Why should we not have the same model erected here at once? The design is admirable. The commissioners should secure a model of this great work, and place it in the Central Park at once, so that it may be first seen here by Dr. Livingstone when, as we hope and expect, he visits New York before he returns to his native land."

Port of London Sanitary Authority.—A first meeting of this new corporation committee was held in the Guildhall, Mr. G. S. Pedler being unanimously elected chairman. Various matters were discussed, bearing on the new duties entrusted to the corporation.

The Combustibility of Iron.—Professor Magnus, of Berlin, has recently devised a beautiful experiment to demonstrate the combustibility of iron, says the *Mechanics' Magazine*. He takes a straight bar magnet of considerable power, and sprinkles iron filings on one of its poles. These filings, of course, arrange themselves in accordance with the lines of magnetic force; and since, however closely they may appear to be packed, no two of the metallic filaments are parallel, a certain portion of air is enclosed, as in a metallic sponge. The flame of a spirit-lamp or gas-burner readily ignites the finely-divided iron, and it continues to burn brilliantly for a considerable time. If the experimenter stands on a little elevation, and waves the magnet to and fro while burning, a magnificent rain of fire is produced. The experiment was first performed in Berlin before the Emperor of Germany and his court. The late Professor Faraday used very strikingly to show the extreme combustibility of iron under certain experimental circumstances.

The Cambrian Archeological Association.—The members of this association are holding their seventh annual meeting at Brecon, and, like their English brethren, they not only read papers, but make pleasant excursions to the national and historical objects of interest within easy distance of the place which forms their temporary head-quarters. The general programme has been arranged, and excursions have been fixed for Brynlllys, Aheredy, Cefn-y-bedd, Clawdd-y-gaer, Pytingwtijn, Digwyflla, Llan-de-failogfach, Maenmorwynion, Cwmab, Digwyflla, and Bettws. It is said that complaints of neglect have been addressed to the general committee from Llyynggffwddvaar, Marthacwm, Blan-Gwraeth, Llanvaircraeriion, Llanvairryryrn, and Lleechynvarwydvach. At the Pontypool police-court, a Welchman has just been charged with assaulting another on a disputed point in the spelling of Welsh names; and no wonder!

Richmond School of Design, Victoria.—Richmond, which is a suburb of Melbourne, with a population of about 18,000 people, maintains successfully a School of Design. At the second annual exhibition and distribution of prizes, held last evening, the hon. secretary, Mr. M. Egan, architect, stated in his report that the average attendance was fifty-two, with ninety names on the list. The report proceeded,

"A great deal has been said about the non-practical character of these schools. At first it was designed that our teaching might be of use to the students in their various callings, but we found that were we so severe in our teaching as to limit them to defined courses of instruction we would be unable to continue even in our present position. One school, in my opinion, has ceased to exist through following this course, and the fact is further illustrated by the most practical class we possess, namely, the architectural and mechanical, which, through our attempting to teach elementary principles, has fallen off from being the largest to the smallest. We can therefore only continue in our present course, and trust that the time will soon arrive when drawing shall be so valued that it shall be taught independently of the wishes of the learners."

Somersetshire Archeological Society.—The twenty-fourth annual meeting will be held at Taunton, on September 10th, 11th, and 12th, under the presidency of Mr. W. A. Sanford. After the president's address, Mr. G. T. Clark will read a paper on "Taunton Castle." The castle, the churches, and other objects of antiquarian and historical interest in Taunton, will then be visited; and in the evening there will be a meeting for papers. On the 11th there will be an excursion embracing Cheldon, Hestercombe, Kingston, Norton Church and Camp, Bishops Hill, Rams-leury Bridge, and Trull; and on the 12th the excursion will embrace Bathpool by the old Road, West Monkton, Creech, North Curry, Hatch Beachamp (if possible), Thornfalcon, and Ruishton. A third excursion is proposed to take place on Friday, embracing Orchard Portman, Thimbleer, Staple Fitzpaine, Curland, and the Camp of Castle Neroche.

The North Surrey District School.—Complaints have often been made as to the bad condition of the children in this school, and a committee of the Wandsworth and Clapham Guardians have now reported:—

"They were deeply impressed with the general air of discomfort prevailing in every part of the establishment, and regret to observe the want of proper arrangements, want of ventilation, want of sufficient accommodation for separate children in different stages of disease, want of cleanliness, imperfect drainage, and the utter failure in the carrying out of what they had understood to be the resolutions of the Board in its general management. The Visiting Guardians regret to have occasion to report their great dissatisfaction on the state and conduct of the infirmary in the North Surrey School."

A more rigorous inquiry seems to be necessary.

Statistical Congress at St. Petersburg. This is the era of congresses. On the 22nd inst. the labours of the Avant Congress having terminated, the Statistical Congress at St. Petersburg was formally opened by the Grand Duke Constantine. His imperial highness delivered an elaborate inaugural address, which was enthusiastically applauded. He concluded his address by bidding the congress welcome in the name of the Government and formally declaring the session open. The programme of the entertainments for the congress included an invitation from the Emperor to dine in the palace at Tsarkoé-Selo on the 26th, from the Yacht Club to a *fiête* on the 26th, and an excursion to Peterhof and Cronstadt on the 27th. The city of Moscow also sent an invitation to the members to visit the Polytechnic Exhibition and to accept the hospitality of the municipality.

A New London Park.—The Metropolitan Board of Works have now completed the improvements of Stepney-green, already alluded to in a previous number, and have thrown it open to the public. This is a valuable addition to the recreation grounds of the metropolis. For many years past the large open space known as Stepney-green, situate in one of the most crowded quarters of the east of London, has fallen into a neglected condition. At the instance of the local authorities, the Metropolitan Board have contributed the whole cost,—about 3,000l.,—of converting the waste fields into flower-garden and public recreation grounds. Stepney-green is the last remaining remnant of the famous Mile-end-green, the rendezvous of the rioters of Essex in the insurrection led by W. Tyler in 1381, and the trysting-place of the architects of the Tudors.

"Weighting" Paper and Cloth with Slate.—Protection has been obtained for an invention which consists in the employment of ordinary slate, or the mineral from which slate is quarried, in a state of fine dry powder or of fine wet pulp, and using it in both conditions as articles of commerce, either with or without the addition of any colouring matter. Slate of different colours is selected as desired, and ground to any degree of fineness in the dry or moist state, and this powder, or pulp, in natural colour is to be used for "stiffening a weighting" cotton or other cloth or paper, either used alone or in combination with china clay or other similar substance. The dry powder or moist pulp is also to be coloured to any tint required, and used in the manufacture of pigments or colours.

Gas Explosion.—At No. 1, Shrewsbury-villas, Plumstead, on Friday night, the occupant (a widow lady), being rendered uneasy by strong smell of gas, called in her next-door neighbour to their help. Seeing that there were lights burning in the drawing-room, he thought there could be no danger of an explosion, a getting upon a table, proceeded to search for a leak in the gas-pipe. For this purpose he struck a match, when the gas, which must have accumulated in the upper part of the room, exploded, with a very loud report, hurling through an open door into the next room, burning him severely about his face, neck, and hands. A young lady also had both her hair burnt, and the curtains and furniture in the room were ignited. The house itself was greatly damaged.

Decline of Cholera Symptoms.—In accordance with what we have more than once pointed out during this summer season as what might be expected in so open and thundery a year, not only in this country but over Europe, we now state that the cholera "has not in the last fortnight really advanced at all in its westerly direction" from Asia, and that "epidemic appears to be steadily declining," whatever may happen abroad, this is no choice year for England; and moreover, the autum and winter will probably be more than usually healthy otherwise, as is generally the case whenever the decaying, putrefying, organic wreck spring and summer.

Society of Engineers.—Arrangements have been made for a visit of the members and associates of this Society, on (this) Friday, the works of the Ransome Stone Company, East Greenwich. After leaving the visitors to proceed to the adjacent works of the Bessemer Steel and Ordnance Company, then to be inspected.

Opening of a new Drinking Fountain at Tunbridge Wells.—A new fountain has been opened at the junction of two roads at the town of Tunbridge Wells (the Grosvenor and St. John's) leading into the heart of the town. The Hon. F. G. Molyneux addressed a numerous assemblage on the occasion, as did also Mr. Veyland, a member of the Metropolitan Drinking Fountain Association. The fountain is composed of a pillar of polished granite, and bears a brass plate, on which are engraved some words of arms, &c., together with the following inscription:—"This fountain is erected by his widow, in memory of Lieut.-General Molyneux Williams, K.H., who died in May, 1871, respected and beloved by all who knew him. 'Blessed are the dead who die in the Lord.'—Rev. xiv. 13." The masonry was done by Mr. George Williams.

The People's Gardens, Willesden.—A series of Saturday *fetes*, to conclude the summer season of 1872, are being held at these gardens, which were opened last year in a somewhat unfinished state. The gardens have been purchased and laid out by "The People's Garden Company," with the object of affording to the shareholders and members a means of healthy and rational recreation, such as cricket, croquet, chery, boating, gymnastics, dancing, &c. The grounds comprise about fifty acres, and are well laid out. The gardens are open on Sunday mornings to members for promenade, when a band attends, and lectures and musical entertainments are provided on that day. The club now numbers 800 members, with the privilege of introducing friends.

Waste Materials at the Vienna Exhibition of 1873.—Among the supplemental exhibitions which will be formed in connexion with the Vienna Universal Exhibition is to be one showing what steps have been taken since 1851 (the date of the first London Exhibition) in the utilization of substances previously regarded as waste. On the one hand will be shown the waste products in all the industrial processes included in the forthcoming Exhibition; on the other hand, the useful products which have been obtained from such wastes since 1851. This is intended to serve as an incentive to further researches in the same important direction.

The Tower Subway.—The report of the directors states that the number of passengers passing through this subway during the last half-year has been 506,072, and the amount earned 1,054*l.* 6*s.* 4*d.*, or sufficient to pay all working expenses and interest at the rate of 5*1/2* per cent. per annum on the original shares. The traffic of the last half-year is 106*1/2* per cent. in excess of that of the previous half-year. It is proposed to declare a dividend on the preference shares at the rate of 5*1/2* per cent. per annum, and on the ordinary shares at the rate of 4*1/2* per cent., although there are not funds in hand to pay it immediately. The report has been adopted by the shareholders.

Destructive Fire at Leeds.—On Sunday morning in last week, a fire was discovered to be going on the extensive premises of the North-eastern Railway goods depot, Wellington-street, Leeds. The goods station is nearly a square, and on the eastern side is the grain warehouse, 40 ft. wide, and on the western extremity is the general goods warehouse, 127 ft. in length by 47 ft. in width. The general goods warehouse was only partly finished. The fire burned throughout the day, and the mischief done was very extensive. There are suspicions that the fire had been caused by an incendiary. The amount of damage done will, it is stated, exceed 50,000*l.* The buildings were insured.

Swimming Bath for Richmond.—A recent attempt to provide a swimming-bath at Richmond by means of a limited liability company having proved a failure, a public meeting has been held at the vestry-hall to consider the best means of providing one, under local direction and by local means. Colonel Burdett occupied the chair. It was unanimously resolved, "That it is meeting is of opinion that a public swimming-bath on the River Thames, in the immediate neighbourhood of Richmond and Twickenham, is urgently needed." A committee was appointed to carry out the object in view.

Tenacious Glue.—Dissolved in nitric ether, says Dr. J. M. Maisch, in the *American Journal of Pharmacy*, glue is about twice as tenacious as when it is dissolved in water.

The Liability of Tenants.—An owner of house property having inquired at Somerset House why the property tax should be charged in excess of the income, has received an official reply stating that the valuation list is accepted as conclusive evidence of the gross value of the property, and adding that the "tenant is only entitled to deduct the tax on the amount of rent actually payable by him, and that the difference should be borne by him unless he can obtain a reduction of the charge in the valuation list, for which purpose he should apply to the assessment committee of the parish, at the office of the vestry clerk. The question is thus really a tenant's and not a landlord's question."

A Breakwater for Jersey.—The local authorities of Jersey having resolved to construct a new harbour, with the view of affording better accommodation, and greater facilities for the arrival and departure of shipping at all states of the tide, the first stone of the breakwater which is to form the protecting arm of the harbour, was to be laid on Thursday by his Excellency Major-General P. M. N. Gay, C.B., Lieutenant-Governor, assisted by Sir John Coote, and the members of the Harbour Committee, in the presence of Mr. John Hammond, bailiff, the members of the States, and public bodies of Jersey.

Alms-houses, Wimbleton.—Mr. Henry W. Peck, member for Mid-Surrey, has founded five alms-houses, freehold tenements, at Wimbleton, and has endowed them with a view of their being occupied by deserving men within the district of Mid-Surrey. The almsmen will each have a cottage free of rent, taxes, and water-rate, and a pension of 36*l.* per annum. The first four pensioners will shortly be elected,—one by the founder himself, one by the mayor and corporation of Kingston-on-Thames, one by the mayor and corporation of Reigate, and the fourth by the magistrates of the county of Surrey.

A Forgotten Lighting Conductor.—A correspondent of the *Times*, reminding the public what an excellent conductor of electricity carbon is, gives the following advice:—"First: keep your chimneys clean. Second: in the language of the telegraphist, 'put your grates to earth,'—that is, connect each grate of your house with a solid and continuous piece of wire, like that used for telegraphic purposes, with a piece of metal buried in the earth, or with the system of iron pipes conveying gas and water through your town."

Fall of a Grand Stand.—The Manchester papers state that at the Robinson Lane well-dressing sports in connexion with the Ashton-under-Lyne wakes, the grand stand gave way, and between 300 and 400 persons were thrown to the ground. The stand was about twenty yards long, and there were on it many spectators. Just as one of the races was concluding the structure was observed by outsiders to shake, but before any warning could be given the timbers gave way. Several persons were severely shaken, and others were bruised, but no limbs were broken.

A Sea Pacifier.—Under this title Mr. Thos. Morris, architect, suggests a form of construction for ocean-shields, breakwaters, piers, lighthouses, and other marine objects. He proposes to form a platform on the tops of a series of vertical cylinders of great buoyancy, kept in their position by struts and braces, and held down to the proper level by weights or anchors. With the understanding that at a depth of 15 ft. the sea in British regions is perfectly still, Mr. Morris concludes that a platform at that distance below the surface would be undisturbed.

Illumination of Limehouse Church Clock. Mr. C. Harston has laid before the committee drawings and specifications explanatory of the proposed work, with details, as to the construction of the new dials. These are four in number, each over 13 ft. in diameter, and projecting 18 in. from the face of the clock. The plans have been approved, and the architect has been instructed to invite tenders for the work. The cost will be about 500*l.*, of which 295*l.* have been subscribed.

Tintern.—On the 14th of August the foundation-stone of a new day and Sunday school, with school-keeper's house, &c., was laid at Tintern, Monmouthshire, by Mr. Thomas Peibick, of Bristol, assisted by the ministers of the neighbourhood. The work is being carried out by Mr. W. Roberts, builder, of Chepstow, from drawings and under the supervision of Mr. E. A. Lansdowne, architect.

State Purchase of Irish Railways.—The chairman of the Dublin and Belfast Junction Railway Company, at their recent meeting, said he had no doubt whatever that the Government had serious intentions of purchasing the Irish lines. It was desirable, whatever determination the Government should come to, that no time should be lost, because it prevented the question of amalgamation going on between them and the Dublin and Drogheda and the Ulster lines.

Advance in the Price of Window Glass. The principal makers, says the *Birmingham Post*, have issued circulars stating that it is necessary, in consequence of the increase in the cost of fuel and other materials, to advance the price of window-glass. They state that for the present the net price for "fourths" crown will be 42*s.* per crate; and the quotation for "thirds," 15 oz. sheet, glazing quality, is 4*1/2**s.* per foot, less 25 per cent. discount.

Great Fire in Kentish-town Station of North London Railway.—Throughout Tuesday night a very destructive fire has ravaged the Kentish-town Station of the North London Railway. Captain Shaw's report shows that about 230 ft. of the arrival platform, four waiting-rooms, and a signal-box were destroyed, and many of the adjacent buildings were more or less damaged.

Fall of a Quay into the Tyne.—The quay frontage at Messrs. Sheldon, Nixon, & Co.'s chemical works, at Hebburn, has fallen into the river. The quay was 200 ft. in length, and had upon it a steam crane and boiler, a coke-oven, a cooper's shed, three or four manganese stills, and 20 tons of soda-ash, all of which were precipitated into the Tyne. Fortunately, no person sustained any injury.

Coal and Steam Superseded!—Mr. John Earl Clare, of Liverpool, has succeeded (it is said) in perfecting an engine to be worked by electro-magnetism, by which an up-and-down motion is obtained whence a power is developed that is applicable to our largest ships afloat, and also to stationary and locomotive use.

New Lighthouse for Ceylon.—Messrs. Shearer, Smith, & Co., of the Dalbeattie Granite Quarries, having lately completed the supply of worked granite for the Great Basses Lighthouse, have undertaken the supply of the worked material for the sister lighthouse about to be erected on the Little Basses Rocks.

South Kensington Museum and Bethnal-green Branch.—Visitors during the week ending 24th August, at Kensington, 19,221; average of corresponding week in former years, 15,540; at Bethnal-green, 40,956.

Opening of the Glasgow Tramways.—The system of tramway communication has been inaugurated in Glasgow, by the opening of the line extending from St. George's Cross to Eglinton Toll.

Hornsey.—According to the *Rock*, a new church will shortly be commenced at Hornsey, to be called Trinity Church. It will be opened under the auspices of the Free Church of England Council.

The New Public Hall in Holloway.—Progress is being made with the Holloway Hall, Holloway-road, and the building will shortly be opened for public meetings and other purposes. It has cost about 5,000*l.*

TENDERS

For rebuilding church at Etingshall, near Wolverhampton. Mr. W. D. Griffin, architect:—	
For Church and Fittings	
Stockton & Son	23,820 0 0
G. & F. Higham	3,082 0 0
Lovatt	2,950 0 0
Horsman (accepted)	2,763 0 0
For Tower and Spire	
G. & F. Higham	2,632 14 0
Lovatt	2,177 0 0
Horsman	1,890 0 0
For the erection of new front, and altering interior of premises, corner of Victoria-road, Aldershot, for the London and County Banking Company. Mr. F. Chancellor, architect. Quantities by Messrs. R. L. Curtis & Son:—	
Kemp	£32 10 0
Mason	873 0 0
Jeffreys	873 5 0
Martin, Wells, & Co. (accepted)	850 0 0
For making new roads and drains on the Eversfield Estate, St. Leonards-on-Sea. Messrs. Fowler & Hill, architects:—	
Hughes	£1,020 0 0
King (accepted)	850 0 0

For new banking premises at Sittingbourne, Kent, for the London and County Banking Company. Mr. C. Jocelyn Parnell, architect. Quantities supplied by Mr. Jas. Schofield:—

Seager	£3,335 0 0
Rantin	3,829 0 0
Cooke & Green	3,116 0 0
Hill & Sons	3,089 0 0

For enlargement of hotel building at Rosstrevor, county of Down, Ireland, for Mr. W. Sanster. Mr. W. J. Watson, architect:—

McGuirk	£510 0 0
Rantin	497 0 0
McShane & Lavery	450 0 0
Wheelan (accepted)	454 0 0

For new Wesleyan manse at Newry, county of Down, Ireland. Mr. W. J. Watson, architect:—

McShane & Lavery	£690 0 0
O'Hare	675 0 0
McGuirk	649 0 0
Wheelan	640 0 0
Rantin (accepted)	639 0 0

For carrying out alterations, and erecting new offices at the Newry Sail Works, Newry, county of Down, Ireland, for Mr. Chas. Langbey, exclusive of ironmongery, chimney-pieces, &c. Mr. W. J. Watson, architect:—

Wheelan	£4730 0 0
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For enlargement of corn-store at Newry, county of Down, Ireland, for Mr. A. R. Walker. Mr. W. J. Watson, architect:—

Wheelan	£533 0 0
O'Hare	475 0 0

For erecting a single-story cottage at Rosstrevor, county of Down, Ireland, for Mr. Edward Greer, exclusive of ironmongery, chimney-pieces, &c. Mr. W. J. Watson, architect:—

Wheelan	£490 0 0
Rantin (accepted)	306 0 0

For alterations to a house at Portadown, for Mr. Richd. Pepper, county Armagh, Ireland. Mr. W. J. Watson, architect:—

Collen, Brothers (accepted)	£161 0 0
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For alterations to a house at Rosstrevor, county of Down, Ireland, for Mr. Edward Greer. Mr. W. J. Watson, architect:—

Rantin	£284 0 0
Wheelan (accepted)	231 0 0

For erecting new offices for the directors of the Newry Gas Consumers' Company, at Newry, county of Down, Ireland, exclusive of ironmongery, chimney-pieces, &c. Mr. W. J. Watson, architect:—

Wheelan	£372 0 0
Rantin	368 0 0
McShane & Lavery (accepted)	349 0 0

For erecting four new houses, which are to form the first portion of a new terrace at Rosstrevor, county of Down, Ireland, for Mr. Edward Greer, exclusive of ironmongery, chimney-pieces, &c. Mr. W. J. Watson, architect:—

McShane & Lavery	£1901 12 0
O'Hare	1,675 0 0
Rantin	1,574 0 0
Wheelan (accepted)	1,550 0 0

For new hall and almshouses for drovers, to be built at the Metropolitan Cattle Market. Messrs. Lander & Beddell, architects. Quantities supplied:—

Warne	£4,009 0 0
Dove, Brothers	3,670 0 0
Ryder & Son	3,405 0 0
Ebbage	3,363 0 0
Jay	3,515 0 0
Williams & Son	3,465 0 0
Grover	3,347 0 0
Axford	3,275 0 0
Mann	3,193 0 0
Manbridge	3,040 0 0

For new cattle lairs, Caledonian-road, entrance of the Metropolitan Cattle Market. Messrs. Lander & Beddell, architects. Quantities supplied:—

Manbridge	£2,651 0 0
Williams & Son	2,559 0 0
Mann	2,537 0 0

For the erection of new school buildings at Blunsdon St. Leonard's, near Swindon, Wilts, for the Rev. W. H. Roach. Mr. William Clissold, architect:—

Harper & Son (accepted)	£333 0 0
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For extending the Free Library and Museum now in course of erection at Blackburn. Messrs. Woodzell & Collett, architects:—

Marshall & Dent (accepted)	£766 0 0
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For finishing pair of villas, Lordship-lane, East Dulwich. Mr. J. Clark, architect:—

Rooney, Brothers (accepted)	£290 0 0
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For eleven cottages, for the London Jute Works, Fonder's End. Messrs. Kennard & Buck, architects:—

Hunt	£1,974 0 0
Cowper	1,740 0 0
Clark	1,730 0 0
Tarrant	1,528 0 0
Rist & Brown	1,525 0 0
Field & Son	1,480 0 0
Crook & Wall	1,470 0 0
" (Concrete)	1,370 0 0
Norman	1,265 0 0

For repairs and alterations to No. 10, Queen's-gardens, Hyde Park, for Mr. H. Montague. Messrs. Davis & Emanuel, architects:—

Goodwin	£578 0 0
Williams & Son	458 0 0
Wagner	456 0 0
Temple & Foster	444 0 0
Verrall	413 0 0

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J. F. M.—J. F. L.—S. F.—W. A. M.—F. R.—S.—J. M. H.—J. R.—F. R.—P.—G. & Son.—H. M.—C.—R.—E.—C.—S.—C.—D.—E. S.—H. W. T.—S.—R.—Y.—F.—C.—O.—J.—H. S. (send us a photo from the tower itself when finished).—B. F. (thanks. No.—J. B. (we will inquire).—G. B.—T. L.—J. A. B.

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NOTICE.—TO THE ARCHITECTS OF GREAT BRITAIN; also the CONTRACTORS. Early in AUGUST, 1872, will be published, EXECUTED EXAMPLES by MODERN ARCHITECTS. Four Plates, Imp. 4to with Four Pages Letterpress and Wrapper Monthly. Price to Subscribers, 7s. 6d. Non-Subscribers, 10s. The First Number will contain a CHURCH, SCHOOL, MANSION and a VILLA. The Architects have kindly consented to lend their drawings, and to become subscribers. All Architects wishing the insertion of their drawings, will please forward same, enclosed with a subscription card. The name and address of each Architect will be given, also the Contractor's estimate for erection, and each monthly number will be varied.

A New Work just published on SPECIFICATIONS, by F. ROGERS, Architect, after the MODEL of BARTHOLOMEW'S. 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The Builder.

VOL. XXX.—No. 1544.

Trevithick.



ICHARD TREVITHICK was a Cornish man, and an able engineer, plain, practical, and great, like Watt, Smeaton, and George Stephenson, — a man of genius.* He had the power and energy of any of them, but not the subtlety of Watt, the accomplishments and scientific knowledge of

Smeaton, or the quality of looking after his own interest as well as that of others that George Stephenson had. He was descended from an ancestry of Cornish Trevithicks, the last of whom before him married a lady whose forefathers came to Cornwall from Ireland. Trevithick was born in 1771. The first practical application of steam to pump water out of the Cornish mines was made by Newcomen in 1705, who combined the ideas of Savery and others with his own great mechanical genius, and applied the action of a piston moving in a cylinder to give motion to a beam overhead. Many of his engines were erected in Cornwall to pump water out of the mines. The cylinders of Newcomen's engines were open at the top, and the efficiency of the machine depended on the degree to which the steam underneath the piston could be condensed, after it had done its work of raising the piston to the top of the cylinder, and thus allowing the weight of the atmosphere to drive the piston down again. It was thus called the atmospheric engine. Keeping to the same principle, various improvements were made from time to time, until Trevithick's father, who was the manager of several mines in Cornwall, in or about the year 1778, substituted self-acting gear and valves for those which had previously been worked by personal attention after each stroke of the piston. Besides this improvement of the engine, he improved the form of the boiler, the top of which had been theretofore made flat; but as this form has but little power of resistance, Richard Trevithick, sen., made the top in an arched form, by which he brought directly into play the tensile strength of the material to resist the internal expansive force of the steam.

In 1777 Watt appeared in Cornwall, with his newly-invented method of using steam by condensing it in a separate vessel, whereas Newcomen had been used to condense it in the cylinder itself, and, as Trevithick's father adhered to Newcomen's method, he and Watt contended for the approval of their respective engines by the proprietors of the Cornish mines. He made also a great improvement in the system of mining; that, namely, of excavating the rock upwards instead of downwards, having first sunk the shaft to the lower level. In the old system,

the road over which the broken rock had to be conveyed was continually destroyed, and the drainage of the water away from the miners was prevented, whereas in the new system these difficulties were got rid of.

All these and other like things became gradually known to Trevithick. The actions of every man are necessarily governed to some extent by the condition in which he is born, and by the circumstances which happen within his apprehension during his youth. Trevithick was a man of great powers of body and intellect, and had no other, or but little, education than that of the things which transpired around him, and which his idiosyncrasy enabled him to observe and appreciate; those, namely, of mining operations. When he was eighteen years old he worked at the Stray Park mine. When he was twenty-one, he was employed by the shareholders in Tin Croft mine, to examine and report on the relative duties, or the work done with a certain quantity of coal, in the patent engine of Watt, and in that of the double-cylinder engine of Hornblower. "Thus," says the author, "at the early age of twenty-one, Trevithick was in public and professional contact with Watt, and from that period dates the competition of the great low-pressure engineer and his youthful and vigorous high-pressure rival."

In 1796, the year before his father's death, and when he was twenty-five years of age, he competed with Watt and with Bull in saving coal, by the various methods of using the force of steam to raise water, Trevithick's method being to improve Newcomen's beam-engine; Watt's (also with the use of the beam), to condense the steam in a separate vessel; and Bull's, to place the steam cylinder directly over the weight to be lifted, and therefore requiring no beam. It was useless, however, to try to compete with Watt so long as the steam was condensed in the cylinder, and Trevithick in some cases worked his engines at high-pressure, without any condensation, the waste steam being driven out into the atmosphere.

When water, admitted into a pump-barrel, is required to be raised to a greater height than about 30 ft., a solid tight-fitting piston is sometimes used, which, in the downward stroke, forces the water up the rising main; but as sand or other obstructive matter is usually drawn into the barrel with the water, the piston or the barrel soon wears out. Trevithick adopted a plunger, which works in the harrel of the pump without touching its sides, the effect being that it displaces just so much water each stroke as its cubical capacity measures, the only part subjected to wear being the gland at the top of the barrel, through which the plunger works.

It is probably not generally known that a steam road-locomotive ran through Oxford-street, Tottenham-court-road, and the New-road, in London, seventy years ago, at the rate of eight or nine miles an hour; but Trevithick, after constructing an engine of this kind at Camborne, in Cornwall, made another in Leather-lane, and drove it through the streets of London. Both came to grief by running off the road, the one into a ditch, the other into a garden. This tendency of his road-locomotive seems to have turned his attention to confining the wheels to iron tracks, and, in 1804, he constructed a locomotive which ran on a tramroad at Pen-y-darran ironworks, in South Wales, taking ten tons of iron and seventy men over a distance of 9½ miles. Soon after he sent a similar engine to Newcastle-on-Tyne for use on the railroad of the Wylam colliery. Here was a chance for the North-countrymen to learn something, and they were not long in doing it. Of course everybody went to see it:—"Mr. Wood and George Stephenson, with Mr. Wilson, the engineer, and Timothy Hackworth, then a blacksmith, afterwards engineer on the Stockton and Darlington Railway, and maker of the *Sanspareil* locomotive,

that, a quarter of a century later, competed on the Liverpool and Manchester Railway." Robert Hawthorne, also, the author thinks, was probably one of the lookers-on, for "a few years afterwards the two great engineering establishments in Newcastle, known as Hawthorne's and Stephenson's, began to grow into importance."

The blast-pipe is an all-important part of a locomotive engine, and both that sent to Newcastle and that in Wales, as well as one constructed at Coalbrook Dale, had it, although the invention was afterwards claimed by others. These are not unsupported statements. Authentic documents and letters are referred to showing their truth. It is, however, open to doubt whether Trevithick, with all his genius, used the blast-pipe for its main purpose in a locomotive,—that of creating a powerful draught of air through the fire, and so increasing the heat to a degree that could not otherwise be attained; or whether, as Mr. Smiles says, he only turned the waste steam into the chimney to get rid of it.

In 1808 Trevithick laid down a circular railway in a field adjoining the Euston-road, near or at the spot now forming the southern half of Euston-square, and placed upon it a locomotive engine; and Mr. John Isaacs Hawkins, a well-known civil engineer, said, in 1847, "On that railway I rode, with my watch in my hand, at the rate of twelve miles an hour."

The author says, and apparently very justly, "To Trevithick and his never-ceasing practical exertions, in Cornwall, London, Shropshire, South Wales, and in Newcastle-on-Tyne, are we indebted for the first practical and real evidences of steam locomotion."

He invented and set to work, on the river, at Blackwall, the first steam dredging-machine. He drove a driftway under the Thames about the same time, *i. e.*, 1808, from the southern shore almost to low-water mark on the northern shore. This was about two miles and a half below London Bridge. It was 5 ft. high in the clear of the timbering, 3 ft. wide at bottom, and 2½ ft. wide at the top, in the clear. He sank a shaft on the southern shore, at Rotherhithe, and drove his heading level for three-quarters of the distance across, being 30 ft. below the bed of the river. He then began to rise towards the north shore, with an inclination of 1 in 9, so as to come out at the surface; but after getting through 1,028 ft., the whole length being about 1,128 ft., he came to a quicksand, which broke into the driftway, and the work was abandoned.

He invented iron tanks for containing water for ships' use, instead of wooden casks, and for water ballast in the hold, and for other purposes on shipboard; a floating dock, made of wrought-iron plates riveted together, for docking a vessel of considerable size while riding at her moorings, by means of which the ship might be supported as in a common dock, and the water pumped out so as to leave the keel dry.

His specification for building ships of iron instead of wood sets forth that the sides and deck are to be of wrought-iron plates; that ships so constructed can be built so as to carry, bulk for bulk of ship, a much larger cargo; that they will be free from vermin, and extremely durable; and that if shot through the side there will be no splinters, as a shot would carry away no more of the ship's side than the diameter of the ball, and the hole could be plugged up at sea. It is stated that in 1812, he, having invented the screw-propeller for ships, offered it to the Navy Board, with a proposal to test its superiority to paddle-wheels.

Davies Giddy (afterwards Gilbert), a Fellow of the Royal Society and a Member of Parliament, was Trevithick's great friend, helping him with scientific explanations of his inventions, and with calculations which he himself,—although not at all an illiterate man,—could not work out, and standing by him with encouragement in all his troubles; but men like Trevithick, after the

* Life of Richard Trevithick, by Francis Trevithick, C.E. Vol. 1. E. & F. N. Spon, 1872.

time of their youth, can bear with but little interference. Had he had scientific knowledge to start with, it might have reduced his impetuosity, but would probably have enabled him to carry out his ideas with greater success, and to greater perfection. He appears to have been free from the vice of selfishness, and cared not who or how many benefited by what he did, showing his inventions to all comers; but, as in many other instances where generosity is unallied with either scientific knowledge or cunning, his great exertions brought him no personal wealth.

The difference between Trevithick's schemes and those of many other inventors is, that his were worked out in detail, as though he were describing something that had been done, rather than what was to be. Most of his ideas, so far as they are revealed in this first volume, have since been carried out by or with the help of mathematicians.

SANTARY SCIENCE AND SANTARY POLITICS.

THE important question of urban purity, so long and so often urged in our columns, has at last taken hold of the attention of the public. It may be said, indeed, that circumstances have compelled an unwilling attention. As to that we are not disposed to grumble; the great point being, that the subject, now that it has condescended assumed dimensions of imperial magnitude, shall not be disposed of by a side wind; but that all those manifold problems which are involved in the one general solution shall be adequately and correctly wrought out.

The facts before us, we have before pointed out, must be regarded not as isolated phenomena, but as a whole. To this whole must be added, year by year, and month by month, the new results of investigation, and the new conclusions of science. On the one hand we have to review the action of the Legislature, as resulting in the Public Health Bill, the details of which we examined at some length on the occasion of its introduction into Parliament. On the other hand we have the debates of the Parliament of Science; in the reports presented to the British Association during the late meeting. We must regard each of these contributions to the law and to the knowledge of the subject, in order to keep up to the level of advancing intelligence.

On one of the questions as to which, in our usual cumbersome and dilatory mode of procedure, we are slowly collecting the data for subsequent legislation, namely, the pollution of rivers, the opinions expressed by the Association were quite unhesitating. Major-general Sir James Alexander read a paper, expressed in very strong terms, as to the injury inflicted on the public, with reference both to the destruction of fish, and to the carriage of the germs of disease by the neglect of the Scottish rivers. He especially called attention to the case of the Forth. Professor Fawcett, the chairman of the section, intimated that it was now too late to raise the general question. The evil of the pollution of rivers was generally admitted. The practical question was, what remedy could be suggested. On this point, however, excepting so far as regarded the general view that "the Government ought to do something," the members of the section were generally mute. Sir John Bowring gave details of great interest as to the fish culture of the Chinese, and as to their culture of edible vegetables in water. Beyond, however, the expression of the opinion that the Government sanitary measure of the present year has only touched the fringe of the question, and that Government should seek the counsel of engineers as well as of chemists, the proceedings of Section F (Economic Science and Statistics), cannot be said to have had much practical bearing on the subject of riparian purity.

The fourth annual report of the Committee on the Treatment and Utilisation of Sewage was received by Section G (Mechanical Science). The division of two essential parts of the same subject between the Statistical and the Mechanical sections is not very happy. Again, the Chemical Section is called upon to discuss the same matters. So important is the subject, and so unfortunate is the result of its being thus frittered away in detail, that we suggest for consideration the formation of a separate sub-section for dealing with the national question of sanitary engineering; including in one view both the

mechanical and the chemical divisions of the subject, on the concurrent elucidation of both of which the economical results must depend. We are not yet in a condition to discuss either of these parts of the subject by itself; and in this fact lies the real source of the difficulty of a prompt and decided action with regard to the restoration of the purity of rivers.

Five distinct methods or examples of the treatment of sewage were reported on by the committee. These investigations have been arrested, for want of funds; but yet have produced some results of value.

The first process dealt with by the report is one which is in operation in the workhouse of Stoke-upon-Trent, an establishment containing about 750 inmates, and known by the name of *Wear's process*. It is unnecessary for us to enter into the details of the report. The principle involved is that of filtration through charcoal, which, at the close of the process, is employed as manure. The result of the process is stated by the committee in a few words. The suspended matter is absorbed by the charcoal. The quantity of ammonia, and that of organic nitrogen, is also much reduced by absorption. But no chemical action proper, or at all events no oxidation, occurs; and the effluent water is stated to be to all intents and purposes merely diluted sewage. As far, therefore, as the report of the committee carries weight, we must add *Wear's process* to the long list of failures; which it would be highly instructive to tabulate in a compendious form.

The second section of the report dealt with the process in use at Ealing; namely, upward filtration, and the method of General Scott. The committee declare upward filtration to be absolutely worthless. This is not the first time that this opinion has been formed. We are not in possession of facts to invalidate the judgment of the committee. At the same time we cannot but think that it must be held to apply to detail, rather than to principle. That, so far as matters suspended in a fluid are concerned, they can be more readily removed by calling in the aid of gravitation, opposing an obstacle to their ascent, than by merely mechanically straining them out from a descending column of water, seems, *prima facie*, apparent. Against this has to be set the greater facility afforded for cleansing the downward acting filters, by intermittent use and disuse. But we must confess some surprise, and some disappointment, that no method has yet been hit upon for enlisting the force of gravitation in the service of purification. We should like to see an upward filtration attempted through a porous artificial substance, which should be subjected, on alternate days, to the *washing* power of a head of water, in the reverse, or downward direction, for half an hour or an hour. The principle of upward filtration cannot be held to be disposed of without some such experiment as this. It is true that chemical precipitation is one of the great engines which we have to employ, but mechanical filtration may reduce the cost of the chemical agency.

Ealing has a population of 10,000, and the daily flow of sewage averages from 350,000 to 400,000 gallons. The precipitants used by General Scott are lime and clay. These are mixed together, and introduced into the main sewer, at the distance of about a mile from the works. This admixture is said to reduce the clinging, quasi-glutinous, character of the sewage, so that the sewer through which it runs does not become coated with deposit. The fluid is then made to ascend through a filter of sand and gravel. The precipitate thus arrested, or strained out, is removed and placed on a floor of hot plates or tiles, below which a fire is kindled. It is, in fact, a sort of drying-floor, in which the solid matters mechanically suspended in the water, and removed by filtration, are treated much like bricks in a brick-kiln. The sewage bricks, however, contain nearly 30 per cent. of organic matter, which is combustible. After the first drying they are burned in a kiln, the organised matter supplying so much combustible material that very little other fuel is required. The product of this combustion is crushed in a mill, and is said to form a good cement, selling at 30s. per ton. This is further said to yield a profit of 10s. per ton, or 50 per cent.; but the committee have not reported on the question of cost. The effluent matter is shown by analysis to contain rather more than two-thirds of the chlorine and of the dissolved nitrogen of the sewage, although the nitrogen appears to have undergone a change in its combination. The ammonia is reduced to one-

quarter of its original amount; but the organic nitrogen is nearly doubled. Results so anomalous show that we are as yet far from a thorough comprehension of the chemistry of the case. The process, if successful, will have a commercial value of much importance to the inventor. We have therefore little doubt that the practical ability of General Scott will not be diverted from the investigation, until we derive, at all events, a considerable increase in our knowledge of the chemistry of the question. We must never forget that it is within the province of chemistry that the real knot of the matter lies. Even in the best cases of disinfecting sewage by passage through the earth, the process is chemical, though conducted in the laboratory of nature. Why and how earth, under certain conditions, *does* disinfect, we have yet to learn. This is the great question which the curators of human health have now to put to the chemist. On the reply to that question will hinge the sewage arrangements of the future. At present it can only be said that, under certain circumstances, one of the great difficulties incurred in the treatment of sewage is alleviated by this process of combustion.

The third, fourth, and fifth sections of the report deal with experiments and observations on the utilisation of sewage, and purification of the effluent water, by irrigation and earth-filtering.

Under the pressure of injunctions from the Court of Chancery, the local board of Merthyr Tydfil have converted 20 acres of land into a filter, on a plan suggested by the Rivers Pollution Commission. The soil consists in a deep bed of gravel (probably the former bed of the river Taff), composed of rounded pebbles of the old red sandstone and coal-measure formations, with loam and sand interposed, forming a highly-porous subsoil, with a vegetable mould upon the surface. The land has been pipe-drained at a depth of 7 ft., the pipes converging into an open drain, which conveys the water into the Taft. The sewage is first passed through a bed of slag, which arrests the coarse matters. How this filter is dealt with when it requires cleansing is not stated. The area is divided into four portions, on each of which the sewage is turned, in rotation, for six hours at a time, being led on by surface carriers and drains. The surface of the land is cultivated to a depth of from 16 in. to 18 in. The average daily supply of sewage is about 300,000 gallons; but, owing to percolation from the river, the quantity of effluent water nearly doubles the amount. This water has been analysed at different sewers. It is stated that the suspended matters are removed, and that the ammonia and nitrogenous organic matters held in solution are almost entirely oxidised, so that they appear in the effluent water in the form of nitrates and nitrites. The Commission therefore report that the sewage is purified, but cannot be said to be utilised. It will be evident that here again are to be found elements of importance for the ultimate chemical analysis of the entire question. The oxidising of the nitrogenous matter by the gravel filter, as compared with the absence of this important process in other cases, is a matter of great importance for us plainly to understand.

In the farm at Romford the committee found by analysis that one-tenth only of the total nitrogen applied to the land was to be detected in the effluent water, and that not in an organic form. 40 per cent. was accounted for by the crops; and the remaining half of the original quantity was as yet unaccounted for. Analysis of the soil is expected to reveal its presence, but experiment on this point is reserved for next year.

In the Chemical Section, on the 20th August, Professor Corfield described the new process known as Whittbread's Patent, in which one equivalent of monocalcic phosphate (the commercial superphosphate) and two equivalents of di-calcic phosphate, are added to the sewage, followed by a little milk of lime. The precipitation is rapid and complete. The suspended matters are removed, and the organic nitrogen is almost entirely removed. The ammonia is increased in amount, and phosphoric acid remains in solution in the effluent water. The precipitate contains phosphate of lime, which is a valuable manure. It also contains 3 per cent. of ammonia, which considerably enhances its value. But the loss of the phosphoric acid in the effluent water is a drawback. The process is one which eminently demands further careful investigation.

The outcome of the debates of the different sections appears to be this. We are in a state of

doubt as to the true chemical solution of the question of utilisation. Fresh information is being daily attained, and the ultimate result, we trust, is not very distant. First, in efficiency, is the power of chemical agency of the earth itself, especially when aided by the organic chemistry of the plant. But the application direct of sewage to land is difficult, and not everywhere practicable. Then we have processes of mechanical filtration; and among these the discovery, by General Scott, of the combustible character of the organic matter is likely to play an important part. Thirdly, we have the method of chemical precipitation. Of the various methods suggested, that of Whittred comes to the fore as most worthy of investigation, in the present state of our information. The question of precipitation and oxidation of the nitrogen by reposition underlies the commercial value of the proposed methods of utilising our refuse.

It is now desirable to examine how far the Act of Parliament, 35 & 36 Vict., c. 73, entitled An Act to Amend the Law relating to Public Health, corresponds with the Bill brought into the House of Commons by Mr. Stansfeld, Mr. Secretary Bruce, and Mr. Hibbert, of which we gave an abstract in our numbers for the 23rd of March and 6th of April last.

With the exception of clause No. 3, postponing the operation of the Act for three months from the date of the Royal Assent, which is now omitted, the first eighty-one clauses of the Act are very nearly identical with those of the Bill. Certain obligations under which the former proposed to lay the local Government Board, as to obtaining a preliminary report of inspectors, are omitted, and the appointments of medical officers of health and inspectors of nuisances, first made after the passing of the Act, are limited to a period not exceeding five years. With regard to future organisation this provision may prove highly important.

The important clauses with reference to the prevention of nuisances are all omitted from the Act of Parliament. The prohibitions as to putting solid matter into streams; as to turning sewage into drains; the powers given to the sanitary authorities in this respect; the penalties as to smoke nuisances, as to neglect to cleanse, as to obstructing sewers, as to adulterating food; the clauses as to closing foul pumps and wells, and buildings unfit for human habitation; the regulations as to purity of water supply, as to gas supply, as to hospitals; as to analysts; as to false representations in case of infectious diseases; and the power to buy up water-mills; all have disappeared. Thus the Act may be broadly said to effect only one object,—the division, or rather the authorisation of the division, of England into sanitary districts, urban and rural, under local authorities, which are to appoint medical officers of health and other officers; and the further giving to the inspectors of the local Government Board similar powers, with reference to those local Boards, to those which the Poor-law inspectors have under the Acts relating to the Poor-law. A single clause, empowering sanitary authorities to destroy infected bedding, and another, inflicting a penalty not exceeding 50*l.*, for wilful obstruction of the rules of the local Government Board, are all that we find of positive sanitary enactment.

There is no doubt that deep and serious disappointment has been felt by the advocates of sanitary reform at the mutilated form in which a Bill that they considered to err, as it was, on the side of defect, has been passed through Parliament. Professor Fawcett called the measure a most imperfect one, and warned his hearers at the British Association not to be misled by any members of Parliament who would now be "running up and down the country singing the praises of the work done by Parliament." At the same time, we must remember, first, that no notion is entertained that this Act is to be final. Secondly, a project to consolidate the whole of the laws relating to the public health is one of such magnitude that it ought to be the principal, or one of the principal, objects of a session. During the last few months, the time of the House of Commons was so occupied by the long and repeated discussions of a political measure that may possibly affect the distribution of seats, and that in a very unexpected manner, that we could not expect the House of Commons to give a due amount of attention to matters that only affect the public health. If pestilence comes on us unprepared, no doubt it will be deplorable. But still, what is that to the question of maintaining a majority? Dreamers, like

ourselves, may hold that we should study national wants first, and political theories afterwards. But these are poor common-sense views, and by no means attain the dignity of Parliamentary importance. Let us be thankful, then, for what we have got, and only trust that some new enigma may not be started as a Parliamentary hare for the session of 1873.

But beyond this great question of the consolidation of the laws, the very magnitude and importance of which forbid any but the most maturely considered legislation, it is evident, from what we have previously stated, that we are not as yet fully ripe for one of the main enactments which the future welfare of the country will require. That our great rivers are foully polluted, and that a stop must be put to this outrage on common sense and public decency, we do not need a Royal Commission to inform us. So far as that, public opinion may be said to have been already formed. But we object to being made ridiculous by contradictory legislation. We object to have injunctions issued by the Lord Chancellor, obedience to which is rendered impossible by the House of Commons. No sanitary authority, no municipal body, no private individual, ought to be placed in so false a position as that now occupied, not of its own fault, by the town of Birmingham. In a word, while as nuisances as any one can be to prevent, first, the pollution of streams, and, secondly, the loss of crop-feeding material, we cannot admit the propriety of stopping up the end of a sewer without providing a proper mode of dealing with its contents. With certain matters, such as the offensive refuse of manufactories, we think that the law should at once, if necessary, be enlarged so as to deal. We doubt much whether it is not, at this moment, only awaiting appeal to its efficacy. But with the general and immediate arrest of the actual course of all our sewage are not in a position summarily to deal. We may do much—we may prepare for doing all. But we must have the chemistry of the matter made clear before we can impose immediate penalties. We are hard upon the traces of discovery. We can, by one process, purify effluent water. We can, by another, utilise sewage to a certain extent. In a third instance we see rich crops rise out of what was once barren land. But we cannot afford to leave every local board to its own devices. We must throw all the light that science can shed on this vital question. We must avoid the theorist, the speculator, and the airer of hobbies, no less carefully than we avoid the old stager who is for leaving everything alone. The great power now placed at the disposal of the head of the Local Government Board must be guided by adequate science. Full illumination, such as there is now for the first time an opportunity of summarily obtaining must be shed on the point. The time for Commissions of Inquiry must be considered past and gone. Such a patient, exhaustive, able, investigation of the great requirements of the country in the matter of sanitary engineering, as Prussia inaugurated in the matter of military organisation, must be taken in hand. Of such an organised attack on ignorance and on filth we cannot doubt the triumph. The one thing necessary is, that the difficulties be confronted as a whole, and dealt with as a serious matter of business. The natural configuration of the country must be one main element in the consideration. The treatment of the sewage of Norwich, and that of Oldham, or of Keswick, are problems in which nearly every element varies. They are very different cases of a rule, but cases which must yet come under one general rule. The country demands adequate legislation. But, still more imperatively does it demand that clear intelligence of the case by which alone legislation can become otherwise than mischievous. We look, with an anxiety that is shared by nearly all conversant with the subject, for indications of the action of the Government in two particulars. First, how will they give a guiding impulse to the local organisation of sanitary authorities provided for by the recent Act? Secondly, how are they confronting the great question of the general sanitary engineering of the country?—the preservation of its streams?—the restoration of its fisheries?—the water-supply of its population?—and the application, in each physically-defined district, of the best outcome of the present condition of chemical and mechanical science?

The Autumn Military Manœuvres.—A map of the district has been published by Mr. Wylde, of Charing-cross,—very useful just now.

THE NORTHAMPTONSHIRE EXCURSION.

STARTING early from Wellinborough on the fifth day of our wanderings (the 23rd ult.)* we made a delightful beginning of the day with Finedon Church, "the Heckington of Northamptonshire," well known by reputation as one of the noblest churches of Late Decorated style in the country. The tower, with its rich deeply-cut bands of trefoil and quatrefoil decoration, and the beautiful tints of the grey stone and lichens, diversified by bands of red stone, is as pleasant an object as the eye could desire to rest upon in the sunshine of a bright morning. The wide spacing of the arcade, the fine mouldings of the capitals and piers, and the deeply-recessed windows with their escocion arches, combine to give an aspect at once of solidity and spaciousness to the interior. The window tracery is nearly all of that reticulated form common in the period to which the church belongs, but entirely destitute of foliage; a peculiarity, but not one to be imitated or admired. The most remarkable thing in the church, in one sense, is certainly the stone straining arch, if we may call it so, built across the nave between the piers immediately west of the transept bay. The north and south aisles terminate eastward with arches carrying a solid wall above, dividing them from the transepts; but no such arch spans the centre aisle; the natural consequence of course would be the thrusting inward of the nave-piers at this point by the side arches abutting against them. That the original builders of the church should have overlooked so obvious a want of balance in the construction is as discreditable to them as the clever and picturesque manner in which they remedied the mistake is creditable. This is effected by throwing a segmental pointed arch across the nave between the two piers affected, met by an inverted segmental round arch from the wall above each pier; a kind of flying buttress being thus formed across the church, the spandrels filled in with tracery. The mouldings show this feature to be somewhat later than the main building, so that the necessity for such a constructive addition was not at once discovered. The architect who contrived it evidently obtained credit for his work, and was called on to repeat the same thing at Rusden, some five or six miles off. The church has been carefully and conservatively restored by Messrs. Slater & Carpenter. In the west gallery a Renaissance organ-case, of remarkable beauty and elaboration, suggests something out of the common way; and the following little bit of history in relation to this instrument, supplied in the report of Mr. Holdich, who recently repaired it (dated May 10th, of this year), will be of sufficient interest to many of our readers to excuse its insertion:—

"*Finedon Organ.*—This most interesting instrument was built by Christopher Schneider, son-in-law of the celebrated Father Schmidt. It was opened in the church 17th of May, 1717, by Dr. Croft. J. Kent, who wrote many beautiful anthems, was the first organist. Nothing had been done in the shape of modernising, excepting that the 'echo organ' was included in a box with a sliding front, to make an attempt at a swell. This was done, I believe, by the Rev. W. Jones, of Nayland, who wrote the beautiful tune 'St. Stephen's,' or 'Nayland,' so called. He was curate at Finedon."

In 1833 I was bold enough to add two octaves of Bourdon pedal-pipes and German pedals. In this state it has remained until the present time, when, from age and decay, the machinery would work no longer. I have now entirely rebuilt it, but used all the pipes I could, and retained the handsome case and curiously-dispersed pipes. I should doubt whether there is another organ in the kingdom that can show such an original exterior."

It would be wrong to leave Finedon without a word as to the effect exercised on the picturesque character of the neighbourhood by the good taste and liberal expenditure of Mr. Dolben, whose grounds, with their beautiful lime-tree avenue ("the cathedral of Finedon"), adjoin the churchyard. Some of the cottages and ledges erected by him in the district do equal credit to the owner's intentions and to the way in which they have been carried out by his architect, Mr. Law.

Our next church, Dillingborough, should be better known than it is, for its fine and almost unique tower, with solid square substructure and octagon upper story; quite unique in the manner in which it has been shored up by masses of masonry on the east side, to provide probably against the result of some failure of the foundations, that great hugarbear of the Middle Age builders. Architecturally excrescences, these buttresses yet add materially to the wily picturesque expression of this singular tower,

* See p. 689, ante.

standing quite apart to the westward of the church, which later in itself is nothing remarkable. Higham Ferrers, with its grand Early Decorated tower and spire, is too well known through illustration to call for much comment here; except a word as to the effect which the small flying buttresses at the base of the spire have exercised on the angle pinnacles, which are visibly pushed out of perpendicular. It is as well that young students of Gothic should recognise that Medieval architects really did make mistakes sometimes; and that features essentially constructive, when used where construction does not call for them, will sometimes revenge themselves on the architect for his mistake. The interior, with its fine double nave, has been restored and re-seated recently; the natural polychromy before referred to, obtained by bands of limestone and ironstone, has been largely used in this interior, but irregularly. The brasses in the chancel are of unusual size and elaboration, and in excellent preservation. It was in this church that, at one period, a perpetual service was kept up, day and night, by the zeal and devotion of the Ferrers family. Allusion to this is made, if we mistake not, both by George Herbert and De Quincy, in their respective fashions. Rushden, hardly a mile from Higham, is very similar in the general character of its tower and spire, though far less rich. The ironstone is largely used here in bands, and as quoins to the buttresses, in contrast with limestone. The effect of colour here is remarkable, for while the ironstone has retained its strong deep red on the west side, the returns to south and north, the former especially, are coated with a greyish vegetation, while the limestone has been weathered to a greenish tint. The effect is very rich and unusual, and would furnish good employment for the artist's brush. The font in the church should be noticed for some singularly bold and broadly-treated leafage ornament of the Transitional period, almost "classical" in its symmetrical arrangement. Our next church, Irchester, is also noticeable chiefly, if not entirely, for its tower and spire of Decorated date, singularly happy in proportion; and here we find the most deliberate and regular use of polychromy we have yet chanced upon, in the masonry of the tower, composed entirely of bands of red and grey stone of equal width. As harmonised by weather, the effect is very good, but must have been very "streaky" when new. The spire branches are remarkably low and equal in proportion; but the effect (the whole being on a small scale) is by no means bad. The Saxon tower at Bart's Barton, which we next inspect, is well known, occupying such an exposed site as it does, on high ground, one is surprised to find it, at this date, still in such fair preservation. The church is small, and not of special interest. A drive of seven miles brings us to Northampton, to find comfortable quarters and super-excellent fare at the "George," another of the houses which bring their traditions from the "good old" coaching days.

Every visitor to Northampton who knows what he is about will go, in the first place, to St. Peter's Church: it was matter of course, therefore, that we all went there first. This really is a Norman basilica in all but the apse. The eastern end is square, nor is any trace of an apse known to have existed. Apart from this, however, the long, low proportions of the church, the varied and highly-enriched capitals, some of them quite unique, others with a strange touch of Byzantine character about them, convey an impression curiously at variance with our ordinary associations in regard to English architecture. Externally, the long range of small round-arched windows forming the clearstory furnish another characteristic feature. There should be some history connected with the tower arch at the west end of the nave; from the adjustment, or want of adjustment, of the arch-moulds to the caps of the jamb-shafts, it would certainly appear as if the arch had not been always in its present position, or had been rebuilt. The next point of interest (forming the first rendezvous on our Saturday morning's round), is the Templar church of St. Sepulchre, grand in its internal perspective of octagon arcade and heavy pointed arches. The eastern portion, by Sir G. Scott, is a modification of the more florid Early English manner, with, perhaps, rather too much use of the band-work of red and grey stone suggested by the old churches of the district. A passing glance at St. John's Hospital, where there are some good bits of late Decorated work, affords opportunity

for some remarks from Mr. Sharpe relative to the employment of stained glass in light diapered patterns, with plenty of white, rather than in masses of strong colour. The east window of the chapel, however, is rather too fragmentary, in its re-arrangement of old bits of glass, to stand as the basis of a theory, however intrinsically correct. Then we drive out some five or six miles to eastward of the town, to Cogenhoe, noticing in our way through the suburbs a very good class of suburban houses, not without architectural merit, though, in the main, with considerable sameness of manner. As to Cogenhoe Church, there is not very much in it, excepting a very nice bit of Early English work on the south side of the chancel, where lancet windows are coupled under escutcheon arches, the shafts of which are carried down to the floor, past the sill of the actual window. Externally the best thing here is the beautiful wooded landscape seen from the platform on rising ground, which is occupied by the church and parsonage; and the old-fashioned looking parsonage-house, with its trim, well-kept garden. Whiston Church, a mile or two farther on, also most pleasantly situated in a high churchyard amid a circle of tall, dark trees, has a more architectural interest. The tower is one of those fine specimens (of which All Saints', Aldwinckle, is another example) built at the early part of the Perpendicular Period, when something of the feeling of the previous style still survived in the details, and before richness of elaboration had degenerated into weakness and wretchedness. And here there is the most picturesque and artistic use of the stone polychromy of the district which we have had occasion to notice. Instead of the red and grey stone (here a most delicate grey) being arranged in continual bands of mechanical regularity, we find them here in bands in the lower stage (giving somewhat the same effect as rustication); then an unbroken mass of grey for the next stage; then a broad band, 6 ft. or 8 ft. deep, of the red ironstone, below the heltry stage; then the banded arrangement recurring on the heltry stage, and a band of red, two or three courses deep above it; after which the tower is finished in the grey stone. The effect of this is most pleasing, and the angle pinnacles of the tower, with crocketed heads and gables, are treated with a peculiar breadth and richness which we have rarely seen equalled; and the whole appearance of this upper portion of Whiston town, the lighted portions shining with almost a white glare under the bright sun, and contrasted with the dark foliage adjoining, formed a bit of effect to be remembered for long after. Internally the church is an admirable specimen of the period, with very narrow piers, and a wide arcade, with traceted spandrels, and a low timber roof (which has probably been more or less renewed), most elaborately carved on the sides and soffits of the principals, and along the cornice. The arrangement of seats in this church affords a good hint for cases where a church has been provided, from any cause, too large for its congregation. Instead of crowding the whole area with seats half of which are not wanted, the seats have been arranged in small square blocks between the piers in each bay, leaving a wide aisle in the centre and an unusual amount of unobstructed floor space. The effect is exceedingly pleasing, and gives a spacious look to the church which it would not otherwise possess. A short and very pleasant drive brings us to Castle Ashby, the church of which is known as possessing a Norman doorway of excellent character and in good preservation; in other respects there is little or nothing of ancient interest left in the church, the interior of which is almost entirely modern work, by Mr. Street,—but not, we should probably conclude, very recent. A monument by Tenerani (Rome) is to the memory of the second Marquis of Northampton, which stands at the west end of the church, is known beyond the locality: it consists of a sitting figure, more than life size, of the angel of the Resurrection, waiting with upturned face for the signal to sound the trumpet which he holds. This has been immensely praised, and there is a great deal of beauty in the reverential countenance of the angel, but a certain want of power even here; and we submit that the introduction of the trumpet, a sculptured trumpet of ordinary aspect, is a dire mistake, at once giving a littleness, a trumpet (no pun intended) character, quite inconsistent with the grandeur of the idea intended to be conveyed. "The last trumpet" is, partly through association, an expression highly suggestive when vaguely used

as poetic imagery; but to translate it into realism in sculpture is as inconsistent with the feeling of the subject as is Handel's "Trumpet Solo" before the air in the "Messiah." A bas-relief monument by the same sculptor, in the north chancel aisle, is a very elegant composition, reminding one a little of Flaxman in feeling, and a monument to the Hon. Mrs. Leveson-Gower, in the wall of the north aisle, deserves notice. The portrait sculpture of the lady represents her in the last sleep on a flower-strewn couch, in a deep niche in the wall. At the back of this is a very low bas-relief of an angel, apparently flying past, and in the act of throwing a pall over the prostrate figure. There is a tenderness of feeling and refinement of execution in this figure such as have not always been associated with the works of Marochetti, by whom the figures were executed. The architectural details are by Mr. Gillott, a former pupil, we believe, of Sir G. Scott, but they are rather wanting in refinement. It was a pleasure, under such a bright sun as we had, to look at the Italian mansion adjoining, sparkling with its white stone and niches and statues, and well-known halustrade over the cornice, consisting of a Latin inscription (the big letters forming the balustrade), and at the terraced garden below with similar halustrades, and gorgeous groups of flowers laid out in the kaleidoscope patterns, which the modern gardener produces for the enjoyment of those

"Who in trim gardens take their pleasure."

And so we drive away down the long avenue, and back to Northampton to our final dinner, and to leave-taking speeches, and congratulations on the glorious weather we had enjoyed all the week; and the health of our accomplished and amiable conductor; and of our reverend friend who had accompanied us on every expedition hitherto; and of our Irish professional brethren, four of whom had crossed the Channel to join us (more power to them!); and of the veteran architect of Northampton (whose name we have had occasion to mention more than once), and who gave some opportune advice to the students to sketch detail carefully, and not to be one-sided, but study Classic equally with Gothic. Our attention to Northampton itself, exclusively of the old churches, was necessarily somewhat meagre; but the town-hall received due attention from a good many of the party. All Saints' Church, a great Renaissance church, Greek cross on plan (weakly attributed by the townsfolk to Wren), is a fine specimen of a really congregational plan, and might be a very fine interior if all the detail were very different from what it is. The grand organ here, with its four key-boards and magnificent body of tone, is one of the finest and largest church organs in the kingdom.

In concluding our notes of a very pleasant architectural tour, it ought to be explicitly said that, on the part of a good many of the party at least, this was no mere tour of inspection. Though much was necessarily hurried into a short space of time, a great deal of material was collected which may be more or less available for illustration of buildings or details not already published. Several of the younger members of the Association in particular arranged to obtain the measured details of the principal (nave) arcade in each church visited; and in this manner the materials were collected for accurately drawing out specimens of the arcades, including of course sections of moldings, &c., of no less than thirty-nine churches. This must be admitted to be a good week's work, and highly creditable to the character for industry and application of the members of the Architectural Association.

NOMENCLATURE OF GOTHIC ARCHITECTURE.

AFTER dinner on the first day of the Northamptonshire Excursion, Mr. Edmund Sharpe made an address to those present. We have already referred to it in our general notice of the proceedings (p. 660, ante), but may usefully print a portion of it *verbatim*—

It is obvious, said Mr. Sharpe, that along with finer perceptions as to characteristic treatment of different phases of Medieval art,—differences already referred to, which require only to be pointed out to be at once recognised and appreciated, and the knowledge and detection of which increases immensely the interest we take in its study,—it is clear that along with advanced knowledge of the true history of this admirable progress comes also the necessity for a minutest classifica-

tion of its different periods, and of fitting terms by which to distinguish them. And here, in fact, we touch on the greater difficulty that the architectural student has to contend with. Not only are the terms which we have employed for the description of our buildings, so long as we classed them by centuries, inadequate for our present purpose now that we have learned to divide them almost by decades; but there is at this moment the greatest want of unanimity, on the part of those who write and speak on this subject, in the terms that they employ; nor do they indeed always employ the same term when speaking of the same thing. I will give you two remarkable instances of this want of definiteness on two recent and prominent occasions.

On the recent visit of the members of the Architectural Conference to Westminster Abbey, Sir Gilbert Scott was good enough to give them a description of the building, and in the course of his description he made use of the following terms as applied to different portions of the works of the Abbey. After having noticed the Anglo-Saxon and Norman remains, he spoke of those belonging to the great Transition from Norman to Early English, or rather, he added, from Romanesque to Early Pointed. He next spoke of the transition from Early Pointed to Middle Pointed; but corrected himself further on by calling the latter the "pure Late Decorated style." He speaks also of "Henry III.'s style," and of the "transition from the Middle Pointed to the Perpendicular," and lastly of the "Tudor style," and of that development of it which he recognises as the "Pan-groining" style.

Now, if the "imaginary individual" to whom Sir Gilbert Scott professed to address himself on this occasion, and whom he supposed to be somewhat ignorant of the subject, were really present during the delivery of this address,—what remote notion could be possibly form of the nature of the architecture of Westminster Abbey from the terms in which it was thus described? And would not the ten or twelve terms which the learned Professor employed for this purpose be likely to confound and deter him from further approaching a study, the very threshold of which is encumbered with technical difficulties of so formidable a kind?

On the other hand, we have the president of the Northern Architectural Societies urging that the styles of Gothic architecture should be named "from the centuries, or, better still, from the king's reigns, because they possess many characteristics not covered by the old definitions."

Now, what the death of one king, or the coronation of another, can possibly have to do with the progress of architecture, it is difficult to conceive, nor yet why it should be perceptibly changed at the close of each century. Nevertheless, we find Mr. J. H. Parker realising this idea at the recent meeting of the Archaeological Institute at Southampton, by describing the Gothic remains of the neighbourhood as twelfth, thirteenth, fourteenth, or fifteenth century work, varying his descriptions by designating some of it as Edwardian, and as work of the Periods of Henry II., Henry III., Henry VII., &c.

Were this system to be adopted, we should have no less than fifteen periods, corresponding with so many kings, between the eleventh and sixteenth centuries.

The indefiniteness of the first of these terms,—twelfth-century work,—is obvious when we remember that that period covered the whole of the Norman work of Peterborough Cathedral, which was commenced 1117; the whole of the numerous and remarkable works of the Transitional Period; and the choir and eastern transcripts of Lincoln Cathedral, its lancet windows and clustered columns. What possible idea could this term then convey to Mr. Parker's hearers at Southampton? To me it seems infinitely more practical and sensible to accept the six great classes into which our national architecture, from the Conquest to the Reformation, naturally divides itself, and which every one in his descriptions has now more or less begun to recognise and to fix, by common and unanimous consent, on the terms by which we shall distinguish them.

This we have, I think, a right to demand. As regards the selection of these terms, I am, for my own part, quite indifferent. I have, as you know, proposed terms to apply to these six periods, but I have also, as you know, more than once offered to throw them over if better ones can be found, or others to which more universal assent can be obtained. Till these be offered, I

shall retain my own as answering the purpose sufficiently well. It is certainly preferable if possible to retain old terms than to adopt new ones; but there are objections to two of the terms already in use, as applied to the new division, which have always appeared to me insuperable.

It was in the middle of the twelfth century that the influence which Norman art had exercised for ninety years over architectural design in this country began to decline. The next half-century was signalised by that remarkable contest between two rival systems, the circular and the pointed, which ended, at the close of the twelfth century, in the supremacy of the pointed arch in all parts of the building. During the forty-five years of this great Transitional Period, more churches were erected in England than at any subsequent period within the same lapse of time; they show great fertility of invention, great vigour and nobility of design, and, in certain parts, great richness of ornamentation. That they were built by native artists there cannot be a doubt, for in the treatment of their details they are, with a single exception (the choir of Canterbury Cathedral), totally unlike the contemporaneous work of other countries, especially that of Normandy.

I claim, then, for the architecture of this period, the importance and originality of which is not even yet sufficiently recognised, the credit,—first, of its being the earliest English architecture, subsequent to that of the Saxons that we have; and, secondly, of its being the first Pointed architecture that this country ever saw: for the arches of constructions as a measure of utility, and subsequently used into the arches of decoration, prevailed throughout its entire duration. To call any other than this period, either Early English or First Pointed, is then impossible. And to limit the application of these terms to this Early Pointed period, after their long use in another sense, appears to be equally so.

What is absolutely certain is, that we cannot go on as we are at present, with four systems of nomenclature used by different writers, and two or three used indifferently, as we have seen, by the same writer. How soon we shall arrive at the unanimity in this respect that is so desirable, is difficult to say; meanwhile our course is a simple and an easy one.

You have already recognised the advantages which an intelligible classification, most simple and definite terminology, bring to the student; and the rapid and suggestive manner in which their use enables you to seize upon, and retain the characteristic features of a building, to be utilised hereafter in the same way that the old masters themselves used them; for, rely upon it, they were students in the same way that we are ourselves.

To learn the grammar of their art was as essential to them as it is to us; and there is no reason why you, if you become as thoroughly imbued with the spirit and feeling of the style in which you design as they were, should not be as independent and as original.

It is true that there are some to whom originality is impossible: such men are condemned to copy; they have simply mistaken their calling. They belong to the residuum of which Sir Gilbert Scott speaks in the otherwise excellent address to which I have already referred, and from which I will read an extract, that I venture to think is not inapplicable to the objects of our present meeting, and to those who have attended it and others in this and former years. It embodies, at all events, the sentiments which led to the establishment of these annual excursions:—

"One valuable means of perfecting our knowledge of architecture, is by measuring, sketching, and studying over and over again such buildings as those we have now around us, till we have mastered their principles, and have thoroughly imbedded our minds with the character of their details. If we do this with anything like system we shall do. We ought, at least, to attempt it. Some of us have done so with more or less success. Unhappily we cannot afford to be so polite as to shut our eyes to those who are a residuum of architects who pay no attention whatever to the cultivation of their artistic powers: who are architects only in name, and whose works are a disgrace to the architectural works of the nation."

"There is an admirable race of young architects coming up—men not much known, and very little patronised by the public, but men who are following up, heart and soul, the work which their predecessors have attempted—the revival of Gothic architecture in this country; and whether we are to go on to the natural end of our term, or whether we are to be sacrificed at the behest of newspapers and reviews, I hope it will be to the school of rising architects I have mentioned that our works will be committed, for then we shall have hope for the future."

DRAWING.

To be able to draw lines correctly on paper is as necessary as to be able to write, for all persons engaged in constructive works, and is an excellent idea of the publishers to put into the hands of workmen something from which they may learn what they ought to have learnt at school, but "Drawing for Bricklayers" * will not do that. It is an absurd hook, and the disappointment of the bricklayer who may have bought it, with the hope that from it he might learn to draw, may be imagined. A great portion of the hook has no reference at all to drawing, and the instructions conveyed are of the most meagre description. The other part consists of extracts from Peter Nicholson and from General Pasley, and of some original remarks, such as that "In England, the bricks, when burned, are rather less than 9 in. long, 4½ in. broad, and 2½ in. thick." The London stocks are of about that length and width, but thicker, while the red Suffolk and the Midland Counties bricks are both wider and much thicker. There could be no objection to the size of bricks or anything else being stated correctly, but why go out of one's way to convey wrong information? "The white Suffolk may be called a London brick, whilst the red clay in Cheshire yields the red bricks used to so great an extent in that district." But the colour of the clay has nothing to do with the colour of the brick when burnt, which depends upon the chemical properties of the clay, and not upon its colour. A very yellow clay will make a red brick when burnt. The various kinds of bricks are pretended to be mentioned, amongst which are "concave bricks made flat on one side, like an ordinary brick, and hollowed on the other, used for drains and water-courses." † while the ordinary culvert bricks which are used for drains are not mentioned at all; neither are the Staffordshire blue bricks. Lintels, it is said, have a hearing of 1 ft. or 18 in. at each end, and a drawing of a door or window-head is given, in which the lintel is shown as resting on pieces of wood 6 in. square placed across the wall.

The author gives a curious illustration of how our money was spent in laying a barrel-drain at the Ordnance Barracks at Chatham. "The bricks were ordered to be cut and ganged," so that the ordinary radiating or culvert bricks seem to have been as unknown to the Royal Engineers, as to the author of this book.

It would have been, one would have thought, an appropriate instruction in drawing for bricklayers to have given some examples of the arrangement of house walls, both of small and large houses. The only examples of this useful kind of work given in this hook is that of one villa, and in this the water-closet is placed as uncouth as can be in the centre of the building.

"Drawing for Cabinet-makers" ‡ is better, but it has one fault in common with the book more mentioned. They form two of a series, and the reader is frequently referred to some other hook of the series for the information necessary to complete the understanding of the subject. This may be very ingenious, but it is unjust to those persons to whom the books are specially addressed. The position taken is one that ought to be worthily filled, and if no better information can be given than is to be found here it were better to say nothing. If criticism is to be worth more than the paper on which it is written we must not hesitate to condemn such books as these.

"The Art of Drawing what One Sees" †† shows the rationale of perspective drawing. Here there is no writing for the sake of making a book, but every line tells its own story intelligently, building up the structure of the book line upon line without confusion of ideas, and genuinely putting before the reader what the author's views of the principles upon which perspective drawing depends, and reducing it to a science. Artists, or higgling their pardon, pseudo-artists, think they have nothing to do with science. In perspective drawing, however, they must proceed on scientific principles, and they will find them plainly stated in this book.

The manner in which the eye conveys to us the impression of the existence and relative positions of objects, the rays from which we receive into the eye, is wonderful. If studied

* Drawing for Bricklayers. By Ellis A. Davidson Cassell, Petter, & Galpin.

† Drawing for Cabinet-makers. By Ellis A. Davidson, Cassell, Petter, & Galpin.

‡ The Art of Drawing what One Sees. By Lieut. W. H. Collins, R.E., F.R.A.S. Longman, Green, & Co. 1872.

more closely it is astounding. Bacon said that Nature reveals but little of her charms to the stranger, and reserves the greater part for those who come again; and whether we shall ever understand her is a mystery, but she makes no mystery of herself to those who will seek to know her with diligence and humility. The want we find we have is that of intelligence to understand what we do see. That very important part of the actions of Nature which enables us to see and appreciate the relative positions of objects and to represent them on paper is well set forth in this book.

A perspective picture of an object, says the author, is an enlargement of the picture thrown on the back of the eye through the pupil, and interpreted by the brain. The perception of the object or interpretation of the little picture within the eye is *sight*; and the image itself, or an enlargement of it, is the perspective view (from *perspicio*, I look at).

"It is thought by a beginner that correct drawing is the result only of a correct eye, and that, like the poet's art, the peculiar faculty must be born with one, and cannot be acquired; but it is astonishing how soon the novice is capable of bringing rigid rule to bear upon the production of his own drawing, and upon the criticism of his master's. Master and he have then become pupils of Nature."

MANUFACTURE OF STAINED GLASS.

DURING a recent course of Cantor Lectures at the Society of Arts, Professor Barff treated of the manufacture of stained glass. The lecturer said, coloured glass is made in the same way as ordinary glass, except that certain substances are added to colour it. It is often said that the mystery of stained-glass painting is lost,—that the art which was once known to our forefathers in the Middle Ages has been lost. But this is altogether a mistake; there is nothing which they did which we cannot do. It is true that, after the decay of Medieval art, up to about thirty years ago, the stained glass that was made was anything but like that which it was intended to imitate, viz., the glass which adorns the ancient cathedrals of this and other lands. You will understand this if you look at some windows in the Temple Church, which are extremely good for the time at which they were made. They were a decided advance in the right direction upon what had preceded them. I shall have to allude to them again, as well as to other windows, in the next lecture, when I speak of the styles of glass-painting. I cannot help referring to them now, for this reason. A gentleman, named Whinston, a barrister, was much interested in this subject of glass-painting, and studied it very carefully. He saw that there was something wrong in the treatment that was being adopted, and he desired to ascertain how it was that the old windows, which had been made so many years, were so different from these modern imitations of them. He, in conjunction with Messrs. Powell, of Whitefriars, to whom we owe entirely this revival of the ancient mode of making glass, set to work, and analysed the old glass, to see with what metallic oxides they were coloured, &c. They also examined carefully the method in which they imagined the old glass was made. Mr. Whinston examined old treatises on the subject. He read carefully a book by a writer of the Middle Ages, and a translation is given in the appendix to a work which he published. It is interesting to see how very similar the older methods were to those employed at the present time; yet there were differences. I will not go through a description of the various stages of their work; however, we owe them both a heavy debt of gratitude. Others may have taken up the same subject, and doubtless have; but they were first in the field, and the enterprise and intelligence which Messrs. Powell displayed in this matter are beyond all praise. They have furnished us with specimens of their coloured glass, and by means of these I hope to be able to illustrate to you the method of manufacturing glass suitable for church windows and decorative purposes of all kinds, and contrast it with that which is used for domestic purposes, and show you how it was that gradually stained-glass painting began to decline from about the end of the sixteenth century. If you look at this cylinder, which is a beautiful specimen of glass, sent by Messrs. Chance of Birmingham, you will see that it is most perfect in its manufacture, and all their glass in domestic uses is of this character, most carefully and beautifully

made. But it is because the glass which those who revived glass-painting employed was so perfect in its manufacture, and so fine in substance, that much of the effect of the ancient glass-painting was wanting in their works. Various means were employed by architects and others to remedy these defects by covering the glass in places with opaque enamel, so as to give it an antique appearance, and also to give it lustrous effects which they saw glistening forth in the windows of the old artists. The effect of this was to cause darkness, and to destroy utterly that brilliancy which they hoped to attain.

Now, here is a cylinder of glass which is made for church windows. I dare say that even at this distance you can see that it is very imperfect on its surface, and irregular in its substance. The cylinder is not particularly true in its form, it is not even in its thickness, and the glass has not been refined with the same care as that which I showed you just now. It is full of air-bubbles and streaks; and if you look at a person through it, his features will be distorted in all kinds of directions. In fact, you cannot see at all distinctly through it. Now this very defect in the manufacture of glass for stained windows is its beauty. If you allow the light to pass through a sheet of glass, like this fine specimen, it passes through it uninterruptedly; but if you allow it to pass through this coarser glass, it is refracted, and this gives it its beauty and brilliancy.

There, again, is another sheet of glass which will illustrate it better; it is full of striae and air-bubbles. It is interesting to watch the course which the change in the manufacture of glass has taken in the last thirty years. All sorts of what one may call tricks have been resorted to to produce the effect of old and partly disintegrated glass. It was found, on examining the old glass, that it was full of little spots, or minute holes. I think I told you the reason of this in a former lecture, that it is because the glass is not perfectly homogeneous; some silicate, more alkaline than the rest which composes it, has dissolved out, which, you will remember, it does readily when water acts upon it slowly, and there is no doubt whatever that to this disintegration of a great portion of the old glass its pearly lustre and extreme beauty are owing. These irregularities in thickness all refract light, and cause it to stream through the glass as through a number of prisms, and thus we get a more lustrous and beautiful effect than we do when light is allowed to pass through a perfectly homogeneous medium.

Here is a specimen of patent-rolled plate glass, which I allude to because I think it right to give all the credit to those who, by scientific means, have done anything to improve or advance this beautiful manufacture. This was invented by Mr. Hartley, of Sunderland, a glass-maker of great intelligence, who found out a very simple thing, that he could ladle out from a pot of glass a desired quantity, and throw it upon a table, and roll it. These marks which you see are from engraved lines in the iron table upon which it is rolled. This glass is very lustrous, and is often used in the manufacture of stained-glass windows. Mr. Hartley has also done much in the improvement of coloured glass. I will now describe how glass is coloured. Here is a piece of blue glass. It is what is termed pot metal; that is to say, the blue colour passes all through the substance of the glass. It is made blue in the pot. Here, again, is a piece of ruby glass, and in it you will see striae and irregularities in its colour which make it so valuable to the artist. This glass is not coloured throughout its substance, but is simply coated on the surface. There are certain other glasses which can be coated; for instance, blue glass can be coated, because oxide of cobalt when used in quantity imparts a very deep blue colour to the glass, so that you can have a thin film of it covering white glass, and producing a deep blue colour. Again, greens and purples also can be coated, and they are all of them, I believe, to be obtained coated either in this country or from abroad. But ruby is always a coated glass. If you look at this specimen, you will see that it is perfectly opaque. It does not look like glass, but like a piece of red sealing-wax; it is coloured with the sub-oxide of copper. When the workman is making a disc or cylinder of ruby glass, he gathers upon the end of his blow-pipe, first, a piece of ruby glass, which is like this opaque glass, and then on the outside he gathers a quantity of white glass. He knows how to take the two glasses in proper proportions, so as to have a proper thickness of white and of ruby. He

then blows and gets a globe, or cylinder, which is composed of white glass covered with a very thin film of ruby glass; and it is only when this ruby glass is seen spread out thin that you are able to see its ruby colour.

Here, again, is the material used in making another kind of ruby glass, which is very beautiful. This is ruby made with oxide of gold. Here, you see, is a mass of red glass, not particularly brilliant in colour, which is made in the glass-pot, and great care is required in its manufacture; for if it is heated too much the oxide of gold is destroyed, and is reduced to a regilded state, and metallic gold does not colour glass. A piece of this glass is attached to a blow-pipe, just in the same way as the other, and is coated in the same way with plain glass. I hope to have a small piece of this gold ruby here next week, that you may see its beautiful colour. I will proceed now to the subject of stained glass or glass-painting, and leave to my next lecture the colouring of glass in the mass, because next week we shall be able to make some coloured glass in small quantities; and, having the electric light, I shall be better able to show how the white glass is coloured than than I can do now. I could not commence the description of the method of staining or painting glass without first mentioning the way in which glass is coloured, because you will see, when we come to treat of the manufacture of stained glass windows, that there is, properly speaking, no staining whatever except in one instance; it is simply painting. It is called stained glass, but this is an incorrect name for it. This piece of glass is not stained: it is coated with coloured glass.

I have here a piece of yellow glass. It is stained with oxide of silver, and this is really the only stained glass which is used in windows. Other glasses are either coloured throughout their substance, or are coated. I shall this evening illustrate the method of staining yellow glass. This little furnace, which you see here, will be used for the purpose. I shall, I hope, be able to show you also a method by which a ruby stain can be obtained. Silver stain varies from a light straw-colour to a deep orange; but a ruby stain is, as its name implies, a true red. Here is a piece of glass which was coloured with a ruby-stain in this muffle, but as the heat was allowed to become too great, there has been a little metal reduced here, which spoils the colour in parts. It is very instructive to examine this, because it shows the importance of attending to temperature in all these operations. In making a stained window, the first thing to be done is to make the design. Here are some sketches of various designs for windows; these, as well as everything pertaining to stained-glass manufacture, have been lent us by Messrs. Lavers, Barrand, & Westlake, of Endell-street, artists who hold a very high position as glass-painters: it is, therefore, quite unnecessary for me to make any comments on the merit of their works. The first thing to be done is to make the design. After that the working drawings, or large cartoons, are drawn by the artist. You see here a series of them, which have been used in the manufacture of a stained-glass window, and here is the window which was executed from them.

The various black lines which you see are lead lines. When a cartoon is finished, tracings are taken from it, and thus you see how easy it would be for any one who has a talent for drawing to make first a small sketch, and afterwards to make the large cartoon. As to the taste required and the style to be adopted, I will not say anything, as I am now simply speaking of manipulation. There is nothing easier than for a person who can draw to enlarge the drawing afterwards. A tracing is made of the whole and of different parts of the windows, and it is from these tracings that the glass used in the window is cut. One tracing will serve both for cutting the pieces of glass required to make up the window and also for performing the operation of leading, of which you see a sample here. Here are the pieces of glass which were laid upon this tracing. It is very easy, when they are cut, for the workmen to lay them down in their places and join them together by means of these pieces of lead, in the way which I will presently show you. I now come to the most interesting and important of all the operations after the cartoon is drawn,—that is, the painting of the glass. Certain substances are used for the purpose of painting on glass. Here you see certain dark lines, indicating the shape of the design. If it were a rosette or a face, it would be outlined in

just the same manner. Mr. Yeoman, an artist from Messrs. Lavers, will illustrate the work before you. He will take a piece of glass, which he has got ready for the purpose, and will show you how the manipulation is performed. He will put upon it a colour, the composition of which I will describe, and afterwards I will put it into this muffle, and fire it before you. The material with which Mr. Yeoman is going to paint is opaque. It is quite clear that if much of that material were used, the transparency of the glass, the property for which we most prize it, would be destroyed. Therefore, an artist who knows his work is as sparing as he can be in the use of this material, provided he can produce the effect which is desired. The material is made of various oxides of iron which are infusible, which do not enter into chemical combination to any appreciable extent with the fluxes employed, but which are simply held in suspension by them, and which are fixed on the glass when the fluxes are fused. There are different ways of making fluxes, and in my supplemental lecture I shall have an opportunity of showing you new methods of making them, by which they can be easily produced, and rendered very fusible; and where the flux is required to be coloured so as to be transparent, it can be so composed as to insure this effect at the temperature which is at our command. The bases of most fluxes are borax and oxide of lead. Borax is a substance which renders the glass fusible, and so also is red oxide of lead. Many prefer to use the lead and the borax in chemical combination, and for this purpose they precipitate a solution of common borax by a solution of lead nitrate, and they then get a lead borate, which makes an exceedingly good flux; but there is always a drawback to the use of borax as a flux for painting stained-glass windows. I do not know whether you have ever noticed it, but if you look, you may notice on the outside of many modern church-windows a white milky appearance upon the dark brown colour with which the glass is painted. If the glass, by any accident, gets placed the wrong side outwards, and that sometimes does happen, when it is painted on the wrong side—the painted portion is exposed to the action of the weather; this and the moisture in the air cause the borax to dissolve slowly, so that the flux which fixes the colour upon the glass is to a great extent destroyed. I have seen many works of really distinguished artists in which some of the lines and shading of the faces have disappeared altogether, owing, no doubt, to the fluxes being made soft with too much borax.

WORCESTER GUILDHALL COMPETITION.

The town council met last week to receive the report of the Survey Committee, recommending as we have already mentioned,—

"That the set of plans for the re-building, sent in by the architect under the motto, 'Bakalum,' be awarded the first premium of 100*l.*, on the distinct understanding that the architect guarantee that the proposed building, exclusive of the tower, and of sculpture and enrichments shown in the exterior perspective, which, as the elevations show, are not necessary to the design, can be carried out for the estimate sent in; otherwise the premium to be withheld." "That the set of plans sent in by the architect under the motto, 'Fiat Justitia,' be awarded the second premium of 50*l.*, on the same conditions." It was resolved unanimously,— "That, there being only two sets of designs for the re-construction, and this committee having previously reported that 'Convenience' had not complied with the conditions, they therefore presume that the premium must be awarded to the architect signed 'Vincit Veritas.'"

Mr. T. R. Hill said the council should not commit themselves to the award of the premiums until they were satisfied that the requirements of the advertisement had been complied with in respect to time. He would ask the town clerk whether they would be acting strictly according to law in making the award until it had been ascertained that those terms had been complied with.

The Town Clerk said, I know as a fact that 'Bakalum' was amongst the first six. I cannot answer the question as to one of the others.

Mr. Airey was glad to hear that this design was one of the six delivered within the time stated in the advertisement, having been strongly of opinion that the council had committed a mistake in admitting the three received late to competition, and especially so after hearing the very decided opinion of the editor of the *Builder*. He hoped the second was also one of the six; and that care would be taken that they had a *bona fide* guarantee as to the cost.

The recommendations of the committee were

ultimately adopted. The letters giving the names of the authors of the plans were then opened, and it was found that the three designs were sent in as follows:—

Bakalum.—Mr. C. G. Wray, 44, Cannon-street, London.

Fiat Justitia.—Mr. E. C. Robins and Mr. G. F. Roper, 16, Southampton-street, Strand.

Vincit Veritas.—Mr. E. A. Day, Worcester.

SLAG AS A BUILDING MATERIAL.

EVERY visitor to the neighbourhood of iron-works is struck with the enormous accumulations of unavalaible product, and is almost sure to inquire, "Can nothing be done with it?" Numerous plans of utilising it have been proposed, many in our own pages, but still there lie the mountains of slag added to by every month's work. At the American Institution of Mining Engineers a paper on the subject was lately read by Mr. S. Egleston, a portion of which we reproduce.

The necessity of having building stone in certain countries of Europe, where it is very scarce, led to a long series of experiments, which, after a multitude of failures, resulted in the manufacture of a very useful product for certain kinds of constructions. These experiments began at a charcoal blast-furnace, the slag from which was taken out of the fore-hearth with a ladle compressed into a mould, and cooled slowly. In order to keep the slag in the hearth from becoming cool, it was covered over with charcoal. A small quantity of the powder of the charcoal became mixed with the slag, and effected a partial devitrification in the moulds. The attempt to apply this exceedingly simple process to a coke furnace failed entirely. The bricks became too porous from the evolution of gases resulting from the admixture of coal-dust. Sand and coke-dust were then substituted, but as the bricks were still fragile they are now annealed in furnaces. This process is applied in Konigsbatte, in Silesia, to the manufacture of building material, of which some of the important constructions of the works are built. The slag is run from the furnace into a hemispherical basin on wheels. The bottom of this basin is covered with sand or fine coke-dust, to the depth of about three centimetres. The wagon is then drawn to the point where the bricks are to be made. The slag and sand are mixed together with a curved iron tool until most of the gases have escaped, and the mass is about the consistency of dough. It is then drawn with the same tool into a mould with a hinged cover, and punctured several times to let out the gas. The cover, which fits into the mould, is then turned down, and the slag compressed. By the time three or four moulds have been filled, the first slag brick is sufficiently solid to be removed. This is done by raising a clamp, which allows the mould to separate. The red-hot brick is now drawn into a kiln, covered over with powdered coal, and left to anneal. Each kiln contains 1,000 bricks, and is from three to four days in cooling. Four men can make 600 of these bricks in five hours. The loss in the manufacture from the breakage is about 20 per cent. The cost of annealing is about two shillings per 1,000. These bricks are rough on their surfaces, but, on account of their larger size, do not require more mortar than ordinary bricks. They do not readily absorb moisture, and for that reason are extensively used in the construction of foundations. The pillars supporting the main wind-pipes at Konigsbatte are built of this material. In Silesia these bricks cost 25 per cent. less than ordinary brick.

A brick much inferior to this in every respect is made in the Hartz mountains out of the lead furnace slags, which are silicates of iron. These are moulded and compressed, and are used for buildings. As the bricks are very brittle, the constructions in which they are used are generally covered with a coat of mortar. The buildings of Clanshal are built of this material.

Mr. Sepulcre, a Belgian engineer, was one of the first who successfully transformed the slag into a stone which could be generally used. This he effected by causing the slag-channels to terminate in an excavation, the sides of which had an inclination of about 30°, and with a capacity varied from half to ten cubic metres. The very steep inclination of the sides causes the section of the pits to increase very rapidly, and this allows the solid crust, which forms on the surface of the liquid slag, to rise with it without becoming attached. The slag must flow con-

tinuously into the excavation; and if, from any cause, there is an interruption, the crust must be raised to allow of the liquid material flowing underneath. In this manner the whole mass of slag in the pit is sure to be all liquid, and will solidify from above and under pressure. After the excavation is full, it is left for five to ten days to cool, the only precaution required being to cover the top with ashes or sand to a sufficient depth to prevent the mass cooling too rapidly. The stone so produced grows hard on exposure to the air. When first made it can be easily broken into any required shape, but after exposure for a period more or less long, it becomes so much harder as to require double the number of tools to work it.

All kinds of slag are not suitable for this manufacture; those which contain too much lime fall to pieces on exposure. In general, it may be said that they should contain from 38 to 44 per cent. of silica, and that the furnace should be working well.

According to experiments made at the Conservatoire des Arts et Métiers, in Paris, this stone, when made from slag; while the furnace was running on white iron, never became fissured under a pressure of less than 212 kilogrammes the square centimetre, and was crushed at a pressure of 886 kilogrammes as a minimum. When made from gray iron, they do not crush under a pressure of less than 405 kilogrammes, but they have fissures at a pressure as low as 222 kilogrammes, or a little less than the white iron slags. This material is, therefore, stronger than the best marble.

One of the Belgian furnaces, which produces 2,500 tons of slag in thirty days, made from it 1,177 cubic metres of stone. The expense of manufacture was 820 dollars. The material sold for 1,600 dollars, making a profit of 780 dollars in thirty days; 70 per cent. of the slag produced was profitably used. In order to introduce it the price was put 25 per cent. lower than ordinary stone.

BLACKPOOL MARKET COMPETITION.

Forty-seven sets of designs were sent in, and these were referred by the Local Board to Mr. Jas. Green, architect, of Portsmouth, near Tordmorden. In his report, just now adopted by the Board, Mr. Green says:—

"Out of the remaining designs I shall notice six especially for your consideration, viz.—Nos. 5, 7, 17, 21, 29, and 36.

In considering the six designs I have no hesitation in recommending to your notice that of No. 7, bearing the motto 'Mercurius,' as worthy of the first premium, both on account of the arrangement of market, which is well lighted and ventilated, also shops and offices, and the excellent style of elevation it presents. I estimate the cost of carrying out this design in its integrity, including the handsome clock tower, would not exceed 7,500*l.* The tower would absorb about 300*l.* of this sum; but as it forms so great a feature in the design, and would be at once so useful and ornamental an acquisition to the town, I should strongly recommend the committee, if they decide to accept this design as the first, to carry out the whole as drawn.

For the second premium I select No. 17, bearing the motto 'Knowledge is Power.' This I name as having an excellent arrangement of plan, both of market and offices. The elevation I consider not so good, but the author has evidently considered the amount to be expended, and I think has not exceeded the amount in his design.

For the third premium I select No. 21, with the motto 'St. Swithin,' which has a much superior elevation to the last mentioned, but is not so good in plan, having less light and ventilation to the market, and not so convenient a board-room. I think the cost of this would not exceed 7,000*l.*

The premiums were accordingly awarded as follow:—

First, 30*l.*, No. 7, "Mercurius," Messrs. W. & J. Hay, Liverpool.

Second, 20*l.*, Mr. Charles O. Francis, Liverpool.

Third, 10*l.*, Messrs. Thomas Bird & Son, Manchester.

"LANDS THAT WANT HANDS."

STR.—If the statement be true that "men who eat and drink well ought to work well," the converse is also true, that "men who work well ought to eat and drink well." Experience teaches us, that unless men do eat and drink well they cannot work well. It is as vain to expect the contrary as that the steam-engine shall work without the burning of fuel. No matter whether the labour be mental or physical, brain labour or muscular exertion: it has been abundantly shown that men cannot perform it unless they live well. Now, living well involves a good supply of animal food,—meat. Unless men eat plenty of meat they cannot do plenty of work. It will not, then, be a matter of surprise

in these busy times, when great exertions are being made, and labour performed at railway speed, that there should be a great demand for meat; and also that, in consequence of that demand and the very natural wish of those who have meat to sell to share in the general prosperity, meat should be at a high price. It would be a matter of surprise if, under these circumstances, meat was cheap; but a very general impression has got abroad, especially in our cotton counties, that meat is much dearer than it need be, that cattle-breeders are getting more than their fair share of profit, and have by some underhand backstairs way induced the Government to protect them in their dealings by prohibiting the importation of foreign stock; ostensibly, it is true, on account of disease, but really to prevent competition. It would be well if this impression could be explained away. From a statement recently published it appears that our meat supply is derived mainly from our own soil, and that we import to the extent only of some 5 per cent. of the whole. If that be so, the cry recently raised requiring the Government to remove the restrictions against the importation of (diseased) cattle seems uncalled for. Let us have free trade in (healthy) cattle certainly, but let us not be deluded by the belief that other countries in Europe will have much to send us. Denmark used to be our great source of supply; but ever since the German hosts were launched into Schleswig Holstein, there to acquire that appetite for beef which has later swept the face of fair France of its cattle, and which appetite is not likely to be appeased, now that the splendid feeding-grounds of Denmark and France are "annexed," we shall, in all probability, get next to nothing from them. Spain, too,—sleepy Spain,—sends us a few cattle; but let the spirit of enterprise get abroad under a vigorous Government, and Spain will want all its cattle for its own use. We clearly cannot depend upon these. On whom, then, are we to depend for our meat-supply? Not on our colonies; for, in spite of the noise made with their tins of preserved meats, the bulk of the people will not be satisfied with them. "It no fill him belly," and no foreign country offers anything better. It is clear we must follow the old advice, "If you want a thing done, do it yourself." We must depend upon ourselves. Already a great stimulus is given to production by high-selling prices. Farmers will do their utmost to meet the demand, by growing root crops instead of corn, which can be well imported, and by hesitating to send their calves to the butcher. Government may do something in that direction also, by prohibiting the slaughter of calves and lambs under a certain age; for why should not these have a "close time," as game and wild-fowl have? These remedies to scarcity will do something, but they will scarcely do enough. We want more people to live in the country, following agricultural pursuits. If we want a peasant proprietary. Looking over the volume of the *Builder* for 1870, I have been much impressed with your remarks upon this subject. I can avouch that there are in this England of ours abundant "lands that want hands," for I have gone through a great portion of it on foot, and have observed the manner of its cultivation, and also of its waste; and, as a result of my observation, I may affirm that, leaving out the 30,000,000 of acres now uncultivated, if the remainder, said to be cultivated, were in good hands, and under the management of intelligent peasant proprietors, our country would produce for us in abundance everything,—except tropical productions,—of which we stood in need. Not only that, but there would be an immense improvement in the people themselves. Our town artisans, many of whom have been country bred, but who are mostly only one degree removed from starvation, would be infinitely better off as cultivators of their own land, although its extent be no more than that of Miss Martineau,—a farm of two acres. A man need not cease to be an artisan by such an acquisition. A good system of light railways throughout the country would keep him in sufficient connexion with his employers; and it will require no stretch of imagination to see that a man with his family so situated would be practically above the reach of want.

And now let me repeat your question, "Who will help us to such a position?" There are large numbers of us scattered about the country who mean to have it, either in our own or some other land,—men with large families, who would be welcomed in any country except our own. The United States are absorbing a large

number of our best workmen; and Canada, our own colony, is not only offering to us such inducements as the possession of good land gratis, but is also paying for us part of the cost of reaching it. In these countries men think themselves hardly used if they do not eat beef or mutton three times a day and every day. There every country family, and many town ones, possess cattle, so that they get a good supply of fresh dairy produce,—a luxury which we town-dwellers in England seldom or never obtain.

Will not some noble lord or honorable gentleman who is in possession of a portion of the surface of this land of ours put some of us with large families into possession of, say two to three acres each family, at an equitable rental and a long lease; the first three years at a peppercorn, gradually rising to the full rental at the end of ten years, or as may be determined by the merits of the case? We can pay a good rental; we can pay more per acre than any tenant-farmer in the country; and we shall produce more, take us altogether. We shall have no strikes and no starvation, and, consequently, no poor-rates and workhouses, and I am quite sure we shall want no lunatic asylums. But we shall want good, healthy homes, and large storehouses for cattle and crops, and good schoolhouses for our children. We shall want, and shall be able to have, many things of which we can only read and dream now.

Our cry, then, is "Back to the land; back to the land! Who will be the first to start a home colony on the 'Builder's plan' or any other?"

E. G.

SCHOOL BOARDS.

London.—On June 26th the Works Committee were instructed by the Board to take the necessary steps to invite a competition of four architects for the Board offices, to be erected on the Thames Embankment. They have submitted the conditions and particulars which have been drawn up for the guidance of the competing architects.

Conditions and Particulars.

The School Board for London invite competitive designs from the four selected architects for the offices to be erected on the Thames Embankment site, near the Temple Station, a lithographed plan of which is herewith sent. A schedule of the probable accommodation required is appended, but the competing architects are invited to submit suggestions.

An honorarium of twenty-five guineas will be paid to each of the four selected competitors. Each architect to give the cubic contents in feet of the whole building, measured from the bottom of the foundations to half-way up the roof; the available internal superficial area of each floor, as contained in the rooms; and an estimate of the cost, together with a general specification and description.

The Board reserve to themselves the right of rejecting the whole of the designs, should none of them be considered suitable. The plans, drawn to a scale of 8 ft. to an inch, to be delivered to me not later than 5 p.m. on Saturday, the 30th of November, 1872.

With reference to the appointment of officers for the architect's department, Mr. Tabrum explained that the altered arrangements as to the services of the architect would involve a saving during the first year of 25,000*l.*, and as the architect would have thirty sites placed at once in his hands, the committee thought it desirable that he should have a sufficient staff.

Brighton.—The Education Department have approved the designs of Messrs. B. Fletcher and J. S. Nightingale for the schools in Ivory-place.

SEWAGE WORKS AT BUCKHURST-HILL.

THESE works have been carried out under the direction of Mr. Grindle, of Hertford, and have been in successful operation for nearly twelve months. "The population of Buckhurst-hill," says the *Woodford Times*, "is about 2,000. The sewage is very strong, being nearly double the strength of ordinary London sewage. Originally an irrigation farm was thought of, in deference to the frequent visits of London excursionists, and the high price of land, the Sewer Authority decided on adopting a system of precipitation combined with intermittent filtration as recommended by Dr. Franklin. The raw sewage is taken to the subsiding tanks from the main sewer down the Queen's-road to the works which are situate about 300 yards below the railway station. On its way to the tanks it is treated with sulphate of alumina to assist subsidence; it is then received into a tank 30 ft. long, 12 ft. wide, and 5 ft. deep, in which the solids fall quickly to the bottom. These tanks

are frequently cleansed by means of valves and pipes in the bottom of the tanks, which convey the sewage mud to drying beds. This frequent cleansing is found necessary to prevent secondary decomposition taking place, and so further polluting the supernatant liquid. The surface of the liquid is always maintained at one level, so as not to allow any disturbance of the partially settled solids, the liquid being gradually delivered upon a sand-filter 20 ft. square, containing 1 ft. in depth of sand. From these sand-filters, the liquid, being deprived of all matter in suspension, is run upon one of four beds of calcined earth, 40 ft. square, and 6 ft. in depth. It is allowed to pass through one of these beds for eight hours, and so on the others alternately, thus giving each twenty-four hours' rest for the purpose of allowing the air to follow the sewage to oxidise any organic matter contained in solution. The effluent water runs direct into the River Rode, clear and sparkling. The works are in duplicate, so that no delay may take place during the cleansing of the several tanks and filters. The use of alum is to coagulate the albumenoid portion of the sewage, and to assist in its precipitation."

PAVEMENT IN PALL-MALL.

Stg.—I should like to draw your attention and that of the parishioners of St. James's, Westminster, to the relaying of the foot-pavement on the south side of Pall-mall by the authorities of the parish.

PEDESTRIAN.

CANTERBURY CATHEDRAL.

ONCE more a priceless treasure has been imperilled by the plumbers. All England has heard with a thrill that on Tuesday morning last the east end of Canterbury Cathedral was in flames, and that, but for great and judicious personal exertions, and the most fortunate circumstance that Canterbury has a high-pressure water-supply, the building could scarcely have escaped. As it is, the damage is mainly confined to the roof, and is merely a question of money. The circumstances of the fire, and the considerations that grow out of it, may be better treated of as a whole on another occasion.

KENILWORTH IN 1872.

Who but a wealthy English nobleman can indulge in the luxury of nursing the decrepitude of a shapeless ruin, and letting seven acres of land lie untilled? That some are to be found at the present time who are rendering this service to mouldering walls and mounds of earth is in itself, in the eyes of archaeologists, a sufficient justification of the perage. But the English public is not without its obligations to some noble squire; for were it not for them, how seldom would John Bull see with his bodily eyes the actual records of the great past of his country; and in all probability we should not be able to take our stand with quiet pleasure in the base-court of ruined Kenilworth. We owe our thanks, then, to the Earl of Clarendon for the very evident care that is constantly bestowed upon all that remains of Kenilworth Castle. We could wish that there were fewer printed notices posted on the walls to warn the climbers of them,—fewer spikes and rails at every turn and corner,—a less evident preparation for the reception of excursionists. But, above all, we wish away the disgusting additions of modern masonry, especially where they take an ornamental form, quite uncalled for and most unwelcome to the eye that dwells with interest upon the old stonework. The architectural value of the ruins is not great, and cannot for a moment be compared with their historic worth. There are to be found no such delicate and varied details as gem the broken walls of Tintern or Fountains Abbey. Of true detail there is little or none. The huge pile known as Caesar's Tower is austere in its plainness. The tottering wreck of what remains of Leicester's Buildings presents, indeed, towering rows of millioned windows in the walls and in projecting bays; but the details of these are coarse and scanty. Only in the ruins of the Great Hall, in its grand porch, in its windows and its beautiful oriel, is any approach to refined architectural detail to be discovered, and even here its distinctness is obliterated by long exposure and by reason of the soft nature of the reddish sandstone of which the hall is built. The architectural student will find, then, little here to fill

his sketch-book. The ruins are too essentially picturesque and shadowy to afford many determinate features for him to seize upon. The artist with his colours is the proper person here, and for him how many charming and affecting subjects are presented in the great circuit of what remains of Kenilworth. But detail apart, the architect may find much to instruct him, especially in the disposition of the various masses of building, and in the shapes and aspects of the different halls and chambers. The natural beauty of the site is great, but the old builders have made the most of it; and in spite of the thickness of the walls and the narrowness of many of the windows,—in spite of vaulted ceilings and turret stairs,—when the castle was entire there could hardly have been a corner of it that was not cheerful except the dungeons. Of how many modern houses, with all their lightness, can this be said? Two of the windows on the western side of the great hall are recessed, and look over towards Honily. Before Cromwell gave the castle up to be spoiled by his followers, these windows looked on to a vast lake, which stretched away from the base of the outer walls into the dim distance, the wooded neighbourhood of Honily. From day to day the idle courtier or the proud lord of the domain could command from these lofty trauced windows as fair a view as could be found in England. And when the Princely Pleasures were held at Kenilworth, the mighty Queen herself no doubt often rested upon the broad stone seats beneath them, while Leicester pointed out to her the various beauties of the lake and the encircling trees of the chase beyond it. Two more charming windows could scarcely be found. A ceaseless flood of daylight once poured through their glazed and jewelled traceries, and still continues to pour through their bare ruined openings. The summer breezes that blow through their opened casements must have been bewitching, for they are bewitching still. The entrance to the castle is now by the side of Leicester's Gatehouse. Before the Gatehouse was made into a dwelling by Hawkesworth, Cromwell's officer, the road passed through the centre of it under an arch 12 ft. wide. This building is well preserved, and is inhabited as a farmhouse. The path to the castle is on the west side of it. A gravel walk, with flower-borders on either hand, conducts you through a gate or two into the grassy base-court, which rises rapidly to the foot of Caesar's Tower on the right and Leicester's Buildings on the left. Passing through the broad opening (once covered with buildings) between these two masses of ruin, the great hall with its fine oriel immediately faces you, and all that remains of Leicester's Buildings is on your left hand. At the northern end of the great hall stands the famous strong tower, which Scott in the romance calls Mervin's, and makes it the retreat of the unfortunate Amye Robsart when she ventured to drag her wrongs and sorrows into the unsympathising presence of the princely pleasures. To take his seat in the midst of these ruins on a long summer's afternoon, on a day when there is no excursion to the castle, is productive of mingled sensations in the mind of the visitor—arising with the natural bias of his thought. Around him rise the symbols of a power which is no longer such, but very weakness, for the feudal age with its chivalry has passed away. Here are the stern remnants of walls as old as the Conqueror side by side with the tottering fragments of others that were brand new in Elizabeth's time. History for a season made her home here in the persons of mighty kings and of almost as powerful subjects. The flower of our race, and the leaders of our nation, assembled here, just about 300 years ago, to take part in one of the most glittering pageants of which there is any record, when, for many days in succession, a gorgeous throng filled every nook and cranny within the great circuit of the walls, and eddied with its sparkling waves about the person of the virgin queen. We look up at the windows where beauty once took her stand to gaze at the life and bustle of the great court-yard below, or to catch the breeze from the surrounding lake. The windows are dark now, mere voids, and the ivy clammers about their broken millions. We sigh over the departed life of our ancestors, even if we believe it to have been inferior to our own. But we cannot sympathise with it: we belong to another age; we are mere spectators here. The strength of stone and the tenacity of mortar have preserved these records of life in the sixteenth century for us to look upon, but we can do no more. The resistless current of change has borne us so far from

these ancient landmarks that we feel like strangers and aliens in their presence. What have the men of to-day, whose familiar are steam and lightning, and whose politics are veering on lawlessness, in common with the men who reared these walls?—whose powers, as compared with theirs, were as the quiet drying out of a summer's day in contrast with a storm in the tropics? Of what real value, then, is an hour spent at Kenilworth to the active worker in this present age, and primarily to the architectural worker? The good of such a visit is surely for his heart, and scarcely at all for his art. If rightly viewed, ruins such as these, with the reflections they give rise to, will teach him, amongst other things, how utterly his age is severed from that in which these mighty buildings were executed, and that he must look for the sources of the power and beauty he is fain his art should display elsewhere than in dried-up fountains.

S. D.

TASMANIAN WOODS.

TASMANIA has woods which might usefully be introduced to the English market. A discussion has been going on recently in Tasmanian papers on the subject. The *Launceston Examiner* says:—

"We have immense forests of both hard and soft wood, as solid and enduring as British oak, as soft and more lasting than American pine. Practical men pronounce Tasmanian blackwood to be quite equal to mahogany—some say it is even better: it is pleasant to work, after seasoning will not shrink or warp, is everlasting, and may be had in planks 3 ft. or 4 ft. wide. Our gums, especially the blue gum, are in no way inferior to oak, either for strength or durability; while our pines—the Hoop, celery-top, sassafras, and pencil—are equal to any in the world. Besides which we have fancy woods in great variety, most elegantly marked, and capable of receiving a very high polish. We should like to see some of the woods we have mentioned introduced into the English market. Manufacturers would hail them with delight if they could once be persuaded to give them a trial, and thus a trade would spring up that would be of mutual advantage to the old country and the colony. One of the principal objects of international exhibitions is to show the resources of different countries—what they have to sell, and, by inference, what they are likely to buy. We think it can scarcely be doubted that Tasmania has suffered through not being properly represented at the various exhibitions that have been held in Europe."

All bear testimony to the valuable character of some of the timbers, especially blackwood, for nearly all purposes for which timber can be used, from post and rail fencing to the veneering of the most delicate cabinet work. Blackwood (*Acacia melanoxylon*) is certainly a most beautiful and very useful description of timber. It is handsomely grained as mahogany, and takes a high polish, so that to the cabinet-maker it is an invaluable timber. Furniture of all sorts is now made from it, while it is also largely used for interior fittings, for window sashes, and carriage work. This timber should, if properly introduced, command a high price in the English market, and it is worth the attention of those in the trade.

THE LIGHTING OF SCHOOL-ROOMS.

A PAPER "On School Life in its Influence on Sight," read recently at a meeting of the College of Preceptors, by Mr. Liebreich, Ophthalmic Surgeon in St. Thomas's Hospital, deserves the attention of architects and school boards. We print a portion of it, in which the writer speaks of the position of windows in class-rooms:—"The Education Department in its rules to be observed in planning and fitting up schools, has made regulations for the lighting of class-rooms, and has chosen, of all the different kinds, the very worst. No. 15 of the rules is as follows:—"The windows should be so placed that a full light should fall upon the faces both of the teachers and of the children." Light coming from the right hand is not so good as that from the left, because the shadow of the hand falls upon that part of the paper at which we are looking. Light from behind is still worse, because the head and upper part of the body throw a shadow on the book; but the light that comes from the front, and falls on the face, is by far the worst of all. In the first place, it does not attain the object desired; and next, it is most hurtful to the eye. The object is to make the fully-illuminated faces more visible to the master; but the children, instinctively desirous of avoiding the unpleasantness of the full glare, assume all sorts of positions, which turn their faces from the master. In reading, they turn the head round the vertical axis, generally towards the right, in order to let the light fall on the book, which, when held straight before them, is completely in shadow; while, in writing, or in reading (the book being on the table), they bend their heads

as low as possible, in order to shade their eyes by the projection of the forehead. In this way the faces are much less visible to the master than if they were held upright and illuminated from the left side; and if, according to the regulations of the Committee of Council, the light also falls full upon the face of the master, he will be entirely prevented from seeing them. This method of lighting the room is very injurious to the eye, because, firstly, the retina becomes fatigued by the full glare upon it, and the diffused light renders the comparatively dark images of the printing and writing more difficult to be perceived. Secondly, the position assumed by the children, in order to avoid the disturbing influence of the light, places the axis of the eye in a very unfavourable direction, which, as I have already mentioned, and shall explain more fully by-and-by, induces short-sightedness, differences in the sight of the two eyes, and certain weaknesses of the muscles of the eye. The motives of this diversity in the lighting of rooms cannot easily be given, as they are different in almost every school. I will, however, mention a few of the more prevalent. Some of the principal schools are in buildings, two, three, and even four hundred years old. Here the windows are not in the most desirable positions; comparatively speaking, however, the lighting in the large class-rooms is very good. They have high Gothic windows, and the light falls through them more directly from above. The more directly the light falls from above, the less it feels any fault with regard to the side from which it comes. In small old buildings the lighting is frequently very bad. This would have been of little consequence where the old building serves merely as a nucleus for new ones, were it not that the unfortunate idea of building the new part in the old style has deprived the children of the favourable opportunity of obtaining several well-lighted rooms, in addition to a small number of badly-lighted ones. If we have to condemn this sacrifice of a most important object to architectural taste, what shall we say when one of the first architects in England builds, at an enormous cost, a perfectly new, large, splendid school on an extensive piece of ground, open on all sides, and lights every class-room from three sides at once by low broad windows; thus rendering it impossible to place the desks in any suitable position? Are trustees and architects aware of their responsibility, when they build a school without consulting the masters, and only for the ward show? Or have they no misgivings of the evil consequences resulting from such unpractical arrangements in a school? In the schools of the middle classes I have generally found better arrangements with regard to light, especially where limited means did not allow the architect to ornament the house in the Tudor style, in which the upper part of the window, i.e. the most important, is useless, but obliged him to build in a simpler manner. Buildings with rectilinear and rectangular ground plan, with high, rectangular modern windows, do not produce such a pretty effect in the landscape, and do not proclaim the genius of the architect to the superficial beholder; but this seems to me of small consequence in the case of institutions of such practical importance as our schools. In the schools for the poor, where the light depends essentially upon the situation and means of the school, and where the first is often unfavourable and the latter limited, no one can be blamed for the lighting, which is generally insufficient rather than ill-arranged."

CATHEDRAL OF ST. CANICE, KILKENNY.

THIS cathedral is the see of the Bishop of Ossory, a diocese which embraces nearly all the county of Kilkenny and portions of the Queen's and King's counties, in the province of Dublin. Originally seated at Seir-Kyran, in the King's county, the bishops of Ossory subsequently had their see at Aghaboe, in the Queen's county, but it was finally removed to Kilkenny at the beginning of the thirteenth century. Commenced early in that century, and finished about 1280, this cathedral is in style a pure Early English building, and is said to bear strong tokens of affinity to the South Wales school of that style. The plan is cruciform, with a tower at the intersection of the cross. There are aisles to the nave and to the western portion of the choir; the former having lean-to roofs, the latter being gabled. Besides the choir aisles which served as chapels (the piscina and credence still remain), there are two chapels opening eastward from the transepts; that to the north served as the parish



CATHEDRAL OF ST. CANICE.

church, and is plain and small: the southern chapel is much larger and more ornate. It has three closely contiguous three-light lancet windows to the south; the lancets being mullioned, and each triplet contained by shafted piers and a moulded internal arch. Its earlier window consists of three similar lights of two lancets each, the central light rising considerably above the side ones. It may safely be assumed that this chapel is later than the main structure, as, if the heads were pierced, the windows would be examples of plate tracery. The choir is lighted by lofty lancets grouped in threes in the east end and at each side, and separated by massive piers with moulded trefoiled heads (over round-headed windows) and jamb shafts; over the roofs of the side aisles five clearstory windows admit light also to the choir.

The original tower fell early in the fourteenth century, and has been rebuilt, with a curious, though not servile, adherence to the style of the previous century. The fan-tracery of the tower arch could not, however, have been erected until the fifteenth century. It is said to have been the work of Bishop Hacket, reputed to have designed the Abbey of Batalha, in Portugal, and is the only bit of Perpendicular work in the entire building.

The external aspect, as may be seen in our view, is plain, but pure Early English work. Notwithstanding the plainness of its style, and its comparatively small size, the cathedral, both

internally and externally, is not without a certain degree of massive grandeur. It was restored and roofed by the Dean and Chapter just previously to the disestablishment of the Irish Church, at an expense of about 15,000*l.*, of which the greater portion was borrowed on the credit of the Economy Estate, 3,000*l.* were advanced by the late Ecclesiastical Commissioners for Ireland, and 400*l.* subscribed by private persons. The architect was Mr. Thomas Newenham Deane, whose work is not very happy where he had not the ideas of the old architects to guide him; notably in the sheeted hammer-beam roof of the choir, and the bishop's throne and stalls. The adaptation of stone water-courses to the exigencies of modern work has not been successful, as they leak under the wall-plates, and have already caused the unavailing expenditure of several hundred pounds in the endeavour to make them water-tight.

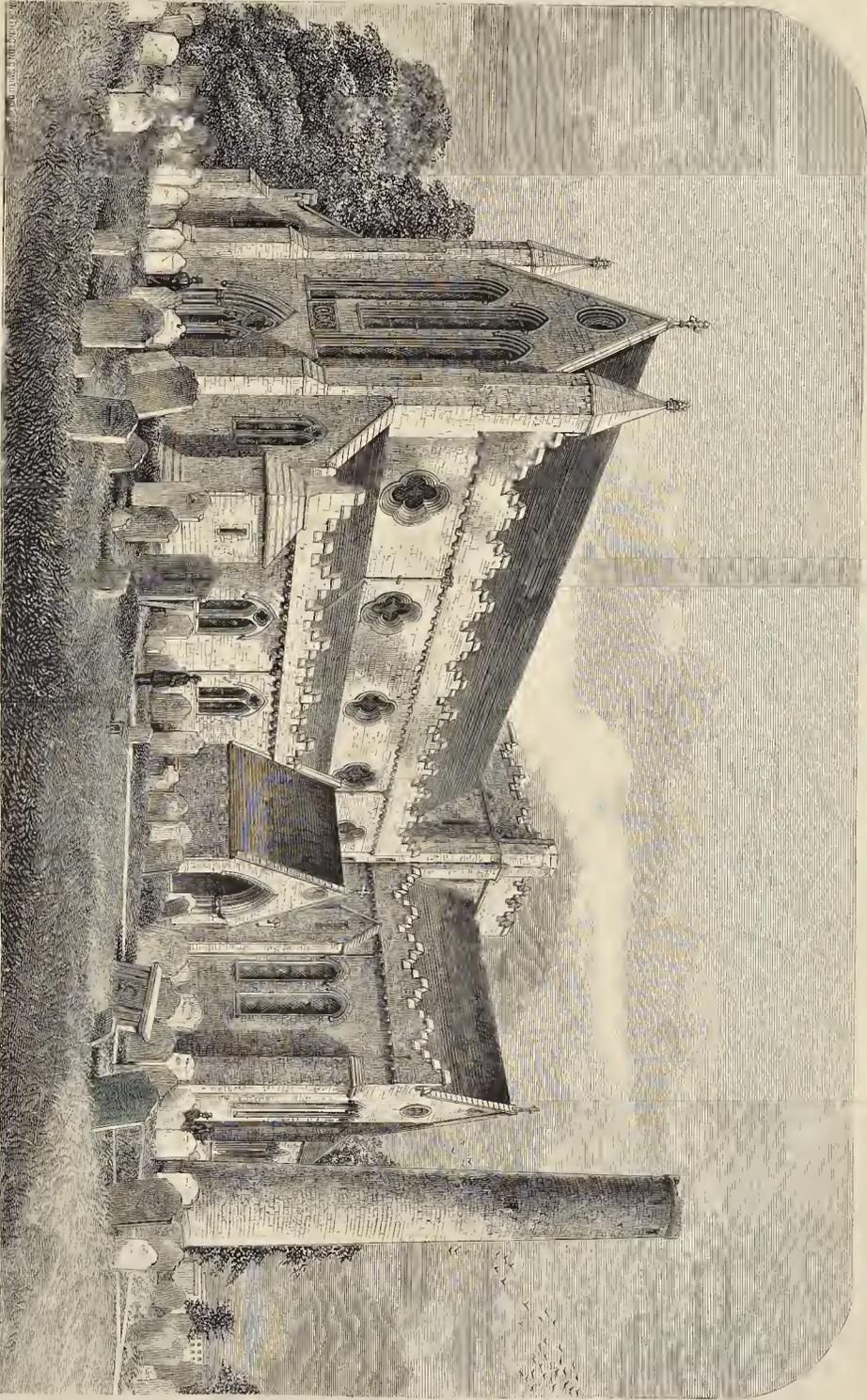
The church is plainly floored with Minton's tiles and Irish marble, and seated with movable open benches, the sittings being entirely free. It is lighted by a series of part-polished and part-painted large corona, suspended from wrought-iron ornamental tie-rods, and supplied by Messrs. Richardson, Slade, & Co., of Brownlow-street, Holborn: one of these corona pendants we have illustrated. The pulpit and most of the carving of the new work are by Harrison, of Dublin. There are four principal doors: a very fine double door to the west, of an ornate character; one with a porch, giving entrance to

the south side aisle of the nave; one in the north side aisle of the nave; and one in the north transept. The last-mentioned exhibits a round-headed entrance under a moulded pointed arch, and is considered the most curious feature in the church; unfortunately it suffered much from injudicious cleaning some years ago, as did also the finely-moulded arches of the nave arcades. The stone principally used in the dressed work is Kilkenny marble, or mountain limestone, of a dolomitic nature; a good deal of local sandstone was also introduced by the old builders; and the north transept door seems to be of Caen stone.

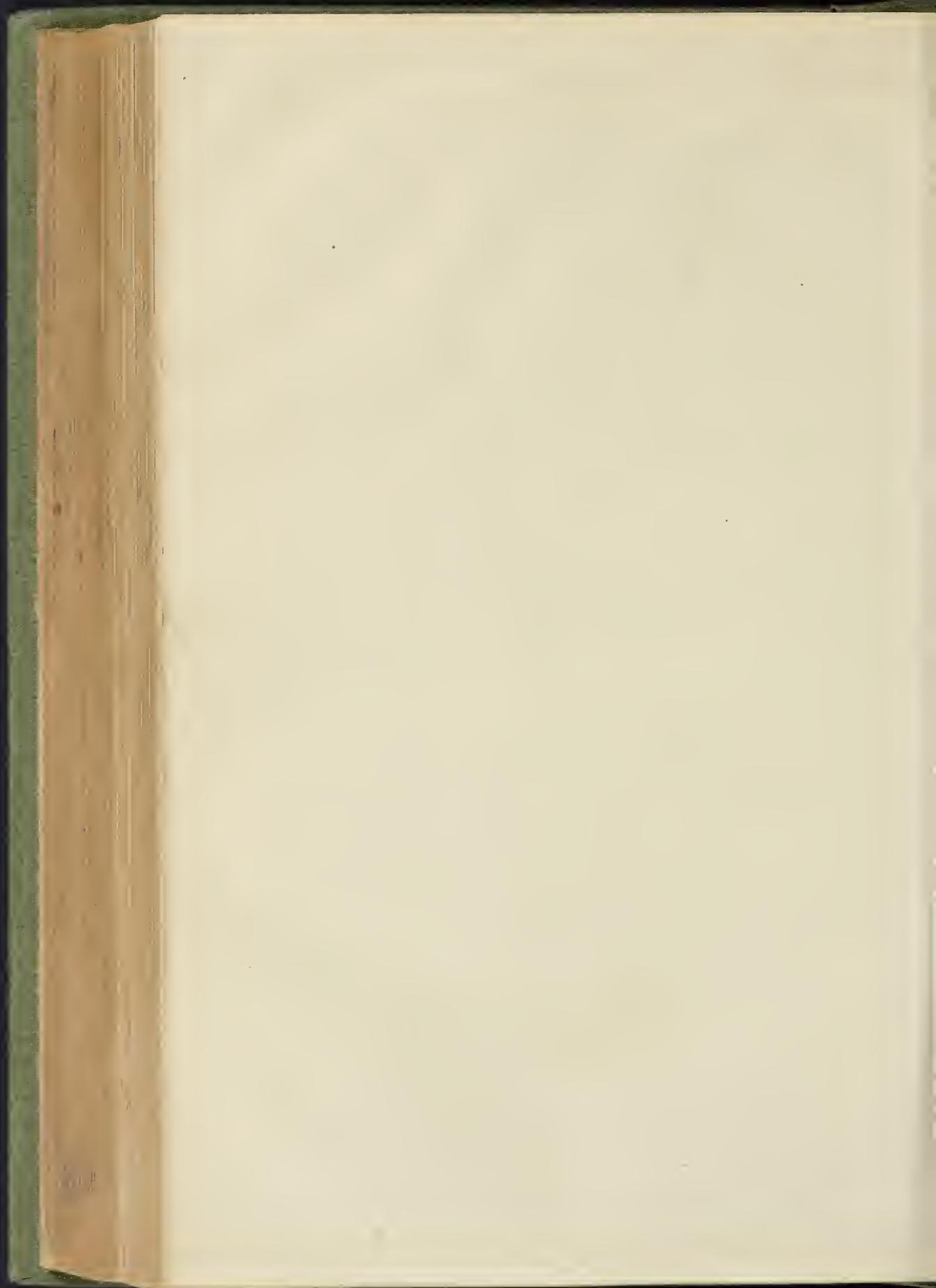
One of the ancient Irish Round Towers adjoins the south transept, and is well seen in our engraving. It is 100 ft. high.

The principal measurements of the cathedral, clear of the walls, are as follow:—Nave, 107 ft. by 28 ft. 3 in.; side aisles of ditto, 14 ft. 7 in.; north transept, 38 ft. 10 in. by 28 ft. 11 in.; south transept, 38 ft. 8 in. by 28 ft. 10 in.; choir, 73 ft. 10 in. by 28 ft. 8 in.; choir aisles, 48 ft. 6 in. by 15 ft. 10 in.; lady chapel, 28 ft. 7 in. by 20 ft. 8 in.; area of tower, 26 ft. Total length from east to west, 212 ft. 3 in.; total breadth across transepts, 117 ft.

* In the modern restoration work a very good fossil-coloured fine-grained sandstone from the lowland of Coolcullen, in the Castlecomer coalfield, has been successfully used; it is easily worked, and hardens on exposure to the air.



CATHEDRAL OF ST. CANICE, KILKENNY, IRELAND: AS RESTORED.



RANSOME STONE AND BESSEMER STEEL.

The Engineers' Society, as already announced in our columns, have paid a visit to the Patent Stone Works of the Ransome Company, and to the Bessemer Steel Works, both situated down the river-hank, at East Greenwich. The visitors, who were marshalled by Mr. Nursey, secretary of the society, included Messrs. H. Adams, the vice-president of the society, W. MacGeorge, C. J. Light, W. H. Le Fourre (past president), Baldwin Latham (ditto), J. Crowley, J. Cargill, A. Williams (hon. sec. and treasurer), and a number of visitors and friends of the society. The first visit was paid to the Ransome Works, where the whole process of artificial stone-making was exhibited and lucidly explained by Mr. Ransome, the managing director. The members of the society were marching in their examination and inquiries, and the sum of their opinions was that the Ransome patent stone (which has often been named of in our journal) is admirably adapted for building, and especially for ornamental purposes. The visitors then proceeded to the new factory, now in course of erection, for the manufacture of Bessemer steel, and of ordnance made of the material. Mr. Bessemer was in attendance, and explained his process. The reports shown in which the ore is fused until it comes a liquid; then the vessels into which it passes, and where, by the introduction of a powerful blast of oxygen, the silica is separated from the metal, and the latter is transformed to pure steel; and finally the finishing process, by means of which the material is turned to railway rails, guns, and various other articles. On the interesting conversation that arose, it was gathered that Bessemer's steel and Bessemer's gun have greater triumphs still in store than any that have as yet been achieved. We go to have a Bessemer steel gun, which will prove the problem that may be said to have solved the "Woolwich Infant,"—namely, that of charging a shot proportioned to its size without ultimately destroying the gun. By his method he expects to make the discharge of one or shall of five tons weight a matter of easy everyday occurrence. Another of Mr. Bessemer's novelties discussed during the visit was his works was the Channel packet-boat built by him, in conjunction with Mr. Fowler, Esq., in which an oscillating cabin, which a water-lift, is always to keep its level, and which is to form the voyage from Dover to Calais in sixty minutes.

"A BRIDGE OF EASE."

So Mr. H. W. Tison entitles the suspended trolley he proposes should be formed over the London railway. The rough sketch which he has submitted to the Commissioners of Rivers and other bodies shows his plan as applied to King William-street, London Bridge, and the South Eastern Railway Terminus. The proposed footway and its supports are to be constructed of iron, of a light construction. The estimated cost is about 40,000*l.* The idea, as our readers know perfectly well, is old one. The only novelty or usefulness could be about it would be in the mode of trying it out; but, as Mr. Tison evidently knows nothing whatever of engineering, the proposal, we are sorry to have it to say, is altogether valueless.

EXTENSION OF THE EDINBURGH GASWORKS.

The extension of the Edinburgh Gasworks on and cleared in Shoemakers' Close is proceeding apace. In a line with the chimney runs southwards towards the Canongate, a new gas-works is being erected. The stores are 200 ft. in length, consist of an iron roof pitched on iron piers supported by girders, leaving both sides open. The completed the stores will be capable of holding 14,000 tons of coal, and this will increase the storage room within the works to 25,000 tons. Eastward of this range of stores are being built a double row of ovens,—twenty-five on each side. These ovens are of fire-brick, and in a row there will be five retorts of the best and most improved description. The retorts will be covered by iron-roofed sheds of similar description to that of the stores, and will extend a length of 206 ft. When in full operation the 250 new retorts will enable the

company to manufacture 1,348,000 feet of gas per day, in addition to the 2,500,000 feet which are made by the existing works. The whole of the new works are expected to be finished before winter sets in. Messrs. J. & R. Park are the contractors for the building work, and Messrs. Tol, Leith-walk, for the ironwork.

The long range of old, tumble-down buildings called Shoemakers' Close, lying between the Canongate of the works and the Canongate, were acquired by the company some time in the beginning of this year. In their demolition some curious knowledge was gained of this part of old Edinburgh. The houses, which must have been between two and three hundred years old, were built on the site of an ancient tannery; and Shoemakers' Close was erected on forced earth. Cuttings laid bare the old tan-pits, and the wood with which they had been lined was quite fresh, although it must have been embedded in the earth for hundreds of years.

THE METROPOLITAN BUILDING TRADES MOVEMENT.

ALTHOUGH the dispute has terminated, it will be some days yet before matters go on smoothly. On Saturday last the central committee of carpenters were fully occupied in attending to numerous applications from small building firms unconnected with the Masters' Association, as to the terms upon which their men would be allowed to work in the future, and to deputations from the men in several other firms, who attended to report that, an application being made to their employers to ascertain whether they intended to work their shops under the terms of the new agreement, they were met with evasive replies in several cases, and in others by a distinct refusal, and wishing to know from the committee how they were to act. To the application from the masters the committee replied that an official printed copy of the agreement between the employers and workmen, with the interpretation of that agreement by the committee, would be forwarded to them through the post, and that they would be expected to comply with those terms. The reply given to the men was that the committee had no power to instruct them upon the matter, but that all firms declining to carry out the terms of settlement would be reported to the delegate meeting on Thursday evening, who would deal with each case upon its merits. They were also informed that it was highly probable the delegates would call out the men from those firms refusing to carry out the agreement. It was reported to the committee that several of the firms who had taken no part in the lock-out had notified to their workmen at pay-time on Saturday that they would commence working under the new arrangements upon Monday of this week.

The following is a copy of the printed document posted on Saturday evening by the central committee of carpenters to every building firm, large and small, throughout the metropolitan district:—

"2, Westminster Chambers, Aug 27.

The working-hours to be 52½ hours all the year round for joiners in shops, and 52½ hours per week for 40 weeks in summer, and 48 hours per week in winter, for out-door works, leaving at one o'clock on Saturday during the winter weeks. The wages to be 8*½*d. per hour all the year round. Overtime beyond the above hours, when worked at the request of the employer, to be paid for at the following rate: for the first hour at 9*½*d. per hour, and from the end of the first extra hour until eight o'clock p.m. at the rate of 10*½*d. per hour; after eight o'clock, at the rate of 1*½* 9*½*d. per hour. This scale not to apply in the case of men working overtime at their own request, or to make up time lost by them during the week. Extra time on Saturdays to be paid for at the rate of time and a quarter up to five o'clock, and after that time at the rate of time and a half. Moved by Mr. Hannen, seconded by Mr. Matkin, and carried unanimously.—That in the opinion of the sub-committee of the Master Builders' Association, and the deputation of the carpenters and joiners, now met together, it is desirable that an endeavour should be made to settle all future questions which may arise on trade matters by conference, or by arbitration.

On behalf of the employers,
BENJAMIN HANSEN, Chairman,
On behalf of the workmen,
C. MATKIN, Secretary."

As regards the bricklayers' deputation, they returned to the masters' committee with more power to settle the matter, and after several hours' talk, they accepted the terms concluded with the other branches, and succeeded in getting tacked on to them some additional provisions which custom had already sanctioned. The agreement or memorandum runs thus:—

"2, Westminster-chambers, 30th August, 1872.

At a conference between the Sub-Committee of the Master Builders' Association and a deputation from the

Operative Bricklayers' Society, the following arrangements have been agreed to:—

The working hours to be 52½ for forty weeks in summer, and 48 hours per week for twelve weeks in winter, leaving off at 1 o'clock on Saturday in the winter weeks. The wages to be 8*½*d. per hour all the year round. Overtime beyond the above hours when worked at the request of the employer, to be paid for at the following rates, viz.:—for the first hour one penny extra; from the end of the first extra hour up to 8 p.m., at the rate of two pence extra; after these hours to be paid for at the rate of time and a quarter up to 5 o'clock, and after that hour at the rate of time and a half. This scale not to apply to the case of men working overtime at their own request, or to make up for time lost by them during the week. Half an hour for breakfast and half an hour for dinner to be allowed during the winter weeks. Gauged work, when executed as day work, shall be paid for at the rate of a penny an hour extra. Bricklayers sent from London at the request of the employer to country jobs to receive London wages, with an additional allowance for lodgings, the railway fare to be paid to the job, and if discharged by the employer the fare back to London.—(Signed), B. Hannen, G. W. Jackson, J. M. Macey, W. Brass, Stanley G. Bird (hon. secretary), E. Coulson, J. Batchelor, H. Honor, W. Crawly, J. Paget, G. Knapp."

The Executive Council of the London General Labourers' Union have addressed the following notification to the huddlers' labourers of the metropolis:—

"Brothers,—We wish to inform you that our delegate, Mr. Kenny, got the following terms from the Master Builders' Association for all labourers (shops as well as jobs):—One halfpenny rise: those who had 4*½*d. will have 5*½*d.; those who had 5*½*d. will have 6*½*d.; those who had 6*½*d. will have 7*½*d. Overtime: First hour, one halfpenny extra; the following two hours, penny extra per hour; after eight o'clock at night, time and a half. If you work after twelve on Saturday, time and a quarter till five o'clock; after five, time and a half. In our memorial we ask for sixpence per hour, which is little enough for our labour. If you think so, unite at once with us; if you do not, we will have to take for your labour the buyer's price, and not your own. The above agreement, signed on behalf of the masters, comes into operation on September 2nd."

THREATENED INJURIES AT STIRLING.

SIR,—Should your attention not already have been called to the threatened destruction, or, at least, disfigurement, of the Castle Rocks at Stirling, will you kindly devote a corner of your valuable space to expose the iniquity and barbarism of the whole affair? It appears that the town council of that borough have actually disposed of a considerable portion of this beautiful and classic rock,—one of those rare, isolated, and igneous basaltic protrusions on which the royal Castles of Edinburgh, Stirling, and Dunbarton are so picturesquely perched,—for the base purpose of quarrying it for road-metal! Shade of King Robert the Bruce! where has our national sentiment of patriotism gone to? What would Sir Walter Scott have said on hearing of the destruction of his darling "Grey Bulwark of the North"? Here is what he did say on one memorable occasion respecting a similar act of vandalism (the destruction of the Cross in the High-street, of Edinburgh):—

"Oh, be his tomb like lead to lead
Upon its dull destroyer's head!
A minister's malice is said!"

May let us have a little anathema from the Builder.

ALPHA.

NOTES IN THE BROMPTON CEMETERY.

MR. DILTON CROKER, continuing his sketches in the *South London Press*, gives an interesting account of the West London Cemetery, which extends from the Fulham-road to the Richmond-road, and was consecrated in 1840. We condense some of his remarks. Some years ago, says Mr. Croker, it was proposed that the Government should become the owners of the various cemeteries around London, and a Bill was prepared for the purpose, no doubt being entertained but that it would pass through Parliament without opposition. An agreement was in the interim made with the West London and Westminster Company for purchase. The Bill, however, was thrown out, but the agreement was insisted upon by the company, and we are given to understand that this cemetery is now Government property.* Here T. P. Cooke and Walter Montgomery lie side by side, on the path right of the catacombs, close to one of the hell towers. We read on Mr. Cooke's monument that he served under Nelson, and was present in his Majesty's ship *Danger* at the battle of St. Vincent; then follows a fitting tribute to his able delineations of the character of the British seaman. About half way down on the right of the centre avenue is the handsome monument, 21 ft. high, erected by public subscription to the general

* Quite correct. It was valued for the Government by the late Mr. J. W. Higgins, Mr. Lockyer, and Mr. G. Godwin.—E.B.

and gifted Alfred Mellon (sometimes styled the English Costa), who died at the early age of forty-seven, mourned by all who knew his many endearing qualities.

Separated by one grave, we find that of Alfred Mellon's niece, Nelly Moore, who will be long remembered as a charming *ingenue*, whose death, when only twenty-four years of age, saddened the whole of the theatrical world, and a number of private friends, by whom she was dearly loved and respected for her gentle nature.

Immediately behind will be found the memorial cross which Mr. C. Millward caused to be erected at his own expense, "in affectionate remembrance," over the grave of Joseph Henry Irving, the comedian, whose performance of "Triah Heep" was so full of promise, and whose career ceased when he was only thirty years of age. Near these graves are those of the graceful and gentlemanly Leigh Murray, and J. H. Tully, the conductor of the orchestra at Drury Lane for many years. On the other side of the avenue we come upon the grave of the father of Albert Smith. Here are also buried Mr. and Mrs. Albert Smith, and Arthur, the brother of the former. Close to the hideous monument of John Jackson, the professor of sparring, will be discovered the grave of Charles Godfrey, hand-master of the Coldstream Guards, the father of the now celebrated Dan and Charles Godfrey.

In this direction is the resting-place of James Rogers, the comedian, who died on April 15, 1863, aged forty, and which has the following inscription:—

"You have heard—some know—the story of his life,
That brief existence with afflictions rife;
How to the last he struggled with the foe,
Whose shadow darker nightly seemed to grow,
Still smiling through his sufferings, and though wrung,
By quivering pain, a jest still on his tongue,
He had cause indeed to wish the play had power
To 'ease the anguish of the torturing hour.'
Shall it not aid, the man who bravely fought
Life's battle out, no noble lesson taught?
No! 'twas a hero's sermon for the age,
Preached from the player's pulpit of the stage,
Remembered by us."

Nearer the Fulham-road entrance are the graves, next to each other, of Robert Keeley and Frank Matthews; not far off is also that of Edward Wright. What agreeable memories do these three names recall! If one of the most pleasant of humanities be to laugh, well may we hold them in grateful remembrance. The tomb of Sir Roderick and Lady Murchison will be seen in the centre path, where a handsome but rather too pretentious marble mausoleum, with a figure of "Hope" at the top, has been recently erected by a Mr. Henry France, of Wardour-street, to the memory of his wife, which must have cost a very large sum indeed. The coffin is seen through the opening, and at the back is a window of stained glass. Amongst others may be mentioned the graves of H. F. Chorley, the acute musical critic; Sir S. Canard; Pettigrew; F. W. Fairholt; R. B. Peake, the dramatist; Mr. and Mrs. Tayleure, actors; Sotheby, the well-known auctioneer, author of several learned works, the most remarkable of which is his "Principia Typographica;" Captain Harrison, a distinguished member of one of the first yacht clubs; Robert Gunter; Francis Nicholson, the landscape-painter, one of the founders of the old Water-Colour Society, who died when at the patriarchal age of 91; and his son-in-law and daughter, Mr. and Mrs. Crofton Croker, whose deaths occurred within two months of each other,—the first on the 8th of August, and the second on the 6th of October, 1851. Here is also the grave of Sydney, Lady Morgan, upon which rests an effigy of an Irish harp, above which are two volumes, inscribed "Wild Irish Girl" and "France."

THE NEW CHURCH OF FATHER IGNATIUS'S MONASTERY, IN THE WILDS OF WALES.

THE foundation-stone of a new church has been laid by the Rev. Father Ignatius, at the Monastery of St. Mary and St. Dunstan, Llanthony. After leaving the ruins of the old priory, a drive of four miles along a rough and dangerous road brings the visitor to the monastery, at which the superior of the English order of Benedictine monks, with eight or ten of the brethren, have taken up their sequestered abode. The monastery is situated on the slope of a bleak and hoary mountain, commanding a view of the sequestered valley of the Ewias. In these solitudes Father Ignatius has reared the germ of what is intended to be developed into

an extensive monastic institution, one wing only of which is at present built. The structure, when completed, will bear an exact resemblance to the old Abbey of Llanthony, the length of which, from west to east, is 212 ft., and the breadth, including the aisles, 50 ft. The length of the transept from north to south is 100 ft. The new monastery was commenced about three years ago, by two brothers, who had previously been living in a hut on the mountain, subjecting themselves to great inconvenience, and even privation, in the winter. The land was given by a lady "associate." The choir and nave of the new church (the portions now commenced) will be erected at a cost of about 3,500*l.*, the whole sum being given by an English Churchman. The architect is Mr. C. Backridge, of London and Oxford. These are odd times in which we live!

ECONOMY IN FUEL:—THE "BUILDER" FIRE.

A CORRESPONDENT of the *Times* describes what has for so many years been well and widely known as "The *Builder* Fire," but whose paternity, like that of many other good things, has been lost in the lapse of years. With this correspondent's description of our celebrated fire we may refresh the memory of our old readers, and instruct the new at the present juncture:—

"The plan advised is the insertion of an iron plate 4 in. in thickness, closely fitted upon the bottom grating of the stove, leaving the space between it and the front bottom bar open as it is at present. The fire should be made by being well packed with small lumps of coal about half-way up. The wood should then be placed, and an upper layer of coal, and then lighted. By this means the upper layer of coal becomes speedily ignited, and a good fire is soon obtained; and as the air cannot pass upwards through the bottom, the fire will gradually burn downwards, not only taking a considerable time to do so, but effectually retaining every particle of fuel, which cannot fall through."

This fire will last for many hours without any fresh supply being required, and will give out a much larger volume of heat than an ordinary fire. By this means small coal, and even dust, may be as readily used as large, while the saving in consumption, as the *Times* correspondent says, he has long proved, is quite 50 per cent. in all stoves except the kitchen range, which is, no doubt, capable of considerable improvement; while, in addition to the saving of fuel, the result is greater cleanliness and comfort, more heat, and less necessity to attend and replenish the fire. The use of the poker is almost entirely superseded, it being only necessary once during the day to thoroughly press the fire together, and being replenished, it will burn till night. In very small grates this plan will not perhaps suffice. A small surface of fire will not obtain sufficient air through the front bars to support combustion; but in all of a moderate size it may be used with the advantages enumerated.

THE "NATIONAL SCHOOL-BOARD DESK."

SIR,—In noticing, in your last issue, a new desk, with the above title, by Mr. Moss, for seating children in pairs, which is certainly ingenious, you very rightly conclude that "the question of space will probably arise." There is, it appears to me, a practical objection to its general use in national schools which the inventor has not taken into consideration,—viz., its *inconvertibility* into the various uses for which school-desks are now generally called into play. Under the name of "convertible," a bench with desk, variable in length, is now pretty generally adopted, which, as well as doing duty for school purposes, can be used as a table for school teas and treats, or as a bench, with sloping back, arranged for lectures, concerts, &c. Mr. Moss's desk in pairs seems to offer none of these advantages. FREDK. R. WILSON.

THE SPEAKER AND HIS FARM LABOURING PARTNERS.

THE Right Hon. the Speaker has given his annual treat to the labourers on the Glynde estate, to celebrate the in-gathering of the harvest. He presided at the dinner, and in the course of his remarks said:—

"I will make a proposition to you, and to all in my employ. If you have got 5*l.*, we will say, in the savings-bank, and you would like to lend that to my farming business, I will engage to give you, as the savings-bank does, 2*l.* per cent. for the money. And I will do more than that. I will, supposing the profits of the farm amount to

more than 2*l.* per cent. for the money I have invested, give you rateably precisely the same interest upon the capital you lend me. That is to say, supposing I get 10 per cent. profit on the capital I have invested on the farm, you shall have 10 per cent. on your 5*l.* instead of 2*l.* So you will see, you will be in this position, that you will not get less than the 2*l.* per cent. you receive at present, if the farm yields more you shall have the benefit of it. Carriers, shepherds, &c., for instance, receive about one per cent. per week, and out of this seems to me to be by no means impossible that some may save 2*l.* a week, or the year, if you the 5*l.* if you desire it, plus 2 per cent., or whatever rate of interest arises from the year's farming operations. I am quite sure of this, that we shall never come to a satisfactory settlement of the relations between employer and employed until the latter, according to the amount of labour and capital he has invested, has an interest in good conduct of the concern."

His sole object, as he stated, was to give farm labourers a personal pecuniary interest in the conduct of the farm, and to endeavour raise them a little above the position they now occupied as labourers.

THE THAMES CONSERVATORS AND THE CHELSEA VESTRY.

AT the Chelsea Vestry, a letter was read from Payne referring to a statement in the *Builder* relative to the Thames Conservators and the conduct of the Vestry. In his letter, Mr. Payne said he considered the parish had been most unfairly treated by Thames Conservators and the Metropolitan Board, the mode of transit by the river from the parish had been hindered for years was taken away, and nothing given in return. The embankment had ruined the river from Swan at Chelsea to the old church. The river could be widened on the opposite side. This letter was considered by the Vestry. Mr. Marr's offer of accommodation at the jetty at Cremorne, but no action was taken.

ASPHALTE IN CHELSEA.

THE Chelsea Vestry having proposed to lay asphalt in the parish as an experiment, and either for the same at the end of twelve months, or require the asphalt company to take the asphalt up, the following companies and their terms in—Val De Travers 2 in. of asphalt on 6 in. Portland cement concrete 12*s.* per yard super, and remove it and re-lay the way at the end of twelve months, should the experiment fail. If it succeeds the company will receive 5 per cent. interest, provided the asphalt is in a good condition as when first laid down (this and reasonable expenses). The Limmer Asphalt Company offer to lay down 2 in. of asphalt on a concrete foundation, and keep it in repair for two years, at 12*s.* 6 per yard super. The vestry are to get the road ready for concrete, and to pay 60 per cent. of the charge by month after the completion of the work, 30 per cent. at the end of three months, and 10 per cent. at 12 months. The Barnett's Patent Asphalt Company offer to lay down 2 in. of asphalt on 6 in. of Portland cement concrete at 12*s.* the square yard.

The vestry, after some discussion, decided that as one of the companies had complied with the conditions of the vestry's proposal, they could not entertain their proposal, and that the companies be so informed.

BITUMINOUS BUILDING, PAVING, & GENERAL CONSTRUCTION.

A NEW company has been set on foot, with a capital of 100,000*l.* in shares of 5*l.* each, the prospectus of which, recently issued, extract the following particulars.

Mr. McCullagh Torrens, M.P., is the chairman. Mr. J. L. Norton, whose patents are to be appropriated, will be the managing director for five years; and the consulting architect is Edward Norton Clifton, of London. The primary offices are at No. 8, Old Jewry.

"The recent successful employment of bitumen in the formation of street pavement has been generally looked upon as the method in which asphalt can be rendered serviceable. That this notion, however erroneous, may be shown by reference to manifold uses to which asphalt was applied by the ancients: the existing ruins of buildings evidencing the important part which it occupied as a constructive material from the time of the Assyrians and Egyptians down to that of the Romans; this subject Mr. J. L. Norton, the well-known patentee of the tube-welding process in the Abyss expedition, has for some time past devoted attention, and has succeeded in inventing a perfecting system of employing bitumen, in the opinion of practical men, and as test experience, must lead to great change improvements in building and construction generally.

The various materials used in the past process have stood the test of years, and application and adaptation for the purposes intended may be gathered from the following summary:—

*Bricks.—These may be made in any locality, whether weathering, pugging, drying, or burning.

Moreover, of extraordinary durability, impervious to moisture, unaffected by frost or thaw, and ready for use within a few hours' time.

Building.—Resolutions and basement-floors are made of water and damp proof. Bricks can be laid at the rate of 3,000 to 4,000 daily per man, as compared with 700 to 800 under the present system. Ceilings and the inner side of walls can be prepared in a dry state. **Roofing.**—The rendered thoroughly water-tight, requires only half a number of slates as compared with the present system.

Roofing slating, woodwork, and other decorations can be carried out in a much more effective, expeditious, and less expensive manner than hitherto.

Paving.—Roadways will possess greater durability, and at the same time as clean and noiseless as the asphaltic always now in use; while horses will have as good a thing as on macadamised roads, both on levels and slopes, a desideratum not hitherto accomplished, and removing the great objection to asphaltic as at present. Tramways can be laid down at a reduced cost and increased facilities for construction and maintenance. Sides thus paved will save not only 80 to 70 per cent. of straw usually employed, but will greatly increase the use of the manure, as shown by the accompanying memoranda.

General Construction.—Reservoirs, tanks, basins, basent floors, embankments, sea-walls, &c., may be made at very large saving in cost of material, labour, and time, soundness and durability being unquestionable.

The operations of the company are intended to be carried on by the establishment of a manufactory in the neighbourhood of London for the preparation and sale of the patent construction material. The actual work of construction will be undertaken by the company to an extent sufficient to fully occupy its available capital; licences will be granted to builders, contractors, and others, to avail themselves of the patent processes.

A house built by Mr. Norton, on his patent system, may be seen at his private residence, Try Hill, Worplesdon, near Guildford; and various specimens of the paving are laid down the New Inn-yard, Old Bailey, where they have been subjected to most severe tests.

As regards the supply of bitumen, a contract has been entered into for the purchase of an estate of 60 acres of land in Sicily, containing various deposits of rich asphaltic rock.

Mr. Wyatt Papworth, architect, has reported favourably on Mr. Norton's systems of construction.

COVENT GARDEN THEATRE.

Admitting that Mr. Boucicault's magnificent production of the re-opening of Covent Garden as the National Theatre turns out to be a mistake, and that "Babil and Bijou" is after all but a fairy extravaganza, differing only in degree from many others, he has nevertheless placed, in conjunction with Mr. Planché, who contributed a number of most charming scenes, a very remarkable work of its kind, which some time to come will serve to delight the audiences the theatre has been fitted to give. The first two acts are a little tame, might be greatly improved if the whole of the actors were re-dressed, and Mr. Lionel Brough did exhibit a little more of his usual vivacity.

"The River of Life" is an excellent ballet; the ballet is beautiful (though the changes of scene might be more effectively managed), and the whole culminates in a spectacular display which leaves the spectators no wits for criticism. The composers have co-operated in the production of original music, two or three of which are being very charming, notably the boys' quartet to spring.

"Spring! Spring! gentle Spring!
Youngest season of the year!"

At night they take the horse by storm, and soon be sung in every part of the country as a vocal association exists. Wealth, skill, taste have been lavished, and the result is a success.

WEST HAM SEWERAGE.

Mr. Lewis Angell, the surveyor at West Ham, has represented to the public, through the Local Government Board, that great injury has been inflicted on the ratepayers by the refusal of the Local Government Board to sanction the proposed works of about 100l. per acre on upwards of 100 acres of land to be used for sewage disposal, with 50,000l. added for works, and put up in the open market, the ratepayers are to have had good ground for objecting to preliminary negotiations. Why Mr. Angell should have been angry because his arrangements were not approved he knows best.

The Local Government Board rejected the scheme on financial grounds, and not on the objection of sewage irrigation. The proposed works would have been ruinously costly to the

locality, and clarification of the sewage may serve at West Ham. The following has been forwarded to the Inspectors.

SANITARIAN.

August 27th, 1872.

Sir,—I am instructed by the Committee of the West Ham Ratepayers' Association to forward to you the following resolution, carried unanimously by them at their last meeting:—

That the best thanks of the Association are due, and are hereby tendered, to Mr. Rawlinson and Mr. Harrison, for their thorough and patient investigation into and hearing of the evidence respecting the West Ham Sewage Farm; also for their wise decision in relation to the same.

And to add,—
That in their opinion the wisdom of such decision is further strengthened from the fact that a portion of the said farm was sold, on the 26th of July last, for more than 30l. less per acre than the parish was about to give as the declared market value.—*Vide Essex Times of the 27th ult.*

(Signed) GEO. COOK.

Buxton-road."

THE DRAINAGE AT WINDSOR CASTLE.

The works now in progress for the drainage of Windsor Castle and Frogmore House are being pushed forward. The sewage, which is to be separated from the rainfall, will be conveyed from the Castle, the buildings in the Home Park, and Frogmore House, through earthenware pipes, 9 in., 12 in., and 15 in. in diameter, to a receptacle at the Royal Dairy, Frogmore; thence it will be taken through the main pipe, 18 in. in diameter, for about a mile across the Home Park and Manor Farm, in an easterly direction, to the pumping station, which has been built near the old wooden one over the navigation cut at Old Windsor. Owing to the large amount of water used at the castle the sewage upon reaching the pumping station will be in a very liquid condition. It will here be received in the straining chamber, which is 10 ft. by 7 ft., and then pumped through an iron pipe laid across the new bridge now in course of erection, and which will replace the old wooden structure, to the irrigation plot, a field of about fifteen acres, situated upon the Ham, at Old Windsor. The pumping apparatus will consist of a compressed-air engine of from 2 to 4 horse power, placed near the station; and it is expected that pumping for ten hours a day will dispose of twenty-hours' sewage from the Castle, Frogmore, and the Home Park, and pass it across the cut to the pipes on the Ham. These pipes will be furnished with openings about five yards apart for the purpose of irrigating the farm.

CHURCH-BUILDING NEWS.

Sheffield.—St. Marie's Church, Norfolk-row, has been re-opened, after being cleansed and painted by Mr. Robinson, of Broomhill, under the directions and superintendence of Messrs. M. E. Hadfield & Son, the architects. Advantage has been taken of the occasion to erect a reredos in St. Joseph's chapel, in memory of the late Miss Smilker, of Richmond, the entire expense of which has been defrayed by a friend of that lady. The reredos consists of canopied niches, carved, with arched at the sides, in Caen stone. The architecture is of the early part of the fourteenth century. It has been executed from the design of Mr. Charles Hadfield, by Mr. Earp, of London. The relieve and figures are from the studio of Mr. Pfyffer, who is a Belgian artist, though now residing in London. The centre niche, the only one at present filled, represents in relieve the death of St. Joseph; and in the sides are to be placed figures of angels holding musical instruments, and in the centre below a figure of St. Joseph. Above the reredos are two new stained windows, by Lavers, Barraud, & Westlake, of London.

Bristol.—The chief stone has been laid of a new church, to be called St. Andrew's the Less, upon the site of the old church in Dowry-square, Howells, which has been pulled down. As the plot of ground is in the line of a row of buildings, the sides of the church will not be visible. The principal frontage is in Dowry-square, and the back is in Green-street. The structure, the foundations of which have already been put in, is to be of Brandon-hill stone, with free-stone dressings. The style is of the thirteenth century. The church is to consist of a nave, aisles, and chancel. In consequence of the eastern and western ends being blocked with the walls of the adjoining houses, the only means of light to be obtained is from windows in the north and south sides. The church is divided into four bays, three of which will form the nave proper, and the fourth the chancel. The chancel opens into

a quasi-transept, built upon the old burial-ground, and that towards Dowry-square forms the vestry and organ-chamber. There is to be a tower at the south-west corner, with a slate spire, the total height of which will be between 90 ft. and 100 ft. At the side of the tower is a staircase leading to a gallery at the west end. The internal columns throughout the church are to be of blue Penman, with carved capitals. The church is to seat to be free. The sacristy and chancel are to be paved with Godwin's encaustic tiles, and the body of the church with Staffordshire tiles. The architect is Mr. J. C. Neale, and the builder Mr. R. J. Crocker, of Bexminster. The total cost of the building will be about 2,000l.

Ivinghoe.—The church of Ivinghoe, in the archdeaconry of Buckingham, has recently been opened, after a restoration by the diocesan architect, Mr. G. E. Street. The church stands at the foot of the Chiltern hills, a little eastwards of the London and North-Western line of railway between Cheddington and Tring. It is a cruciform building with central tower. The piers and arches of the tower and nave are of the thirteenth century, and the remains of the Early English building are also discoverable in the transepts and other parts of the edifice. The church was encumbered with high pews, and with a formidable western gallery, and the fabric generally greatly needed the hand of the restorer. The renovation, so far as it goes (the exterior still needing restoration), is what might be expected from the able architect.

Barton Moor Lane (near Manchester).—Emmanuel Church was re-opened by the Bishop of Manchester, on Saturday last, after undergoing alterations, comprising the addition of a chancel aisle and south transept, enlargement of vestry, erection of an entrance at the west end, and the entire removal of the south porch. The west gallery has been taken down, and the lower part of the tower, situated at the west end of the south aisle, and which formed the entrance to the gallery, is now converted into a baptistery. Stained glass has been put in the west window, by Hardman, of Birmingham. The inner vestibule is formed by a traçoered screen of pitch-pine, glazed with cathedral plate, in geometrical lead lights. A. The original accommodation was for about 500, which is now increased to 650, 280 of which are free. The church is in the Decorated style of architecture, and built as recently as 1858. Messrs. Horton & Bridgford, of Manchester, were the architects, and Mr. Cardwell, of Altrincham, was the contractor.

DISSENTING CHURCH-BUILDING NEWS.

Southsea (Hants).—The Congregational Church for the new district in the Dover-road has been completed, and dedicated. It is built in the Early Decorated period, and consists of nave, apse, east and west transepts, and aisles. The foundations are also put in for the tower in the north-west angle. The extreme length is 92 ft.; width, 62 ft.; height to ridge, 54 ft. The pewing is of pitch pine, and fitted to accommodate about 650 persons, with standing room for about 150 others. A school-room was first erected in the rear of the site, and worship has been conducted therein during the erection of the church. Mr. Stent, of Warminster, Wilts, was the architect; and Mr. Smith, Portsea, the builder. The heating was done by Messrs. Haden & Son, of Trowbridge; and Mr. Barnden was the clerk of the works to the whole.

London.—The foundation-stone of the new Welsh Congregational Chapel, to be erected on the site of the old one in Southwark Bridge-road, has been laid by Mr. Samuel Morley, M.P. The total cost of the chapel is to be about 5,000l., of which 3,000l. go to purchase the site; Mr. Thomas, of Swansea, is the architect; and Mr. Gough, of Chelsea, the builder.

Horsna (Yorkshire).—The foundation stone of a new Congregational Church has been laid here by Mr. E. Crossley, of Halifax. The plan shows the building to be entered by a porch and tower entrances, leading into a vestibule, from which access is obtained to the ground floor of the building, which consists of a nave and two shallow transepts, affording accommodation for 410 people; and with a small west gallery the building will contain sixty persons more. At the rear of the church, and opening from it, is placed the schoolroom, contiguous to which, and having an entrance into the church, is the minister's vestry. The church will be provided

with open seats having solid ends, and will be covered by an open-timbered roof, which (with all internal woodwork) will be lightly stained and varnished. The tower is to be placed on the south-west angle of the building, and to be surmounted by an octagonal spire in brickwork, to rise to a height of 91 ft. It is intended to place in the tower a clock and bell. The building is to be erected in bricks, and faced with white stocks, relieved by bands and arches of red stocks, and will have Yorkshire stone dressings to windows, &c. The glazing will be in cathedral glass in quarry pattern. The building will be in an early style of Gothic architecture, and erected by Messrs. Hulse & Stephenson, bricklayers; Messrs. H. & W. K. Barr, joiners; Mr. John Denton, mason; Mr. James Barr, plumber, glazier, gasfitter, and painter,—all of Hornsea; and Messrs. King & Co., and Dawber, of Hull, are contractors for the ironwork and slating respectively. The building is from the designs, and to be carried out under the superintendance, of Mr. Musgrave, of Hull.

Faversham.—The memorial stone of the new Baptist chapel now in course of erection at the bottom of St. Mary's-road has been laid by the Rev. C. H. Spurgeon. The building is to be 60 ft. by 37 ft., and is intended to afford accommodation for about 400 persons. The total cost will be about 1,800l.

Manchester.—The foundation stone of a new Congregational Church, to be erected in Broughton Park, has been laid. The site is near to Broughton Hall, and surrounded by three roads. The church will be in the Decorated style. It will consist of nave and side aisles, with transepts, the north aisle being terminated by a tower and spire, rising to the height of 175 ft. At the east end of the church there will be a lecture-room affording accommodation for 200 persons. There are to be vestries for ministers and deacons, with rooms appropriated for ladies. Accommodation will be provided in the church for 600. Separating the lecture-room from the church a Gothic screen, in the shape of an open Gothic window, is designed, and, as occasion may require, it can be so arranged as to convert the lecture-room into a part of the church proper during divine service. Ample provision has been made in connexion with the lecture-room for the requirements of social gatherings. Mr. S. W. Dankes, of London, is the architect. The arrangements for the building are not yet completed, no tender having been accepted, but it is expected that the cost will amount to about 12,000l.

Kenilworth.—The foundation-stone of a new Independent chapel, at Abbey-hill, Kenilworth, has been laid by Mr. Alfred Keep, of Edgharston, Birmingham. The chapel is to be built of brick, with Bath stone dressings and windows, from the designs of Messrs. G. & J. Steane, of Coventry, architects. The style is Gothic: the length about 70 ft., and width 31 ft. 6 in. The cost will be about 1,600l. The chapel is to hold 300 persons in the body, and 100 boys in the gallery. The builder is Mr. J. B. Stanley, of Leamington; and Mr. Jenkins, of Leamington, has the contract for fitting up with hot water.

Middleton-One-Rov.—According to the *Darlington Times*, the foundation-stone of a new chapel, for the use of all Christian denominations, has been laid at Middleton-One-Rov. The site faces the river, opposite the centre of the village, and has been placed at the disposal of the promoters of the new edifice by Mr. H. A. W. Cocks. The plans have been prepared by Mr. Robinson, of Darlington. From these it appears that the building will be 38 ft. in length by 24 ft. 6 in. in width, and will provide accommodation for about 168 persons. Utility has alone been considered, and not architectural beauty; the building will therefore be comparatively plain. It will be constructed of red brick, and faced with stone. The cost is estimated at between 400l. and 500l.

SCHOOL-BUILDING NEWS.

Widewater (near Rochdale).—The corner-stone of this school, which is to be used for day and Sunday purposes, has just been laid. The building will be of Parpout stone, with Yorkshire stone dressings. A method is adopted of utilising the whole of the class-rooms when required for public meeting purposes. The cost of the building will be about 2,200l. The architects are Messrs. Maxwell & Tuke, of Bury.

Wolverhampton.—St. John's Schools are now being enlarged by the addition of a room to

accommodate about 170 infants, with class-room attached. The building is one story high, of a plain description. The tender of Messrs. G. & F. Higham at 368l. including galleries, &c., was accepted, and the works are being carried out from the designs and under the superintendance of Mr. J. R. Veal, architect.

Halifax.—The foundation stone of the new Sunday School in connexion with the Harrison-road Congregational Chapel in this town has been laid by Mr. John Crossley, of Hopwood Hall. The site selected for the school is that portion of ground formerly known as Cadney's Croft, on the lower side of the chapel, and on which many circus proprietors have often pitched their tents on flying visits. But now the whole site is being filled up with dwelling-houses, and a considerable portion of it will be occupied by the new school. The contractors are—For the masonry, Mr. J. W. Wilson; joinery and carpentry, Mr. H. Dearden; slating and plastering, Messrs. Taylor & Firth; plumbing; Mr. Joseph Barker; hot-water apparatus, Mr. E. Lunby, all of Halifax.

Northampton.—New Roman Catholic poor schools for girls and infants, erected on the Lower Mounts, in connexion with the Convent of Notre Dame, Abington-street, have been opened here. The building is a two-storied one, its elevation from basement to ridge being nearly 40 ft. It is a plain red-brick erection, but is relieved with white brick and stone ornamentation for window arches and sills. The front entrance is also arched in stone, and it is intended to add a little further ornamentation at this point by placing a figure of the Virgin and Child under a canopy. The room on the ground floor is to be used for infants, and is fitted with a gallery; and that on the upper story for girls. Both schools have class-rooms adjoining; they are also provided with lavatories, and other requisite conveniences. The dimensions of the two principal rooms are:—On the surface floors, 49 ft. by 22 ft.; height of lower, 14 ft., and of upper, about 18 ft.; class-rooms (infants'), 22 ft. by 12 ft., and girls', 22 ft. by 19 ft. The rooms will afford accommodation for about 300 children. Mr. Hull was the architect; and Mr. Watkin, whose contract of 910l. was the accepted one, was the builder.

Stoke Prior.—New schools, erected by Mr. Corbett, of the large salt-manufactories, have been opened here. The building is to serve as schoolroom for the children of his workpeople, a place for holding divine worship on Sundays, and a lecture-room or hall for use when occasion requires. There is also attached a dispensary, in which a supply of medicines and appliances in case of accidents will be constantly kept, the whole to be maintained at the sole cost of Mr. Corbett. The edifice is built from designs by Mr. M. Bohill, and was erected by Mr. Corbett's own workpeople, on a site given by him in Shaw-lane, near to his works. It is of the Gothic order of architecture, and the lecture-room is 90 ft. by 36 ft.; class-room, 36 ft.; infants' school, 28 ft. by 21 ft.; height to the wall-plate, 16 ft.; the roof (an open one, stained and varnished), rising 21 ft. to the ridge, with an ornamental bell-tower in the centre, and a tower over the front porch. The large room can be divided, so as to form two school-rooms. The playground is 180 ft. by 150 ft., and the school will accommodate 500 children, attached to which is a residence for the schoolmaster and schoolmistress. The cost of the building amounts to about 3,500l.

Books Received.

Health and Comfort in House Building; or, Ventilation with Warm Air by Self-acting Suction Power. By J. DRYSDALE, M.D., and J. W. HAYWARD, M.D. London: Spon. 1872. In a previous volume we printed part of a paper by Dr. Hayward, read at a meeting of the Liverpool Architectural Society, descriptive of a house built by him, with special arrangements for warming and ventilating. The volume now before us is an elaboration of this paper, made in conjunction with Dr. Drysdale, who had previously erected a house in the suburbs of Liverpool, in which he had attempted to meet many of the defects of ordinary houses. The scheme worked on may be said to be, plenty of fresh air admitted to a heating chamber in the lower part of the house, and thence supplied to the various rooms through openings in the cornices,—the collection of the foul air from the various rooms,

into a foul-air chamber formed in the roof, whence it is taken down to the kitchen fire, and passed off to the air by an air flue formed and adjusted to the smoke flue. The due adjustment of the openings for admission and emission, and the prevention of accidental ventilation which would interfere with the results of the calculations, course comes into discussion as difficult points of the problem to be solved. All the flues, they are provided for a probable maximum attained only on extraordinary occasions, may be controllable by valves. The difficulty "squaring" all the antagonistic circumstances must be great; nevertheless the authors state the result of practical experience, that "in houses erected in accordance with these details the whole scheme works with an accuracy sufficient for all the requirements of practical utility." In an appendix the various methods of calculating draughts in hot-air flues are viewed, several formulae being given, and there is a record of some original experiments performed in one of the houses. The volume will be of value by those who know how to use it.

A Few Lines on the Hunter, the Charger, and the Roadster. By WOODMAN. London: Sampson, Low & Co.

The writer of this little book is evidently "horsey" man, in the best acceptance of the word: he is fully impressed with the importance of his subject, and dwells on the good point of a horse with all the affection of a young lover for his mistress. Many persons who drive work horses know nothing about them, and would be glad to get a little knowledge on the subject, but are deterred by the largeness of books in which it is treated of. To such would recommend Woodman's "Few Lines," which will be found a very good introduction.

VARIORUM.

AMONGST reprints of papers and lect. touching the sewage question, we have to notice a paper read before the Philosophical Society of Glasgow, "On the Drainage and Sewage of Towns," by John Phillips, C.E., the substance of two lectures read before the Literary and Philosophical Society of Nottingham, by M. O. Tarbotton, C.E., entitled, "Sanitary Legislation and Science, with especial regard to Sewage and Water-Supply," published by E. & F. N. Spon. Mr. Phillips before now set forth his views in our paper. Nevertheless, we give a *résumé* of the deductions he arrives at in the paper now published:—

1. That it is expedient that the subsoil of a town should be thoroughly graded and vented, and the houses erected thereon free from damp.
2. That it is expedient that the surface water should be collected into channels, with which the subsoil should be carefully excluded, so that the water conveyed thereby should be discharged into the water-courses or rivers in a practically innocuous dilution.
3. That the sewage drainage should be removed separate channels or pipes of dimensions not large as necessary for its passage, and should be conveyed outside the towns by gravitation or other means, and there clarified by chemicals in tanks, and afterwards distributed by irrigation over land made fit for its use by deep surface pulverisation and deep drainage, or similarly clarified before permitting to enter a stream or river.
4. That a system of sanitary police be established, duty it should be constantly to collect the horse droppings and surface refuse, which should be removed and deposited upon the land, and, further, to render the surfaces perfectly clean by continually sweeping the occasionally washing them.
5. That, with the view of reducing the volume of water for irrigation and filtration within manageable limits, so that the water-supply fittings, and the supply to closets, should be supervised, in order to prevent leakage and waste, and needless use of water, that the fittings in houses and factories should be purged by the rain and subsoil water into the streams and rivers.
6. That, with the view of more readily adopting a system of sewerage which I have advocated, if a system of sewage farms be obtained, upon which sewage should be discharged by irrigation after passing through the necessary preliminary stage of extraction of solid matters from it.
7. That, with the view of effectually preventing the escape of noxious gases into the houses, it should be incumbent upon the owners or occupiers to provide pipes from the sewage pipes, carried above the highest part of the houses, away from chimneys and attic windows.

—"The Hours of Labour" (Vickers, S) is the title of a paper read at the Century under the auspices of the Labour Representation League (Mr. Brassy, M.P., in the chair), George Eccarins. The object of the writer is to show that a general reduction of the hours of labour is necessary on social, economical, and moral grounds, and is demanded by the working classes all over the world. The w

are well and fairly stated, and the pamphlet deserves the attention of those who erect themselves in the question.—*The Utmost Magazine*.—New Series. September, 1872. In this issue of the *Utmost Magazine* there is an account of Page's revolving paddling-mill, with an illustration. The apparatus, which is interesting from its simplicity, is already in use in several British ironworks, though only produced by Mr. Page, the engineer, to the fish ironmasters, about three or four months ago. The belt admits of its adapting itself with to the great variety of positions requisite; the paddling-bar revolves 300 to 800 times a minute with white cast iron, and 800 to 900 for grey. Amongst the other papers is a brief one on Port Sanitary Authorities.—Prison Congress of London, July, 1872. Edited by the Howard Association for distribution at home and abroad. From this tractate we extract the "general conclusions of the Congress."

The general nature of the final recommendations of the Congress is thus summarised in the concluding report of the Executive Committee:—

"Recognising, as the fundamental fact, that the protection of society is the object for which penal codes exist, the committee believe that this protection is not only consistent with, but absolutely demands, the enunciation of a principle that the moral regeneration of the prisoner should be the primary aim of prison discipline. A progressive classification of prisoners should be effected in all prisons.

"The treatment of criminals all disciplinary punishment that inflicts unnecessary pain or humiliation should be abolished.

"Impel a prisoner to self-exertion should be the aim of prison discipline, which can never be achieved unless they succeed in gaining the will of the State.

"Work, education, and religion are the three great forces which prison administrators should rely on."

"The gathering may be considered to have been wholly successful, and will probably be followed up by another a few years hence.

Miscellaneous.

Ethics of "Tenders."—*The Globe* has a piece of sharp practice in connexion with "tenders for contracts," which, if true, is highly disgraceful. In one of the London parishes it was found necessary to contract for paving and watering the district. The number of firms in the metropolis capable of undertaking such a work is necessarily limited, and it is stated that their representatives, in consequence of the advertisement for tenders, gathered together, and decided among themselves to accept the lowest bid best suited to his interest; "the others sending in tenders as such that they must inevitably be refused. It is an effect, if the facts stated are correct, a combination to defeat the object of advertising tenders altogether, and to control the market. The contractor was not forthwith decided on, the contractors would withdraw their tenders, and, on excuse or other, make a much higher bid when further called upon. There was, consequently, in the face of this Sibylline prophecy, but one course to adopt,—to accept the lowest tender, and to submit to the enforced monopoly.

Disinfecting Dwelling-rooms.—Some experiments prove the defectiveness of the dry process of disinfecting dwelling-rooms, and infectious and contagious diseases, without a same time stripping of the paper and washing the walls and painted surfaces with soda. In Manchester nearly all the men employed in this duty have had fever or infectious disease, although the houses previously to their having been disinfected with chlorine, carbolic acid. It is believed that contagious matter is retained in the paper, particularly when a number of layers have accumulated on the walls. The coats of paper, they describe a fusty which of itself may possibly give rise to the recurrence of fever in the same house. In Manchester, it is said, has greatly increased since the introduction of this mode of cleansing.

Infirmary for the Parish of St. Paul.—At a meeting of the board of health, held on Wednesday last, the resolution passed at a previous meeting, postponing the commencement of the new building for a period of six months, was rescinded, and the order of Messrs. Thomas & Co. accepted. Orders are to proceed forthwith.

Fresh Works, Dover Harbour.—At the last meeting of the Dover Harbour Board, a decision was arrived at in reference to the improved scheme of Continental communication proposed to be effected by the adoption of the designs of Mr. Hawkshaw, whereby the harbour will be deepened so as to admit steamers of a draught of not less than the Holyhead class, and a certain other improvements effected, including a covered way extending from each of the railway stations to the landing wharf, so that passengers may embark and disembark with perfect comfort, whatever the condition of the weather. The plan extends the harbour beyond the present entrance, and will cost in round figures some 200,000*l.* The improvements will include the covered way and station as above referred to, which will be used in common by all the railways; the erection of a Custom-house, if necessary; and the provision of any other appliances requisite for the due accommodation of the public, and for averting the possibility of confusion and inconvenience which now sometimes arises.

Discovery of an Egyptian Papyrus 3,000 years old.—A papyrus has been found in a tomb, by Mr. Harris, editor of the *Hieroglyphical Standard*. As described, it forms a roll 134 ft. in length and 1 ft. 4 in. wide. It dates from the end of the reign of Rameses III. (the Ramses of Herodotus), and contains valuable information relative to the political and religious civilisation of Egypt at that distant period. It is written in hieratic characters,—a mixture of hieroglyphics and signs for letters and syllables. The text is an allusion to Rameses III., "to his people and all the men on earth." Rameses therein recounts how he re-established the ancient Egyptian worship, rebuilt the temples, and endowed them with munificence. The religious movement alluded to relates to the period of Moses, to the monotheistic worship founded or restored by him, and comprises all the events which terminated in the ruin of monotheism in Egypt and the exodus of the Jews. This papyrus is, consequently, held to be of the highest interest for the study of the Mosaic religion and legislation.

Science and Art Instruction in the North of Scotland.—Classes for instruction in science and drawing are now very general in many parts of England and Ireland; but these classes have not met with much success in Scotland, except in a few large towns. The long-expected Education Bill for Scotland, and the naturally cautious habit of the people in adopting new subjects and ideas in education, have operated somewhat unfavourably. The Educational Institute of Scotland has held two or three meetings of teachers, at which the subject has been very fully discussed, and favourably received. In the northern counties most of the parish teachers are Masters of Art, and can receive payments for science-teaching without further examination. This will probably lead to the establishment of several classes during the coming winter. The papers also report public meetings at Aberdeen, Dundee, Banff, Cullen, Inverary, Irvine, Coatbridge, and other places, which have been addressed by Mr. Buckmaster, with very encouraging results.

Memorial of Sir John Simeon, Bart.—This memorial will shortly be commenced upon the selected site, at Newport, Isle of Wight. The proposed memorial consists of a cross about 10 ft. in height, placed upon a rectangular basis about 5 ft. high, which, in turn, rests upon a large mass of stone and a step. The whole height above the ground-level will be not less than 18 ft. The cross itself has a plain, solid stem and arms, at the junction of which it bears a large quatrefoil of incised work, containing the well-known monogram of our Saviour, "I.H.S." The base upon which this cross descends is the most ornamental portion of the structure, being on each side formed into a gable, covering a decorated niche filled with floral carving. Pinnacles complete each angle of the base. Below this recommences the plainer work, which forms the substructure. The memorial is to be executed in hard white stone, probably Portland, under the superintendence of Mr. Thomas Woolner, A.R.A., sculptor.

Chapel of St. Paul's, Stony Stratford.—We are asked to add to the account we gave of this building in our last, that it is warmed by means of pipes placed in trenches and covered with trellis, Messrs. J. L. Bacon & Co. executing the work.

Steam Power on Canals in America.—Although the offer of a prize of 100,000 dollars for the best mode of propelling canal boats by other means than horse-power appears to have stimulated invention, it looks very much as if it were likely to prove a failure, for the present at least, in eliciting any practical plan of propulsion that will meet all the required conditions. The commission appointed to test the inventions and make the award assembled in Albany a few days ago. The commission, after arguments by the various competitors, decided to modify the original rules, and adjourned to meet in Syracuse on the 1st of October. The final award will not be made until the close of the year. Several models have been prepared, of which one presented by Mr. Chase, of Portland, Maine, appears to have been the most novel and effective. It consists in the application of air, by means of a 15-horse-power engine and a rotary blower, under the stern of the boat, which is made in the shape of an inclined plane. The air is liberated by pipes against the stern, which is thus propelled in one direction, and the water in another.

Another Gas Explosion.—Another explosion, somewhat like that lately described, but of a more serious nature, has occurred in the residence of Mr. T. Eastlake, situated in the Temperley-road, Balham-hill. It seems that three persons were sitting in the dining-room on the ground-floor front, when the gas must have escaped from some parts of the chandelier, and not being detected by any of the inmates, had accumulated along the ceiling until it reached the burners, when the vapour became ignited, and an explosion of a loud and fearful character followed, prostrating and burning the three unfortunate occupants of the room, and at the same time blowing into the roadway the windows and igniting the furniture, &c. The wall of the drawing-room on the first floor was split and thrown out of its perpendicular, and eight other rooms in the building were also severely damaged by the force of the explosion. Fire-engines soon extinguished the fire, but the damage done is very considerable.

Twickenham Drainage.—The liability of the local authorities of Twickenham to pay a fine of 100*l.* a day for neglect in regard to drainage began on Friday, the time allowed by the Conservancy Board having expired on Thursday. At a special meeting of the Twickenham Local Board of Health, held the previous evening, Mr. Donnithorne, J.P., in the chair, the board having been informed by their legal adviser that the members themselves were personally liable to the penalty, the following resolution was carried unanimously:—"That the plans prepared by their surveyor for the drainage of the parish, including the river-side embankment, be adopted, subject to the approval of Mr. Lawson (the engineer who had been consulted by the board), and that such approval being obtained, the necessary steps be taken to obtain the requisite power to borrow the funds required."

Sewage Utilisation.—The Leeds Town Council Sewerage Committee have reported that they had carefully considered the process of the Native Guano Company, and that a contract had been entered into, after taking the opinion of Mr. Hawksley, for the first section of the necessary works, comprising a reservoir 618 ft. in length, with twelve compartments, enabling the sewage to flow at the rate of 12,000,000 gallons per day. The cost will be 14,950*l.*, and the committee hope to have the whole in the contractor's hands in the course of a few weeks. The present works have been in full operation since October last, treating the sewage at the rate of 1,500,000 gallons per day of twenty-four hours, and the effluent water has been remarkably clear, it is said, and highly satisfactory to the committee.

The Air in Public and Private Buildings in Leicester.—Three instructive tables, with remarks by Mr. Richard Weaver, C.E., F.C.S., are given in the *Lancet*. The analyses given in the tables were undertaken during the past winter months, and test the condition of the air of manufactories representing the staple trades, and of places of public resort, schools, and private dwellings, in the busy town of Leicester; also the cubic space per individual, the number of persons present, and of gas-jets burning at the time of observation, with the internal and external temperatures, and the provision for the ventilation of rooms.

Statistics of Iron.—The total annual production of iron is estimated at about 11,125,000 tons for the whole world in 1863, and must have increased greatly in more recent years. At that time England produced over 5,000,000; the United States of North America over 1,500,000; France nearly 1,125,000; Prussia rather more than 1,000,000; Belgium not quite 500,000; the Austrian Empire a third of a million; Sweden and Norway nearly 400,000; Russia and the Zollverein nearly 500,000 tons between them, of which four-sevenths came from the former; Spain and Italy made up nearly 100,000 tons, two-fifths from the latter. The increase in the production of the United States in the five preceding years was nearly 64 per cent.; in Prussia, 36 per cent.; and in England, in six years, 26 per cent.—*Mechanics' Magazine.*

Wrought-iron Riband Columns.—The Riband Telegraph Post Company appear to be contributing their share towards the realisation of the principle in construction of a maximum of strength with a minimum of material. Their wrought-iron riband pillars are both economical and ornamental, and will no doubt come into use in other forms than that of telegraph-posts. For railway-stations, verandahs, conservatories, and shedding they seem to be well adapted. As to their relative strength, or the weight of roof they are capable of carrying, some particulars will be found in our advertisement columns. Compared with cast-iron pillars, the riband wrought-iron ones are said to be little more than one-third of the cost, as well as of the weight, while they are decidedly more ornamental.

The Liverpool School of Science.—The committee of this school have just issued the eleventh annual report, in which they say:—The number of students is much the same as in the previous session. Out of a rather smaller number of students, eighty-nine have passed the examinations in May, 1872, against 43 in the previous year, and of these the greatest proportional increase has been in the higher stages, namely, advanced and honours. The committee draw attention to the fact that three of the teachers were formerly pupils in the school, and two others have received instruction in similar institutions. The treasurer's report shows a considerable deficit this year, owing to the annual subscriptions falling far short of the required amount.

Proposed Improvements in Leeds.—There are several improvements contemplated by the Corporation of Leeds in their new Act of Parliament. Power has been taken to widen various streets. The powers of the Corporation for the compulsory purchase of lands for any of these improvements must be exercised within five years of the passing of the Act, and authority is given to borrow 100,000*l.* (in addition to the money borrowed under the Act of 1863) for the purposes of the improvements authorised by the new statute. It is to be hoped the Corporation will be well advised.

Farnham.—The work of building is proceeding extensively in this town, and considerable improvement is especially being manifested in South-street and the Borough. An Assembly room, contiguous to the Royal Deer, has just been commenced, of which Mr. H. Harding is the architect; while the Wesleyan and Congregational chapels in the same road are progressing. The extension of Mr. Ransome's establishment, at the corner of South-street and the Borough, will effect an improvement in the appearance of that locality. Mr. Harding is also the architect of this work.

Yorkshire Archæological Society.—This Society had its annual trip this year to Ripon, where it was received by the mayor. Fountains Abbey was visited, and its details explained by Mr. Edmund Sharpe, M.A. Ripon Cathedral was afterwards inspected; descriptive remarks and a plan of each being given on the programme of the day's proceedings. A special first-class train ran to accommodate the members and friends, and thanks to the active exertions of Mr. Fairless Barber, the secretary, all passed off pleasantly and with success.

"Notes and Queries."—Sir Charles Dilke has become the proprietor of our useful and amusing contemporary, *Notes and Queries*, and has confided the editorship to the able hands of Dr. Doran, F.S.A. Mr. W. J. Thoms, its erudite and estimable founder, after conducting it for twenty-three years, had come to desire relief from the continuous work of editorship.

Harbour for Jersey.—The foundation-stone of a new harbour for Jersey has been laid. The works comprise a breakwater on the west, and a landing-pier on the east of the present harbour, to enable the mail packets to land passengers at all states of the tide. The estimated cost of the undertaking is 254,000*l.*, and it is to be carried out under the direction of Sir John Coode, who was engaged on the Portland Breakwater.

Fall of a Railway Viaduct near Plymouth.—An accident has occurred upon the Cornwall Railway, near St. Germans, ten miles from Plymouth. The line crosses the river Nottor by two long viaducts, one of which gave way. The accident, however, involved no consequences more serious than several hours' detention of trains.

American Patents.—The Patent Office has had a most extraordinary development within the past five years. Up to 1850 the patents but once reached 1,000 per annum. From that period until 1860 no year showed 5,000 patents; while the average of five years past has been over 13,000 per year.

The Local Board of West Ham District have determined to erect the necessary appliances for testing on a large scale General Scott's lime and cement process for treating sewage. Their resolution is based on the recommendation of their surveyor, Mr. Lewis Angell.

Cannon's Gas Regulating Cocks.—These cocks give the means of satisfactory control over the gas supplied to various floors of a building. They are made so shapely, too, that they need not be hidden away, but can be placed in positions where they may be easily seen.

West Ham Park.—A movement has been started in Stratford in favour of converting West Ham Park into a place of public recreation. It is stated that the land can be purchased for 20,000*l.* A committee has been formed to raise a fund for the purpose.

Technical Museum in Russia.—Russian journals have announced the opening at no distant time of a special technical museum for children. This museum is intended to teach the young the processes of manufacturing the various objects used in daily life.

Copper.—The *Financier* states that the price of copper was on Tuesday officially reduced as follows:—Manufactured, 110*l.* per ton; tile and tough copper, 103*l.* per ton. This shows a fall of as much as 8*l.* per ton as compared with the last officially fixed prices.

TENDERS

For the erection of warehouse on Dryers' Hill Wharf, London Bridge, for the Monument Warehouse Company. Wrought-iron joists to be supplied by the proprietors, Messrs. Eastman & Son, architects. Quantities by Messrs. Franklin & Andrews:—

Lucas, Brothers	£30,900 0 0
Higgs	39,223 0 0
Myers & Sons	39,200 0 0
Macey	38,584 0 0
Webster	37,610 0 0
Little	37,340 0 0
Coleman	36,700 0 0
Colls & Sons	36,550 0 0
Hill, Keddell, & Waldram	36,480 0 0
Atford	36,390 0 0
Rider & Sons	36,200 0 0
Brown & Robinson	35,870 0 0
Ansombe	35,240 0 0
Elkington	33,900 0 0
Crocket & Dickinson	33,490 0 0

For Trowbridge Drainage Works. Contract No. 1. Messrs. Gotto & Beasley and A. W. Estridge, engineers:—

Chappell	£15,900 0 0
Linsley	13,850 0 0
Wickham & Strecker	11,950 0 0
Coker	11,635 0 0
Neave	11,420 0 0
Potter	10,700 0 0
Long	10,470 0 0
Bugbird (accepted)	10,698 11 0
Stevens & Crook	9,621 0 0

For Baptist Chapel and Schools at Melton Mowbray, Leicestershire. Mr. F. T. Mercer, architect. Quantities supplied:—

Hobson & Taylor	£1,847 0 0
Dean	1,843 0 0
Barnes	1,839 0 0
Chapman & Waite	1,848 0 0
Hayes	1,613 11 0
Clarke	1,433 9 3

For repairs, alterations, and additions, at No. 11, Berkeley-street, Portman-square, for Mr. James Moore. Mr. William Ward, architect:—

Garrod & Smith	£755 0 0
Slade	579 0 0
Brown	550 0 0
West	538 0 0
French (accepted)	495 0 0

Accepted for new Independent school, East Moor, W. field (exclusive of fittings and painting). Mr. A. Hatton, architect:—

Elvey	£256 10 0
Rycroft	21 10 0
Squires	95 10 0
Kirk	13 0 0
Tattersall	19 10 0

For the erection of a new chimney-shaft and setting at the brewery, Earl-street, Maidstone, for Messrs. Fremlin, Brothers. Mr. George Scamell, architect. Quantities supplied by Messrs. Curtis & Son:—

Meredland & Son	£1,020 0 0
Bridge	1,010 0 0
Yaugham	890 0 0
Ansombe	888 0 0
Wallis (accepted)	879 10 0

For addition to infants' school, Roehampton. Mr. Chambers, architect. Quantities not supplied:—

Dawson	£805 0 0
Gibbs	795 0 0
Grover	718 0 0
Aries (accepted)	700 0 0

For main brick sewers "Sale Sewerage Works, Cor 12 and 13," for the Sale Local Board. Mr. A. G. Melchior, engineer:—

Hammett (accepted)	£1,369 0 0
Contract 12	0 0
Contract 13	0 0

For schools and master's house at Linslade. Mr. Lawrence, architect. Quantities supplied by Messrs. Paice, Brothers:—

Mead & Hammetton	£2,317 0 0
Waterson & Co.	1,795 0 0
Edwards	1,763 0 0
Smith & Fincher	1,712 0 0
Snell	1,700 0 0
Alcu	1,600 0 0

For alteration and addition to No. 139, High-Croydon, for Mr. J. Pelton. Mr. R. W. Price, architect:—

Hipwell	£720 0 0
Walker	697 0 0
Jarrett	676 0 0
Smith	627 0 0
Legg	595 0 0
Pesckett & Taylor (accepted)	589 0 0

For erecting new infirmary for the parish of C. Messrs. John Giles & Gough, architects. Quantities supplied by Mr. C. H. Goods:—

Neave	£19,882 0 0
Heath	19,331 0 0
Fish	18,985 0 0
Stephenson	18,459 0 0
Elliott	17,967 0 0
Lathey, Brothers	17,855 0 0
Gough	17,490 0 0
Sawyer	16,895 0 0
Manley & Rogers	16,797 0 0
Rankin	16,135 0 0
Thorne & Co. (accepted)	15,750 0 0
Turrell, Brothers	15,687 0 0

For repairs and alterations at 10, Queen's-Head-park, "Verrall" should be *Fernal*.

TO CORRESPONDENTS.

M. F. (there is nothing to prevent any one from writing his name if he so desireth)—J. A. B. (would require an essay him)—H. H. V. (please send plan)—A. O. (we cannot lose B. & Co. (we cannot state what we are not informed of)—Mr. E. F.—A. H.—H. H.—H. B.—B. F.—J. N.—J. A. B. Voice from the North.—W. F.—A. McE.—O. W.—A. S.—P. B.—P. & T. We are compelled to decline pointing out books & addresses. All statements of facts, lists of tenders, &c., must be accompanied by the names and address of the sender, not necessarily publication. Note.—The responsibility of signed articles, and papers for public meetings, rests of course with the authors.

Bath and other Building Stones of Quality.—RANDELL, SAUNDERS, Limited, Quarriers and Stone Merchants.

List of Prices at the Quarries and Depots. Cost of Transit to any part of the Kingdom furnished on application to Bath Stone Office, Corsham, Wilts.—[A] Ashtons & Green, Slate, Iron, and Marble, and best selected Stocks of Portland, Green Roofing Slates, Slate and every description of Slate Goods, and Enamelled Slate Chimney-pieces, Ranges, Rainwater Goods, and General C. A. & G.'s special Red Ridge Tiles. D and prices upon application. Offices and rooms, 14 and 15, Bury-street, St. M. London, E.C. Agents for sale of Whitland Green Slates in town and country.—[A]

WANTED, by a first-rate ARCHITECTURAL DRAUGHTSMAN, a RE-ENGAGEMENT SITUATION. Address, L. M. Smith's, 2, 3, Gray's-inn-road.

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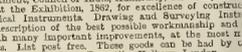
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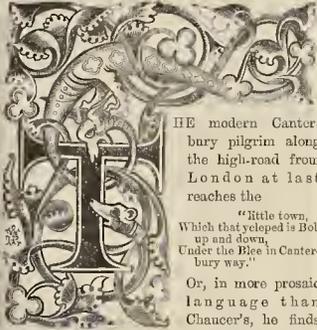
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The Builder.

VOL. XXX.—No. 1545.

Canterbury Cathedral: the Fire and its Effects.



THE modern Canterbury pilgrim along the high-road from London at last reaches the

"Little town, Which that yeloped is Bob up and down, Under the Bise in Canterbury way."

Or, in more prosaic language than Chaucer's, he finds at Harbledown the

last ascent and descent in the road that is to lead him into the city,—in the valley of the Stour. In the course of that descent he probably reflects that his predecessors, in the days of quaint dresses, caught sight on the very hill-brow of the huge temple now hidden therefrom by pleasant planting. When the great pyramidal mass is suddenly seen, outlined against the green downs in the distance,—the central tower relieved against, let us say, the transparent pearly clouds lighted through by the early morning sun,—the spectator is on the produced east and west axis;—the building, seen from the raised road, and as rigidly symmetrical as a soldier at drill, with its exact balance approaching an architect's elevation more nearly than anything else in nature. Thus, he does not from this historic road get in the distance any indication of the something strange that, in the shape of a large, intensely black gap, attracts the attention of another wayfarer approaching from Sandwich;—when imitating in the main Cour de Lion's (March, A.D. 1194) pedestrian method; but, in vagrancy of soul and freedom from traditional disciplinary poas, following the prospect-commanding footpath over the quiet sheep-haunted downs.

Passing eastwards along the broad gravel, skirting the trim grass sward round the south walls of the cathedral, the eastern arm is reached after going by the first transept, running north and south from the majestic Bell Harry Tower over the crossing. Five bays from the tower the second transept comes forward (about 10 ft. internally) beyond the well-pronounced western cross, and as tall and forcible as the choir itself. The cathedral, with these and other bold projecting masses, conveys on the outside the impression of immense internal area,—an impression hardly justified in the interior owing to the many differences of level; and, perhaps one may add, that the building rarely looks all its prodigious length, for which accidents of site and the comparative shortness of its western limb are of course also in part responsible. About in a line with the centre of the piers between the second and third bays, moving still eastwards from the south-eastern transept, the ridge of the steep-pitched, lead-covered roof which the eye has followed from the central tower, and down the transept and round to this point, suddenly ceases; and a ragged, raking line of leadwork, broken by some half-dozen blackened rafter-couples jutting out above

eventually meets the lead parapet about a bay and a half further to the east. A dark cavernous space shows itself when looked at from beyond the eastern wall of Becket's Crown. The two bays eastward of the south-eastern transept have their sides parallel to the axis of the building; then,—as all who have once caught sight of the inside of the choir will not fail to recollect,—the side walls begin to converge. As the chapels of St. Anselm and St. Andrew,—excellent chapels beyond the choir aisle of the (shorter) older church,—were not to be removed, they "would not allow the breadth of the choir to proceed in the direct line." These converging walls last for two bays, when the present screen, forming, what we will call, the east end of the choir, is reached,—for two bays further the walls are ruled by the axis. A creak outwards of 6 in. each side corrects the passage, and we reach into the semicircular apsidal end (divided into five sections) of the Trinity Chapel. Practically, it is from the beginning of the bold convergence of the walls that the east part of the choir is roofless; the vault (not a roof, but a ceiling) of course, however, remaining intact over both choir and Trinity Chapel. From the Green Court on the north,—looking over the ivy-covered ruins of the Priory, and consequently from a greater distance,—the details are seen to be similar; but the eye, guided by the imagination, is able to fill in among the lines of that less angular perspective the missing 80 ft. of straight ridge, and to trace in air the sloping line of the semi-cone as it stood aforesaid black against the morning sun.

Looking up inside the Trinity Chapel, the vaulting is seen to have absorbed some of the water profusely poured out above it. The *tas-de-charge* and the ribs are of Caen stone, the filling-in of clunch and Falaise tufa, whitened to a surface on the underside. The bosses, pierced with cradle-holes,—one in the cross arch at the spring of the apse, and another a bay and a half westward,—happened to be well placed for the passage of the liquid lead dripping on the back of the vault from the blazing roof. On the rough decayed surfaces of the Purbeck slabs that occupy the site of the Becket shrine, fragments of the lead remain; but on the patterned pavement, the "Opus Alexandrinum,"—covering the floor immediately to the east of the present choir-screen,—there are no traces of the several pounds of metal that streamed down there. Through the holes further westward water came, sufficient to float over the surfaces of the polished Purbeck floor, and the steps of the altar; and alarmed the well-intentioned assistants into removing the altar, tearing up the altar rails, unlining the pulpit and throne, and seeking out the readiest means of sawing the fixed seats from their cills. The reliques of the Black Prince attached to a beam (over his tomb), at the level of the tops of the caps of the piers on the south side of the Trinity Chapel, were all taken down, and placed away in safety. The shield, chapeau and helm, surcoat, laton gauntlets, and leather scabbard, with the buckle and fragment of belt attached, have all been replaced in the position they have so long occupied,—a concession to the feelings of the very numerous visitors brought here by the circumstances and the holiday season. It is to be hoped, however, that the suggestion of Mr. A. Hartshorne will shortly be acted on, and a strong glass case, in the aisle of the chapel, preserve from air and moisture the perishing crimson velvet, brown with age, and the other perishable materials, that in about five years' time will for five centuries have been among the treasures of this cathedral; and are now the most ancient and complete remains of the kind in existence.*

* It has been asserted several times recently that the reliques have clung to the beam undisturbed for centuries. This is, however, an error. The leopard (or lion) crest—of pasteboard, coated with plastic material, in which the

The eastern end is said to have been filled with steam from water rushing through with and falling on the molten lead on the floor; and in time by every opening wood-smoke reached the inside of the building, filling all down to the west of the nave with a blue haze. The stained-glass windows on the north side of the Trinity Chapel—brilliantly lighted up from the outside by the fierce light above—and streams of luminous metal, 10 ft. in length, rushing down at intervals;—the whole, viewed from the south-eastern transept, is said to have been a scene of weird awful beauty.

Mounting and passing along the roof of the south-eastern transept, all that will stand by itself is seen still in its place,—charred timbers, bending parapets, &c. Of the roof over 80 ft. in length, by widths of 50 ft. to 35 ft., the few beams and fragments here and there, a mass of charcoal on the green below, and black powder profusely scattered on every lower roof, are the remains. The back of the vaulting is being covered with a strong cement rendering, so that this small model of rounded chalk-downs may throw any rain-water well into the hollows of the vault pockets. These,—never more than 5 ft. 6 in. deep below the backs of the vault ridges,—have little windows to light them (3 ft. 8 in. by 11 in.); and through these, now deprived of glass, the water will run out on to the aisle roofs. As the liquid metal ran down the vault slopes into the pockets, and formed a level floor when it reached these window-cills, it enabled fresh melted metal to find its way out on to the water tables of the buttresses immediately below; and further down (in parts 4 in. thick) on to the flying arches conveying vault-thrust to the outside of the aisles. Dropping tears in shining metal, knotted interlaced tails, and many another eccentricity, are here to be found, where froth melted metal has run in among cooled and cooling streams. A solid east-lead table raised out of one of the pockets is seen by a moment's calculation to weigh 1½ to 1½ ton (in parts ½ in. thick). It must be slit up into lumps not much over 1 ft. super. before it can be with comfort (and safety) conveyed to the hoist at Becket's Crown. The walls show 3 ft. 7 in. wide to the splay of the cornice, situated about 9 in. out from the face of the wall below. On the outer edge the wooden^o lead-covered parapet stood,—from 3 ft. to 1 ft. 11 in. high where remaining on the north side, giving the awkward raking lines so judiciously replaced by the horizontal top in there constructed south-eastern transept roof. It was from the covering strips of the tops of these parapets that the stained glass windows ran their greatest risk. When the insides of the parapets were burnt, these long lead ribbons hung over and flapped to and fro. (Probably, however, not a score pieces of the glass have been knocked out by all the accidents.) When the parapets burnt through—the lead from the outer surfaces fell on window-cills, strings, hood-moulds, and aisle-roofs; bucketfuls of what looks like short lengths of the wire for silver filagree have been gathered from the lower levels. Inside the parapet two wall-plates carry heel-pieces (or sleepers) 7 in. by 6 in., projecting inwards 15 in. to 2 ft., according to position; inclined struts, 6 in. by 4 in., start upwards from their ends, forming "knees" at the bottom; rafters, 1 ft. 8 in. apart, are 7 in.

shaggy locks are moulded—fell off the chapeau about twenty years ago, and was carefully re-connected. Twenty years ago the jupon was taken down and lined with leather, in order to keep it from falling to pieces. About forty years ago, when the Duchess of Kent brought the Princess Victoria to the cathedral, all were taken down, and placed so that the heir to the throne of England might touch and see in detail some of the personal and other reliques of one of the most famous members of her family.

* A suggestion by Mr. E. B. Denison,—“It would not cost much gradually to replace all the wooden gutters of the cathedrals with stone, and then such accidents would be impossible,” is not without its practical value. Stone parapets have, however, not been contemplated in the roofs at Canterbury. The space from the front edge of the cornice of the choir (on the level of the top of the wall) to the starting of the roof-slope [12 in. above the cornice] is only 14 in.

by 5 in. x 4 in. by $\frac{3}{4}$ in. longitudinal battens, 3 in. apart, support the lead; collars and inclined braces complete the roof. The whole of the timber is oak and chestnut, and very dry.

Seeing thus the shape of the works, the story of the fire in its best authenticated forms, seems very simple. A plumber and man on Tuesday,* the 3rd of September, were at 10:30 a.m. at work in the south gutter, over the Trinity Chapel. The tool-bag must have stood over the fourth pier castwards from the transept, as the tools have been dug out of the lead in the pocket below. The fire began, however, somewhere between this point and the springing of the apse. The plumber, by the way, is stated on all hands to be a very steady, trustworthy man, seven or eight years in his present employ. A peculiar "whirring sound" inside the roof, led them to go inside, when they found three of "the knees," described above, on fire. The best conjecture seems to be that the dry twigs, straw, and similar debris, carried into the roofs by birds, and which it has been the custom to clear at intervals out of the vault-pockets, had caught fire from a spark that had in some way passed through the roof covering; perhaps under a sheet raised a little at the bottom by the wind;—the surface of the pocket at the spring of the apse was only 32 in. under the timber-knee. After efforts to extinguish with water, with additional water fetched up from the crypt, and to "rub out" the fire with sail cloth,—the authorities were informed; the bell tolled; military, citizens, and fire brigades assembled. The fire had then run up to the ridge, and was giving out smoke and flame (about 11 o'clock). Air to feed the fire came from the various openings under the gutters, from the doors into the western roofs, and through the lead laps; the roofs were, however, so filled with suffocating smoke, that endeavours to reach the fire from the transepts failed. Then followed the efforts to obtain water,—effected at last by junction to one of the hydrants in Burgage-street in a direct line south of the choir; and the hose, about 700 ft. long, was carried over a wall and through gardens, hung up by ropes, and carried aloft. Mr. Andrews, superintendent of the cathedral gasworks, reaching—by ladder from the roof of St. Anselm's Chapel, a dormer intended for access to the choir gutters from the inside of the roof, situated just by the west angle of the converging wall, entered with the hose (12 o'clock), and began to play on the most western portion of the flames, then licking along the upper part of the roof; and at once saw them yield to the water. Once the progress stopped, the beating back of the flame on the parts already alight followed. Another hose had played on the outer surfaces of the lead from the ground without any good result; but when carried (12:15) through one of the little windows mentioned above a useful additional stream was poured out. By half-past twelve the whole was seen to be extinguished. The south aisle roof was set on fire in two days, but put out after only trifling damage had been done. Buckets of water on the pockets—containing charred smouldering timber,—kept all so well at rest, that (about 2 o'clock) an enterprising photographer was allowing the sun to depict a group ranged across the vault under the part-burnt roof. At 4 o'clock the authorities held the evening service, so as not to break a continuity of custom extending over centuries; and, in the smoke-filled choir, the whole of the chapter in residence for the proper Psalm (xviii.) found expression for the sense of victory over a conquered enemy.

Cathedral authorities, fire brigades, soldiery, and townspeople seem to have pulled together with the oneness of purpose proper on such occasions. With the ready gallantry, and great personal risks in all quick movements at such high levels, it is a matter of congratulation that absolutely no important injuries are mentioned.†

* The fire that injured the choir finished by Prior Conrad (dedicated 1130), broke out 5th of September, 1174, a date that has been remarked upon by those who note odd coincidences of coincidence. To that fire we owe the work carried on in the next ten years,—the dignified and elegant designs of William of Sens, and William the Englishman, recently imperilled. Dean Stanley, "Memoirs," 4th edition, p. 295, does not pass without notice what Langton (1221) had not failed to point out,—the Tuesday in the past history of this Foundation. On Tuesday (the 26th December, 1170.—4th January new style), Becket was murdered; on Tuesday (the 7th July, 1250), the "Translation" of his relics from the crypt to the new shrine took place.

† Perhaps the soldiers showed some excess of zeal when they cut and pulled up the lead of the west valley where the roof of the north-east transept abuts; and more still when they used the axe on the sheets next to Bell Harry

Mr. Andrews, who appears to have shown a cool determination in every way admirable, and whose entrance inside the roofs was evidently the turning-point of the story, was in no way hurt,—though melted lead, striking on the timbers, now seen covered with little shining patches, spattered from time to time round him and burnt his clothes; and though the scorching heat and the flame were driven westward towards him continually by the wind. No doubt, the set of this wind (blowing gently but steadily from the east) had something to do with the rapid passage of flame along the ridge after the covering was once broken. Almost directly after the fire was got under a strong wind sprang up from the same quarter.

What might have Happened, and What should be Done.

It may not be out of place to conjecture all the possible results, if—as can be imagined—no large quantity of water had been obtainable at the requisite level; and the flames had maintained an uncontrollable supremacy in spite of the creation of considerable gaps in the roofs, and other efforts. A strong wind and night-time may be assumed in order to select the most unfavourable conditions. The whole of the roofs as far as the central tower would have been destroyed: comprising those of the Trinity Chapel, choir, two eastern transepts, probably also those of the aisles and adjacent chapels. It is difficult to imagine an extension of disaster that would have affected any roofs further to the westward. From falling timbers, by evil hap,—the stone vaults being fractured in their filling in (perhaps leading to the fall of some complete sections),—fire would be communicated to all internal fittings; injury done to much stonework by flame; and—possibly by falling masses of stone and timber and heated metal—monuments and stone screenwork mutilated (comparatively little injury has, it is true, been done to stonework by the recent fire);—wall and other painting would run, under such circumstances, great risk of entire ruin. That such destruction would seriously affect the stability of the building does not appear at all probable; and it is to be noted that some considerable portion of the irremediable injuries would only happen in case of a more or less complete failure of the vaulting. The behaviour of the vault in the present instance will incline every one to regard with some satisfaction these incombustible substitutes for wooden ceilings, notwithstanding that they want the constructive and complete fire-resisting qualities of the Roman dome and the Celtic stone vaults and roofs. From this consideration, however, of extreme not-impossible consequences, sufficiently saddening to think of, we see perhaps more distinctly the absolute necessity of the provision of many available resources,—that shall, in all fair probability, always avert such worst results; and also the advisability of doing away altogether with, or at least keeping under the strictest control (with the use of more than ordinary precaution), all the obvious sources of possible beginnings of destructive fires.

Under the influence of the sudden shock the manifestation of some eagerness to visit some person, or body, or system with blame, and call them responsible, was naturally to be expected. It must also be confessed that, through the press, and in other ways, the ordinary desire to render everything secure to the remotest future after one horse has been abduct, has been very fairly manifested. While proper reasonable provisions and precautions are in so many instances neglected, most of us who have to deal practically with the preservation of buildings are ordinarily content, to limit ourselves to urging apparently elementary caution and simplest preparation in case of possible casualty. Knowing so well the natural tendency to inertia when all is going on as usual, one would wish on principle to avoid the risk of what always suggests the hithermost irony of fate,—when elaborate contrivance is left to depend, in process of time, on not-always-intelligent routine. But this need not prevent any one from seizing an opportune

Tower, 150 ft. west of where the fire was stopped. It was proposed, just before the success of the water, to take out the 20 ft. of ridge east of the transepts, and the portions of the roof extending thence to the north-east and south-east valleys; and thus to leave the choir roof to burn itself out if need be. If one side had been stripped before the other, as the lead on each side approaches two tons in weight, this might have led to accident; and one bay or a part of a bay of the choir roof, now leaning well in that direction, would possibly have toppled over westward.

moment—to point out some of the sober, practical details that might well be lodged in the minds and in the practice, of those who have the care of important public monuments.

As no irremediable damage appears to have resulted from the recent fire, it is nearer sober truth than mere cynical endeavour to say, that the menace and the actual damage will have been of real service, if our public buildings throughout the country have the benefit of searching inquiries into their means of meeting similar calamity,—such inquiries being made with all the point and purpose that result from the still fresh teaching of the inexorable logic of facts. Deeming the thorough conservation of historical buildings an unmixed good, and no pains to secure it in reality too great, we (*mutatis mutandis*) regard the matter with something like the optimism of the insurance offices, which look for sure indemnification for any specially heavy losses in the more general contributions of the community to fire-funds, and an increased personal care.

It cannot be denied that if in any instance patching with solder might be excused, the old choir-roof at Canterbury was that instance. The framework,—judging by portions remaining,—in not too excellent condition, crippled in places and patched and strengthened,—the whole leaning westwards in a way needing no plumb-line for its detection;—the leadwork old beyond memory, and repaired with patches and seams of all sorts and sizes, and apparently of many dates;—it would seem that to deal with the weakest places, to limit the work to keeping out the weather by the simplest means, would not be a very unreasonable course. Necessarily the total replacement of such a covering as existed here (and exists on the north transept), would to any judgment be only a question of suitable time and sufficient funds. In the case of such an admirable roof-construction (as in the progress eastwards of rigid-construction) was put, not so long ago, over the south-east transept, with its handsome timbering and framing and bracing; its 10 lb. lead gutters,—the leadwork now in the grey uniformity of early oxidation;—it is really difficult to contemplate in one's own time the need of repair of any kind. And, indeed, on a roof in such condition mere temporary repair of any weak place would probably never be proposed; a new piece of metal would be put in, and the old removed for recasting.* Even at an expense (as it would commonly be found to be) of several times the $\frac{1}{2}$ d. per foot super. for labour and coals of a reported test experiment at Lincoln Cathedral, the gain in permanence alone would be sufficiently decisive,—where the aim was not to secure temporary serviceableness at the least cost, but the very best kind of maintenance.

But however desirable it may be that all leadwork should be thus replaced, it is to be feared that, even in the case of the most precious buildings, the custodians—in the exercise of their ordinary judgment—will rarely be able to dispense with the less thorough descriptions of patching. Most of us have times and again to do, not what we would, but what we can. But it can be a rule that unprotected fires and lights—open flame and fire of any kind—shall not be carried in any case into certain agreed-upon places; and such a rule should at once be made, and carried out on pain of instant dismissal of workmen infringing it. Not that workmen are the only people to whom the rule should apply! Must not most of us, who have poked into the holes and corners of buildings beyond count, cry *peccavimus* in our secret souls,—when we recall some of the incidents, say, of creeping in the night-time through belfry and passages, eventually to clamber out on to the starlit tower-top to view the sea's horizon, or the lights on the distant hills? Or, as we think of the roof-spaces, the hoarding underfoot littered over with dryest accumulations,—it may be of centuries,—all powdered with the dust from the decayed surfaces of the wooden beams above? A candle wrapped in paper for the hand, and guttering at each sharp cross-air-current, and notebook and measuring-rod in charge,—have we not on occa-

* In the old choir roof the sheets are prevented from slipping by bands (not unlike bow-door-handles) carried round the 4 in. by 3 in. battens (which are put 3 in. apart); the ends of the bands being doubled into the rolls. In the new transept roof, the sheets of lead are narrow and not lengthy,—clips at the bottom of the middle of each sheet hang over the battens, and straps soldered on each lead alternately of the back of the sheet at every 1 ft. 6 in. or 2 ft. of length are also carried over the battens, and nailed to them, inside the roof with copper nails. The rolls are of course not on woodwork, but formed only by the bending up and wrapping over of the edges of the thick metal.

sion reflected (after our return) that we should have readily submitted to carry a Davy-lamp if need be, if only it had been put into our hands? Especially would the complete banishment of the plumber's fire-pot, in its ordinary unprotected form, be no little gain to the community at large; and often it may be said,—though the woes of private persons do not form part of our present subject,—would such a banishment be no small comfort to a worthy householder or owner. Viewing the lamentable, all too frequent, miserable destruction wrought by this apparently simple and innocent implement,—it would not, in last week's state of public opinion, have been deemed outrageous for insurance companies to obtain powers to prosecute and recover heavy penalties from any tradesman causing them loss by permitting such an unshielded fire-basket to be used. A little ingenuity and determination on the part of the leading plumbers would, without difficulty, secure the necessary amendment. Certainly the most scrupulous pains—pains rarely possible if the performance of a reasonable quantity of work in a given time is at all to be considered—could only succeed in rendering accidents somewhat more rare,—from this spark and lighted wood shedding contrivance,—which, however carefully put under the shelter of a stone wall, must always have the control of its own conduct there, when meetings come round for the workmen. (The workmen at Canterbury have, it is stated, had for years past directions to put out all fires half an hour before leaving work for the day.)

We think a word or two may usefully be said in this place, as to assumed blameworthiness in this case at Canterbury. In the natural desire to select and if possible punish some one, which most of us share with Mr. Samuel Weller and other leaders of opinion, "the workman" was pitched upon at once, and credited, on convincing new evidence, with uniform culpable carelessness; this even, in some instances, improved into a mocking Mephistophelian satisfaction in the undoing of work already done. Like all class-characters depicted without bias tints, this happily is only a caricature; and seems to involve also a misconception of some of the conditions under which much hard mechanical work is carried on. The absence of keen anxiety,—one of the happy results of habit and hard work,—would, if with difficulty acquired, be regarded by any well-disposed critic of human nature as a thing that a man should earnestly seek for; and this,—quite compatible with proper care,—is often mistaken by unthinking observers for heedlessness; really quite a different thing, too prevalent, no doubt, but not anything like universal. Indeed, what risks—in building scaffolding, in shoring, in special dangers of most building trades, are avoided, as by a clear, through the steady nerves, and almost instinctive decision of ordinary workmen? Who could wish that anybody should pursue his daily tasks with an habitual view of all possible consequences of every act? Is it not sufficient to remember that there are arguments that have shown us the blessings of our ignorance of futurity? In this instance, as we have stated the case above, the plea of mere misadventure may surely be listened to;—and, indeed, many an accident, however calamitous, might be accounted for without suspicion of criminal neglect;—a suspicion that we like the less when it goes the length of imputations,—aimed beyond the individual at the moral status of a large part of our people,—who probably are imperfect, and happily are not more thin-skinned than other healthy-minded people, but are not habitually wanting in all the qualities in which we of the middle classes take some pride for ourselves,—such as, among others, far care in the performance of understood and undertaken duties, and a habit of considering at some stage or other that somebody or something has a right to be thought of besides ourselves.

On this head of prevention the question of the use of incombustible, fire-resisting construction should not be passed by without a word. It is probably not yet decided to renew the timber roof; and it will be worth argument at least, as to whether a construction suitable to the building could not be put up that should have fewer disadvantages than the wooden one. With the roof not incalculable spans, and the steep pitch, the special covering material, and some provision for force of wind, the construction cannot be a light one; no doubt a very costly matter in iron just now. Probably, by the way, a considerable weight in the roof is very advisable, if not abso-

lutely necessary, in order to supply (being cleverly arranged) direct downward pressure on the piers that sustain the vaulting. We shall note with interest the decision that is come to in this case, a decision that would be a precedent in other cases; complicated as it is with many considerations—not among the least the question of the probable endurance of iron. The failure of galvanisation, once regarded so hopefully,* and the cost and at the same time incompleteness of protection from the air by painting, instantly come into the mind.

Whether a suggestion that has frequently been made as to the coating of the inflammable surfaces of timber with fire-resisting solutions is practically feasible, awaits experiments and tests. No doubt much would be done with such solutions if justified by sufficient expectation of useful result.

The isolation of large buildings, and their division into distinct thoroughly separated sections are matters too much neglected. Why should there be even a possibility in any case that the burning of the inflammable roofs of a choir should affect, through a central tower, the inflammable roofs of the abutting transepts and nave, &c.?

The next consideration to prevention is—cure; in the case of ordinary medicine signifying the expulsion of disease; in the case of an ignited building the putting out of the fire—in other words, water-supply. In this Canterbury instance, it would be slaying the slain to insist at any length—on the mistake that the dean and chapter made in not obtaining the benefit of the high-pressure water supply immediately on the completion of the city waterworks. The cathedral precinct has long been supplied with water for culinary and other purposes from a special water-supply; derived from a spring on the hill behind the barracks, about a mile distant, and carried by lead pipes to a reservoir near the Green Court, up 25 ft. or 30 ft.† From this, pipes are led into the crypt of the cathedral, among other places, and it was from these that the buckets were carried up the stairs in the north transept, at a run the whole way, in the early stages of the fire. The waterworks for the supply of the city have been opened two or three years. The water is obtained from an artesian well, sunk in the valley, and forced up to the reservoirs on St. Thomas's Hill, not far from Mr. P. C. Hardwick's well-known Clergy Orphan Asylum, on the road to Blean. These works are, it is said, arranged so as to supply 150,000 gallons per day, with continuous service, at a pressure of 70 lb. to the square inch. This will account for the splendid volume of water obtained when once the hose was fitted; and for the fact that the streams directed inside the roof, against the flaming ridge, burst upwards in columns, 20 ft. above it, although that ridge was nearly 115 ft. above the grass in front of St. Anselm's Chapel below. Of course, when a fire occurred in Sunstreet, in the city, in November last, and was put out by means of this high-pressure service, the cathedral authorities noticed the matter at the December audit, and saw that the question of protecting the cathedral would deserve some consideration,—eventually giving instructions for hydrants round the buildings at the June audit.

As we leave Mercury-lane, on market-day, and enter the Precinct by Christ Church-gate, and walk on in the long shadows thrown by the westerly sun, and notice the black-robed peaceful visitants of the towers, decorously announcing their own approach in a gentle monotone, it is not over a mere two or three years that we seem to have slipped back as we entered this self-sufficient system with its central orb and planetary "homes of ancient peace." . . . And we cannot expect these privileges without paying some price or other, considerable or inconsiderable; let us be satisfied in that a complete water-supply of the most thorough kind is now here assured,—as well as in every such

* The galvanised iron covering to the roof of the chapter-house at Canterbury now shows, especially on the north side, red blotches of very considerable extent (put up a little over twenty years ago).

† Readers of Professor Willis's admirable "Conventual Buildings of Christ Church, Canterbury" (1869), will not need to be reminded that the subject of the waterworks for the supply of the Precinct,—from the earliest period to the present time,—has been considered and proved worthy of laborious investigation on the part of that distinguished writer. By some strange power in the author,—his reader is made to enter into the process of discovery and the unravelling of difficulties,—till every part of what at first sight looks like a collection of the dustiest and most commonplace of mechanical details,—is found to be possessed of all the interest of a mysterious contemporary cause célèbre.

building throughout the country where high-pressure service is to be had. Mains led to different points round the building; hydrants at selected spots; in each distinct section of the building a rising fire-main, with fire-cocks on every distinct story,—crypt, ground story, and triforium; all cocks and hydrants screwed to one gauge so as to be used with the hose of the neighbouring fire brigade, and provided as well with hose,—the greatest length of the section,—to be kept, with wrenches and keys, adjoining each fire-cock,—and special lengths for the hydrants:—these are among the cares that one looks at with satisfaction, once on a glance at, and times and again on a careful survey of, an important building. Sizeable cisterns always full, and an array of glossy leather buckets,—some filled for use,—are also pleasant to the eye. It is true, as we have observed above, that the inefficiency of an absolutely indispensable portion of a carefully and skillfully arranged system is the oddest of all practical satire. This has so struck our national imagination and sense of humour, that the horse and well-equipped vehicle and the forgotten or missing driving-rein have passed into a proverb. May the practice days of provincial fire-engine volunteers, and the case of a notable City of London building (the National Provincial Bank of England), supply illustrations of efficiency maintained by rehearsal. In the latter case, the architect has a special (and comprehensible) dislike to the accumulations of soot and mud that deface so many London buildings. There is a thorough system of fire-mains inside the building,—all sealed,—to be used only in case of fire (not for the purposes of ordinary supply). Once every three months the seal is broken, and in the early morning (or rather what we call late at night in ordinary thought and speech), the Portland stone front is played upon, till its old colour appears, and the grime has hastily accompanied the water-streams down the gutters. The water company officials seal once again all that they wish, and till the next time comes it is probable that hose is in its place and sound throughout, that cocks can be joined to hose, and that the old and any new officials will be able fairly to do their part in the routine,—if by chance a real performance should be necessary a couple of months after such a rehearsal. Such practice as this, if only with the effect of watering the turf, and washing a piece of the leaden roof of a cathedral, or making rainbows in its Green Court for the delectation of the lookers-on, would probably not be wasted time, water, and energy.

The provision of large cisterns, filled by special hoisting or forcing, and of bucket supplies, is of course all the more imperative in cases where a high level cannot be reached by the water-service; and perhaps it might here be suggested that in place of a Cathedral Dignitary presiding over the plumbers and carpenters, and keenly glancing at glue-pots and pans, in the course of repairs (or, as we should conclude, an Alderman in the case of works at an old Guild-hall)—it might be possible to keep attached to every large building a "water-supply man," who should be skilled in the extinction of fire, and on the alert, when he knows that fires and lights are being used, to secure conformity to rules.

The splendid service rendered by Mr. Andrews at Canterbury, due to his intimate knowledge of the building, is the best possible case to show the value of an intelligent, muscular officer of the kind in question.

Not, however, to weary out "good intentions" by other details that might deserve attention in a more lengthened exposition, we may confess that most of us would be in the main satisfied if only special hazards were superseded and an efficient water-supply maintained. And we will not deny ourselves the satisfaction of hoping that,—when all panic and, to all seeming, all remembrance of the lessons of the recent fire have passed from the general public,—on the two heads we have named "prevention" and "cure,"—the Capitular Bodies, the authorised custodians of some of the most valuable of our national memorials, will have left a fair but critical observer no room for cavil.

The Norfolk Fine Arts Exhibition.—The annual exhibition of the Norfolk and Norwich Fine Arts Association was opened on Monday, at the Crown Bank. The collection is quite up to the average of former exhibitions, and the local artists, and particularly the amateurs, show in strong force.

A NOTE AT EXETER.

THE restoration of the interior of the choir at Exeter Cathedral, now far advanced under the direction of Sir G. Scott, promises to be a very successful and conservative cathedral restoration. Those who only know the interior under its whitewashed condition will find a new beauty in it now, in the delicate and harmonious contrast of tone formed by the unpolished bluish-grey marble of the clustered piers, and the light cream-white tint of the stone forming the arches and the superstructure. Almost the only new features, the only features for which no precise original was found, appear to be the screens north and south of the choir, in the western bays of the arcade. These occupy the place where a brick wall had been built during the dark ages (of architecture). Most judiciously has the hand of the restorer been restrained from any superfluous application of colour on the vaulting; and while we had occasion to notice, some little time since, with regret, the unhappy effect of the blue and gold colouring applied (under the same direction) to the roof of Cloucestor choir, especially in reducing its apparent height, we here notice with proportionate pleasure the satisfactory and delicate effect of the simple lines of gilding with which the fillets of the vaulting-ribs are brought out, and which give just the requisite sparkle to the vault, lighting up its leading lines, and leaving the spandrels an expanse of pure untouched stone, illustrated only by shadow and air-tint. With the bright sunlight which illumined the interior on the day of our flying visit, it would be difficult to find anything more truly noble in effect than this interior as at present restored, with its large and grandly proportioned windows of the finest period of tracery, shedding a flood of light over the beautiful triforium and deeply moulded arcade. The remains of the old glass, in one of the north clearstory windows especially, show how light-toned and bright glass such as this, with no heavy masses of colour, assists the aerial perspective of such a building. A beautiful result might be obtained if the whole of the large clearstory windows could be filled with glass of the same type, and on the same light scale of colour; and it would be a righteous work also if the parts of the east window, which are now filled with tawdry modern glass of the worst period of the Revival, were restored by a skilful and artistic hand in a style in keeping with the older portions. A like sentence might well be passed against the west window, which not only disfigures the cathedral, but is a means for the propagation of bad taste in a small way, being habitually pointed out by the ignorant custodians of the building as "a fine window;" concerning which it is sufficient to say that the date thereof is about the end of the last century. What, in the course of the restoration, is to be done with the episcopal throne,—that noble specimen of Mediæval woodwork? Let us express a hope that when re-decorated, as it inevitably must be to some extent, the same counsels which have already guided the rest of the work may prevail; and that colour, if applied, may be applied delicately; gilding used with a wise and cautious discretion; and that there may be no violent eruptions of red, blue, and gold, in unnecessary deference to Middle Age precedent. The small and beautiful late chapel adjoining the south aisle of the choir stands as a warning in this respect. This has been "restored" in point of colour, of which we are informed sufficient remains were left to form an exact guide; and what is the result? A tawdry mass of strong blue, strong red, and gilding splashed on in true gin-palace decoration style. If the designers of the original chapel really coloured it in this way (which we take leave to question), all that is proved is that they did not know the value of their own work when they had produced it. Slightly decorated by gilding, perhaps, and with the elaborate and delicate stone carving left to tell its own tale, this little apartment would be quite a gem (allowing for the decadence of the style); treated as it has been, it becomes vulgarised into a mere piece of coarse tawdriness. If walls are to be covered with colour at all, there is surely something more refined to be invented than these perille efforts in two continually repeated colours and gilding. Why is a combination which even in a theatre, in the present state of decorative knowledge, would be accounted too strong and glaring to escape the charge of vulgarity, to be regarded as the normal scale of coloured decora-

tion for a church, with its soberer and more solemnising associations? Those of the public who are maintained by modern-mediævalising fancies perceive the incongruity, we imagine, very plainly.

One regret to find still retained at Exeter the system, now happily abolished in several at least of our cathedrals, which degrades these noble monuments into show-places, and leaves the visitor at the mercy of the half-educated official who insists on "showing him over," and telling him gratuitous architectural falsehoods—"gratuitous" only in one sense, he it understood. If the showmen at these places understood their own interests, instead of insisting that "nobody can go round without the verger," they would put up a tariff, "half-a-crown charged for attendance round the building, and five shillings for being let alone." They would get plenty of five-shilling "tips." But why do not deans and chapters put an end to this useless nuisance?

Except at the Cathedral, things architectural seem to be very quiescent at Exeter. The Church of St. Michael and All Angels, built three or four years ago from the designs of Mr. Hawkins, seems to be regarded as the point of attraction in modern architecture, of which the interior (arranged with narrow side aisles for passage only) is the best portion, and is solid and monumental enough in character, and satisfactory in the nature of the carved work (of French type); but the whole rather too like an imitation of the manner of a more eminent modern Gothic architect. The treatment of the nave buttresses externally is good, but the tower and spire cannot be called a success, being at the same time weak in general composition and deficient in refinement of detail; the latter remark applying, indeed, to the whole of the exterior treatment. It is almost necessary to say so much, because it appears that the church is shown and held up in the neighbourhood as a model of modern church architecture,—which it certainly cannot be said to be. The new Albert Museum, not far from the Cathedral, is a creditable building in French Gothic, containing among other things a very well-arranged collection and classification of the building stones of Devonshire and one or two of the adjoining counties. The collection of birds is worth looking at, on account of the cases of splendidly-mounted specimens of falcons and some other birds, lent by an amateur, in which the birds, instead of being stuck formally on pedestals, are represented with great spirit and fidelity in their natural actions and attitudes,—flying, fighting, &c.,—somewhat after the spirit in which Audubon used to make his drawings of birds. One group is an exact and very clever copy of the picture of two hawks fighting for a teal, painted some years ago under the title, "Just Out,—the Tail of a Teal;" the artist's name has escaped our memory.

The Exeter railway station is so commodious and roomy that the traveller along this line is tempted to inquire why the same qualities cannot be extended to the construction of the company's carriages; more particularly when he contrasts the price paid for his ticket with the discomfort of his conveyance. The rates of fare are exceptionally high on the Bristol and Exeter line; the carriages, the second class particularly, exceptionally (we had almost said disgracefully) cramped, mean, and uncomfortable. Persons living mostly in narrow-gauge regions are wont to associate ideas of excessive comfort with broad-gauge travelling. The fact is the reverse; what is given in breadth is saved in length in the latter carriages, where the seats and the space between them are so economically narrow that all comfort is out of the question. A "London and North-Western" carriage is a paradise by comparison. As we are on a railway grumble, let us ask once more, what we suppose every one going through Bristol asks,—Whether there is anywhere to be found an important central station so egregiously and ingeniously inconvenient, comfortless, shabby, and dirty, as that of Bristol;—where the stations of three different lines are combined at three different angles to one another, one of them only to be reached by a scramble across a network of rails at an oblique angle; where the booking offices are hidden away in the most unlikely corners, with no indication of their whereabouts; and where all printed announcement as to which station is which, seems to be thought quite superfluous, and strangers to the place may be very thankful if they find their way by accident to the right spot just in time to see their train off. If this is not an "architectural" subject, it

ought to be; for a place with such a meeting of railway traffic as at Bristol ought to have a new station, planned in an intelligible and reasonable manner.

BITUMEN, AND ITS PRACTICAL APPLICATIONS.

THE application of bitumen interests so many of our readers at this moment, that we have thought it desirable to translate some observations on the subject published in the *Bulletin de la Société d'Encouragement pour l'Industrie*, August, 1872:—

Bitumen has been known from a very remote antiquity. In ancient days, at Babylon, and elsewhere in the East, it took a place amongst building materials; but the mortars and cements, first skilfully elaborated by the Greeks and Romans, have found greater favour in modern times. After having been abandoned for ages, the application of bitumen to purposes of construction was revived about the year 1849. Bituminous cements were then tried in France for covering footways and roofing vaults and arches. The success which attended these experiments attracted public notice, and cements of this description came speedily into vogue.

The rage for bitumen, and the bituminous compounds, all and sundry, which made their appearance about this time; the impetus thus given to the trade, and its varying fortunes and descents, are within the personal recollections of many of us. Briefly, besides the cements formed of native asphalt from the mines of Scyssel, and of bitumen from Lobsann, there appeared a multitude of similar compounds, made with spurious bitumens obtained from the refuse of the gasworks, which were foisted upon the public as equal, or superior, to native asphalt. The failure of most of these substances bade fair to ruin the new industry; but time and perseverance have shown the utility of certain of them, and we have now natural and artificial bituminous cements, each having a recognised place and uses in construction. The success which attended the employment of asphalt as a covering for pavements and footways generally, naturally suggested its application to streets and roadways, and many unsuccessful attempts were made in this direction. Not until twenty years later was the difficulty practically solved by the formation of the roadways of "compressed asphalt," which now covers some five thousand running metres of the Paris streets, and which our neighbours across the Channel began about the same time to use as a substitute in the streets of London for "macadam," of which they, like ourselves, had experienced the inconvenience.

Bitumen, which would appear to be the result of a subterranean process of distillation of organic matter or of coal or lignite, is still involved in considerable obscurity as to its origin. Numerous theories have been broached to account for its formation, and impregnation with various matters found in combination with it. Moreover, chemically considered, it is a very complex substance, formed of various compounds of hydrogen and carbon. Just as fatty matters are made up of olefin and stearin, so bitumens consist of a highly carbonised solid substance, combined or amalgamated with certain essential oils of more or less volatile character. When exposed to the air, these oils evaporate slowly, giving rise to the varying states—solid, viscous, and liquid—under which bitumen is found in nature. Originally, the terms bitumen, mineral-pitch, mineral-tar, asphalt, and the like, were applied rather vaguely to denote the degree of consistency of the material. At present, in accordance with the system of nomenclature proposed by M. Milo, in 1861, the term *bitumen* is applied to the bituminous principle in all compounds of this class, whilst *asphalt* is restricted to those compounds of bitumen with calcareous matter, which form the basis of the cements in use for paving purposes, and the substance of the "compressed asphalt" now employed on our carriage-ways.

Bitumen is widely distributed in nature. It is met with in various states:—1. Free and unmixed. 2. In a state of admixture with quartzose sand or earthy matters. 3. Impregnating schists. 4. In a state of combination, or of more or less intimate admixture with calcareous rocks, in which state it constitutes the substance we know under the name of asphalt.

Springs of pure bitumen have been known from a very high antiquity; but those which would seem to have been formerly very abundant

are now much reduced, and their yield gets smaller year by year. Those of Judon, which furnished the bitumen employed at Babylon, give scarcely any yield; that of Gabian, in Heralut, which formerly gave 1,500 kilogrammes per annum (3,300 lb.), is now almost exhausted; and the famous "pitch fountain" at Clermont is well nigh dried up. It would appear, however, that in China the supply is still abundant. Near the Cape Verdes, the bitumen at times overflows the surface of the tide; and in certain places in the Holy Land it rises to the surface of the water in a sort of scum, which is drifted to shore by the wind. In the island of Trinidad, on the bed of an ancient lake-basin now dried up, are found masses of bitumen solidified by the evaporation of their essential oil or by the addition of foreign substances. Bitumen in a pure, unalloyed state, as it here occurs, forms, as we have said, the basis of all bituminous cements.

At Seyssel, at Bastennes, in Auvergne, and in numerous localities in France, Spain, and Switzerland, may be found beds of sand impregnated with bitumen. These *mollasses* are generally in the vicinity of deposits of asphalt, most frequently to be seen. The bitumen is extracted from the sand by being in water, during which process it rises to the surface like a scum. Lastly, bitumen, in a vaporous as well as a fluid state, appears to have made its way, under conditions at present unknown, into the marls, schists, and jurassic-limestone beds of the lacustrine epoch, in which it exists in a state of admixture, perhaps even of combination.

Bituminous schists are extremely plentiful in the coal-basins of Aatun (Saone-et-Loire), of Buxiere (Allier); and are also found in Provence, in Dauphine, and doubtless in many other localities. Calcareous bitumen appears to be of rarer occurrence as it also is of greater industrial utility. In France, we know at present but of four or five deposits susceptible of being advantageously worked. The oldest and best-known are at Seyssel, Seyssel-Volant, the Val de Travers, in Switzerland, and at Maestri, in Spain. Latterly some deposits have been opened in Haute-Savoie, and several beds near Alais, which, in the excellence of the yield, bid fair to rival that of Seyssel or the Val de Travers. Some trials have also been made in Auvergne, in the neighbourhood of Clermont, but the proportion of bituminous matter in the limestone is too variable and uncertain hitherto to admit of its being worked to profit.

Bituminous limestone, or asphalt properly so called, has the appearance of mortar. Its colour is chocolate, of a shade depending upon the proportion of bitumen contained in it. When broken, it shows a fracture of a lighter colour, such as a scratch with a knife leaves on the surface of chocolate in cake. The grain is fine, and a close inspection shows that each grain of limestone has a separate bituminous envelope; each grain is thus parted from its neighbours by a coating of varnish, which varnish binds the whole together firmly in mass. In hot weather this varnish becomes soft and sticky, and often times the weight of a block in itself is sufficient to cause rupture. In winter, on the contrary, the bitumen is dry, and the mass presents a remarkable degree of hardness and impenetrability. When heated on an iron plate to a temperature of 170° to 180° Cent. (335° to 350° Fahr.) asphalt decerpitates and falls to powder.

The proportion of bitumen in asphalt ranges from 15 down to 7 or 8 per cent. Generally speaking, those from the Val de Travers and Haute-Savoie give an average of 12 per cent. Seyssel asphalt yields 8 to 10 per cent only. In the works in the department of Gard, which are in a series of superposed beds, the proportion varies considerably, but the percentage is uniform throughout each individual bed. The richest yield 15 to 20 per cent, and the poorest 7 to 8 per cent. But the proportion of bitumen even in the richest beds is not sufficient to cause them to soften in hot weather. When after breaking the asphalt into 3 in. or 4 in. fragments, we heat it to a temperature of 130° to 140° Centigrade, it falls to powder, as we have before said; and if the temperature be raised still higher, the bitumen passes off in the form of a thick smoke. If, on the other hand, we cast the powdered asphalt into pure molten bitumen, it dissolves, so to speak, and as much as 90 per cent. may be added before the mass assumes a paste-like consistency. Upon this singular property is based the process of manufacture of bituminous cements.

Formerly, Bastennes, in the Landes, and Lob-

sam, in the Bas-Rhin, supplied a sufficiency of bitumen in a fluid, or, at any rate, in a viscous state, for this purpose; but now the springs appear to be nearly exhausted. Pure bitumen can only be obtained by boiling the *mollasses*, or bituminous shales, for a lengthened period,—say, ten or twelve hours. This is the mode of procedure at Seyssel; but it is costly and incomplete, and the bitumen thus procured always retains a certain proportion of sand. Even at Seyssel, where the shale is in close proximity to a rich deposit of asphalt, the process has been well-nigh abandoned; and there, as elsewhere, the native bitumen has been given up for dry bitumen from Trinidad, dissolved in mineral tar, obtained by a second distillation of certain bituminous shales found in considerable abundance in the department of Air.

To 800 kilog. (1,760 lb.) of Trinidad bitumen are added 250 kilog. (550 lb.) of mineral tar, and the whole is boiled, stirring well the while, for the space of ten hours. In this way we get what is called "refined bitumen," which now takes the place of that from Bastennes and Lobansam.

To form the bituminous cements used for paving, &c. we throw into the molten bitumen aforesaid, by degrees, and stirring well the while, the fragments of asphalt reduced to a powder, either by the action of heat or by mechanical pressure. The latter method is to be preferred, as it precludes the possibility of the bitumen getting burned. 100 kilog. (220 lb.) of refined Trinidad bitumen will thus take up 1,400 kilog. (3,080 lb.) of powdered asphalt. After six or seven hours' cooking, the compound assumes a paste-like consistency, and is then run off into moulds bearing the trademark of the manufacturer. In this way are obtained the blocks in which asphalt is offered for sale. Formerly it was the custom to melt these blocks on the spot, with the aid of a portable furnace, and the addition of six or seven parts by weight in the hundred of fine gravel. After melting, 60 to 70 per cent. of pure bitumen was stirred in, and the mixture laid on hot. But the smoke and the disagreeable smell thus emitted were productive of serious inconvenience in the Paris streets, and hither to the cement has been amalgamated with the sand or gravel at the contractor's works, and brought to the required spot in covered conveyances, provided with small coke furnaces, for keeping the contents at the requisite temperature. The latter are stirred from time to time by means of an "agitator," worked with a rotary handle. The success which attended the use of bituminous facings for footways naturally led, as we have already observed, to a desire to apply the material to carriageways equally, either in the form of concrete of small stones embedded in some bituminous cement, or by flagstones, cemented together with asphalt. But, in each case, the alternations of temperature and humidity destroyed the setting, and the essays proved unsuccessful. Numerous other attempts proved equally abortive, and it was only after many long years of experiment that it was found practicable to form roadways of compressed asphalt, such as now covers over 10,000 square metres of the Paris streets, and is rapidly coming into favour in England. It should be stated that, although the experiments at Paris were unsuccessful, at Seyssel and at the Val de Travers the roadways formed by the continuous droppings of fragments of asphalt have a smooth, homogeneous surface, very compact and very durable. This fact suggested the application of the material in its natural state, as in the roadways now laid with "compressed asphalt," as it is termed.

For this purpose the asphalt is reduced to a fine powder, and heated to a temperature of 130° to 140° Cent. (260° to 280° Fahr.). It is spread out in layers, of 2 in. in thickness, over a concrete flooring, and well compressed by ramm- ing, until cool. It forms a compact mass, as homogeneous in its powers of resistance as the rock itself in its natural state. At first, the asphalt was pulverised, by breaking it into 4 in. or 6 in. fragments, which were placed on strongly-heated iron plates. This method was only applicable to the richest asphalts, as that of the Val de Travers, and the bitumen often got burned in the process. Now-a-days it is pounded cold by a very ingenious mechanical arrangement, equally applicable to any sort of asphalt, so long as it contains 7 or 8 per cent. of bitumen. The powdered asphalt is placed within large horizontal drums of plate iron, revolving over portable furnaces, which, with the aid of a

system of rails and turntables, can be run under them as required. When the powdered asphalt has acquired a temperature of 150° Cent. (300° Fahr.), the portable furnaces are withdrawn, and in their place covered trucks, with double sides, to retain the heat, are run in under the drums, to receive their contents, and to wheel them off for immediate use. The loss of temperature in the trucks is small, and on arrival at its destination the powder is spread out and rolled with slightly-heated rollers into the requisite state of pulverisation.

The success of the operation depends much upon the state of the weather. In cold, and particularly in damp, weather, the powder cools too quickly; it then binds well at the surface only, and when the surface goes the road is destroyed.

Very many roads which have been made or repaired in unfavourable weather have lasted a very short time. Now, in Paris, operations of this description are no longer performed in winter,—all alterations and repairs are deferred until the summer, the stopping of holes and the like being done provisionally with boiling pitch, until the weather will admit of their execution in a proper manner.

Roads formed of "compressed asphalt" are cheaper in respect both of prime cost and of maintenance than ordinary macadamised roads. They produce less noise, less mud, and less dust. The resistance to traction upon them varies much according to circumstances. In winter it is less than over a flagged road; in summer-time, on the contrary, it is greater than on a paved road. Their greatest defect is that they become very slippery when covered with a thin coating of mud; they should therefore always be kept clean swept. Their greatest practical inconvenience is, as we said, that repairs can only be effected at particular seasons.

THE TEACHING OF PHYSICAL GEOGRAPHY.

At the recent Brighton Congress the Rev. Edward Hale, of Eton College, read a paper "On the Place of Geography, Political and Physical, in Education." The author gave it as the fruit of long experience as a teacher, that the rudiments of sound education should form two branches, viz., human and natural philosophy,—the one taught by literature and history, and the other by mathematics, physics, and science. Geography, physical and political, should form an essential part of rudimentary education. He considered geography, in its broad sense, to be one of those elementary studies absolutely necessary to the proper study of the history of man and nature. Having been for many years a teacher of modern history, he had found boys absolutely ignorant of the commonest geographical facts, and, therefore, unable to understand the political importance of treaties affecting the boundaries of countries or exchange of colonies. It was not so obvious that physical geography should be the groundwork of science-teaching. All parents are aware of the inquisitiveness of children, and must have observed also how, after school life begins, this inquisitiveness seems to vanish. The author's opinion was, that it is generally stifled by the evil geni of Latin and Greek grammar. Its disappearance did not prove that it was dead: with warmth and gentle rains it sprouts afresh, and this stimulating power is afforded by physical geography. As soon as the first principles begin to be taught, i.e., the phenomena of day and night, summer and winter, boys become interested at once,—the intellectual cravings of childhood revive and are being satisfied. At the end of the author's first lecture to his class on this subject, boys would remain behind, asking for further information, "Why is this?" or "Explain this again." Instruction in physical geography, in the author's own practice, begun with these astronomical relations of the globe. These lessons were followed by others on the first principles of heat, the effects of solar heat on the earth, the tides, winds, and currents, evaporation and rain, the first principles of geology, changes in the physical features of the earth, volcanoes, ice, rivers, the formation of chalk and coral, and the distribution of plants and animals. If, at first, the natural inquisitiveness of the boys is excited, at the end they feel their intellectual powers. They see how, from the knowledge of certain facts, the great laws of Nature are deduced; in short, the reasoning faculties are excited and strengthened. Boys who,

From some cause, are unable to appreciate the refinements of grammar, suddenly awakened, as it were, when first taught the principles governing the phenomena of Nature. A great moral good is effected in such boys. They are enabled to maintain that self-respect they were in danger of losing under the feeling of inferiority in other departments. An objection may be made against physical geography, that it is too discursive. The author admitted that a boy's training should be thorough, but this requirement was not injured by the study in question. The want of thoroughness is seen when boys are successively put through courses of astronomy, chemistry, mechanics, &c., anything like a thorough knowledge of which, within the time they are taught, being impossible. But the principles of such of the sciences as are necessary to the study of Nature may be thoroughly taught, and can be properly understood by a boy of fair intelligence. The author then described the method of teaching which he followed with his class at Eton, which consisted of about thirty boys. He gave them no text-book. Each boy has an atlas of physical geography; he himself drew his information from the works of Humboldt, Herschel, Tyndall, Murchison, Reclus, and, above all, the "Principles of Geology" of Lyell, to which he made his principal references. His apparatus consisted of wall-maps, photographs, and a microscope, to which he was preparing to add a small but good geological museum. He required each boy to bring a large note-book, with each page folded in the middle. Commencing his lecture by stating, first, its immediate subject, he dictated from his own notes an abstract of its first division, which each boy writes on one half of his folded page. He then enlarged on and illustrated his subject by facts, putting, at the same time, frequent questions to the boys. On the other half of their pages they make their notes, and, at the end of the lecture (lasting nearly three-quarters of an hour), he referred them to the authors and the chapters of their books which treat more fully of the subject. After every two lectures he requires each boy to bring an abstract of the lectures, and for this marks are given, with additional marks for good diagrams; and after every eight or ten lectures a prize is given to the boy whose aggregate marks are highest. He believed that some sort of field instruction would be a most valuable addition to his lectures, which should include the teaching of the use of instruments.

In the course of the discussion which followed, approval of Mr. Hale's views was strongly expressed by several speakers.

"DE LUNATICO INQUIRENDO."

MR. HOLLOWAY'S scheme for building and endowing a hospital near Windsor (of which illustrations of the first and second promoted designs have already appeared in our pages) will probably add a more than ordinary interest to Sir James Cox's speech at a recent meeting of the Medico-Psychological Association, held in the rooms of the Royal Society of Edinburgh. Sir James Cox (the president), it is well known, is a distinguished physician and a commissioner in lunacy for Scotland; he has also devoted the labours and researches of a long series of years to the important questions arising from the treatment of lunacy; and it is remarkable to find that his opinions are tending more and more in the direction that the results of asylum treatment, even in its highest phases, are not sufficient to cope with the portentous growth of insanity in our population. We have only room for one or two quotations, which, however, are deserving of attention, as coming from a practical authority:—

"After quoting a variety of statistics from the returns of lunacy in England and Wales, he said, on the whole, everything considered, I fear we must come to the conclusion that during the last twenty years medical science has not succeeded in effecting any increase in the proportion of recoveries, or any decrease in the rate of mortality among insane patients in asylums. What, then, is the object sought to be attained by the establishment and constant enlargement of asylums for the insane? The answer to this question involves the consideration of many important points. We have gradually become so accustomed to the extension of asylums whenever they are full, that few stop to inquire whether this is the proper course to pursue. But a little reflection will suffice to show that the institution of asylums is merely an expedient to counteract an evil which has its origin in remote and complicated causes. When the Lunacy Acts were passed, a belief was extensively prevalent that the establishment of asylums would powerfully contribute to check the growth of lunacy; chiefly by the numerous cures they would effect, and by the difficulties they would place in the way of the propa-

gation of the malady. We have seen that this hope has not been realised, but that, on the contrary, the number of lunatics has been greatly increased. It is not enough the more frequent occurrence of insanity, if we may so interpret the increase in the number of admissions, and partly through the predominance of admissions over discharges and deaths. Even if we accept the latter cause as sufficient in itself to account for the increase in the number of lunatics, and regard their accumulation as simply the result of life prolonged through improved treatment, it is difficult to see in this explanation any adequate reason for the constant extension of asylums. The question still remains,—What have they accomplished towards diminishing insanity, either by repressing its growth or by promoting recovery? Of course, it is impossible to call in question the fact that a large proportion of the patients admitted into asylums are restored to sanity. But this fact, nevertheless, leaves totally unaltered the problem how far recovery is due to any special influence of asylum treatment, or simply to the recuperative powers which nature displays whenever the circumstances which produced the malady are removed or neutralised, wherever that may occur."

Sir James proceeds to deal with the common argument in favour of asylum treatment, that recovery follows in a much higher ratio in the cases which are admitted in the earlier stages of the disease. "It cannot be denied," he says, "that such is the case." And it is not impossible that the plain deduction, that recovery was due to the removal of the patient to the asylum may also be correct. "But it will be observed," he adds, "that this is an assumption, in support of which it is very difficult to bring forward proof."

"Nobody can tell whether recovery would not equally have taken place had the patient not been sent to an asylum, and had simply those other circumstances which have been adopted which are resorted to in many other maladies—such as a judicious administration of purgatives, tonics, or other drugs, with proper regulation of diet, and change of scene and surroundings. On the other hand, when it is pointed out that recovery rarely follows the admission of chronic cases into asylums, it is impossible to doubt the fact. But when it is maintained that recovery would have followed had admission taken place at an earlier stage of the malady, we have here again an assumption which is beyond the power of proof. In admitting this assumption, we should be bound also to admit that all patients received into asylums in the early stages of insanity invariably recovered. But we know from experience that this is not the case. Even where there is no apparent organic disease, where the malady manifests itself as simple excitement or depression, or where there is merely delusion without either excitement or depression, we find the malady not infrequently requiring treatment at however early a stage the patient may have been brought to the asylum."

Sir James Cox does not, however, undervalue the usefulness of asylums:—

"Every one must admit that asylums, under the exigencies of modern social existence, are indispensable institutions. They meet a great want, and, moreover, they meet it, as a rule, in an admirable manner. Therefore, I beg it may not be supposed that I am arguing in any way against other asylums or their management. My purpose is to point out what I consider to be the proper application of these establishments, and to warn against their unreasonably use. I have often in visiting them been inclined to question the propriety of detaining certain patients. There was no doubt as to the existence of insanity, but there was, nevertheless, the doubt whether it was such an extent as to necessitate continued detention. From the superintendent being of opinion that such was the case, or from other difficulties in the way of discharge, the patient was left. At a future visit I have found him (the patient) much more confirmed in his delusions, or more liable to excitement, or, perhaps, incoherent. This result, looked at from one point of view, would seem to confirm the propriety of detention, but from another it may be regarded as bearing out the doubt that was felt. One thing, at all events, was clear; asylum treatment, whether successful or not, had failed; and, whatever the result, whether, of course, remain unknown; but it has always appeared to me very questionable reasoning to maintain the propriety of detention from its unsuccessful results. However, it is not uncommon to hear it asserted that even where asylums do not cure, they at all events improve and humanise. It cannot be denied that this is frequently the case; but, on the other hand, there is not wanting evidence to show that association with the insane has occasionally a degrading and deteriorating effect."

We should feel inclined to substitute the word "invariably" for "occasionally," in the last sentence, if Sir James means to signify that perfectly sane patients were compelled to associate with insane ones. But it is not clear that such is his meaning. Moreover, it is not asserted that such a deteriorating or degrading effect may or could arise from the contact of a couple of innocent lunatics. Under certain circumstances, indeed, we should fancy the association not only to be quite harmless, but actually beneficial! We remember hearing a story many years ago of a rencontre which happened between three crowned heads and a harmless lunatic, and which occurred during the occupation of Paris by the Allied troops in 1815. Three military gentlemen were walking one morning in the Jardin des Plantes, when its beauties were quite scientifically pointed out and described to them by an oddly-dressed and singular-looking personage, whom they supposed to be one of the under-gardeners. He dwelt with peculiar emphasis, it was remembered, on the beauties of the Indian trees,—the lotus, the palm, the banyan tree, &c.; and, after concluding his botanical survey, he turned to his audience and politely requested the strangers' names. "I am

the Emperor of Russia," said one of the party. "Indeed! ah! and this gentleman?" "He is the Emperor of Austria," was the answer. "Oh! Must I also understand," pursued the singular querist, "that this gentleman is an Emperor too?" "No," replied Wilhelm, smiling (who then saw Paris for the first time), "I am simply the King of Prussia. But," continued His Majesty (with a touch of that grave humour which is characteristic of his race), "will you be so good as to tell us in return the name of our distinguished *otomane* to whom we are at present so much indebted?" "*Monseigneur mon frère*," replied the eccentric botanist, drawing himself up and laying his hand on his heart, "*Messieurs mes frères, je suis le Grand Mogul!*" Alexander of Russia, who frequently told the story afterwards, used to add that the Great Mogul was probably the happiest monarch of the four.

There is more in Sir James Cox's valuable address deserving of study. Although leading strongly to the curative effects of home treatment, he nevertheless admits that "the great advantages of asylum treatment are its convenience and its economy." He is silent, as far as we observe, respecting the vital question of dangerous lunatics, and the method of their treatment; but the following observations are as valuable as they are just.

"There cannot be a doubt that the inspiration of genius, and the knowledge acquired from experience, will often point the way to successful treatment in specially difficult or obscure cases; but, as a rule, recovery from an insanity is due far more to an adherence to the broad rules of hygiene than to any peculiarity in the treatment. In supplying abundance of food and clothing in providing comfortable lodging and bed, in giving proper attention to cleanliness, and in affording ample means of varied occupation and exercise in the open air, lies the great secret of the successful treatment of insanity. Purgatives, hypnotics, narcotics, and tonics are useful as auxiliaries; but a comfortable meal is the best of sedatives, and abundance of exercise the best of hypnotics."

So that it would appear, in Sir James Cox's estimation, that the proper and most philosophical treatment of the insane,—like that of other helpless and dangerous increments of our population,—is more and more verging on the simple yet beneficent principles of public health.

SCHOOL BOARDS.

Erith.—The Erith School Board have appointed Mr. Herbert Ford, architect, for the erection of suitable buildings to accommodate 575 children, also residences for the master and mistress of same, at Erith, Kent.

Dromfield.—It was resolved, at the last meeting, that Messrs. Flockton & Abbott, architects to the Board, be requested to prepare the necessary plans and estimates for intended schools and master's house in Cross-lane, such estimates to include the requisite fittings and furniture for the school. It was also resolved that Messrs. May & Lucas be requested to examine the plans and estimates before they be submitted to the Board for approval.

Staplehurst.—This Board has held a special meeting, to consider in what way to deal with Mr. Bridge, whose tender for the erection of the schools, namely, £2,000, was accepted, out of six, although the Board were somewhat surprised to find the lowest tender exceed 4,000. The Board have recently received four new tenders; the estimates are not to be disclosed until next meeting. It was remarked that there was a superfluity in the ornamentation of the adopted plan, which rendered it costly, to which it was replied that it was desirable to erect a school of which they might not feel ashamed, either internally or externally. Eventually a resolution was carried unanimously, to the effect that no tenders be opened, and that Mr. Lewis (the architect) be requested to obtain from Mr. Bridge the amount to which his tender would be lowered by the reduction of the ornamentation. It would then be compared with the new tenders, and should his figures approximate to them within a reasonable sum, his offer would be accepted.

Reading.—Two reports of committee were read. Amongst the subjects referred to were the following:—Plans of the new school buildings in Silver-street had been pronounced "satisfactory" by the Education Department. The alterations to the temporary school in Silver-

street required by the Education Department would cost about 25*l.*, and therefore the committee did not think it advisable to incur this expense. With reference to the new school proposed to be built at Releigh, correspondence had taken place between the Board and the Education Department, and it was deemed advisable to postpone the whole question for the present. Twenty-two tenders had been received for the new school in Silver-street, and the following had been accepted:—Mr. Charles Waite, brick and slate work, &c., 926*l.*; Mr. A. Shepherd, carpenter's work, 392*l.* 15*s.*; Mr. Pecover, iron-work, 92*l.*; and Mr. Sumner, plumber's work, 18*l.* 10*s.*; total, 1,489*l.* 5*s.* The reports were adopted.

Southampton.—The Works Committee reported that after advertising for tenders for the erection of schools in Bevois Town, estimated to accommodate 700 children, the following had been received:—Messrs. Laver & Rowland, 3,595*l.*; Messrs. Bull & Sons, 3,627*l.*; Messrs. Reynolds & Eldridge (Brighton), 3,740*l.*; Mr. H. Sanders, 3,849*l.*; Mr. S. Stevens, 3,865*l.*; Mr. J. Nichols, 3,887*l.*; Mr. J. Crook, 3,920*l.*; Mr. Gambling, 3,950*l.*; Mr. Jas. Dyer, 4,045*l.* 10*s.*; Messrs. Martin & Son, 4,195*l.*; and Messrs. Dunkley & Son (Edgington), 5,200*l.* 10*s.* The committee recommended the Board to accept the lowest tender, viz. that of Messrs. Laver & Rowland. In respect to the site for a school in St. James's district, the committee instructed the Board's surveyor to bring up an estimate as to the cost of erecting suitable schools. Mr. W. C. Westlake moved the adoption of the report, and reminded the Board that the acceptance of the contract for the schools at Bevois Town would be subject to the approval of the Education Department. The amount was larger than they anticipated, but the rise in the price of material and labour had been recently very great, and accounted for a large portion of the increased cost. The proposition to accept the tender was then carried, subject to the surities offered proving satisfactory, and the matter was referred to the special works committee.

Worcester.—The foundation stone of the Board's schools at Hounds-lane has been laid by the chairman. The architect is Mr. E. A. Day.

GLASGOW: STOBECROSS DOCKS.

We understand that Mr. Taylor Shipley Hunter, of Edinburgh, has been accepted by the Clyde Trustees, after much consideration, as contractor for the first portion of the above docks. At first, eleven contractors gave in offers, and from that number four were chosen to give estimates for alternative designs, when Mr. Hunter's, being the lowest, were accepted. Mr. Hunter engages with a somewhat gigantic work, but his previous experience with similar undertakings gives every promise of the Stobecross Docks being constructed satisfactorily. In 1859 he built the eastern harbour at Granton, near Edinburgh; afterwards the Queensferry Railway and Harbour; and, latterly, has been engaged in the erection of the Chickens Light-house, Isle of Man. It is calculated that it will take nearly twenty years to complete the whole of the Stobecross Docks; but Mr. Hunter has undertaken to execute the first portion in two years, at a cost of 160,000*l.* The foundations for the dock-walls are to be of concrete cylinders, while the walls are to be freestone, from the Craigleith quarries, near Edinburgh, of which Mr. Hunter is lessee.

THE ART OF GLASS STAINING.

In one of the Cantor lectures, by Professor Barff, to which we referred in our last, the lecturer said,—I am about to speak to you on the subject of staining glass with metallic oxides. We notice a considerable difference in the ancient glass which adorns the old cathedrals of this and other lands, and the glass which was made some twenty or thirty years ago. We notice this difference in the blues and reds, but more particularly in the latter, and we ask frequently in what does this difference consist? I have already noticed this point, but it is now my business to go into it rather more fully. The texture of the ancient glass is very different from the texture of modern glass, and I shall give some experiments later on to show this, and you will need no further remarks, as the illustrations will speak for themselves. But when old ruby glass is examined, you find that there is a thicker

coating of the colouring matter upon it than there is upon modern ruby. The ground of colour is different, i.e., the white glass—that I have already shown—and to that is owing, in great measure, no doubt, the lustre of the ruby. But it appears as if the operation of dipping and coating had been repeated several times—as if the glass ruby had been taken and dipped into the pot, and coated with white and ruby glass more than once. It appears as if the coloured coating had been put on the outside and not on the inside, and that after the glass had been dipped into the ruby it was again dipped into the white, so that strata of white glass are formed between the thin films of ruby glass. That would very materially increase the brilliancy of the effect produced by transmitted light. All the old ruby glass is remarkably thick, and, no doubt, in former times, those who made windows took the greatest possible care in firing their ruby glass, and a great deal depends upon the firing. I have here a disc of ruby which was lent me to-day by Messrs. Powell, in which we have portions of it perfectly white; but if this white glass is fired carefully it becomes ruby, and if this ruby, which is perfectly red on this side, is overfired, it becomes almost opaque. Great care is therefore necessary in firing ruby glass. In some instances glass painters, if they are not careful in using a flux with their painting colours which is sufficiently soft to run down before the temperature rises so high as to affect the ruby glass, spoil their ruby. Glass painters know that, in spite of all their care, this does sometimes happen, and that ruby becomes so dark with the firing that they have to reject it, and paint fresh pieces. I mentioned, I think, that ruby glass is usually coloured with sub-oxide of copper; it is also coloured with oxide of gold. I have here two specimens, which have been lent me, of ruby glass, obtained from the heating of an almost colourless glass. I shall show you those presently by the aid of the electric lamp, and you will see that one piece is colourless, whilst that which has been heated has become of a beautiful ruby colour.

Before leaving the subject of ruby glass, I must say one word about splashed ruby. As many of you, no doubt, are aware, there are some pieces of old glass taken from French windows, I believe, in which there is clear, white glass with dashes of ruby upon it, just as if the maker had taken ruby glass in a liquid state, and dashed it on the white glass. This is called splashed ruby. The way that can be imitated, and no doubt, the way in which it was originally obtained is this. Portions of this copper ruby are broken up into small pieces and thrown upon the iron implement, which is called the *marbre* or *marver*, and which is used in the manufacture of flint glass. The workman then gathers white glass from the pot on the end of his blow-pipe, and rolls the hot glass on the *marver*; the small pieces of ruby adhere to it, and are softened by the heat. The mass is then exposed at the mouth of the glass-pot, and the pieces of ruby melt and become perfectly united with the white glass and spot over its surface. When the mass is in the proper state it is blown and made (as already described) into a disc or cylinder, and the spots by this operation become elongated, and produce the same sort of effect as would be obtained by throwing a red liquid obliquely on a sheet of white paper.

Another point to be noticed in connexion with ruby glass is that we do not always get a ruby colour with the oxide of copper. Sometimes the sub-oxide becomes oxidised into the higher oxide, and that higher oxide gives a green, not a ruby, colour; so that we get an intermixture of green and red sometimes, and also purplish and bluish tints. Specimens of these I shall show you by and by.

The blue glass which is considered by many to be so beautiful, this sort of purple blue, is stained with oxide of cobalt. I have arranged an experiment or two to-night, to show you how, by running down certain mixtures which we have here, the composition of which I will tell you of presently, we are enabled to obtain coloured glass. Of course, in so short a time we cannot obtain it in a state perfectly homogeneous; but, at all events, we shall be able to show you how blue glass is obtained. Green glass is coloured by various metallic oxides. For instance, even as I have already mentioned, in a certain state of oxidation, iron colours glass green, and the green colour of ordinary bottle glass is owing to the presence of protoxide of iron. Green is also obtained with other

oxides of metals. We have here a beautiful piece of green glass, which goes by the name of signal green, because it is used for railway signal-lamps. It is coloured by the higher oxide of copper, the protoxide, not the sub-oxide. Oxide of chromium also colours glass green, and it has a very powerful colouring effect. Opaque greens are made with it for enamels, and some transparent greens; for if this opaque green be coated upon white glass, we have a similar effect produced to that which we have when the ruby glass is coated upon white; a coated green is obtained. Then, with regard to yellow glass, there are different kinds, which I shall show you presently. Some cold yellows are obtained with sesquioxide of iron, the oxide containing more oxygen than the protoxide. Another yellow is got by silver stain. It is said that the ashes of certain woods colour glass yellow. It is the iron contained in the ashes which, in the state of sesquioxide, imparts the yellow colour to the glass.

Having spoken of the method of analysing colour, I must speak on the texture of glass, for this is a subject of immense importance. It is on the texture mainly, I think, that the richness and beauty of effect which we see in the old window glass depends. I shall have to show this by direct light, putting the various pieces of glass in front of the lantern, and you will see by direct light the difference of effect produced by the texture of the glass; and you will yourselves, I think, be able to see in an instant how very beautiful is that glass which is made according to the system which the ancients adopted in the manufacture of their glass. First, we begin with white. On putting a piece of common glass coloured the lantern, you see no change whatever in the light thrown on the screen; but now I will put a piece of Messrs. Powell's white glass, used for church windows, in front of the light, and you see how beautifully the light is refracted. And if you get this brilliant effect by passing the electric light through this medium, how very much more beautiful will it be when produced by the sun's rays passing through it. You notice these numerous luminous points all of which add to the brilliancy of the effect. Here is a piece of ordinary green glass, through which the light passes uninterruptedly. Here is another piece, on which I experimented just now, and you observe how brilliant it is. Now I will show you a piece of ruby glass, which will illustrate the point I mentioned before. You see there is a border to it, which is deep in colour, but the main portion of it is white, with small streaks of ruby in it. That is the disc which I mentioned had been fired more on one side than on the other, and I said that those parts of it which are now white would become ruby if they were cautiously fired. This is most interesting to me, because it supports the theory which I have held for some time past, in conjunction with many other chemists, namely, that it is not to the presence of the metal, as a metal in the regular state, that the colour of glass is owing, but to the presence of a metallic oxide. This is a subject which I will not go into this evening, because it would take us too far. Here is another specimen of ruby, which has also greenish, greyish, and bluish streaks in it. That is coloured with sub-oxide of copper, but, no doubt, some of the sub-oxide has become oxidised into the protoxide, which gives the green and blue colour. You remember the green I showed just now—bluish green, the signal green—it is coloured by the protoxide of copper, so that you can quite understand how there are streaks of blue there, and how you get streaks of greenish blue and grey mixed up with the ruby colour. I believe it is owing to the presence of these different tints that certain of these rubies which are sold ordinarily, and some of those which are manufactured for stained-glass purposes, when tested by the prism allow other rays, such as a green and blue, to pass through them. Here is another very interesting specimen. You see what beautiful colours and forms there are upon this piece of glass. You will be astonished to hear what they are, and how they are produced. It is a piece of glass which Mr. Powell was kind enough to lend me, and which had been for many years in his stable at Clapton. It is a pane of common crown glass, taken out of the stable-window. It is perfectly smooth on one side, and coloured, but on the other side it is rough and very iridescent indeed. It looks like some of the glass vessels which are taken out from Roman excavations, or from the bottom of rivers. Its surface looks like opal, and most beautiful colours are

seen on it as you move it about. These colours must have been produced by the action of certain substances on the glass, carried as spray in the air, which were in the stable, and which were deposited on this window from time to time, through a long course of years. The action of these substances is such as to destroy the texture of the glass, or at least the texture of that surface with which they came in contact, and having seen this you will not have much difficulty in understanding how it is that, through a lapse of years, certain effects are produced by atmospheric influences upon the church windows, of which we are so justly proud, as representing a state of high art and sentiment in the Middle Ages.

A DRINKING FOUNTAIN FOR PATNA.

A DRINKING fountain has been presented to the people of Patna, near Ayr, and was opened the other day with some rejoicings and speeches. The fountain consists of a basement of polished grey Aberdeen granite, with two basins, into which the water flows through two metal spouts issuing from lions' heads. Above is a moulded plinth of Yorkshire stone supporting the shaft of the fountain, which is of polished Aberdeen granite, having a moulded band across the middle, with a carved shield, and arms a lion rampant. Above the shaft is a carved Gothic capital, with played angles, surmounted by an open corona in Yorkshire stone, carrying a carved conventional fleur-de-lis. The total height of the fountain is 12 ft. from the basement to the top of the finial. Upon the shaft, in incised and gilt letters, is the following inscription:—"Presented by A. Barclay Walker, Esquire, to the inhabitants of Patna." The design was furnished by Mr. Henry H. Vale, architect, Liverpool.

CLACTON-ON-SEA.

THIS picturesque watering-place seems to be rising into importance, and offers a field for investment. A commodious hotel, erected by a limited liability company, has just been opened opposite the pier, and pleasure-grounds are being laid out facing the sea. The nearest railway station is about five miles off, but omnibuses run in connexion with the trains, while the London and Ipswich steamers call daily. A narrow-gauge railway or a tramway, to communicate with the main line, is needed.

A number of new houses and cottages are already occupied, and a London builder (Mr. Snelling) has bought several acres of freehold land adjoining the hotel, and seems at present to be doing the chief building here.

THE TRADES MOVEMENT.

London.—The Carpenters and Joiners' Central Committee have paid their final strike dividend at the rate of 2s. 6d. a day, or 15s. a week per man. During the last week upwards of 350 signed the strike-sheets; but that total does not represent the number actually idle for the whole six days, as by a resolution of the delegates a man could for the space of a month come on and off the sheets at pleasure in the intervals of his being out of work. The strike began the first week in June with very nearly the same number as that which shared in the last dividend. The first dividend paid was at the rate of 2s. a week per man, the second 2s., and the third 2s. Then came the "lock-out," and with it a fall in the fourth dividend to 7s. 6d.; the fifth was 8s.; the sixth, 9s. (lock-out withdrawn); the seventh, 10s.; the eighth, 12s.; the ninth, 11s.; the tenth, 11s. 6d.; the eleventh, 13s.; the twelfth, 6s. (week after the settlement); and the thirteenth, 15s. The highest, therefore, was at the rate of 4s. 6d. a day, and the lowest 1s. a day. The payment of the last, it is said, has pretty nearly exhausted the treasury. What has hitherto been called "The Short-time Movement" will henceforth become a "Uniformity of Time and Wages Movement," and the next business of the delegates will be to arrange for the machinery to extend the adoption of the agreement recently come to with the Central Association of Master Builders to employers outside that body. At last week's meeting three prominent firms in this category were brought under notice, viz., Messrs. Corbett & McClymont's, West Brompton; Adanson & Sou's, Turham-green; and Perry & Co's, Stratford. Deputations from the committee were appointed

to deal with the two first. Messrs. Davis, Benny, and Matkin (secretary) were delegated to move Messrs. Corbett & McClymont's, and they returned with the report that in order to avert a threatened strike the firm had unconditionally accepted the terms of the agreement entered into with the Masters' Association. The shop has accordingly commenced working under the code of rules issued by the Central Committee.—A mass open-air meeting of the builders' labourers of London was held in Trafalgar-square on Saturday evening last, to receive the report of their deputations to the Masters' Association relative to the late dispute in the trade. It was estimated that there were fully 1,500 of this class present, and the proceedings, which occupied about an hour and a half, were characterised by good temper and order from beginning to end. Mr. Halloran moved:—

"That, in the opinion of this meeting, the small addition granted to the wages of the builders' labourers is not sufficient to enable them to support themselves and families; and this meeting of labourers pledges itself to use its influence, and calls upon all concerned to do the same, to extend throughout the London district the Builders' Labourers' Union, so that by our united strength we may be able to command our 6d. per hour."

Mr. J. Leicester seconded the resolution, which was passed by acclamation.

Oxford.—The stonemasons struck for an increase of wages, but the builders having since conceded their demands,—30s. a week,—the men have resumed work.

Beeches.—A meeting of carpenters was recently held, to discuss a demand made of an increase of 2s. per week on wages. The meeting was summoned by the workmen, but the employers were invited to attend to talk the matter over. The only employers who attended were Messrs. Pells and Woodroffe. In the course of the conversation it was stated that the present wages were 20s. per week for ten hours a day; and the reason the men asked for an increase was the advance in price of all articles of diet and wearing apparel. Mr. Pells and Mr. Woodroffe said they had no objection to give the increase if other employers did the same. The meeting was adjourned, that other masters might be consulted.

Birmingham.—It seems by no means improbable that there will shortly be a strike of great magnitude in the Midland colliery district. The Coalmasters' Association have had a meeting at Birmingham to discuss the demand of the men for a further advance of 10 per cent., and have resolved, it is understood, not to grant it. In consequence of this decision the men afterwards met and determined to tender notice to leave work in a few days. Should no settlement be come to, therefore, another strike appears inevitable, and about 20,000 men and boys will thus become temporarily idle!

Labour and Capital.—At a meeting of the Executive Committee on Labour and Capital, in connexion with the Social Science Association, held on the 3rd inst., it was resolved:—

"1. That the committee desire to congratulate the master builders of London and their workmen on the termination of the late strike and lock-out in their trade, on the restoration of harmony, and on the passing of the joint resolution of masters and men, to the effect that, if any dispute should arise in future, they will at once resort to those means of friendly conference which have in this instance proved successful. 2. That it is very satisfactory to the committee that the advice which they ventured to offer, in reference to the late strike and lock-out, immediately elicited from one of the parties concerned an expression of a willingness to adopt it, was soon in part carried into effect, and has now been fully acted upon by both parties. 3. That in the hope that a similar result will follow the tender of the same advice in the case of the London bakers, the committee, again taking advantage of their neutral position, respectfully but strongly recommend both masters and men to appoint an equal number of representatives, with full powers to meet in friendly council and to settle all matters in dispute; or, failing to accomplish a settlement, to choose an umpire, whose decision shall be final."

OPENING OF THE "BLACK BURGH," BRIGHTON.

THE Dyke-road tumulus, or black barrow, about four miles from Brighton, has been opened. In the long account of the excavations, and their results given in the local *Herald*, it is stated that

"the pit itself was an oblong, 12 ft. long and 8 ft. wide, sunk about 2 ft. 3 in. in the chalk, and filled in with chalk rubble. The direction of the pit was N.W. and S.E. The first objects found in the chalk rubble were two bronze coins and some Romano-British pottery, about the level and top of the pit. The coins are, probably, Roman, and, together with the pottery, belong to the secondary interment. At 4 in. from the floor of the pit some Romano-British pottery, of similar character to that found before, was encountered, and on the floor of the pit, with its point to the east, lay a bronze knife-dagger. Slightly to the

south of the dagger, a small food-vessel, of far earlier type, a bronze pin, and about fifty well-made flat heads, about three-eighths of an inch in diameter, apparently made of jet, were found. And then, while clearing the floor of the pit, a skeleton, with its legs drawn up, and resting on its left side, with the face in an easterly direction and the arms crossed, with the fingers towards the face, was discovered. The whole was so crushed by the superincumbent mass that it was only 2 in. thick. It would appear that a pit was cut in the chalk, and that a dead chief was placed in a sitting position—his dagger, beads, and food-vessel placed by his feet; the earth was then put over him, and upon the surface of the filled-in grave a mighty funeral pyre was lighted; then the flint were daked over the charcoal, and the mound raised above the level of the surrounding country. At a subsequent period, the mound was opened to receive another man of mark."

One of the first things noticed at the opening was a cylindrical hole in the chalk, 1 ft. deep and 4½ in. in diameter; next, a similar but smaller hole, 6 in. deep; and then a leg-shaped hole, 1 ft. 7 in. deep,—all cut in the chalk. These were evidently artificial, and differed altogether from the pot-holes met with in the chalk. Nothing was found in them. Mr. Phené, who has written on the subject, Mr. Monks, considers that the leg-shaped hole is in some way connected with religious rites. That they are of common occurrence is proved by the fact that Canon Greenwell has found them in Norfolk, cut in the rock; and they are spoken of as generally associated with mound burials.

ALBERT MEMORIAL.

Sir,—While approving the several remarks of your earlier correspondents on the Albert Memorial, I would wish also to make a suggestion.

It appears to me almost an impossibility to examine carefully and with any amount of pleasure, the beautifully sculptured bas-relief round the podium of this magnificent monument on a fine day, the eye becoming extremely wearied with the glaring brightness of the marble. This I believe might be entirely counteracted by having evergreens and flowers placed in pots on the upper landing within the low railing, and just below the statuesque pavement and at its base.

The green colour of the plants would also relieve the present plain and severe lower part of the Memorial, and help to harmonise the same with the gorgeous upper portion.

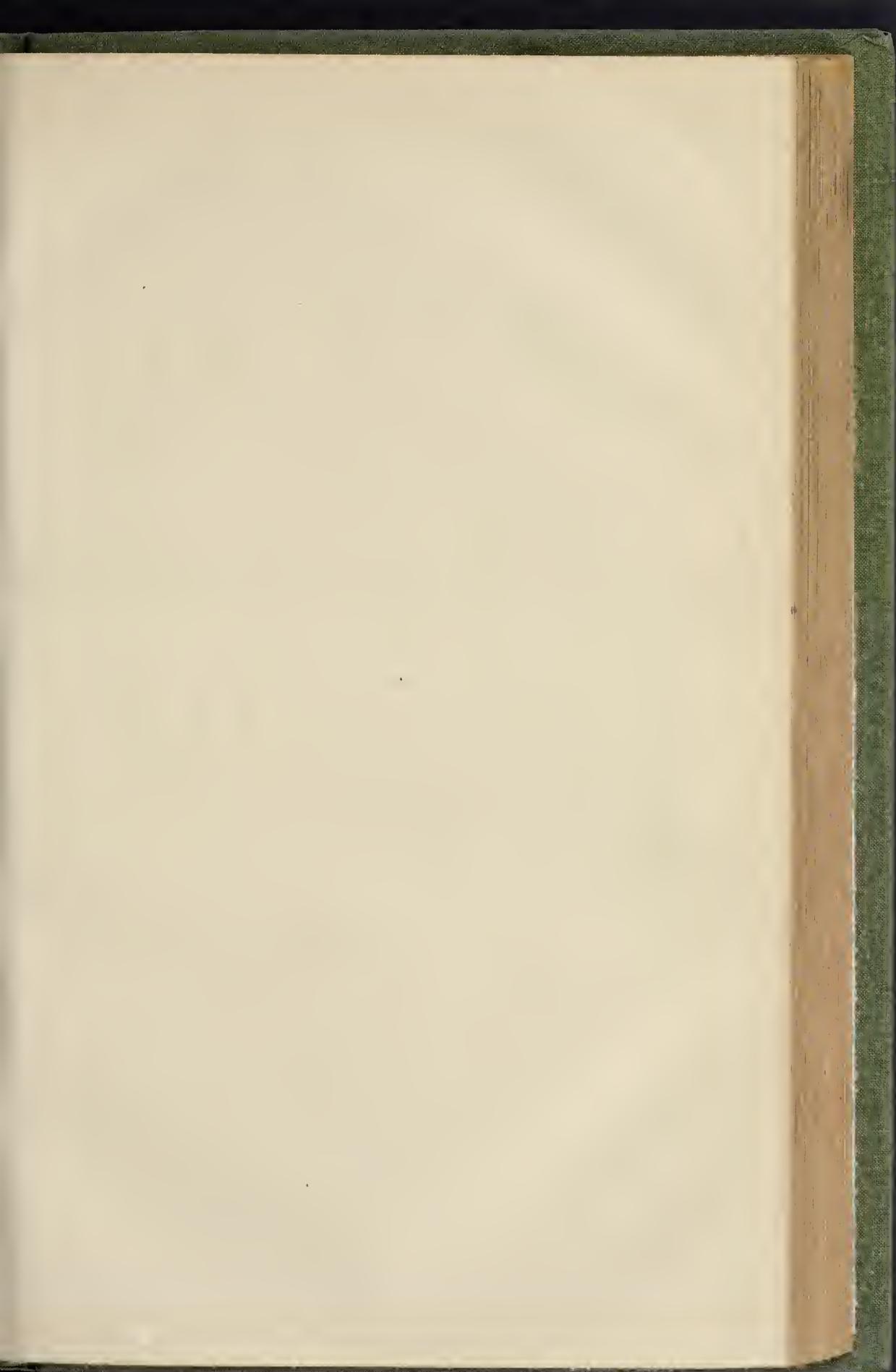
F. N. K.

THE SCIENTIFIC AND MECHANICAL SOCIETY, MANCHESTER.

SECTION I.—ENGINEERING.

At the last meeting of the above society, Mr. A. Hildebrandt moved a resolution,—"That a special committee be appointed to take into consideration the society's future programme, and to make the necessary arrangements of carrying out the same." This committee to draw up new rules, to organise additional sections of their own, representing the staple industries of the district in all its most important branches, similar to the well-known "Société Industrielle de Malhouse," to consider the advisability of taking immediate steps for the establishment of a "Technological Reference Library and Reading Room," and the publication of the society's proceedings. He thought they were now in an unsatisfactory position, and their future line of action required mature consideration, which would bring about a radical change; they had now men of all shades—as regards professional pursuits—in their midst, and they had found by experience that it was not exciting sufficient interest to let them all meet at one time, and join in one common discussion, except by their own desire. For the next session he hoped there would be a section of chemistry, another for spinning and manufacturing, &c. If they looked upon that eminently useful and authoritative body, the Société Industrielle de Malhouse, it was difficult to understand that a similar movement should not have been set on foot in such an important centre of industry as their own district, long ago. It was for them to decide now whether they should set themselves the task of exploring that field, clear as it was that there was ample scope and an urgent want for such an extension. He hoped that those gentlemen who wrote to the *Chemical News*, advocating a similar movement, would consider that they possessed the nucleus for it, and would co-operate with them.

A committee with full powers was then elected, consisting for the present of Messrs. Ziffer, Ross, Lynde, Spriggs, Tolhausen, Waterford, Driefuss, Hulenhansen, Hilton, and Hildebrandt, the hon. sec. of the society. This committee is to commence its labours at once, and the results are to be laid before and sanctioned by the next monthly meeting on the 2nd of October, so that everything may get in proper working order for the next session.





PORTION OF SCULPTURED COLUMN FROM THE TEMPLE OF DIANA AT EPHEBUS.

THE TEMPLE OF THE EPHESIAN
DIANA.

EARLY in the year we gave the public the first view they had had of the lowest frustum of a column, with its base-mouldings, as found by Mr. J. T. Wood on the site of the Temple of Diana in Ephesus, together with an elaborate essay on the probable form of the Temple, and a plan to illustrate it.* This large and interesting relic is now in the British Museum, open to all, together with a grand Ionic capital and other important remains, one of which we illustrate in our present issue. The width of the capital is about 8 ft. 8 in. on the face of the volutes. In the essay referred to, our classical readers were reminded of the account of the temple given by Pliny. He states (xxxvi. 11), that the height of the columns was 60 ft. and the weight of the

* See pp. 103 and 119, ante.

epistylia,—the architrave stones,—enormous; the number of columns he gives as 127, "made by as many kings," of which thirty-six were, he says, *celato* (sculptured in relief), one being by Scopas. Scopas, let us note in parenthesis, executed one side of the tomb of Mausolus. The temple which is now being exhumed, and with which we are concerned, was in process of completion, as we have before mentioned, when Alexander passed into Asia, B.C. 334, in succession to one that had been set on fire on the night of his birth, B.C. 356. Well here we now have a part of one of these columns sculptured in relief, as sent home from the site by Mr. Wood. It is the lowest portion of a column, of marble, about 7 ft. in diameter at bottom, and 6 ft. in height. Our engraving represents one side of it, and shows a female figure between Mercury and a winged Victory. Further round is another upright female figure, with the lower part of a

seated female. The drapery of all the figures admirably modelled.

It was a glorious find, and is of itself worth the money that has yet been expended on the work of excavation.*

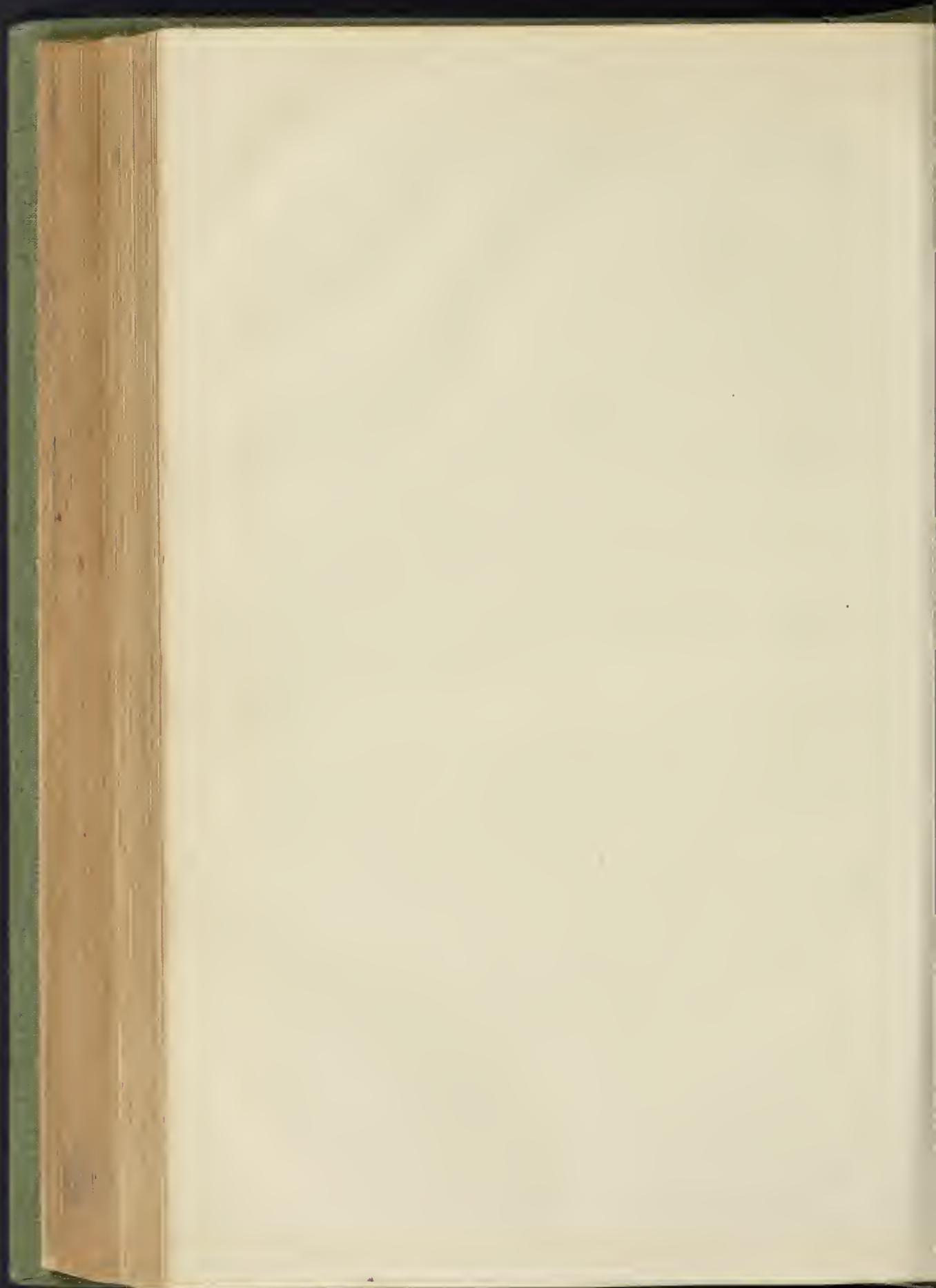
Amongst other remains now in the Museum are part of a pilaster, also sculptured, the subject being "Heracles [our old friend Hercules] struggling with a female figure;" and the lower part of two figures, one sitting, the other standing close behind.

We conclude that these important and deeply interesting relics will be all brought together due time. At present they are somewhat scattered. We must repeat the expression of hope that Mr. Wood will be liberally assisted in the further prosecution of his researches.

* Messrs. Mansell & Co. have published three excellent photographs of the sculptured drum of column, to which we gladly point attention.



THE BOSTON AND LOWELL PASSENGER STATION: BOSTON, U.S.—MESSRS. L. NEWCOMB & SON, ARCHITECTS.



THE BOSTON AND LOWELL PASSENGER STATION, BOSTON.

The railway station which is in course of erection in Causeway-street, Boston, U.S., has a frontage of 205 ft., and extends back 700 ft.; what is there called the Head-house having a depth of 120 ft. out of this. It is modern Franco-Italian in style, and was designed by Messrs. L. Newcomb & Son, architects, under whose superintendence the work is now going on.

The material will be of face-brick, with trimmings of Nova Scotia stone. The central portion projects 18 ft. 4 in. from the line of the front, and is 64 ft. 8 in. in width. This central projection is crowned by a "Louvre" dome, the summit of which is 115 ft. above the street-level. In front of the dome the stonework rises in four pillars, forming a window, above which is another conspicuous projection, containing a large clock. On either side of the window is an ornamental circular window, and a similar one is on each side of the dome. At each of the four corners of the head-house is a tower, 35 ft. by 30 ft. Three of these are uniform in height, while the fourth, at the corner of Causeway and Nashua streets, rises to an altitude of 165 ft., the brick and stone work rising two stories above the main structure, and above all is a mansard roof. The towers, dome, and roof are all surmounted with cast-iron crestwork. The first story is finished in rustic stonework, and the towers are bastioned, and have a considerable inward slope, giving them a strong and substantial appearance. In each side of the roof, between the towers and the dome, are circular windows, corresponding to those in the dome, and just above is a row of smaller ones. In both of the Causeway-street towers are arched entrances, 40 ft. wide, communicating with covered driveways, open on the side, supported by pillars, and extending back to the towers in the rear. The archway in the tower at the corner of Nashua-street is for inward, while that on the other is for the outward, passengers. The driveway is 20 ft. wide, and is to be paved with wood. The rest of the space is to be occupied by a tiled sidewalk, 12 ft. wide, next the main structure.

From the side-walk, roomy entrances will communicate with the great central court of the area, 92 ft. long by 52 ft. wide, with a height of 64 ft. 9 in., and celled with ornamental glass-work. The floor will be of tessellated marble, and in the centre will be a fountain, while all around will be comfortable seats for the accommodation of the traveller. Around the sides will be a double row of corridors, corresponding with each story, giving a view of the scene on the floor. In the arches of these corridors will be chandeliers, and at night the scene will be one of much beauty. The woodwork of the entire interior will be of brown ash, relieved by black walnut; and, in the great court, the prominent points will be brought out in variegated colours. On the west side of the court is the gentlemen's waiting-room, 39 ft. by 40 ft., with barber's shop and closets adjoining. Beyond is the telegraph office, and then comes the vestibule leading from the side-walk to the court.

This vestibule is 19 ft. wide and 40 ft. long. Here are the broad and easy stairways leading to the story above. On the opposite side of the building is a vestibule exactly similar in every respect. The outward and inward baggage-rooms are in the rear of the vestibules. To the east of the court is the ladies' room and a large ladies' waiting-hall. But the unique feature is the ladies' private reception-room, immediately in front of the court, and occupying the central projection. Its dimensions are 52 ft. by 34 ft. It will be fitted up in a luxurious manner. A handsome carpet will cover the floor, and the walls will be adorned with paintings. The windows will be hung with heavy drapery. This room communicates with the ladies' waiting-room, spoken of before, which will have a private restaurant attached.

In the second story on the left is to be a suite of rooms for the manager, including a public and private office; and in the rear will be rooms for the treasurer, with a large fire and burglar proof safe, 9 ft. 8 in. by 6 ft. inside. Directly over the ladies' private reception-room is a large room fitted up for the reception of gentlemen wishing to see the officers of the road on business. On the right are the superintendent's rooms, and in the rear is the attorney's office, with law library attached. All these rooms communicate with the corridor running around the rear court. This corridor is 12 ft. 8 in. wide,

In the third story is a similar corridor. In this story are the directors' room and three large banquet-halls, so connected by folding-doors that they can be thrown into one large apartment. The rest of this story is occupied by rooms for the various clerks of the road, and the civil engineers' room. In the Mansard-roof story is the kitchen, which is to be connected with the restaurant by a steam elevator. The basement will contain the steam-beating apparatus.

The great train-house is 580 ft. long, and has a span of 120 ft., but there being lean-tos 40 ft. wide on either side, the total width will be 200 ft. In the main part will be four tracks: two in the centre 12 ft. apart, and one within 6 ft. of each wall, giving large platforms 40 ft. wide between. Then in each lean-to will be a track close to the inner wall, and outside will be extensions of the drive-ways and side-walks from the front tower entrances. The side-walls are to be 16 in. thick, while the rear wall will have a thickness of 20 in. The rear elevation is of ornamental design, and contains three large rose windows. The great iron trusses supporting the roof spring from the ground 25 ft. apart, and describe a Tudor arch, rising to the height of 74 ft. A monitor ventilator, 22 ft. wide, runs the entire length of the roof. The roof, for 20 ft. each side of the elevation, is to be of heavy ribbed plate-glass, set in sashes of iron, to light the interior. The rest of the roof is of wood, covered with tin and again with corrugated iron. The roof will be painted in parti-colours; the woodwork of one colour, and the iron truss work in strong contrast.

THE HORNSEY DRAINAGE WORKS AND THE CONTRACTORS.

The Hornsey District Board of Works are making strong complaints against the contractors for the drainage works at present in progress, not going on with them as rapidly as is desirable.* At last week's meeting of the Board the chairman stated they had extended the time to complete the works four months beyond that originally specified, and if more activity were not shown they would be into the winter months and still the drainage incomplete. In answer to these complaints the contractors state that they are doing their best against many trials with which they have to contend, and in a letter to the clerk they observe "labour is very scarce; in fact, we cannot obtain more than 100 men up to the present time." It was ultimately resolved that a letter should be written by the clerk to Mr. Latham, the engineer, calling on him to insist upon the drainage works being more rapidly carried on.

THE MANCHESTER TOWN-HALL CONTRACTS.

The proceedings of the General Purposes Committee of the City Council (as reported in the City News), having been submitted for approval,—

Councillor Stewart moved an amendment that they be approved with the exception of the resolution under which it was proposed to give the whole of the contracts for finishing the new Townhall to Messrs. George Smith & Co., the general contractors, without offering the work for competition. He had looked carefully into the matter, and he could not see that sufficient reasons had been assigned by the architect for his recommending that course. In his report the architect spoke of the floors not being proceeded with until the roof was on, but it appeared that both of those departments of the work were in the hands of Messrs. Smith, and consequently could not interfere with the work of other contractors. He (Mr. Stewart) was informed that Messrs. Smith & Co. did not do all the work themselves, but sublet it to other contractors; and if so, that fact entirely disposed of the architect's remark that Messrs. Smith could not well make room for other contractors. Messrs. Smith recently tendered for an insurance company's building in Albert-square, the amount being 9,795*l.*, and the work was let to Messrs. Thomas Clay & Sons for 7,400*l.*, showing a difference of 2,395*l.* in a small contract of that sort. He thought it was fair to assume, then, that the schedule of prices to be sent in by Messrs. Smith for the remaining work to be done on the Townhall might amount to 40,000*l.* or 50,000*l.* more than the work could be

* These complaints forcibly illustrate the present state of the labour market, and the difficulties which contractors and others have to encounter in obtaining men.

done for by others. With regard to the delay which the architect said would occur if Messrs. Smith did not get these contracts, he had consulted several well-known builders, who assured him that no more delay need occur through other contractors being engaged than if Messrs. Smith did the work, because, if the work were let this week to somebody else, it would take nearly all the time between now and the completion of Messrs. Smith's present contract to get ready for going on with the other contracts.

The amendment having been seconded, Alderman Heywood (chairman of the New Town-hall sub-committee) said the keenest consideration had been given to this question, and the committee would not have come before this Council with this proposition if they had not felt convinced that, under all the circumstances, it was the right course to adopt. No doubt, as he had said on a former occasion, the course suggested by Mr. Harwood and other gentlemen was the popular course pursued in the erection of large buildings, but he maintained that in this case there were circumstances which took it out of the category of the ordinary condition of things. Mr. Stewart had given them the opinion of several builders as to what could be done, but he (Mr. Heywood) did not think the Council ought to take that expression of opinion against what they had heard from their architect. He thought it was a very unusual course of procedure for Mr. Stewart to make the comparison he did between the price of a certain work contracted for by Messrs. Clay & Sons and the amount asked for by Messrs. Smith. If Mr. Stewart would consider the position in which Messrs. Clay were placed by tendering for that work as compared with Messrs. Smith, he would see that, though it might appear an argument to his advantage, it was really no advantage at all. He thought he might fairly say what would have been the course adopted by the Council had Messrs. Clay & Sons' contract for the new Town-hall been very near that of Messrs. Smith: the Council would have felt that Messrs. Clay ought not to be removed from the foundations. If, then, there should be any feeling at all in this matter, he did not see why it should not be in favour of Messrs. Smith, who had laboured hard to fulfil the conditions of their contract, and to erect a building which, he believed, could not be excelled throughout the length and breadth of the country. It had not been argued that Manchester men were not to execute the work which had yet to be done, nor had it been said that they would not do it. It had been said that Messrs. Smith were foreigners, and were coming to take the work out of the Manchester contractors' hands; but such was not the case, nor likely to be.

A division was taken on the amendment, with the following result:—for the amendment, 30; against, 20; the amendment was therefore carried.

STOWMARKET CORN EXCHANGE.

The following tenders for rebuilding the Corn Exchange, Stowmarket, Mr. Frederick Barnes, Ipswich, architect, have been received:—

Andrews.....	£1,410 0 0
Gibbons.....	1,390 0 0
Saunders & Son.....	1,340 0 0
Smith.....	1,334 0 0
Cannold.....	1,237 0 0
Girling.....	1,229 0 0

The last was accepted. The internal dimensions of the hall will be 80 ft. by 37 ft., divided into seven bays in the length. The roof will be carried by six cast iron elliptic arches and columns bolted to the side walls. To avoid as much as possible obstruction to the neighbouring property, the height of the walls will be only 20 ft.; but a lantern in the form of a clearstory, lighted on each side, extends the length of the building, framed over the iron arches, thus obtaining a height of 32 ft. from floor to ceiling, the crown of the arches being 26 ft. from the floor. Each bay in the length will have a triple circular-headed window 10 ft. high on each side wall, thus obtaining ample light.

The interior of the walls will be faced with the white bricks and red strings and arches, pointed. The lighting and ventilation will be effected by sun-burners, as the building is designed for the purpose of concerts or balls, and public meetings of all kinds, as well as a corn market. The old Assembly-rooms being contiguous, advantage has been taken to open out one of the apartments to form a gallery for an orchestra at the end of the hall.

CONDITION OF REIGATE.

SIR,—I cannot expect you to allow me to trespass upon your space, to the exclusion of matter probably more generally interesting to your readers than a discussion upon the state of the sanitary arrangements in Reigate. Still, as the statements of "Gargoyles" and myself have been called in question, I hope you will try to find room for these few lines.

I have no idea who "Gargoyles" is, but I have no doubt he is prepared to substantiate all that he has written. I know that I am prepared to do so.

There is the Blue Book of the Reigate Election Inquiry; there are the reports of the council meetings as reported in the *Survey Standard*; and there is the place itself, which any one can inspect. What more is needed?

"R. J. W." states that some of my remarks are unfortunately true, but that I depart from the subject. Now it seems to me that there is a great connexion between the sanitary condition of any place and the authorities who have full power to improve it if they choose to do so.

I do not know the *Survey Advertiser*, and therefore have not seen the "honourable mention" made of "Gargoyles" and my statements, but "*il n'y a rien qui soit en soi une contradiction*;" and if spiced with a little vituperation, it is especially acceptable to some people. It is, however, sheer nonsense to speak of my remarks as "unfounded" and "calumnious."

Permit me to offer a word of advice to the authorities, although it may have no better effect than what others have given them before. Reigate is nothing without its private residents. It has no particular trade or manufacture to support it, but is almost entirely indebted for its prosperity to those who make it their private abode. Now the chief attraction for such a class is the natural beauty of the place, which is undeniably great; but that can be purchased too dearly, as many have found to their cost, through the defective drainage and the stench arising from open privies, drains, and cesspools. Let, then, those who have the means in their hands use them speedily and vigorously to make the place as sweet and clean as it can be made, and clear the reputation which is at present under a cloud. But to do this the matter must not be left to subordinates. Each member of the Council should not rest satisfied without a personal inspection of all open privies, drains, slaughter-houses, &c., and should particularly not be afraid to enter a place for that purpose because it may happen to belong to a fellow member of the Council or a personal friend. By doing this the Council will earn the thanks and goodwill of the large majority of the population, besides rendering the place still more attractive to a class who come into a neighbourhood and are the great supporters of the schools, hospitals, and other charitable institutions in it.

I hope ere long I may have the pleasure of offering a tribute of praise as heartily as I have now uttered my measure of blame.

SALUS POPULI.

CONCRETE BUILDING.

SIR,—I presume Mr. H. Goodwin, in his note appearing in your issue of the 31st ult., refers in some degree to the notice announcing the licence of the Metropolitan Board to use my Patent Monolithic Fire-proof system.

If you will kindly find a place for the following remarks, they may perhaps throw some light on the matter. From what transpired in the course of my applications to the Board as to my patent, it appeared to me they were exercising due caution in their opposition to the use of concrete, on the ground that hitherto concrete walling in this country has been often executed in so unsatisfactory a manner as to be very unreliable, and to have frequently failed. The defects have been increased by the unskillful employment of courses of bricks or stones, variously termed "packing" and "bond courses,"—as though concrete, correctly appreciated and properly wrought, were not itself the finest bonding material in use.

In one word, concrete in England is so erroneously treated as to be generally a weak, spongy mass, in comparison with the powerfully adhesive and impermeable substance it becomes under correct manipulation.

I showed that it was in conformity with this correct treatment operations on my system were conducted.

To show the veritableness of the distinction I have pointed out, it will be enough to say that I have put up a flat roof on my system, chiefly of grey lime and ballast, and another of Portland cement and ballast, but only 6 in. thick, and although exposed to the heavy rain of the last three months, has never exhibited the slightest sign of leakage. On the contrary, I read the following passage in the description of a cement bridge in a scientific periodical:—

"Nevertheless, the porous nature of even such good concrete as that used in this bridge is shown by the fact of rain passing through it in the course of a few hours."

PHILIP BRANNON.

CONCRETE AND THE METROPOLITAN BOARD OF WORKS.

SIR,—As Mr. H. Goodwin is unable to understand the explicit resolutions passed by the Metropolitan Board of Works, relative to the erection of concrete buildings, within the metropolitan area, I will endeavour, as far as I am able, to elucidate them.

It is quite true that I have been summoned twice, as also Tall & Co. (Limited), once, for this system of building, and in each case the complaint has been carried out and withdrawn, but not before the works in progress (including the Peabody buildings), have been carefully watched and minutely examined.

The result of these careful investigations has, no doubt, convinced the practical gentlemen engaged, that the system of building in concrete, as carried out by Tall & Company (Limited), is applicable to the present rules of the Building Act.

Mr. Goodwin appears to understand that it is the Patent Building Apparatus that has influenced the decision. I am of an opinion that the Metropolitan Board of Works have been simply convinced by the superiority of the buildings erected by myself and Tall & Co. (Limited); it cannot possibly be supposed that this company would erect concrete buildings unless they were carried out in the safest and most careful manner, knowing that a failure would be ruin to the company, who have not only a reputation to maintain, but a large capital at stake.

With the speculative builder, the question is very different: so long as he runs up his buildings quickly, and cheaply, obtaining advances as the work progresses, it is all he has to study. I am, however, in a position to prove that a builder cannot build cheaper between planks than with my patent apparatus.

Some works now being carried up at the present time, in London, between planks, are a disgrace to concrete; and I am also in a position to prove that the materials used in some cases are quite unfit for the walls, which are really dangerous.

As the last straw breaks the camel's back, so it is with concrete: it will not bear excessive abuse.

Your correspondent will justly see that it is this class of concrete building that requires a special licence and supervision, which, doubtless, the Metropolitan Board of Works will take care to have properly attended to.

JOSEPH TALL.

NOMENCLATURE.

SIR,—In your report of Mr. Edmund Sharpe's excellent address after the Northamptonshire excursion dinner, a quotation is given from the address of the President of the Northern Architectural Societies on the Nomenclature of Gothic Architecture. Now I do not object to be quoted, even adversely, in such company as Sir Gilbert Scott and Mr. J. H. Parker. I simply write to state that the address referred to was delivered by me as president of the Liverpool Architectural Society, and not the "Northern Architectural Societies." HY. H. VALE.

PROPOSED RECREATION GROUND FOR WARRINGTON.

SIR,—Unless the Local Government Board at Whitehall steps in to interfere, the mayor and corporation of Warrington are about to do a very foolish thing. Under the pretensions of a Public Recreation Ground, they propose to purchase, at the cost of £1,000, an acre, a space of ground in the centre of the borough, very valuable, it is true, for building ground, but, as its present owner states, in a condition of "perpetual eclipse" from the murky and corrosive atmosphere by which it is constantly enveloped. Moreover, this purchase and purpose are vehemently protested against by a large majority of the ratepayers; and, strongest point of all, by the four senior medical practitioners of Warrington, resident there respectively forty-seven, thirty-seven, thirty-six, and twenty-nine years. The folly would be less if the ground could be resold hereafter, but the purchase-money, having to be borrowed from Government under the Recreation Grounds Act, this costly and objectionable site must remain for ever devoted to this, and to no other purpose. Even of the limited space above-named (12½ acres), only 6½ acres are to be allotted for the free and unrestricted use of the ratepayers, where they may indulge in a fair foot-race, or enjoy an honest game at football, golf, or an ornamental garden (oh! such a garden), a cricket-ground, and a bowling-green, none of which can fairly be looked upon as a public recreation-ground.

As a still further addition to the cost, the deed of transfer of the land is to contain a clause binding the corporation to form a new street, of twenty yards wide, along one side of the recreation-ground, the cost of which is estimated at £2,000.

From such a needless waste of the ratepayers' money, it is to be hoped that the discretion vested in the Local Government Board may be powerful enough to deliver us.

M. D.

* * * We insert this in deference to the medical men of the town, and with a view to inquiry as to the fitness in position of the land. We must not be regarded as offering the slightest opposition to the provision of a Recreation Ground for Warrington; a step we would by all means aid.

WEST HAM SEWAGE AND IRRIGATION.

SIR,—To your correspondent who assumes the name of "Sanitarian" in last week's *Builder*, I have only to reply that the cost of land for irrigation when negotiated for by a public Board is a very different matter to its cost at a public auction. My Board were unable to obtain land by any other means than either private negotiation or the exercise of compulsory powers; our negotiations were carried on with one of the most respectable firms in the City (Messrs. Beadell), and my Board, looking to the financial results of the use of compulsory powers and arbitration in other like cases, considered themselves fortunate in securing, without litigation, 750 acres of fresh land, near London, with approaches by road and rail, and a Thames frontage, at an average cost of 96s. per acre. My communications to the *Builder* upon this subject had reference to the general question of irrigation, but as "Sanitarian" cannot rise above the local case and personal remarks, I must dismiss his letter without further comment. LEWIS ANSELL.

MONUMENTAL.

An Aberdeen polished granite cross, 123 ft. in height, has just been erected at Penrhy, in memory of the late Rev. C. Maybery, who had been rector of the parish for over forty years, and an active magistrate for the counties of Brecon and Glamorganshire during the greater part of that time. The red foliated cross stands upon a grey granite circular column with moulded cap and base, and this rests upon a square base of Forest of Dean stone, having small recessed red granite shafts at the corners, with sunk trefoils of similar material in the front of the four gables projecting from the apex of the cap. The inscription slab is of black marble, and is set into an arched recess on one of the sides of the base. Mr. T. D. Williams, of Aberdear, was the sculptor employed by the architect, Mr. E. H. Linget Barker, of Hereford.

THE DRAINAGE OF EVESHAM.

At a special meeting of the town council the sanitary committee stated that Mr. J. F. Fairbank, C.E., had, at the request of the council, made an inspection of the town, and advised the adoption of the irrigation system of drainage, but this, on account of the enormous outlay (40,000*l.*), as well as the difficulty of obtaining land for the purpose, was impracticable. Mr. Barry, of Liverpool, advised the adoption of the "filtration process." On account of the wide difference between the cost of the estimates of these two gentlemen (the latter being about 4,000*l.*) the committee were compelled to exercise the greatest possible caution in the matter, and reported their inability to recommend the adoption of any particular system of drainage, without further advice, and proposed that the Local Government Board be requested to send down an inspector to suggest remedial measures.

ARCHAEOLOGICAL SOCIETIES.

The Cumberland and Westmoreland.—The members of this society have held a meeting in the western division of the district. They assembled at the Holborn-hill Railway Station, whence they proceeded to Mill Church and Castle, several of the ladies and gentlemen taking a circuitous route for the purpose of examining the "Gallows Stone." The party examined the interior of the castle, and Mr. Simpson, who was appointed chairman of the meeting, proposed a vote of thanks given to Mr. Knowles for a paper he read; after which some of the party took conveyances for Kirkcubright and Lacro, and others proceeded to Lacro on foot. Lacro is an ancient cultivated estate on the summit of a hill, 500 ft. above the level of the sea. It is surrounded by a circular stone fence. The objects worthy of notice at Lacro are a kirk, or pill, called "Old Kirk," consisting of an irregular heap of ruins,—two stone inclosures, three artificial platforms or terraces, an inclosure dyke, and an extensively furrowed surface. The party next proceeded to Silcock Railway Station, where a paper on "The Ancient Remains of Lacro and Kirkcubright" was read by Mr. Eccleston. He said that

"The south of Cumberland, until the close of the 12th century, seems to have been specially rich in that class of ancient remains, commonly called 'Druidical.' More than ordinary facilities were offered for the formation of these rude structures by the numerous fragments of rock that bestrewed the district. At the breaking up of Eskdale and other West Cumberland glaciers, the 2,000 ft. of the foot of Black Combe, and for nearly 1,000 ft. up the sides, together with minor heights, were sprinkled with boulders of all sizes and from various quarters. The Esk and other stone structures are, in the south of the Esk, six stone circles, a giant's grave, a kirk, corded, namely, six stone circles, a giant's grave, a kirk

large cairn, and a city—that of Barisac. Of this latter the loss of nearly one half has to be deplored; three circles and the cairn have been wholly obliterated.

On reaching St. Bees, the party dined at the Royal Hotel. The meeting on Friday morning took place at St. Bees Church. An adjournment was then made to the lecture-hall of the college, where Mr. Jackson read a paper on the "Registers of St. Bees." The weather was exceedingly favourable. On reaching Egremont, or the Mount of Sorrow, the party at once proceeded to the castle ruins. At Calder Bridge luncheon was provided at the Stanley Arms, and a visit was paid to Calder Abbey. The members and friends then drove through one of the most beautiful districts in Cumberland to Gosforth Church, where they were kindly received by the Rev. A. B. Cheese, the rector. Here the meeting closed.

The Cambrian.—As we have already noted, a series of five days' excursions has taken place in the neighbourhood of Brecon, under the auspices of this Association. The weather was appropiately favourable, and the programme of meetings and excursions was carried out, on the whole, very effectually, the appointed routine of the out-door proceedings being generally adhered to. On Monday evening, the 26th ult., the inaugural address was delivered in the Town-hall, Brecon, to a large and distinguished party of ladies and gentlemen,—members and friends,—by Sir J. R. Bailey, bart., M.P., the newly-elected president. Professor Balington, of Cambridge, was present. Papers were read at each of the three evening meetings upon various subjects. 1. "On Wales and its Saints in the Sixth and Seventh Centuries," by Mr. M. J. Rhodes, of Tenbyre. 2. "Some Remarks upon Prince Llewelyn," by Mr. W. Rees, of Tonn, Llanidloery. "The Battle of Mortimer's Cross," by Mr. F. Edmunds. "Llanthw Church, and the Ruins adjoining which mark the Site of the Palace of Idris, vicar of Llanthw." 5. "Oldford Castle," by Mr. Wm. Rees, of Tonn, Llanidloery. 6. "Porchester during the great Rebellion," by Mr. Rowland Phillips, barrister-at-law. Trips were taken daily into the surrounding districts, and the chief churches, castles, venerable ruins, and descriptions, and Druidic remains, within the county of Brecon were visited by the party during the campaign.

Re SANITARY SCIENCE, &c.

Sir,—Your ably and sensibly written articles on the public health of our towns deserve to be much more generally known, not only in England but in America. For myself, I feel inclined to see this lovely river, flowing, as it does, through the most beautiful district of England (Maidstone), positively worse than any stagnant pool in Southern Africa.

I came down here last August, after an absence of forty-eight years; but quite unprepared to see almost on the first morning after arrival the whole atmosphere covered with smoke, more than in the neighbourhood of the Lambeth Chimneys,—I mean the village of Tovil. Some person, probably a friend of Lord Romney, has set up oil-cake mills; and, through my window in bedroom, I am almost suffocated with smoke. No one seems to take any notice. As for the river, which used to be pure when I was a boy, I now cannot and do not go within 10 yards of it if I can help it. Do send some one to see this polluted river.

R. HODGKIN.

A STEAM HAMMER FOR WOOLWICH.

PREPARATIONS are being made on the site selected for the new foundry of the Royal Gunpowder Mills at Woolwich Arsenal, for the erection of a 30-ton Nasmyth steam hammer, the largest ever made. It will strike a blow equal to the weight of about 800 tons, and the bed for the mill has therefore to be of great strength. A bed 15 ft. square and 20 ft. deep was first dug, and then piles of timber to the number of more than 100 were driven into the solid gravel more than 20 ft. below, the interstices being filled with concrete. On the foundation a block of 30 ft. broad and 11 in. thick, and weighing 120 tons, was laid, and upon this two layers of balks. Upon the timber was laid another plate, 10 in. thick and 27 ft. square, weighing 121 tons, and then followed more oak balks, being vertically and bound together by wrought-iron hands. Two more iron plates,

weighing 214 tons, have since been lowered upon the bed, and one heavier than any yet employed is to follow. Upon this will rest the anvil-block, which is shortly to be cast in the arsenal, and will weigh 102 tons, and upon this finally the anvil-face, which will be 12 ft. in diameter and weigh 60 tons. This will bring the anvil up to the level of the forge floor, and all the excavations round it will be rammed in with concrete into a solid mass. The erection of the factory walls has not yet commenced, but in several parts the timber-rafts on which it will stand has been excavated and the underground work completed.

"DISINFECTING DWELLING-HOUSES."

Sir,—After stripping off the paper and exposing the bare wall, I have found Mudie's Disinfectant (in solution) to be the best deodoriser. My men have never suffered had effects from infection, and I am sure the above is preferable to carbolic acid, or even caustic soda.

HOUSE PAINTER.

SCHOOL DESKS.

Sir,—Mr. Wilson's letter of last week appears to me to indicate considerable misapprehension as to the meaning of Mr. Moss's desk. The problem is to arrange children for efficient teaching in such a manner that they shall be able either to sit or to stand comfortably, and yet that the desks shall not be moved about. Seeing that the space suitable for sitting is much less than that necessary for a standing position, Canon Cromwell has met the difficulty by the provision of a hinged flap to the desk, which, at a given word, is let down, and the boys then rise. Mr. Moss, on the other hand, devotes his exclusive attention to the convenience of the sitting position, and enables his children to stand by arranging them in groups of two only, so that, at a given word, they stand out laterally into the gangways, one behind the other. Both of these arrangements are highly ingenious, but that by Mr. Moss secures the absence of anything movable and liable to create a noise in the school, while it gives great facility of access (and, therefore, of supervision) on the part of the teacher, and, above all, allows circulation of air by the gangways on one side, at least, of each child. As to actual space occupied by the two plans, there is little difference, but the proportion of the class-room becomes different.

"Convertibility" is the very thing which no one now wishes to see adopted. Hitherto (owing to the necessity of using schools for all kinds of purposes), the best shape and disposition of a school in reference to its educational use has been overlooked in favour of making the room available for school treats, Sunday school arrangements, &c. But School Boards will, no doubt, adopt those arrangements which are best calculated to promote efficient teaching. Only this week I have heard of a "convertible" desk crushing a child's finger.

Great George-street.

E. R. ROBSON.

THE RESTORATION OF THE WEST FRONT OF WELLS CATHEDRAL.

THE first portion of the works,—the centre compartment, reported by Sir Gilbert Scott and Mr. Ferrey to be necessary, having been completed, and the second portion,—the southwestern tower,—being on the eve of completion, a meeting of the general committee was held at Wells, when there were present the Lord Lieutenant the Earl of Cork, who presided, the bishop, the dean, and others, as also Mr. Ferrey, the architect. It appeared that the liabilities on the contract for the second portion of the work exceeded the amount of subscriptions available, and that further subscriptions were needed to meet these liabilities and to complete the third portion of the work,—the north-west tower,—not yet contracted for. It was decided to call a public meeting, to be held in the Chapter-house, on the 9th of October, to receive from the sub-committee a full report of the progress of the works, the work remaining to be executed, and the state of the funds, and to suspend in the interval the consideration of entering into a contract for the third portion of the work.

St. Pancras Surveyorship.—Mr. H. H. Bridgman has resigned the office of Assistant-Surveyor of St. Pancras, London.

CHURCH-BUILDING NEWS.

Wentworth (near Sheffield).—A new parish church is to be erected in this village, on a plot of ground very near to its predecessor, and on the opposite side of the existing carriage-road to Wentworth House. Mr. J. L. Pearson, of London, is the architect. The edifice will consist of a nave, two side aisles, north and south transepts, chancel, vestry, tower, and spire. The extreme length of the building, taking the outside measurement of the walls, but excluding the buttresses, will be 120 ft.; width across the nave, including the side aisles, 52 ft.; width across transepts, 68 ft.; length of chancel, including the chancel arch, 31½ ft.; width of chancel, 26 ft. The vestry will be on the north side of the chancel, and its dimensions will be 25 ft. by 14 ft. The total height of the tower and spire, including ironwork and vane at the summit, will be 180 ft., the tower itself being 87 ft. in height. Height of church from floor level to eaves of roof, 41½ ft.; and from floor to ridge of roof, 56 ft. The tower will stand in the centre of the transepts, or nearer to the east than the west end of the building. Entrance to the church will be gained by a porch on the north or village side, and it is intended that this shall be the sole means of ingress or egress for the parishioners. A small door on the same side will be used merely as a vestry entrance. Light will be imparted to the body of the church by four three-light windows in the clerestory of the nave. There will also be eight two-light windows in the south aisle, and seven windows of a similar description in the north aisle, the place of the eighth window being occupied by the porch. At the west end of the church will be a large six-light window, with tracery in the head. Each transept will be lighted by a large six-light window at the north and south ends, the heading of these also being filled in with tracery. The transepts will have side windows of four lights each. The chancel window will, of course, be the most elaborate. It will contain five lights, and the head will be enriched with tracery. Above the arch of this window, and in a gable, will be placed a circular window, with tracery of seven quatrefoils. The chancel will be further enlivened by two three-light windows on each side. The interior of the church will be stone-geined throughout with moulded and carved ribs and stone spandrels. There will be a triforium round the chancel, and also at the west end of the nave, access to which will be obtained by small towered spiral staircases. The chancel will have an arcade on the north and south sides, each arcade being divided into four panels under the bays of the windows, the heads being traced. The mouldings generally about the arches and the groining will be ornamented with dog-tooth tracery pattern. The tower will spring from, and be supported by, four stone pillars at the junctions of the transepts with the nave and chancel, each pillar having a moulded capital. The roof of the space beneath the tower will be geined as the rest of the roof of the church, and as this ceiling will be considerably higher than the groining of the nave, it has been found necessary to introduce windows on the north and south sides. The ringing-loft will be above the groining, and above this will be the bell-chamber, which will be lighted by two windows on each side of the tower. The nave will be separated from the side aisles by an arcade of four arches on each side. The whole of the nave and aisle passages, with the chancel, except that portion east of the communion-rails, the vestry, the porch, and all other parts of the church, will be paved with Staffordshire tiles, red and black, with black tile borders. The space inside the altar-rails will be paved with a richer kind of tile. The seats will be all open, of American oak, with English oak backs and ends. There will be very little carving or ornamentation about them, but they will be moulded, both at the ends and backs. Provision will be made for the organ in the north transept, and here also will be the seats for the choir. Under the vestry will be constructed a chamber to contain the heating apparatus. The lower, battlemented at the top, will contain a clock facing to the north, the spire springing from the inside of the battlements. Instead of running in a direct line to the point of the angle, the spire will slightly swell outwards. Access to the tower will be gained from outside by a spiral staircase at the south-east angle, formed by the junction of the chancel with the south transept. The church

proper will be entirely built of Danford Bridge rubble stone, laid in random courses. The internal face of the walls and all dressings will be of Darfield stone ashlar. The roof will be composed of Staffordshire tiles of a straw-berry colour, except the roof of the chancel, which will be covered with lead. A large space of ground around the church will be enclosed by a stone wall, and laid out neatly, but not used at present for internments. A carriage-road will run directly from the east end of the tower to Wantworth House, for family use. For the convenience of the villagers a road is intended to be formed in a direct line from the church porch to the principal street of the village. Mr. J. W. Booth, of London, is the contractor. The clerk of the works is Mr. Joseph White, of London.

Dunkirk.—The parish church has been reopened after restoration, alteration, and improvement. The edifice has been built only thirty-one years; but it appears that the foundations of the buttresses were found to be defective, and they have all been pulled down and rebuilt in cement. The old lead on the ridge of the roof has also been removed, and replaced with red ridge tiles. Internally, the organ and choir gallery at the west end have disappeared, and the organ is now placed in a new separate chamber, built out on the south side, forming a transept, with seats for thirty choristers. The chancel, which was quite plain, has been decorated by Messrs. Harland & Fisher, of London. The whole of the pews, which were previously stained, have been painted and varnished, and are now of a lighter colour to be more in harmony with the general character of the internal arrangements of the building. There is also a new lectern of oak on an illuminated pedestal, the gift of Mr. Henry Saddleton, of Whitstable. The restorations have been carried out by Messrs. Goode & Payn, under the supervision of Mr. Broadbridge, architect. The total cost of the works is estimated at 500l.

DISSENTING CHURCH-BUILDING NEWS.

Darlington.—A new Wesleyan chapel in North-road, Darlington, has been opened for public worship. The edifice will seat 1,500 persons. The site has been presented by Mr. W. Barningham. The cost of the structure amounts to 4,200l., of which sum about 3,200l. have been already subscribed or promised. The design was prepared by Mr. Pritchett. The interior is comparatively plain, but commodious. The acoustic properties of the building, however, are good. The building is in the Romanesque style, and of red bricks, with stone dressings. The front towards the North-road has in the lower stage of the centre a double doorway, the space over the doorway being occupied by a large four-light window. This central part is finished by a gable, surmounted by a finial. The sides of the front are occupied by staircases, having steeply pitched roofs, to break the monotony usual in chapel fronts. In the lower story of each staircase is a single doorway, over which are two-light windows. All the doors and windows of the front have recessed jambs, containing pillars with moulded bases and carved caps. The sides of the building are designed with pilasters of brick and round-headed windows, in red and white bricks. The internal dimensions are 100 ft. long by 50 ft. high. The space is divided into nave and aisles by two tiers of iron pillars, the lower tier of which support roomy galleries, and from the caps of the upper tier spring moulded arches forming arcades from the top of which rises a wagon-headed roof, having moulded braces and purlins, and ceiled to the spars and collars. The first bay is occupied on the ground floor by a vestibule in the centre, over which the gallery extends, and by stone staircases at the angles, which, being inclosed all the way up, form abutments, from which the arcades spring. The last bay in the rear is occupied by a large vestry in the centre, over which is the choir, and at each side are three stories of vestries, and a staircase leading up to them. The whole of the seats are low, with slanting backs, and provide accommodation for about 1,500 persons. About 400 of the seats are free and open, all the rest having low doors. The pulpit is of pitch-pine, varnished, and all the rest of the woodwork is painted. The warming and winter ventilation are effected by Lewis's patent warm-air apparatus. In summer fresh cold air can be admitted through the same channel, and also by a number of Sheringham's ventilators near the ceiling, and the foul air is extracted by gas furnaces in the roof, connected with various ventilators by sheet-

iron tubes. The lighting is by star-lights, dependent from the main and gallery ceilings. The site, which contains space for a minister's house, is surrounded on three sides by light low railings on dwarf walls, the back being inclosed by a plain brick wall. The works have been carried out by the following contractors:—Brick, mason's, and plasterer's work, Messrs. Ironsley; slating, Messrs. Atkinson; joiner's work, Mr. Armitage; painting, Mr. Wilson; ironfounder's work, Mr. Davison; plumbing, Mr. Lishman, all of Darlington; warming and ventilating, Mr. Lewis, Newcastle; gasfittings, Mr. Gilbody, Manchester; ornamental metal-work, Mr. Dovey, Manchester; carving, Messrs. Bustall & Taylor, Leeds.

Coniston.—The memorial-stone of a new chapel for the Primitive Methodists was laid last week at Coniston, about one mile from the village of Swine, in Holderness. The tender of Mr. Pickering, of Coniston, has been accepted, at 199l. The architect is Mr. Frank N. Pettingell, of Hull, who is also the architect for the new chapel now in course of erection in Williamson-street, Holderness-road.

Tettenhall Wood.—The memorial stone of a Congregational Chapel, intended to supersede the present inconveniently small and ill-adapted building, in which the Congregationalists of Tettenhall Wood now worship, has been laid by Mr. S. S. Mander, in the presence of a large assemblage from Wolverhampton, Sedgley, Bilston, and other places round the district. The building will be 58 ft. long by 33 ft. broad, and will accommodate, including north gallery, about 400 adults. The style is Geometric. The walling will be stone faced, the stone used being from the Codsall quarries. The north front will be a gable with central doorway, and a turret at the western angle, the turret to be 60 ft. high. The contract has been taken by Mr. Cockerill at 1,808l. The architect is Mr. Billake, of Wolverhampton.

ROMAN CATHOLIC CHURCH BUILDING NEWS.

Kensal New Town.—The new Roman Catholic schools and temporary church in Bosworth-road, Kensal New Town, were opened on Sunday, the 8th inst. The architect is Mr. S. J. Nicholl, and the contractor Mr. A. Stour.

SCHOOL-BUILDING NEWS.

Addingham, near Ilkley.—The memorial-stone of a new Sunday and day school, about to be erected by the Wesleyan Methodists at Addingham, has been laid, in the presence of a large gathering of spectators. The building has been designed in the Gothic style of architecture, by Mr. Geo. Smith, of Bradford, and on a scale that will give accommodation for about 200 children. It is to consist of one large schoolroom, 50 ft. by 30 ft.; and two class-rooms, each 17 ft. by 14 ft. Land has also been acquired for a playground. The cost of the school and land will be about 1,000l., but a further outlay of 250l. is contemplated in the erection of a teacher's residence. The contracts for the various works have been let to Mr. Geo. Smith, builder, Addingham; Messrs. J. & B. Emmott, joiners, Addingham; Mr. James Whitaker, plumber, Addingham; Mr. O. Lister, plasterer, Ilkley; and Mr. Samuel Thornton, slater, Bradley.

Great Wyrley.—New schools and master's residence have been commenced at Cheslyn Hay, Great Wyrley, Staffordshire. The site has been given by Lord Hatherton, and the cost of the buildings will be 800l. Mr. Grocensill, of Great Wyrley, is the builder; and Mr. Griffin, of Wolverhampton, the architect.

STAINED GLASS.

Cadoston Church, South Wales.—A stained-glass window, consisting of two lights and tracery, has been fixed in this church. The subjects are Abraham's sacrifice, Good Samaritan, and the Raising of Lazarus. Mr. S. Bourne was the artist.

Hamsingore Church, Wetherby.—A stained-glass window, by Messrs. Hardman, of Birmingham, has just been placed in this church. It is the gift of Mr. Wood, of Cattail, in memory of his grandparents. The window consists of three lights, representing St. John the Baptist preaching.

Hockerill Church, Bishop Stortford.—Six

stained-glass windows, by O'Connor, of London, have lately been placed in the south aisle of this church. In the eastern window of the aisle, which is a memorial window, the subject is the Female Saints of the Old Testament, arranged in chronological order. In the western window the subject is the High Priests of the Jewish Dispensation, also in chronological order. In three of the southern windows are the twelve Minor Prophets, in the order in which their writings are placed in the Old Testament, four figures being placed in each window. In the smaller window are the figures of Ezra and Nehemiah. Two of the windows representing the Minor Prophets are memorial windows to the Rev. Arthur Henry Blunt, one of them having been given by the superintendent, governesses, and schoolmistresses of the college together with all Mr. Blunt's former pupil during the eight years of his chaplaincy. The dedication of the church (All Saints) has been kept in view in arranging the subjects for the windows. In the west windows are four classes of Saints, Patriarchs, Prophets, Kings, and Martyrs. In the chancel, where the subjects are chosen entirely from the New Testament, are represented in the east window the twelve Apostles, and our Lord in Glory as the King of Saints; in the north window are three of the Saints and Evangelists mentioned in the Acts of the Apostles. One of the southern windows is for its subject the Female Saints of the New Testament. In the southern window are three Bishops, as another class or order of Saints: St. Timothy, St. Titus, and St. Clement.

Dunfermline Abbey.—A stained-glass window has been erected in the nave of this abbey to the memory of the late Mr. and Mrs. Hunt, of Perthshire. The window is situated at the north-west angle formed by the walls of the western tower, and is at once seen on entering from the north porch. Stone mullions divide it into three tall pointed lights, with three tracery openings above. The three upright compartments contain illustrations of incidents connected with the death, burial, and resurrection of our Lord. The first group is seen St. John leading his Mary, the mother of Christ. In the centre light is represented Jesus being laid in the sepulchre by St. John and Nicodemus, Mary Magdalen, and other women. In the third compartment, forming a completion to the series of subjects, is the scene of our Lord appearing to the women after his resurrection. In panels underneath these groups are angels seated upon shrined thrones, and bearing scrolls inscribed "I am the resurrection and the life. He that believeth in me, though he were dead, yet shall he live." Over the subjects are foliated canopies of early character, terminating in crosses of mosaic colouring. In the leading points of the tracery are stary crowns, and the emblem of the Trinity. The glass is entirely composed of thick crystalline colours. The whole has been designed and executed by Messrs. Ballantyne, Edinburgh.

FROM SCOTLAND.

Edinburgh.—After many years of delay Trinity College Church is now fast approaching completion, and can be well seen from Calton Hill, Regent's Arch, or North Bridge. The apex of the original church is being carried up at the same time in the shape of an arch behind the modern church. It is now so far advanced as to be ready for throwing over the stables of the roof, so that in a short time old groined ceiling, with its carved bosses, will again be in proper position after lying so long on the Calton Hill.—A public meeting has been held in the Freemasons' Hall, Blackfriars-street, says the *Weekly Scotsman*, for the purpose of memorialising the Town Council against the re-erection of the piazza at the corner of Blackfriars-street. The Rev. Mr. Gillespie was called to the chair, remarked that the piazza was not only unseemly in appearance, but dwarfed the other new buildings in the street, and hoped that it would not, after being taken down, be put up again. The meeting then agreed to memorialise the Town Council, with a view of having the piazza removed altogether. A committee was thereafter appointed to draw up the memorial, and present it to the Town Council.

Blairdrummond.—The large east window of Kincairdine Church has just been filled with stained glass in memory of the late Mr. and Mrs. Home Drummond, of Blairdrummond.

ndow is divided into four upright compartments, with top tracery. The church is in the peculiar style of architecture, and the walls of the glass are all in accordance with the structure. The subjects illustrated are Jesus weeping at the Grave of Lazarus, Christ's Agony in the Garden, "Christ using His Cross," and the "Angel at the quire announcing to the Marys 'He is risen.'" The subjects, we believe, were executed by Mrs. Drummond. In the central space in the top tracery is a group of angels (shipping). Over the illustrations are canopies, and the remainder of the lights are covered with a borderings and foliated grizaille ground-work. The window has been executed by Messrs. Ballantine, of Edinburgh. We understand that, in addition to the window just noted, the Messrs. Ballantine have been commissioned to put in other three stained-glass windows by parties who have a connexion with the parish of Kincardine.

VARIORUM.

JENKINSON'S Practical Guide to the English to District" (Stanford, Charing-cross), is arently the work of one who well knows the rick, and will be found very useful by tourists. The main point is the want of proper architectural descriptions of remaining structures. The book includes a number of useful maps, clearly noted.—"When Mother Died" (Kitto, Coppsgate-street), is the title of a little tale for children, by Marie B.—It is a very touching story, charmingly written: a little over-sad for children. We advise the writer to take a more lively theme for her next.—"The City Sanitary Organisation: its Aids and Obstacles. By James M. Macleod. Glasgow: Adshedd, 1872." This is a reprint from the *Law Magazine* for Scotland, of a paper read before the Social and Sanitary section of the Glasgow Philosophical Society. Mr. Macleod is Sanitary Inspector of the city of Glasgow. His purpose is rather to point out the duties of the various officers, the provisions and acts of the law, and obstacles to be encountered in carrying out the Public Health Act of 1867, the Police Act of 1866, than to treat of the sanitary state of the city, either before or since the Acts were passed.—In the new number of *Leisure Hour*, Mr. Timbs, continuing his own Recollections, gives appreciative and interesting notes of some who were contributors to the work with which he was early connected:—Charles Mackay, W. A. Chatto, "Alfred Quill," Peter Cunningham, Mr. Henry Cole, and several others.

Miscellaneous.

the Copenhagen Exhibition. — This northern Exhibition of Industry and Art is open. In the fine arts, Norway is especially represented by landscape. Adolph Tidemann occupies a prominent place. Professor Hans E. von Carlshule, has furnished many works of high standard quality, the best being "Morn-ing in a Norwegian Harbour." Ludwig Munthe, Düsseldorf, has supplied a winter landscape with light. Among historical paintings especially notable are "Valkyria" and "The early Ride of the Rulers of Man's Fate," by P. N. Arbo, of Paris. The former idealises the mysteries being called Valkyria, a female in Odin sent to choose from the fallen such as had won the bliss of Val-hall by a fight and a dauntless death. She rode air and water, surrounded by a ghastly army, the so-called corpse-lustre; and, wherever she was seen, was the harbinger of slaughter. The weird idea Mr. Arbo has endeavoured to embody in a handsome figure with a passionate greyish eye, riding intently on a horse exceedingly wild black steed. Of the various treatments in this Exhibition, there is none which commands such an amount of purely national interest as the department of domestic industry. In conception and design, this department is in some respects peculiarly original. The native industry of Norway bears such an unusual stamp that nothing in the world could be mistaken for it. What is exhibited in the same class from Denmark bears a widely different impress, and is so void of specially-marked nationality that it might as well be German.

A Few Words about Strikes.—Supposing the demand of our working men to be reasonable, and that their employers will not listen to their entreaties, is there no other mode by which they can obtain the object in view than by suddenly suspending work, and in a manner declaring war against both their work and their employers? Do they take into account the enormous loss resulting from such strikes to the whole country, the incalculable inconvenience to the parties concerned, the loss to the capitalists, and the still greater loss to themselves and their families? Let them not imagine that it is the same thing to get 11. or 21. a week for their stentation out of the common fund of their trade-union, and to receive an equal amount from their employers. In the former case the expenditure is unproductive, in the latter it is productive. And there is this additional important difference, that while any fund arising from former savings must soon come to an end, the fund arising from continuous productive labour is ever renewing itself. And are they sure that, were they to win and get the advance sought, they would fully recover all they are now losing? Dr. Watt, in a paper on strikes, and their effects on wages, profits, and accumulations, calculated that if a strike for 5 per cent. increase in the wages succeeds, after a given time, the loss of every human month's wages would require one year and three-fifths of work at the extra rate to make it up. But more than this, as money is worth 5 per cent. at interest, it follows that if a strike for 5 per cent. lasts twelve months and a half, and then succeeds, and maintains the interest for twenty years, the workman has lost in interest much more than he has gained in wages, and that therefore no part of the loss can ever be made up; for if he could have worked for the lower sum during the year of strike, and have invested instead of spending the money, the year's wages would have grown into three years' wages nearly by the time in which the gain of the strike would make up for the loss of a single year. How much should we think before we commit ourselves to a position from which we cannot retreat!—*Professor Leone Levi, in "Cas-sell's Magazine" for September.*

Sanitary Report on St. Marylebone.—The annual report on the health of the parish of St. Marylebone, 1871, by John Whitmore, M.D., medical officer of health for the parish, has been printed, by order of the vestry. From this report it appears that, under the Artisans and Labourers' Dwelling Act, eight houses in York-courthouse have been pulled down, which were certified as unfit for human habitation and incapable of structural repairs. All the houses in Stephencourt, five in number, and one in Crawford-place, have also been demolished for the same reasons; in addition to these, all the houses in Burn-place, twenty in number, have been shut up, the medical officer of health having declared them unfit for habitation, and many other houses, which had been condemned, but which were found capable of structural repairs, have since been put into good sanitary condition. A mortuary-house has been erected in the burial-ground adjoining Paddington-street; it is capable of holding twenty dead bodies, and is now in almost daily use for those who have died from contagious or infectious diseases. It is disinfected under the directions of the medical officer of health. A disinfecting apparatus has been erected in the parochial stone-yard. A remarkable feature in connexion with the population of St. Marylebone is the great preponderance of females over males. The census of 1871 shows an excess of the former over the latter amounting to upwards of 20,000, the number of females being 89,668, and the males 69,596. This excess exists in every district of the parish; it is greatest in St. John's, where it amounts to nearly 6,000, and least in All Souls, where it amounts to about 2,300. And if the relative birth and death rates of the two sexes during the past year were to continue undisturbed for some few years longer, the female population of St. Marylebone would more than double that of the male.

The Worcester Architectural Society.—An excursion to Stratford-upon-Avon has been made by this society. The Rev. Dr. Collis, vicar of Stratford, acted as *cicerone* to the churches and other objects of interest in the town and neighbourhood. The excursionists had charming weather. Of course, they visited all the places of interest, which we need not here particularise. The party dined at the Shakespeare Hotel.

Trial of a New Road-making Machine.—A lengthened trial of Messrs. Goro & Green's patent steam-road rammer has taken place at Boston, Lincolnshire. This machine resembles the steam road-roller which has been at work in London, but combines with it two massive rammers, each weighing 18 cwt., which are impelled by steam power forcibly against the ground. At each blow the loose materials of the road are firmly pressed together into a dense and solid mass, which the roller then passes over and smooths, but in no way disturbs. The result is said to be a much superior state of the surface than can be produced by the mere effect of rolling. The machine has been constructed by Messrs. Tuxford & Sons, of Boston. The experiments were conducted by Mr. C. B. King, C.E., of Dowgate-hill, London. It was seen that the rammers could be thrown out of gear at will, and the machine thus made to act as a roller only. The force of the blow also was shown to be completely under the control of the engineer, and prevented from acting injuriously by reaction against the machinery. Major-general Boleau, of the Royal Engineers, who has written a treatise on road formation, was present, and expressed his approval of the double principle of the machine.

Fatal Accident in a Well.—Dr. Diplock has held an inquest at the Lamb, Chiswick, upon the body of Richard Swansborough, who was killed while boring a well at Messrs. Sich's brewery. The deceased and another were engaged in digging out the earth at the bottom of the well, which is 5 ft. in diameter and 132 ft. deep—the stuff so loosened being thrown into buckets and drawn up the mouth of a well by a windlass worked by two men, who were superintended by a third. Deceased and his companion had been but a few minutes in the well, and had only sent up two buckets of earth, the latter of which the superintendent was horrified to see was swinging by its bale or handle upon the very point of the hook. He had barely time to call attention to the precarious position of the bucket, and none to remove it, before it fell the whole depth of the well, striking the unfortunate Swansborough, breaking almost every bone in his body, and killing him instantly. Verdict—Accidental death.

A New Industry in Glasgow.—A few months ago, a gentleman, named Colonel Fish, came over to this country from America, with the object of developing a patent he had just taken out, for the manufacture of asbestos, or, rather, for the application of that mineral to steam-packing purposes. He took steps, in Glasgow, for the formation of a company to work his patent. That company was soon formed, and works for the new manufacture were erected in St. James's-street. Colonel Fish has lately been carrying out a series of experiments at Glasgow, with the view of testing the adaptability of asbestos for the manufacture of cloth and paper. The demand for the steam-packing patented by Colonel Fish has increased so much that it is in contemplation to build other and more extensive works in Glasgow, capable of turning out from 200 to 300 tons per annum. Practical engineers are of opinion that many more useful applications are likely to be found for this mineral.

A Steam Faving Tool.—An apparatus of this kind has lately been tried in Paris, namely, a Steam Rammer. As used from time immemorial, the rammer is a heavy iron-shod implement which the workman raises about 1 ft. from the ground and allows to drop, as rapidly as he may, successively upon the boulders or blocks to be set. The object of the invention of M. Lignier is to save the labourer the severe physical exertion of raising the heavy tool, an exertion producing in time an injurious effect upon the lungs. In the apparatus of M. Lignier the heavy weight is lifted by a small Lenoir gas engine. To the fly-wheel of the engine is connected the rammer of steel, smaller but heavier than the ordinary instrument. The movement of the machine is controlled by the operator; and the rapidity of the operation, according to the inventor, more than counterbalances the greater first cost.

Stowmarket Church.—The quantity of stones that have fallen from the tower of this church during the last few days has been something alarming, and many fears are expressed by those who reside in the neighbourhood that the entire tower will shortly come down. Something ought to be done directly in the matter.

Sanitary Report on St. Mary's, Islington.
The annual report on the sanitary condition of the parish of St. Mary, Islington, during the year 1871, by William H. Corfield, M.D., Medical Officer of Health, has been printed by order of the vestry. In speaking of the sanitary work of the year, this report states that during the hottest part of the summer carbolic acid was used with the watering every Saturday in some of the closest streets; and once a week also McDougall's powder was freely thrown about many of the courts, yards, and dust-bins of smaller houses. The reporter thinks that "the whole system of dusting may, before long, have to be reconsidered, as it is a growing opinion that it would be a wise sanitary measure to abolish entirely all dust-bins, and substitute portable receptacles in their stead; the metropolitan vestries making provision for the daily removal of refuse from each house."

St. Margaret's Church, Ipswich.—During the progress of the restoration of this church, the workmen discovered the remains of a mural painting in the spandrel between the second and third arches reckoning from the west end on the south side of the nave arcade. The picture seems to be an attempt to combine the legends of St. Christopher and St. Anthony praying with the fishes. At the bottom is the kneeling figure of a man in the act of prayer. Just above him are fishes of various kinds, the pike in the act of swallowing a smaller fish, the eel, the plaice, &c., and the water is visible, in spite of the mutilation which the picture has suffered. Above the highest of the fishes, in the widest part of the spandrel, are traces of the figure of a man. The figure appears to be wading through the water.

The Employment of Children in Brick-yards.—At the Birmingham Police Court, Mr. John Bond, brick manufacturer, Garrison-lane, was summoned by Mr. W. H. Johnson, sub-inspector of factories, charging him with having employed in his brickyard four children, each under the age of thirteen years, for more than six hours and a half per day, and also with having employed a girl, under the age of sixteen years, contrary to the Workshops Regulation Act. Mr. Johnson said that not any of the children attended school, for which their parents were responsible. He would not press for a heavy fine, as he thought that the defendant would be careful not to infringe the law again. The magistrate imposed the mitigated penalty of 1s. and costs in each of the five cases, amounting altogether to 3l. 7s. 6d. The full penalty in each case is 3l.

Cambridge.—The guardians of the Cambridge Union are about to erect an infectious disease hospital on an isolated spot on the borders of the town, to consist of, on the ground-floor, for each sex, night and day convalescence wards, kitchen, and nurses' rooms, with offices. On the first floor will be two wards, each containing six beds, 20 ft. by 30 ft., and an occasional ward for two beds. All the wards will be ventilated by foul-air flues, worked in the walls, and a continual supply of fresh air will be admitted into the wards by small inlets, formed with iron boppers, covered with fly-wire, at the top of the sashes. A detached dead and wash house will be provided. The works are to be carried out from the drawings and specification prepared by Mr. Edwin Bays, architect, Cambridge.

Sculpture, Birlingham Church.—We recently mentioned the completion of the works here. We may add to what we said, that the interior includes some carved small figures, &c., executed by Mr. Purdy, of London. On the north side of the church, at the entrance to the chancel, is a carved angel, on a stand. The angel is represented as holding an open Bible, and is intended for the pulpit. On the opposite side is the lectern, representing an eagle on a rock. Both of these are the work of Mr. Pfyffers, sculptor, London, the material used being Corsham stone.

The New Lambeth Workhouse.—It appears from the proceedings which took place at the usual meeting of the Lambeth guardians last week, that the works of the new workhouse have so far progressed that it is now necessary to take measures for providing the fixtures and fittings, and the architect has submitted a set of drawings and specification for the same which, after some revision by the guardians, have been approved of, and tenders for the execution of the works ordered to be invited.

Proposed Children's Playgrounds for Salford.—At a meeting of the Salford Town Council, Councillor Mather moved,—“That it is desirable that three plots of land, respectively situated in Deal-street, Silk-street, and Spring-field-lane, be acquired, either at a yearly rental or by purchase, for the purpose of converting them into playgrounds for the children of the poor inhabitants of the respective districts, and that the General Health Committee be authorised to consider the subject and report thereon.” After some discussion, however, an amendment that the question of the formation of playgrounds for the children of the poorer inhabitants of the borough should be referred to the General Health Committee to consider and report to the Council, was adopted by a majority of twenty to six.

The Proposed New Dock at Maryport.—A crowded meeting of the ratepayers and ship-owners of Maryport has been held for the purpose of having laid before them by the trustees a statement relative to the proposed new dock and works, and the probable cost of completing the same, and to take their opinion as to whether the trustees should proceed with the works. After some discussion, during which it was stated that the dock would cost 120,000l., while the borrowing powers were only to the extent of 88,000l., the chairman took the sense of the meeting as to whether the dock scheme should be proceeded with or abandoned, and it was decided by a large majority that the scheme should be abandoned.

Coate Reservoir, Swindon.—The culvert which conveys the water of a spring underneath Coate reservoir burst, and the water was rushing out when Mr. Fox, the lessee, ran to the hatch and let it down, then to the other end of the reservoir, and arrived in time to see the repulsed water flow out into the meadow there, but by letting down the other hatch he stopped this also. The spot where the leak had occurred was indicated by a whirlpool, and the confined air in the culvert suddenly blew the water up above the surface of the reservoir, like the spout of a whale. It appeared to be a serious leak, caused probably by the brickwork of the culvert settling down, the foundation being upon a kind of bog or quicksand.

Howel Harris's Memorial Chapel, Brecon.—The site selected for this memorial is a piece of ground near the old College at Trevecca, on the north-east side, and in the immediate vicinity of the birthplace of the reformer, and the spot where he lived and died. The ceremony of laying the stone has taken place. A platform had been erected for the purpose of holding a meeting on the spot where the foundation of the chapel lies. The Rev. Edward Matthews, of Cardiff, presided. The chairman delivered an address in Welsh, and, on behalf of the committee, handed Mr. Davies a silver trowel and mallet. Mr. Davies, who is a ready subscriber to worthy objects in the Principality, took off his coat, called for a sledge-hammer, and performed his task in a workmanlike manner.

Covered Sheds or Ventilating Barns.—These buildings save trouble in the field (by the crop being carted earlier than if it were to be placed in the old-fashioned closed barn): they allow corn to dry better than if packed in a stack, and especially they save cost of thatch and thatching. The cost of some such buildings is, it appears, from 8d. to 1s., according to material used, for each cubic yard of contents. Thus, says a correspondent of the *Bedford Times*, if 30 cubic yards were taken as the bulk from one acre, a shed to accommodate the produce of 100 acres would cost between 100l. and 150l. A solid erection of brick pillars, 14 ft. high, and as many feet apart, with a slate roof double that span, and a floor of concrete, would now be not far short of the latter figure.

Bristol City Surveyorship.—The joint committee of the town council to which this question was referred, have decided to recommend the appointment of Mr. Josiah Thomas, as city surveyor, at a salary of 700l., with an allowance of 50l. in addition, for hire of horse and trap. Mr. Thomas will be permitted to retain his private practice, but must not undertake any work in which the interests of the parties concerned are antagonistic to the corporation. The staff required by Mr. Thomas will be appointed by the corporation, and not by that gentleman himself, as originally proposed.

Fall of a Party-wall in the New Cut.
An accident, which, had it occurred at any other part of the day than that during which it happened, would in all probability have been attended with loss of life, took place on Thursday week, in the New Cut, London. About one o'clock in the morning, the inhabitants residing in neighbourhood were disturbed by a rumb noise, and upon getting up to ascertain cause, they found that the party-wall inside premises of Mr. Priest, who keeps a coffee-dining room on the ground floor only, had fallen down, driving the shop-front into the street, destroying all the crockery and other material in the interior, a considerable portion of roof immediately over the shop falling in among the debris.

The Fountain Movement in Paris.
Three new fountains, provided for by the liberality of Sir Richard Wallace, have been opened at the Barrières de la Glacière, M. parnasse, and d'Enfer.

Edinburgh Cathedral Competition.—We understand that the designs have been referred by the trustees to Mr. Ewan Christian, in view of his reporting on them.

TENDERS

New lecture-room adjoining Red-hill Congregational Chapel. Mr. W. F. Poulton, architect:—
Russell £207 0 0
Asstford & Wainwright 325 0 0
Cook (accepted) 325 0 0

For alterations and additions to Balls-vue II Twickenham. Mr. W. G. Wallis, architect:—
Fish £2,065 0 0
Higgs 1,897 0 0
Messian & Wainwright 1,850 0 0
Asstford & Wainwright 1,911 0 0
Hiscoek 1,775 0 0
Langham 1,750 0 0
Knight 1,665 0 0
Lisle 1,630 0 0
Hurst 1,690 0 0

For vicarage-house, Comberton, Cambridgeshire. E. Bays, architect:—
Warboys £1,423 0 0

For the erection of a new Wesleyan chapel, & Blechingly, Red-hill:—
Worsfold £1,657 0 0
Taylor & Son 1,670 0 0
Peskett & Taylor 1,350 0 0
Reynolds & Eldridge 1,380 0 0
Brown 1,325 0 0
Wilcocks 1,238 0 0
Hickinbottom (accepted) 1,374 0 0

For a house at Sheen, for the Hon. S. R. Curzon. Peacock, architect:—
Lathley Brothers £2,927 0 0
Simson 2,900 0 0
Manley & Rogers 2,797 0 0
Admison & Sons 2,775 0 0
Sims 2,743 0 0
Sims 2,690 0 0

For buildings in the rear of No. 93, Fore-street, for Mr. Mein. Mr. J. Harrison, architect. Quasi-supplied by Mr. A. W. Q. Nicoll:—
Henshaw £558 0 0
Lathley Brothers 553 0 0
Brown & Robinson 516 0 0
Ennor 492 0 0
Prince (accepted) 485 0 0

For five houses, Peckham, for Mr. J. M. McD. Mr. J. W. Reed, architect:—
Kell & Co. (accepted) £2,309 0 0

For alterations to old schools, Upper Catherham. Richard Martin, architect:—
Smethurst £177 0 0
Simons 157 0 0
Scrivenor (accepted) 140 0 0
Tooth 110 10 8

For alterations to No. 139, High-street, Croydon new post-office. Mr. R. W. Price, architect. Quasi-supplied by Mr. W. H. Barber:—
Hjwell £720 0 0
Brett 697 0 0
Jarrett 678 0 0
Smith 657 0 0
Leag 685 0 0
Peskett & Taylor (accepted) 589 0 0

Fittings to a warehouse, Hamsell-street, City. H. Ford, architect:—
Crabb £399 0 0
Brass 540 0 0
Young 529 0 0
Henshaw & Co. 484 0 0
Stimpson 458 0 0

For alterations to a warehouse, Hamsell-street, City. H. Ford, architect:—
Hobson £254 0 0
Crabb 235 0 0
Stimpson 234 0 0
Henshaw 184 0 0
Young (accepted) 187 0 0

For Wesleyan chapel and school, Cubitt-town. H. Hoole, architect:—
Hobson £1,350 0 0
Harris & Wardrop 1,325 0 0
Ennor 1,248 0 0

For additions to residence at Cuddington, Surrey, for A. Hector, Messrs. J. Giles & Gough, architects, quantities by Mr. C. H. Goode.—
Jocelyn (accepted).....£2,515 0 0

For alterations, additions, repairs, painting, &c., at South-street, Manchester-square, for Mr. G. Coml. Mr. C. Bradley, architect. Quantities supplied:—
Scrivenor & White.....£784 0 0
Stammers & Budge.....617 0 0
Ashwell.....617 0 0
Stephens.....627 0 0
Chapman.....621 0 0
Harris & Sons.....629 0 0
Simpson & Son.....612 0 0
Brown (accepted).....598 10 0

For St. John's Church, Reading. Net amount, after swing for present building. Mr. W. A. Dixon, architect.—
Manley & Rogers.....£6,988 0 0
Higgs, Bangs, & Co.....6,589 0 0
Mann.....6,455 0 0
Gibson Brothers.....6,185 0 0
Nightingale.....6,158 0 0
Stammers & Budge.....6,576 0 0
Atchison & Son.....6,505 0 0
Niblett & W.....5,437 0 0

For widening the River Medway, near Maidstone, for Wright, Southwark, Mr. M. Turner, Messrs. J. & F. Fuller.—
Fuller.....£750 0 0
Batch.....629 0 0
Burdell.....600 0 0
W. Ellinger & Co.....593 0 0
Dowser.....426 0 0
Hutton.....297 0 0
Sirection.....187 0 0

For making up Raymouth-road for Rotherhithe Street, Southwark, for Mr. M. Turner, Messrs. J. & F. Fuller.—
L. Etheridge.....£1,175 0 0
Batch.....1,699 10 0
W. Ellinger & Co.....1,390 0 0
Hobman (accepted).....1,075 0 0

For making up Wellington-road, Peckham, for Vestry St. Giles, Camberwell.—
Hare.....£160 0 0
Harris.....129 0 0
Batch (accepted).....114 0 0

For rebuilding the "Globe" public-house, Borough Road, Southwark, for Mr. M. Turner, Messrs. J. & F. Fuller, architects. Quantities supplied by Mr. T. Perry:—
Rider & Son.....£3,135 0 0
Sheppard.....2,870 0 0
Mansfield.....2,990 0 0
Hart.....2,880 0 0
Tarrant.....2,870 0 0
Harris & Sons.....2,750 0 0
Downs & Co.....2,750 0 0
Eaton & Chapman.....2,640 0 0
Thompson.....2,623 0 0

For additions to St. James's Schools, Remondouy, Hesketh, architect. Quantities supplied by Messrs. H. K. & A. Andrews:—
Legg.....£1,420 0 0
Talbot.....3,627 0 0
Rider & Son.....1,218 0 0
Arnold.....1,199 0 0
Coleman.....1,185 0 0
Tarrant.....1,120 0 0
Kent.....1,093 0 0
Downs & Co. (accepted).....996 0 0

For completing two pairs of villas, Lordship-lane, East with Mr. T. Clarke, architect.—
Rooney, Brothers (accepted).....£500 0 0

For a detached house, Ninehams-road, Caterham, Surrey, Mr. R. Martin, architect. Quantities by Mr. P. Row.—
Humier (accepted).....£510 0 0

For mansion, &c., at Glyneigh, Sussex, for Mr. W. Ormerod, Messrs. Bailey Denton, Son, & North, architects, quantities by Messrs. W. Burnet and G. Stanham:—
Mansion, Two gate-lodges, Stables and two cottages, tower.....£13,132£4,106
Dobson & Sons.....12,9263,827
Ormerod & Sons.....12,7523,797
Stanham.....12,7133,472

For works at Henley, Surrey. Mr. R. Martin, architect.—
Pair of Stables, semi-detached cottages, house.....£301£4,454
Lett & Taylor.....285462
Ormerod.....310325
Cotton.....316455
Ormerod & Britny.....296428
Ormerod.....235395
Ormerod (accepted).....290348

For schools and teachers' residences, Upper Caterham, the Caterham School Board, Mr. R. Martin, architect. Quantities by Mr. F. Sparrow.—
Roofs slated, with main tiles, roofs covered with ornamental tiles, add £21 0 0
Roofs slated, with main tiles, roofs covered with ornamental tiles, add £21 0 0
Goodrich.....2,750 .. deduct 50 .. deduct 30 0
Dobson & Sons.....2,699 32
Ormerod.....2,689 15
Ormerod & Son.....2,061 13 0
Ormerod.....2,637 30 0
Ormerod.....2,517 .. add 20 .. add 50 0
Dobson.....2,575 .. deduct 50 .. deduct 25 0
Ormerod (accepted).....2,508 add 15 6

TO CORRESPONDENTS.

Man of Kent letter has been sent to the company.—H. K. W. (booklets would probably answer the purpose, properly directed.—J. L. (such arrangements for the formation of concrete walls were in use long before the date of the patent made).—Y. C. C. (the objection to the present construction of water-closets may be obviated by having the seat so cut that the handle may be raised after the seat is down, or by using a thin oval cover for the opening in addition to the ordinary flush.)—H.—Rev. T. R.—R. H. L. E.—C. S.—W. D. G.—Mr. P.—E. R.—Br. K.—C.—Dr. J.—R. H. B.—R. T.—P.—Quercus.—E. R. R.—H. W. T.—D. & Co.—E. H.—T. S.—H. E.—G.—W. S.—J. R. & Co.—W. H. B.—W. J. S.—R. M.—W. B.—J. B. Erratum.—In the account of Northamptonshire Excursion, last number, for "Drinking-borough" read "Drinkingborough." We are compelled to decline putting out books and giving addresses.

All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

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ENGINEER WANTED, by the Ferry Committee of the Wallace Loan Board, to Prepare Plans, Specifications, and Quantities, and to Take Charge of the whole Works for the contemplated Improvement of the Segoe and Egmont Ferries, on the River Mersey, consisting of Masonry, Landing-Stairs, and Bridges at Segoe; and a Pier, Landing-Stair, and Movable Stage at Egmont.

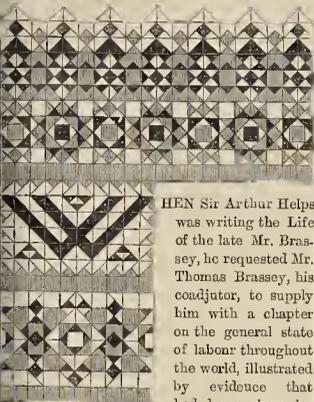
These subjects who have already had experience in such works will be preferred. Applications, accompanied by testimonials, addressed to "The Chairman of the Ferry Committee," to be sent to the Offices of the Wallace Loan Board (Clerk's Office), Church-street, Egmont, near Liverpool, not later than TWELVE o'clock at noon on FRIDAY, the 15th day of SEPTEMBER next.—By order.

T. ROBERT LEBER JONES, Clerk to the said Board. Public Offices, Egmont, 25th August, 1872.

The Builder.

VOL. XXX.—No. 1546.

"Work and Wages."



HEN Sir Arthur Helps was writing the Life of the late Mr. Brassey, he requested Mr. Thomas Brassey, his coadjutor, to supply him with a chapter on the general state of labour throughout the world, illustrated by evidence that had been given by skilled persons, in

reference to his father's career. The subject, however, was found to be so large, and Mr. Thomas Brassey's industry had wrought together such a mass of important facts bearing on the subject, that a separate volume was determined, and this is now before the public.* In it Mr. Brassey treats of strikes, trade unions, hours of labour, the commercial progress of other nations compared with that of our own, co-operation, piece work, and other "burning" questions in debate, with great impartiality and an evident desire to arrive at just conclusions. He urges rightly that clearer knowledge will bring charity and forbearance where jealousy and distrust now unhappily divide the master and the man. There is much truth in the observation of the recently-married Pere Jacquinthe,—"Toutes les fois que le voisin commet une faute, accusons-nous nous-mêmes, nous ne vivons pas assez édifiés." Mr. Brassey's hook is calculated to édifier many, and we trust it will be so used. We will condense some of his observations with such comments as may be necessary. We agree with him that English workmen but imperfectly realise the serious odds against which our industrial establishments have to contend, from the difference in the rate of wages here and on the Continent. It requires skill in the employer, and energy in the workmen, to compensate for the difference. Perhaps the most successful engineering establishment on the Continent is M. Krupp's, at Essen. Between 8,000 and 10,000 men are employed. Day workmen and helpers receive only 2½d. to 1s. 9½d. a day, while the wages of smiths, puddlers, carpenters, and masons, average 8s. to 6l. 15s. a month. These wages would not satisfy the English artisan; yet they are the highest which are paid in any part of Germany. His low rate of wages is to be explained partly by the cheapness of provisions; and it may here be remarked that the comparative cheapness of provisions in some districts of the Continent goes long way to compensate our foreign competitors for the higher price which they have to pay for coal and iron. Moreover, the mode of living adopted by the artisans in Germany is more frugal than English habits will permit. The writer points out that the working-classes in the

agricultural districts in France are, as a rule, more provident than the same class in England. When the works were first commenced on the Paris and Rouen Railway, the contractors endeavoured to introduce a system by which the workmen were to be paid once a fortnight instead of once a week, as had been the custom in England. But very soon after operations had been begun, the Frenchmen requested that the pay might take place only once a month, whereas the English navy generally desires to be paid on Saturday night—and, by the following Wednesday, often wants something on account of the week's work. It is the opinion of Mr. Lothian Bell, one of our highest authorities, that, after all the efforts of our iron-masters to contend with the difficulty of high-priced labour by the improvement of machinery, labour costs 15 per cent. more in England than on the Continent, and this disadvantage in his opinion entirely neutralises the advantages we derive from our great facilities in the proximity of our iron-mines to our coal-heds. Our workmen are not sufficiently alive to the necessity for the exercise of the utmost efforts of ingenuity, in order to enable capital invested in England to hold its own in the industrial campaign.

Speaking of the effect of supply and demand, as opposed to the action of trade-unions, Mr. Brassey says our operatives have but a faint conception of the rise of wages which has taken place abroad in countries where trade-unions did not exist, and where the improvement in the workman's condition was attributable solely to the increased demand for labour. From the tables given in the report prepared by Mr. Phipps, on the industrial classes in Wurtemberg, it appears that the average increase in the rate of wages, in eight branches of manufactures and industry, during the last thirty years, amounted to between sixty and seventy per cent. In the building trades the rise of eighty to ninety per cent. is to be explained solely by the unusual activity in the trades. As a general average, sixty-nine per cent. may be taken as the increase in the daily wages for the out-door labourers. In their class the increased demand for labour is peculiarly noticeable.

The advance in wages in the building trades in London has been considerable; but the writer maintains that it has been the necessary result of the altered relation between the supply of workmen and the demand for labour. Abundant evidence in support of this explanation of the cause of the rise of wages in all branches of trade is supplied by employers by no means friendly to the trade-unions. Mr. Trollope, for example, in his evidence before the Commissioners, says:—"Hitherto there has been such an enormous pressure for work, that almost every man who can handle a tool has been taken on at an unreasonable rate." Again, speaking of the advance in wages in the building trades in the provinces, Mr. Mackay, a member of Mr. Brassey's staff, observes:—"Wages have risen, during the last twenty years, from twenty to twenty-five per cent.; but by the force of circumstances they would have risen as much or more if trade-unions had never existed." We fully believe that the rate of wages cannot long continue so high as to deprive capital of its fair return; for if it did, capital would seek some other investment of a more satisfactory nature. Neither can the rate of wages long continue below the amount necessary to maintain the labourer and his family. The fluctuations in the rate of wages between the two limits depend entirely upon the varying demand for labour.

In the United States the wages of skilled workmen average from 9s. to 15s. a day, and those of unskilled workmen from 2s. 6d. to 7s. 6d. It cannot be supposed, says Mr. Brassey, that so great a difference between the reward of labour on the opposite shores of the Atlantic is due to the superior organisation of trade-unions in the

United States. In New England there are powerful combinations among the artisans, but none among the agricultural labourers; yet, as compared with the same class in England, the condition of the common labourer is, of all others, the most improved by emigration to America. And let it be observed that, as agriculture is the most flourishing, so it is the most important of all the industries of the United States. The value of the total annual production of the leading industries has been estimated by Mr. Wells at 1,365,000,000. To this total agriculture contributes 685,590,000. The demand for labour to bring under cultivation the vast tracts of land still unoccupied is such that it has never yet been satisfied. Hence a rise of wages in strict conformity with an economical law.

In one of his chapters, the author maintains what some would deem a paradox; namely, that daily wages are no criterion of the actual cost of executing works, or of carrying out manufacturing operations; and he does this to reassure those who fear that we may no longer be able to compete with foreigners. It is quite possible, of course, that work may be more cheaply executed by English workmen, notwithstanding that their wages have largely increased; but there must be no artificial restraints by trade-union by-laws if that is to be hoped for.

At the commencement of the construction of the North Devon Railway, the wages of the labourers were 2s. a day. During the progress of the work their wages were raised to 2s. 6d. and 3s. a day. Nevertheless, it was found that the work was executed more cheaply when the men were earning the higher rate of wage than when they were paid at the lower rate. Again, in London, in carrying out a part of the Metropolitan Drainage Works in Oxford-street, the wages of the bricklayers were gradually raised from 6s. to 10s. a day; yet it was found that the brickwork was constructed at a cheaper rate per cubic yard, after the wages of the workmen had been raised to 10s. than when they were paid at the rate of 6s. a day. Again, in Russia the nominal price of labour is lower than in any other country in Europe; yet the manufacture of iron is at least as costly in Russia as in England; and it is considered politic by the State to give an artificial encouragement to the iron manufacturers by paying a bounty of 4l. per ton on all rails made in the country.

The contract for the Paris and Rouen line included some difficult work. There were four bridges across the Seine, and four tunnels, one of them one mile and five-eighths in length, passing through hard limestone. The English were chiefly employed on the difficult work. The French labourers drew away the staff, or wound it up the shafts; but the mining was done by Englishmen. In the tunnels the skilled work was all done by them. At one time there were five hundred Englishmen living in the village of Rollebois, most of whom were employed in the adjacent tunnel. Although these English navvies earned 5s. a day while the Frenchmen employed received only 2s. 6d. a day yet it was found, on comparing the cost of two adjacent cuttings in precisely similar circumstances, that the excavation was made at a lower cost per cubic yard by the English navvies than by the French labourers. In the same quarry at Bonnières, in which Frenchmen, Irishmen, and Englishmen were employed side by side, the Frenchmen received three francs, the Irishmen four, and the Englishmen six francs a day. At those different rates, the Englishman was found to be the most advantageous workman of the three.

If our agricultural labourers were better paid and bred, we have very little doubt that they would do more work, and do it better too.

Mr. Brassey believes that it is equally true that the hours of labour (of course he means

* Work and Wages practically Illustrated. By Thomas Brassey, M.P. London: Bell & Daldy. 1872.

within certain limits) are no criterion of the quantity of work done. Using greater diligence an energetic man may do as much in nine hours as he formerly did in ten. When hours are shortened with the expressed intention of doing correspondingly less work in that time, it is necessary to remember that trades, which can only flourish by successful competition with the foreigner, must, to a certain extent, be regulated with reference to rules established abroad. The British workman must take care that he does not, by working shorter hours, so increase the cost of production, that competition with foreign industry becomes impossible.

Mr. Brassey is quite satisfied with the success that has attended British enterprise in competition with foreign industry, and has no gloomy forebodings. Summarising some statements by Professor Leone Levi, he says,—

"In 1763 the population probably was 10,000,000. In 1870 it was 31,000,000, showing an increase of 210 per cent. But if the population has increased three times, the imports have increased thirty times, namely, from 10,000,000, to 300,000,000, the exports nearly twenty times, namely, from 10,000,000, to 240,000,000; the navigation of ports from 1,500,000 tons, to 38,000,000 tons, and the shipping belonging to the kingdom fourteen times, namely, from 550,000 tons to 7,700,000 tons. The whole trade of the kingdom actually doubled itself during the last fifteen years, having grown from 290,000,000, in 1855, to 570,000,000, in 1870. The sum invested in railways in 1845 was 88,000,000. In 1870 the capital embarked amounted to 530,000,000. The increase most fully demonstrates the growth of capital, the vastness of our accumulations, and the extent of our industrial resources."

With a few words to note that Mr. Brassey, while he sees the difficulty of introducing the co-operative principle into the arrangements between masters and men, hopes yet to see it more largely introduced into British industry, we must end our notice. The introduction of this principle would teach workmen to appreciate the difficulties and hazards attending the investment of capital in business. We shall be glad to see a cheap edition of this volume extensively circulated.

STONEHENGE: THE AUTUMN CAMPAIGN.

The ring of arms and the roar of cannon, happily unshot, that have attracted so many eager spectators to the Wiltshire downs, cannot be expected to find a very distinct echo in our pages; and yet, while the attention of the country is riveted on that which is at once a test and a lesson of military skill, we may be pardoned for recalling, with no little pleasure, our own long advocacy of the importance of the engineering education of our troops. From the Italian war we drew the inference that a great change was setting in in the relative power of attack and defence,—a change that would tend greatly to modify the principles of military architecture, and thus, in the sequel, to alter many of the main features of our cities and towns. The lesson given as to land-fortifications by the siege of Gaeta was repeated, with reference to floating batteries, by after events and the various calamities that beset those gigantic iron-clad structures, in some of which the primary principles of naval architecture were altogether set at defiance. This series of costly lessons,—costly in far more than money,—in needlessly sacrificed life,—seemed to culminate in the loss of the *Captain*. With the short, sharp campaign that terminated in the decisive battle of Sadown, a fresh set of most instructive facts claimed our attention. The influence of arms of precision and of repetition in the decision of a critical battle was there proved to be of the utmost importance. In fact, it might almost have been said that a new arm was given to the soldier. At all events, infantry tactics had to be wrought out under new conditions. The shield to be opposed to the terrible efficacy of the rifle, we showed, was to be forged by the agency of the pick and the shovel; and we watched, with no small anxiety, the slow development of the new relations between the parade-ground and the spade.

With the slow deliberation with which one of our old sailing three-deckers might have got under weigh, the armed force of England has spread on its canvas to the breeze. A great change, from which we would gladly expect the results promised by its proposers, has been introduced into the entire system of our land forces. Purchase is no more; and the scientific corps have received a wise and liberal measure of justice, which it was deplorable to see any one who bore Her Majesty's commission attempt to prevent or to postpone.

To all this, on a scale increasing year after year, has been added an annual repetition of that practical education of the soldier which, under the old system, was deferred till he was in the presence of the enemy. Of the details of our home campaign it is not our purpose to speak. Their value is recognised by all competent judges. And the opinions which we so frequently advanced, as to the increasing importance of the labouring and enduring, as compared with the merely fighting, qualities of the soldiers, are now receiving, each year, fresh illustration.

It adds extraordinarily to the interest of the campaign of the present autumn that it has taken place on those wide and unbroken downs that preserve, in the midst of the busy civilisation of the nineteenth century, an aspect not very different from that which they may have borne in the time of Alfred, of Offa, or of Cæsar. Nay, in the time of Cæsar himself, so far as any evidence of change or of decay can be obtained from the memory of man, or the references of the earliest chronicles, they may have been dominated, as they are to-day, by the same solemn, mysterious watch-towers,—the abandoned home of a race whose very name has been obliterated. It cannot but strike the philosophical student of history with admiration that the latest outcome of a science which has been actively prosecuted since the time of Galileo,—we may say, since the time of Alexander,—appears to be a return to that circular plan which was common among that stone-building people who have raised so many monuments in our own and in other countries, that yet remain the very cradle of the archaeologist.

We are not about to enter into any argument as to the date, origin, or archaeology proper of Stonehenge. The subject has been not unfrequently raised in our columns. And yet, having witnessed the dotting of the Wiltshire downs with the trim tents of our troops, having seen the roads filled by regiment after regiment of a splendid cavalry, and choked by the long trains of the improvised means of transport; above all, having seen the grey trilithons of Stonehenge lighted up by the scarlet, and gold, and green of the uniforms of the foreign officers of distinction who have assisted at our manoeuvres, and contrasted the intelligent respect shown by the owners of names famous in European history with the vandalism and neglect which are now attacking these irreplaceable monuments with the chisel of the gravestone cutler,—we are anxious to offer our readers a few considerations that are, as we think, novel. We wish, for a moment, to regard Stonehenge, not so much from the archaeological point of view as from that which is offered by the higher motives of the architect. The evidence afforded by such features as choice of site, orientation, indication of religious rite or faith, and resemblance, or the reverse, to any known religious or civil structures, has never, we believe, been discussed or even fairly stated. We wish to avoid what is disputed, but to bring out more clearly than has yet been done what is certain, but what has been remarkably overlooked.

Few ruins in the world,—not one in England,—can so powerfully affect the imagination as Stonehenge. Its first view is never to be forgotten. No picture, no description exists, that in any way does justice to the grandeur of the scene. Leaving the picturesque street of Amesbury, the distance of which town from the nearest railway station has preserved to it much of the character of the England of five-and-twenty years ago; passing the fine old church, in which three of the seven lancets of the choir have been replaced by a fine Early Decorated window some 500 years since, the road crosses the Avon by a stone bridge, just below a broad weir and tumbling waterfall. The noble timber and stately grounds of Amesbury Park shadow the links of the river. Turning to the west, on leaving the town, the road diverges on passing one of those fast-vanishing features of pre-railway England, a turnpike; and runs over broadly-swelling undulations towards the open country. Clumps of well-grown timber, and the scarped chalk that bounds the park, crested with a dense zone of trees, are left to the right hand. To the left opens a wide range of down towards Salisbury Plain, on which groups of wizened and elfin-looking trees mock the expectation bent on the giant stones. At about a mile and a half from Amesbury the brow of a hill is surmounted by the road. The last dense clump of timber is passed. Before the view stretches a wide expanse of heathy down, on a gently-

rising plateau, in the middle of which, in solitary grandeur, is Stonehenge.

Very much has been written as to this unexplained relic of a hoary antiquity; very much too, that the visitor will do well to leave unread or to banish from his head, if he unfortunately have prepared himself for a visit by the unprofitable study. The word Druid must be unpronounced. The ingenious, half-crazy theories of Stukely, which, for fault of a better, dominate most of the literature of the subject should be named only as an instance of the audacity which may be attained by the writer who projects his facts out of his own brain. We must remember that almost all our ideas of Druidical rites are derived from Cæsar; and that the account given by that great general of his campaigns in Gaul and in Britain has a very close family likeness to the hulletins of Napoleon. Each was the account given by the general, who safe from fear of contradiction, of his own exploits, for the sake of producing a political effect. The Commentaries were framed for the *gobe-mouches* of Rome, as the hulletins were for those of Paris. In each it is often possible to read between the lines a story very different from that presented to the Forum and to the Bourse. In his two scrambling raids through Britain, the latter of which turned to actual flight (as is proved by the clumsy pretext ordering the hostages to be sent after him) Cæsar never looked at the walls of the centre of British power, the great city of Verulam; the widespread ruins of which bear a far more incontrovertible testimony to an ancient civilisation than do the scraps of gossip which Cæsar gives second-hand from Divitiacus. It is remarkable that people should have received a simple good faith an account involving such ridiculous marvels as some details of the natural history of Gaul, according to Cæsar. Taking then, what he says of the Druids for what it may be worth, there is not the slightest connexion to be traced between a priesthood who rites were of a forestal character, and the night-masons who wrought Stonehenge.

The first idea that impresses the intelligent (when fancy allows reason to commence its work), is that of the antiquity of this structure. Language fails to give us a such measure; human tradition, in its shadowy, yet most ineffaceable form, that of a name, is utterly lost. The names of heroes a country that their memorial is all but eternal. Those of the two builders who may most closely vie with the founder of Stonehenge, Solomon and Sulpis, are ineffaceably connected with the mighty wall that girds Mount Moriah, as with the vast bulk of the great Pyramid. In other cases, the name survives the meaning; its associations, as in Kit's Cotyhouse and, perhaps, Silbury Hill. But here the Saxon strangers gave only their own simple title of Hanging Stones to monument as mysterious to them as it is to us. If their British predecessors had any definite tradition, it has perished. In the associated instance of Avebury, a yet more ancient megalithic work has only a Saxon name. Hackpen, in the neighbourhood, has a British sound, but one that is mute as to its significance. No word lingers in human speech to tell of the origin of the mighty pile Stonehenge.

As regards the entire group of the megalithic remains of Wiltshire, Stonehenge is, there can be little doubt, the most modern. It shows undeniable traces of an elaborate masonry which is far less visible at Avebury. The great store of the impost preserve, in one or two cases, even a distinct arch. The mortises and trusses are apparent. The circle of stones immediately within the great line of the trilithons present indications leading to the conclusion that they were not only wrought, but polished. The geological character shows that they came from quarries different from those (alike unknown) that furnished the larger blocks. None came from any part of Wiltshire, or of the entire range of the chalk districts. Icebergs have been pressed into the service, as the carriers of the larger blocks from—no one has yet suggested what mountain. But icebergs would not be selected and brought from some other locality the smaller stones, of a character adapted to bear a good polish. In one on the left hand the principal part of the building, is yet evident a long vertical groove, as if made for the turn of a door. The very high state of art which masons of Stonehenge had attained, as well as the yet remaining sharpness of some of the (while less carefully selected stones have been

shapeless from the influence of weather), are reasons for concluding this Wiltshire marvel to have been one of the latest efforts of the megalithic art of England.

Tradition, then, is utterly silent as to Stonehenge. In the earliest notices we have of its existence, it appears vast, dim, and unknown, even as it is to-day. Language has failed to emblazon any reference to its origin. Geology has refused as yet to tell where its builders sought their well-selected and carefully-squared blocks. What can we know about it?

In the first place, we must remark on the compact and castellated form of the ruin. To this all the representations fail to do justice. As seen from the first point of view, on the Amesbury road, it might be thought to be yet habitable. That it was a complete and highly-finished building there can be no doubt. Whether the interstices of the gigantic coists and pillars were filled by wood or by smaller stonework, whether the roof was conical or of other form, we have little as yet to tell us. The nearest approach to a plan is found in the temples or churches of Abyssinia, which have one great conical roof covering their concentric rings and divisions.

The building was not an ordinary throned, such as the megalithic chambers of the Mediterranean islands will have been, even if the shade of giants. It must have been devoted to some especially solemn purpose, whether of state, of religion, or of the two combined. Whatever were the details now lost, a great central hall, with five graduated thrones or altars, is surrounded by an ambulatory, and dominates a sort of smaller interior theatre or place of audience.

It must be remembered that the relation between the vallum, or remains of a bank and ditch, that surrounds the outer wall of Stonehenge at a distance approximately equal to the diameter of the building, is obscure. There is nothing to make it an integral part of the monument.

Stones lie in one or two places near its existence, and a certain external fence, or hedge and ditch, but even this is uncertain. There is an essential and primary difference between the earth-building and the megalithic habitations of these regions, to which we shall presently refer, which is enough to warn us never to assume an identity of structure between a mound and a building which it may surround. The circular plan of structure, which possesses extreme advantage as a defensive characteristic, is common to most of the megalithic remains. At Stonehenge, while the external wall is circular, the plan of the central hall approaches the horseshoe form. No small amount of practical science is involved in the harmonious adaptation of these distinct elements of structural arrangement.

The central hall itself was not calculated to contain a large number of persons. If their number had been that of our own times, the building would have been inconveniently crowded with more than 600 persons. It would not seat more than 200 persons. About 200 might find room in the inner hall, the same number in the outer, and again the same number in the inner ambulatory. If the stature of the inhabitants were larger than our own, these numbers must be diminished. This, considering the costly nature of the building, points rather to the seat of the throne than to that of the altar. The worship of the spot must have been restricted to sacerdotal giants.

The site of the building has been determined what we may call truly architectural considerations. It is not placed in astronomical azimuth, as was the great Pyramid, and as were most of the Oriental temples. It occupies a commanding position, although it is in its turn commanded by a swelling eminence of the hill on which it stands, much as the site of the temple of Solomon was by that of the fortress which, under the third dynasty, was named Antonia. Its portals face the site where the direction of some of the roads of the ancient city is yet indicated on the soil. At twice the distance of the diameter, the straight central avenue was guarded by a vast flock of stone, probably bearing the insignia of the monarch, or some emblem of the venerable structure, and compelling those who entered to turn to the right or to the left, as a mark of respect on setting foot within a palace. The grave and stately habit of the people is indicated by the magnificence of the avenues, of which we have relics at Avebury and elsewhere, and by the great regularity often to be observed in the lines indicating the plan of their streets and cities.

Although not astrolatrical in its position, or

visibly connected with the observation or the veneration of the planetary bodies, Stonehenge was built by masons who were not without some knowledge of astronomy, at all events as matter of observation. A giant stone lies, 100 ft. from the circle, in a position over which an observer, on the summer solstices, may now (and many annually do) see the sun rise from the stone known as the altar. Thus, whether palace or temple, Stonehenge is a monumental calendar.

The worship, if such it were, of the builders of Stonehenge, appears to have been unlike that of any faith now existing on earth. In all Egyptian temples, and in those Syrian, Grecian, Roman, and Western sanctuaries which show marks of relationship to Egyptian knowledge and tradition, the *cella*, or holiest place, forms an essential part of the sacred building. We find this at Thebes, at Jerusalem, at Athens, at Paestum, at Baalbec; we find it in Rome, at Canterbury, at St. Alban's, at Westminster, and at York. We find it in every church of Latin or Anglican rite. It is replaced by the *kehlch* in the mosque. The form of the central hall is more approaching that of the basilica, or Roman tribunal, than any other which we know. But it differs from the basilica in possessing five principal thrones or canopies instead of one.

The numeric arrangement of the building is not one that is familiar to us. Five, three, and two are the normal numbers, used by the builders. The great trilithons are five. The council-table, or altar, is alone. The piers of the outer wall were thirty in number. The internal divisions of the plan, as far as discernible, were five, viz.,—the outer and inner ambulatories, the space between the trilithons and the inner circle, the main hall and the apse behind the altar stone. If we attempt to associate the number with that of the minor planets, the sun being indicated by the pointer, we still fail to note anything that can be associated with the moon. From the irregularity of the path of that planet, no architectural feature can be determined by astronomical reference to the moon. Sir Walter Scott, in his imaginative indication of the tomb of the Wizard by the cross of red thrown on it by the moon beam, has taken a poetic licence which no astronomer can condone. We rather find indications of a people who used a decimal notation, than any other inferences to be drawn from the numeric arrangement of Stonehenge, and of most cognate monuments.

To go further is only to guess. We stand at Stonehenge, in the presence of a monument of great antiquity and of lost tradition. It was reared by a race that had attained extreme mechanical skill, producing masons of ability. Its materials were brought from sources as yet undiscovered; but stone from different geological formations was selected for different objects. The building was not astrolatrical or astrolatrical in its purpose; although its builders have left proof of astronomical observation. It was disposed with a picturesque skill in choice of position and of orientation of which any architect might be proud.

It appears, from its dimensions, to be rather palatial than templar in its design. It evinces no relation to any existing form of worship, although it contains something that recalls the idea of an altar, or perhaps still more faithfully of a council-table. Everything about it is dignified, enduring, colossal,—approaching the superhuman. That the faith and worship of its founders were associated with the hope of immortality is a natural deduction from the fact that the megalithic builders had the habit of hurrying their dead, a custom by which they are ethnographically distinguished from the contemnerous tribes (whether contemporary or otherwise) of earth-building, harrow-rearing people, who hurried their dead. Nay, the megalithic cromlech builders hurried their chieftains not only in costly sepulchres, but in the very attitude of prayer. Further, as yet, we cannot go. We have called Stonehenge an unpenetrated mystery. In the age which has witnessed the invention and the application of the spectroscope we decline to use the word impenetrable.

Canterbury Cathedral.—It is estimated locally that to repair the damage an outlay of between 3,000l. and 4,000l. will be required. The work of clearing away the ruins has already begun, and the restoration will, it is understood, be carried out by Messrs. Gaskin & Godden, of Canterbury, builders, under the direction of Mr. H. Austen, the cathedral surveyor.

COLOURED GEMS, AND A FEW THOUGHTS ABOUT THEM.

In these days of rapid change and never-ceasing progress and unquiet, it is interesting, and may be salutary, to some of us, to go back in time and see what our forefathers did. They were quieter than we are, and went about in slower coaches, and took more time over things, and certainly, as a rule, thought over matters before coming to conclusions for a much longer time than we of this present day are able to do or do do. There may be some disadvantages in this slow method of work, but it has its advantages; for to give timely thought to a thing is almost always to do it better, and to save time in the end. We are going on at a most rapid pace, always by rail, and so no one can possibly say that we are standing still, and not moving on; but the real and vital question is, where are we going, and is the movement made really "progress" in the sense of everything being upon the whole better than it was? Say that railways are better than the old coaches and the pack-horses of past days; but who shall say that the *mental* or even *bodily* good to be got out of the travelling is an "improvement"? Musical instruments, again, are all improving, we are told on all hands; but are they indeed so? Old Stradivarius contrived to make violins which no one in these mechanical days pretends to be able to rival. We say nothing of sculpture and painting; but there is one subject, just now, of some interest which illustrates these remarks. What is to be the future of gems,—of diamonds and pearls,—as objects of beauty, and as human adornments? In old days no difficulty seems to have been felt. People knew well what use to put jewels to, and how and when to wear them. To have a gem was to utilise and to display it, without affectation and without ostentatious display. Large gems, as well as small ones, were equally well worn, and added not a little to the beauty of the dress which they were bought to adorn.

We have before spoken of the cutting of diamonds and of their singular value, and of the place they hold in Nature's great storehouse of the Beautiful. But there are other gems besides diamonds, and hardly less beautiful,—coloured stones of wonderful richness and power of touching the sense of the beautiful in man, as the ruby and emerald, and others, and it is to them that we would now call a moment's attention: to the cutting of them, and to the difference between them and the diamond itself, and a word also on the "poetic beauty" that some more imaginative people seem to have found in precious stones. It is in an artistic sense, and as how to best show forth the beauty of a gem, and as to the cutting and polishing of it, that we are mainly concerned; for it is a melancholy fact that, for the most part, and with but few exceptions, the modern and mechanical gem-cutter makes a mistake, and cuts away just where he ought not to, cut at all, and where he should cut, he goes wrong or does not cut enough.

Let us, by way of example, take the ruby, the next gem after the diamond itself and in which Nature seems to have impressed the idea of beauty. It is not a little remarkable, and we might philosophise for some time about it, that while the diamond is made up of pure carbon, or simple black and opaque charcoal, the ruby, the next in order in value and beauty, is nearly made up of pure alumina, or common clay,—98.5 per cent,—the colouring matter, iron, making up the rest of it; the mere trace of lime found in it being unappreciable.

Nothing, we may venture to say, in Nature's chemistry is more wonderful than this fact of the dull, colourless, and lifeless clay, becoming *metamorphosed*, by some hidden and almost miraculous way, into the transparently clear, red-coloured, and almost living gem! Imagination itself fails to find a theory to account for all this, and no progress in chemistry can invent a theory to fit it. It is a somewhat curious coincidence that the ruby, as well as the diamond, and other precious stones, are so often found associated with gold: where they are the gold is almost sure to be present. Nature produces these her riches together, and it afterwards is the province of *art* to keep them together, and to exhibit them as one object. How much remains to be done before this artistic feat is well performed; for, as things are, the beauty of the stone is as often as not spoiled in the cutting and fling. We are inclined to think that no coloured stone should be cut at all. Rubies, for instance, always look richer by the

being simply polished or cut *en cabochon*, or tallow-topped, as it is termed. It is the marvellous depth, and purity, and intensity, of colour, as seen in the ruby, the sapphire, the emerald, and such-like coloured stones that make up the beauty and value of them, and not, as in the colourless diamond, in the coloured sparks of light which are seen in it. The blue sapphire, it may be noticed, is simply a variety of ruby or corundum.

We live in practical and mechanical days, and in times of universal enlightenment, and general knowledge, and in a state of positive suspicion of things we cannot quite see into; so that all that is "dreamy" and mystical in the "stones of fire" has well nigh disappeared. But the time was when, in the possession of a precious stone of price, a man held in his hand, and carried about with him, a real poetic charm, almost a *material poem*. Is the world really improving? is a question that we cannot help repeating. In these days a gem is simply a pretty thing to be worn by the rich and fair, because it is pretty, and costs a good deal, and evidences at once the wealth and taste of the wearer; but the time was, as in the days of Jerome, when the sapphire and the ruby were a good deal, nay, infinitely, more than this. That great doctor himself thoroughly believed that the sapphire could procure not only the favour of princes, and could pacify enemies, but could also free from *enchantment*, and obtain a man freedom from captivity. It also prevented evil and impure thoughts, and was such an enemy to poison, that if put into a glass bottle with a venomous insect it would kill it. Strange fancies these, and how different the feelings of those who held them, and believed in them, to those of us whose only mystery concerning them is the present and future riddle of the diamond market! It must surely be a very ingenious man who could fairly argue the world into the belief that the getting above and superior to these harmless fancies added to the value and interest of these wonderful beauties of nature. Not, be it observed, that all the mystery of them is done away with, for no science, however advanced, has as yet been potent enough to divine a cause for them, or why they came into existence at all. Their origin truly is as mysterious as is that of the beginning of life itself. Nothing, indeed, can be fuller of artistic thought than is this curious subject of precious stones, and we could say much on it in many ways, and at some length, but it is impossible to cease wondering at the marvellous colour found in them in such small quantities, yet so vivid and full of intense beauty. In the emerald, for instance, is to be found the most intense green colour, surpassing any green herb or plant in colour; indeed, so vivid is the colour given forth from this splendid gem that it was anciently thought to give a green colour to the surrounding air, and to be capable of colouring the water it was dipped into. But if the intensity of the green colour to be found in the emerald is a wonder, no less a wonder is it,—beyond all chemistry it would seem,—as to what it is that causes it. Formerly it was thought that chrome in a most minute quantity coloured the emerald, but lately it has been found that the colouring matter is organic in its origin; indeed, that the green colour in the gem is of the same kind as that which colours the leaves of trees and the blades of grass. Where then does it come from, and what was that organic something which could exist when the dull inorganic clay passed into the clear emerald? The most subtle chemistry can tell us but little or nothing about such marvels. Hard words in plenty, but little else.

There is one other curious fact, or rather one among many others, connected with the colouring of gems, worth notice, for the fair for whom jewels are made might be yet fairer were but a little more thought about it in the "market." Colour in most things, as we all know, is found to add to the value of them. A picture is more valuable than a bare drawing. A coloured flower is more attractive than a colourless one, and things by daylight look the better as more full of colour than they do by candlelight. But the colourless diamond, perfectly pure, and without trace of colour, is in the "market" fully 50 per cent. above, or more valuable than the palely-coloured stone from the newly-discovered African diamond-producing district. In the lustre of a fine gem of either kind, there is little or no difference; but the difference lies in the fact of the African diamond being tinged with the faintest possible tint of straw or pale yellow

colour. To many this might seem to add to the beauty of the stone, and to give it warmth, and to harmonise it with its gold setting; but fashion rules all things, even the hard and intractable diamond. If the colouring matter in the emerald is a mystery, so is it in that of the coloured diamond, for so faint is the trace of it, and so infinitesimally small is the quantity of colouring matter added to the pure carbon of which the gem is composed, that the profoundest chemical analysis has failed to detect what it is with any certainty. We can but theorise, and perhaps some of us call upon the "imaginative faculty" to help us to solve the mystery; but even here we soon come to an end, and not even a Swedenborg, who "saw nature at work in the deep recess of her vast laboratory," could do more than dream!

CONSTRUCTIVE CARPENTRY, JOINERY, AND STAIR BUILDING.

We have before us a book that deserves the attention of architects, builders, and operatives and not alone of them, but of members of various other crafts, workers in metals as well as in wood and stone, to whom a practical knowledge of the rudiments, at least, of geometry is indispensable for an accurate designing or "setting out" of their workmanship.* To the carpenter, joiner, stonemason, and metal worker, this book will be specially valuable. In a word, the work contains the constructive science of carpentry and joinery simplified and epitomised, yet without comprehensive and plain for building operatives of the most ordinary capacity. Mr. Riddell's former works evidenced his ability as a workman and an instructor; the book under notice proves him to be a thinker, a worker, and a thorough technical teacher of his art. He has struck out an almost new path for illustrating the most difficult forms of constructive carpentry and joinery in the present volume, and by the aid of cardboard models, which at the same time form the plan and the elevation (for the stretched-out elevation can be at once lifted over the plan), he proves to a palpable demonstration the accuracy of his lines for producing a perfect execution in detail of the work required.

We may premise here that this new volume and condensation of Mr. Riddell's previous works is divided into three sections: the first treating of "Practical Geometry" as applied to the plans of construction laid down in the book. This section includes eight plates or cardboard models, some cut for illustrating the constructive development in elevation, others left uncut for the purpose of testing the learner's powers who may desire to copy them and construct cardboard models independently of those in the book. The second section of the work deals with the most important problems in carpentry and joinery, including the construction of difficult forms of framing, panel, or other work standing on a given slant, the way to obtain the cuts, bevells, and mitres. The "acting out" and construction of different forms of roofs on irregular plans and the methods of obtaining the bevells and cuts for the parlians, jack-rafters, and hip-rafters, &c. There are also methods and models given to find cuts and mitres of work standing on rake and level; the construction of niches whose ground-plan being a semi-ellipse and the elevation or front rib a semicircle; the construction of a niche standing in a circular wall; and the construction of niches on other plans. Similarly to these there are methods given to find a curve on leave-boards for circular, turret, cupola (dome), or other work; the construction of ribs for lath-and-plaster groin or vault in masonry; the construction of door-frames with semicircular heads, standing in a circular wall, with jambs radiating to a centre, and for those which stand in a circular wall, the pulley-stiles being square with chord-line of plan, with the development of a veneer for bending round the same.

Plates 9 to 24 inclusive, embracing some cardboard models, belong to the second section of the work; the cardboard models, 9, 10, 11, and 15, are well-selected examples of illustrations for showing the construction of splayed framing and panel-work, as also of a perfect model of a roof either in the flat as a plan or elevated as a

* The Practical Carpenter and Joiner; illustrated by Cardboard Models (new and original). By Robert Riddell, author of "Hand-Railing Simplified," "Practical Geometry," "The Carpenter," "New Elements of Hand-Railing," &c. London: printed by Virtue & Co., City-road.

model. The ordinary plates are equally well chosen, and may be utilised by the workman with nearly equal advantage as the others. The lines and methods given are applicable to a variety of other work in carpentry and joinery; for obtaining the bevells, lengths, and exact cut which may be wanted in its construction.

The third and most important section, as also the most ambitious, in the book is that devoted to "Lessons on Handrail Construction." The plates and cardboard models, cut and uncut in this section, are entitled to every commendation for their originality, clearness, accuracy, and the ingenuity displayed in their "setting out." Here is, indeed, handrail construction developed, simplified, and demonstrated. Here is every line almost, and every section, in the elevation work projected on the plate beyond the plan yet still attached to it, and the section being cut through to half the thickness of the cardboard, the model of the handrail and wreath, when lifted, is made to stand perpendicularly over the plan, winding round its cylinder, and both shanks of the wreath, or straight portions of the handrail, standing on their proper pitches. Nothing could be more exact or beautiful than the several illustrations given in the plates and cardboard models on handrailing.*

In our notice of Mr. Riddell's former work "New Elements of Handrailing" (vol. for 1870) we entered into detail on several matters connected with the use, progress, and practice of the art in the British islands, so it is unnecessary to go over the ground again on those matters. However, we desire specially on those matters to give to building workmen to draw the attention to the practical lessons given and illustrated so admirably by models in the present work. With very little study the workman who still adheres to the antiquated methods of working handrails by the aid of drums, cylinders, boxes, cradles, and other expedients, can entirely dispense with their use. Even the aid of falling-moulds (though useful to know their methods of construction) may also be entirely dispensed with. The construction of the face-mould for the wreath of a handrail is a very simple operation indeed: the curves of the template or mould are simply portions of semi-ellipse, or, in other words, the section of a cylinder cut obliquely; the circle, or its quarter, being the ground-plan, its elevation or pitch being the developed elliptic section, ranging or winding over that plan. It is immaterial whether the workman constructs the face-mould in its elliptic form by the aid of two pins or nails, with the aid of a string, or uses a trammel. The former is the go-ahead American fashion and is an expeditious method. The trammel, we think, the safest for the inexperienced. The prime essentials are the obtaining of the proper bevells and the application of the moulds obtained to the plank. On the correctness of the drawing or "setting out" depends the accuracy of the moulds and bevells belonging. Whether the stair be a platform one or one having under the ground-plan of each being semicircular, it is of the utmost importance to the learner in his first practical lesson to understand the part that tangents play in the formation of a handrail. Both the tangents and the bevells for the joints in the construction of the wreath are mutually dependent on each other, and may be said to be inseparable. A reference to the cardboard models in Mr. Riddell's work will prove this at glance.

In plates 25 to 32 inclusive, there is comprised all that is practically needed by those who have already some knowledge of stair-building and hand-railing. Methods are given and illustrated for obtaining the moulds for wreaths where the planks have to be thrown for wreaths where the practice may be said that these methods are applicable where the wreath has to wind over portions of two flights of unequal incline, owing either to a difference in the height of the risers, or cases where it is necessary that the handrail should rise a certain height in a given number of feet, to suit exigencies not uncommon in stair-building.

Although the use of scrolls was discontinued, and their methods of construction eliminated from Mr. Riddell's former work

* A word here may not be amiss to the workman or other student using Mr. Riddell's work. The plans should be carefully studied, and the cardboard models attached carefully handled. The models are not intended for rough and constant usage, but with a proper degree of care they will last for years. It would be far better, however, if the young workman to carefully copy the lines, and construct a series of similar models of cardboard, veneer, or the thicker seasoned material. The knowledge and the practice he will obtain by doing so will repay him well for the little trouble he may experience.

handrailing, he has considered it advisable, as we (and others) have differed with him, to include a plate treating on the construction of the scroll in the present book. Though American stair-builders have abandoned scrolls for the commencement of the hand-rail, and adopted panelled octagon and other forms of newels, scrolls are still extensively used throughout the three kingdoms. There is, indeed, some truth in the author's remark about the "very objectionable bundle of balusters standing on curtain step, forming a receptacle of dust, cobwebs, and other offensive matter." The dust and other offensive matter need not exist, nor is it necessary that the bundles of balusters should be retained, though the scroll may, and still receive a more ornamental support, from a line perpendicular to the joint on its shank to its eye or centre. The problem, plate 7, aient the construction of a pyramid, or a piece of framing or panelling of pyramidal shape, is worthy of extended notice. The cardboard model is simple and correct, but its construction, simple as it is, has puzzled thousands of carpenters and joiners in the obtaining of the different levels necessary, and their proper application afterwards. Out of this problem may be said to spring a variety of others applicable to the construction of framing standing on the slant, the hips of roofs, the preparing of columns in joinery, elevated soffits, and domical, conical, and other complex forms of framings and coverings.

THE SOCIAL SCIENCE ASSOCIATION AT PLYMOUTH AND DEVONPORT.

The inaugural address of Lord Napier and Ettrick on Wednesday was a very able one, but the work of the Congress might be said to have commenced on Thursday. An excellent address on Law Reform, by Sir John Coleridge, the Attorney-General, was admirably delivered, and the several sections met immediately afterwards. In the section of economy and trade, at the Royal Hotel, Mr. Thomas Beggs read a paper "On Arbitration in the Settlement of national Disputes," in course of which he said:—Were Berlin, or Vienna, or London in the extremity that Paris found herself in 1871, there are in each city crowds of men who would be ready to take advantage of that extremity, and try to desolate the homes, in the midst of which they had found a shelter. The ruffianism which has been generated by vice and neglect would be only too ready to commence the work of spoliation when the opportunity occurred, and the work of the incendiary huffles all military strategy. It is surely wise to rescue the industrial classes from such leadership as this. He then referred to the encouragements for hope that the time for international arbitration is at hand. These arise from the danger which had been pointed out, and from some hopeful indications that a nobler ambition will supervene in France, and stimulate higher aims. The best preparation for the great work that all good men desire to see—a friendship among nations, is to break down every barrier to free intercourse, close every custom-house, and abolish all duties upon exports and imports; in a word, establish perfect free trade. Science and commerce are the great civilisers. The greatest encouragement, however, is supplied to us by the result of the Congress at Geneva. All speculation as to its award is now at an end, and at length two powerful nations have submitted to arbitration a dispute that once assumed a threatening importance. A dispute which involved far greater considerations than any pecuniary compensation has been settled by peaceful means; the spirit of an aggrieved nation has been appeased, and without the aid of the sword. The result is valuable as a precedent, as showing what many people doubt, that arbitration is practicable; but it is scarcely less valuable in teaching us the importance of maturing a code of international law.

In the Health Section, Mr. H. W. Acland, M.D., F.R.S., presided. A paper by Mr. P. H. Holland was read by Mr. Michael, Q.C., on "What Steps should be taken to guard against Sewage Poisoning?" No collection of filth should, he said, be allowed anywhere under any circumstances. The only safe course would be the immediate removal of every disgusting subject, and to take care that none lodged by the way, as it was less from sewage than from its deposit from which danger and annoyance proceeded. As little foul air as possible should be allowed to form in the sewers, or, if it did, it should escape where it would do the least mis-

chief. He advocated the free ventilation of sewers outside the dwellings, and the absolute non-connexion of the sewers with the internal parts of the house. Mr. J. N. Stevens, M.R.C.S., in another paper, advocated drains being made of Portland cement; they should be of such angle as would allow the rapid flow of sewage to outfalls. The interiors should be smooth. The sewers should be oval. He objected to the use of pipes for carrying off the gases, believing the foul air would be carried in at the windows if they were used. The sewers should be disinfected with charcoal or chloralum. In the discussion Dr. Hearder pointed out the difficulty of carrying out the chemical means proposed, and said the bringing up pipes from the ground to the tops of the houses would be impracticable. He did not see why, in some places, large shafts should not be used for carrying them up. Dr. Hardwicke, medical officer of health for Paddington and Bayswater, objected to the ventilation by pipes, and believed the practical remedy against gases was flushing with a proper water supply. Dr. Nankivell thought the best plan was to have short pipes placed into sewers at no great distance from each other, which might intercept the foul air in its passage. Mr. Buttel, F.R.C.S., drew attention to the necessity of proper supervision in the laying of drains, pointing to cases where wells had been poisoned through carelessness in regard to this. Mr. E. Vivian was in favour of tall shafts, but would have them so constructed that the weather or lee scuppers should be opened according to certain winds. Mr. Michael pointed out that the great thing was to have no connexion between sewers and human habitations. Mr. T. Baker, barrister, read a paper on the prevention of disease. In the discussion that followed, Dr. Shrimpton said diseases were not contagious except under those conditions and in those places where they may be produced. Dr. Hardwicke expressed regret that under the late Government Bill no provision had been made for appointing properly-qualified veterinary surgeons, engineers, and it might be analytical chemists, to act in conjunction with the medical officer of health. Earl Fortescue entirely agreed that it would be most desirable that medical officers of health should have the assistance of veterinary and engineering skill at their disposal.

In other sections, namely, Licensing and Trade, Repression of Crime, Jurisprudence, and Education, a number of papers were read and discussed. One of the most important discussions took place in the thinly-attended section on the repression of crime. It was carried on between experts, and had the direct value which complete knowledge can give it. A paper was read by Mr. J. B. Baker strongly advocating the adoption of cumulative punishments for minor offences. The system is being adopted, and is said to work well. The difficulty is how to apply it. Miss Carpenter stated, as the result of her long experience, that the severity which was best for society was best for the criminal, and that the constant bringing up of incorrigible offenders, and the repetition of the same incidental sentence, inflicted great injury on society. Colonel Radcliffe, of Birmingham, testified to the immense diminution of drunkenness which had been caused by the enforcement of the new Licensing Act in that borough, the cumulative penalties of which he regarded as a most valuable step in legislation.

The mayor of Plymouth gave a grand reception at the Royal Hotel, which was very full. The Association had this time double municipal patronage, in the two corporations of Plymouth and Devonport, the first one of the oldest, and the latter one of the youngest, in England. The two towns shared the visit of the Association, and both did all they could to make their visitors feel that the long journey to this far western seaport, with all its natural beauty, its historic interest, and its present importance, was well worth the trouble and the cost.

On Friday the Health Section was but thinly attended, but the gentlemen present were nearly all practical men. Mr. W. H. Michael read a paper on the principles which should characterise a new Sanitary Bill. There seemed to be a feeling that Mr. Stansfeld's Bill of this year was unsatisfactory; that in making new sanitary machinery before passing a new sanitary law we have put the cart before the horse. This opinion may, however, be regarded as that of sanitary authorities who want to lay down an entirely new system. Mr. Michael proposed strong measures. He was for superseding existing authorities, and appointing a Minister of Health, with a council,

which, under the check of his responsibility, should have very large powers. The paper was so generally approved by the section that a special resolution was passed asking the council to print it, not merely in the Transactions, but for circulation.

A lively discussion took place in the section presided over by Sir John Coleridge. The room of the Athenæum, which is Greek in form, arrangement, and ornamentation, was crowded. The Rev. John Stock, LL.D., of Devonport, read a paper in which he set forth the arguments for establishment of an international tribunal to settle all disputes between nations, and cited examples from ancient history and modern experience to prove its possibility. Mr. R. N. Fowler, M.P., said that he could see no possible practical result which would ensue from it; that England had emphatically shown her disposition for the peaceful settlement of international disputes; and it was in France, Germany, and Russia that the peace agitation needed to be carried on.

In the Education section, Mr. T. Chatfield Clarke, of London, read a paper, in which he strongly advocated the plan he has urged on the School Board of London—that of the establishment of a national training college, in which the students should board with their parents, or in lodgings, and in which the teaching and training should be common to persons of all denominations; the Government merely to provide the building, and a grant to Queen's scholars to be spent partly in education, partly in maintenance. Mr. G. W. Hastings delivered an address on Education, in the course of which he said he attached great importance to the teaching of science in all schools. By scientific teaching, he meant the development of the powers of observation and the training of the understanding, and not merely the accumulation of a number of scientific results. It produced habits of careful thought which were invaluable, and by cultivating a spirit of inquiry, they taught the child to examine for himself, and thus educate himself. They were incentives to adult education and prolonged activity.

Questions as to taxation, evidence, &c., were discussed in other sections; and in the evening a working men's meeting was held in the Albert Hall, Lord Napier and Ettrick in the chair. It was well attended, and addresses were delivered by Sir John D. Coleridge, Sir John Bowring, Dr. Acland, Mr. Morrison, M.P.; Mr. Hastings, and others.

The Mayor of Plymouth (Mr. I. Latimer), received the members of the Association in the evening, at the ball-room, Royal Hotel, which was decorated for the occasion. The company was very numerous, and the visitors were hospitably entertained by the mayor and mayoress.

Saturday was not quite an "off" day at the meetings, but it was a kind of half-day. The sections met in the morning, and in the afternoon the members generally made some pleasant excursion. There was rather more sight-seeing than business. Some of the sections were prematurely deserted; for there was a trip to Mount Edgumbe at two o'clock, and the Mayor of Plymouth had asked those who wished to see the Town-hall and Assize Courts to meet him and the architect there at half-past twelve. The visitors noted the grouping of the new municipal buildings, which are rising in the centre of the town. The new buildings have been arranged in two blocks, with a wide space between them, so that they form a kind of quadrangle, of which St. Andrew's Church and tower form one end. The new buildings form each a side, and the remaining side is an open street. The buildings are in the Early Pointed style, and are constructed of granite and Devonian limestone, with Portland stone facings. On one side are the municipal buildings, with council-chamber and municipal offices for town business; on the other side is the great hall, to seat 2,500 persons, and two smaller halls, for assize business, with all the usual appliances of police and assize courts. These buildings, it appears, will be paid for out of the profits of the water-supply, which is in the hands of the corporation, and from other sources of existing revenue, and will not add a farthing to the borough rates.

The visit to Mount Edgumbe, in the afternoon, wanted nothing but fine weather to make it one of the most delightful excursions the Association enjoyed.

A good deal of business, however, had been done in the morning, before the pleasure. In the Municipal Law Section, an important paper

"On the Transfer of Land," of which we give a separate abstract, was read by Sir R. Torrens, M.P. The address of the day, in the Representation of Crime Section, by the president of that section, Mr. Kennaway, M.P., was a careful review of the position of the criminal question as it was left by the Prison Congress which lately met in London. Mr. Kennaway anticipated nothing but good from a congress in which the representatives of some four-and-twenty nations or governments were assembled, and which enabled them to compare criminal systems through the agency of the very men who administer them; but he strongly dissented from some of its conclusions. It thought only of the criminal, and overlooked society. Mr. Kennaway maintained, amid the apparent sympathy of his audience, that we have not only to consider the reformatory effect of punishment on the 30 per cent. of the perpetrators of crime who are discovered and punished, but must also look to its deterrent effect on the 70 per cent. who are never found out at all. He also pleaded for the employment by Government of the convicts in such work as that carried on at the Pimlico factory, and feared that now Portland Break-water was finished, and the works at Cbatham were drawing towards completion, there would be difficulty in finding work to keep the convict establishments going.

Mr. George Smith, of Coalville, near Leicester, of whose efforts on behalf of children employed in brickfields we have before spoken, read a paper in one of the sub-sections on Economy and Trade, on the imperfect protection which is still given to such children. He declares that owing to insufficient provision for inspection the Act of 1871 is nearly a dead letter. Children at and under eight years of age are very extensively employed in the manufacture of tiles, which is actually worse in its laborious character and its unhealthy nature and its demoralising associations than brickmaking itself, and the evasion of the law is practically unpunished. The Act allows the Home Secretary to make exceptions, and Mr. Smith states that such exceptions are made without regard to the interests of the children and on the representations of manufacturers. One of his statements gives a curious example of evasion. Before 1871 the tile manufactories were regulated by the Act of 1861. That Act applied to "ornamental tiles," and the makers of such tiles escaped by calling them plain tiles. The Act of 1871 has put plain tile factories under more severe restrictions than the others, and they have, therefore, changed their definition, and obtained leave from the Home Office to be regarded as ornamental tile manufactories. It is, however, not the tiles that have changed—only the name.

Mr. Henry Dunant, of Switzerland, founder of the "Red Cross" and of the Convention of Geneva, read a paper in one of the sections in which he made a proposal for introducing among the civilised Powers a High Court of International Arbitration with a view to avoid war.

In the Health Department a paper was read by Mr. Christopher Bulteel, F.R.C.S., "On Some of the Provisions of the Public Health Act of 1872, with special reference to Plymouth, Stonehouse, and Devonport;" and Mr. Symington read one "On the Method of Dealing with Sewage proposed by Mr. Strong, of Glasgow." The principal feature of the system consisted in the interception of each kind of sewage in detail at its source, by means of an apparatus designed for the purpose, which retained for separate removal all the polluting matter, and allowed only the water in a harmless condition to pass into the sewers. The system had been practically tested, and had been found to work satisfactorily. It secured the entire exclusion of all noxious matters from house drains and sewers. One of the chief recommendations of the plan was its extreme simplicity, and the facility with which it could be applied to existing arrangements.

In the Economy and Trade section, Mr. Jeremiah Head read a paper on the subject of "Retail and Co-operative Supply Associations." He said he considered that the gentlemen who recently waited on the Chancellor of the Exchequer to complain of civil servants carrying on co-operative stores were protectionists. They afforded an example of the way in which men lost faith in a true principle if for a time it seemed to operate to their disadvantage. Consumers encouraged the multiplication of shops, from a mistaken notion that competition would reduce prices. Notwithstanding the multitude of retailers, the cost of distribution was seldom less than 20 per cent. on the wholesale prices,

whilst the co-operative associations were able to distribute for less than 5 per cent. He believed that if three-fourths of the existing shops were abolished, the remainder could do the whole retail trade of the country at a proportionately cheaper rate. The remedy for the existing waste of capital and energy was the extension of the co-operative system. The importation of sentimentality into any economic question was as mischievous as indiscriminate charity had been found to be. There was no public obligation to support more distributors than were necessary, especially when there was an outcry for more producers.

Dr. Littleton, late assistant-surgeon R.N., read a paper on "A New Method of Constructing Ships, with a self-regulating power as to their specific gravity, so as to enable them to secure the advantages enjoyed by fish." The numerous and disastrous accidents, he said, which had recently happened to several of our iron-clad fleet must have occasioned great anxiety to every patriotic Englishman, and it became a question of the deepest interest to discover whether means could not be devised to avert such calamities. Dr. Littleton then spoke of the difficulties to be overcome, and explained the manner in which he hoped he had met most of those difficulties, referring to a model of his new ship, which was placed on the table. The specific gravity of the whole hull of a ship and her cargo was diminished by the temporary inflation of collapsible air-cylinders fitted on the outside, so as to enable the ship to float in a less draught of water, and thus enter a harbor or disengage herself when aground, or prevent her sinking after springing a leak. There might also be air-cylinders within,—incompressible air-tubes,—and compressible tubes.

On Monday the Congress adjourned to Devonport, and there seems to have been no falling off in the number of persons attending it. The arrangements at Devonport were, in most respects, as convenient as those at Plymouth.

The event of the day was the address of Dr. Acland as president of the Health Department. A crowded audience assembled to hear it, and Dr. Acland held their attention for more than an hour and a half. The address was extempore, and perhaps the most important part of it was the eloquent vindication of the sanitary legislation of last session. Dr. Acland began by illustrating the nature of international sanitary inquiries, and showed how elaborate investigation in diseases in one part of the world benefited the whole human race. After showing how intimately the physical health of a nation affected its mental wholeness and vigor, Dr. Acland came to the question of sanitary administration. He had made a list of twenty-nine departments of such an administration, and in answer to Mr. Vernon Harcourt's joke that if experts had their way they would regulate the cut of an old woman's flannel nightcap, said that the duty of Government was to do whatever was needful to health which a poor man could not do himself, and to leave to the people's own care whatever was within their own power. Pure air, pure water, pure food, means of recreation and rest, hospitals, and, more than all, education, were to be looked after by Government. Dr. Acland would not have these things centralised. Looking at the inevitable course of affairs in this country, health administration ought to be conducted by the people themselves. Local government had made England what it is, and Mr. Gladstone had done right in committing the England of the future to the same bodies and the same organization which had in the past made it what it now is. He rejoiced that Mr. Stansfeld had, with rare modesty and sagacity, created a real administration of the public health, and he believed that, in spite of all that had been said, there was under the Bill of last session ample power to appoint experts as referees in all needful cases. These experts should not be men who had failed in their professions, and who wished to have the care of a Government salary; but the highest men in each branch, paid, not by salaries, but by the piece, by fees for each particular reference. So far from the Health Bill being a mutilated Bill, Dr. Acland thought it was sufficient for present needs. "I earnestly desire," he said, "that there should be no Public Health Bill next session. Sanitary machinery we have, but sanitary law we shall only get as the working of that machinery all over the country shows us what provisions are needful, and what are incapable of enforcement."

The Health Department was otherwise occupied with sewage. Mr. Hope read a long paper

on sewage irrigation, in which he insisted that engineers huddled in laying out sewage-farms like water-meadows, and insisted that not a drop of sewage should run off the ground, but all be made to percolate through it. Mr. Siller described the successful operation of what is called the A B C process, as carried on by the "Native Guano Company."

A large meeting of the National Association for Promoting Social Progress in India was held after the business of the day, and the Mayor of Devonport, in the evening, gave a splendid reception to a large number of members of the Congress.

At the meeting in the Devonport Mechanics' Institute, on Tuesday, the address of Sir John Bowring, the President of the Economy and Trade Department, opened the proceedings. In it the present position of the agricultural labourer formed one of the principal topics of observation.

The Health Section had an interesting discussion on the present position of the town of Birmingham. Mr. Hope read a paper on the rejection by the House of Commons of the Birmingham Sewage Bill on the third reading. Birmingham has hitherto thrown part of its sewage into its river, but received some time ago notice that it must cease to do so. Thereupon the corporation undertook a long and expensive inquiry into the best mode of dealing with it, and adopted a double system, by which a great part of the sewage is kept out of the sewers, and taken away in carts. The part which could not be thus dealt with, was by the Bill to be made use of on a large sewage farm in the neighbourhood. The Bill empowered the purchase of this farm, and it was opposed by Sir R. Peel and Sir C. Adley, on the ground that it would be a nuisance to them. Their opposition failed before the Select Committee; but the House itself yielded to them, and threw out the Bill. The corporation are under a Chancery injunction not to put their sewage in the river, and Parliament forbids them to put it on the land. They cannot obey the injunction, and Mr. Hope says that the Court has issued a sequestration of the corporation revenues; that in November next a receiver will be appointed; and that local self-government in Birmingham will cease. It is a dead-lock, and all that the section could do was to suggest to the council that a copy of Mr. Hope's paper should be sent to the proper department of the Government.

To the Tuesday's proceedings in the other sections we have no space to refer.

In the Economy and Trade Section, Mr. G. J. Holyoake read a paper "On the Abuse of Industrial Partnerships."

On Wednesday, the concluding general meeting of members and associates was held at the Mechanics' Institute, Devonport. The chair was occupied by Lord Napier and Ettrick.

Several excursions took place in the afternoon. The Gun-wharf, Keyham Steamyard, and the Devonport Dockyard, were open, by permission of Admiral Hall, to members and associates, and at the latter hour steamers conveyed the excursionists to the Breakwater, the River Yealm, and Port Eliot.

On Thursday a party, limited to fifty, by invitation of the Duke of Bedford, were to visit Endsleigh, his grace's seat. There was also to be an excursion to the Eddystone Lighthouse.

The Council have accepted an invitation to meet next year at Norwich, and recommend Glasgow as the place of assembly in 1874.

THE IMPROVEMENTS AT LINCOLN'S INN.

EXTENSION OF THE LIBRARY.

THE enlargement of the Library at Lincoln's Inn, which has for some time been in progress, under the superintendence of Sir Gilbert Scott, the architect, is now nearly completed. The building has been extended a considerable distance eastward, which admits of a largely-increased space in the Library as well as the dining-room of the Hall. In carrying out the extension, the architectural features of the original building have been adhered to, the added portion not only resembling the old in every main feature, but, so far as was possible, the materials, including the brick and stone work of the east end of the building, were carefully preserved, and have again been used in the enlarged structure. This particularly applies to the stonework of the large eastern window, the whole of which, after being removed, has been replaced in the extended building, and now pre-

ments precisely the same appearance as it did before its removal. Carved arms, escutcheons, and armorial bearings, in stone, uniform with those in the original building, are displayed outside the structure in the spaces between the lower and upper windows of the added portion. A distinct and additional architectural feature has been imparted to the building by the erection of an octagonal tower at the south-east angle. The materials used in the construction of this tower, up to the eaves and parapet wall of the main building, are uniform with the main building itself, being of red brick, with stone facings. From this point the tower is carried up, entirely in stone, to an additional height of about 15 ft., the stonework being carved. The extreme height of the tower is surmounted by a spire, from 12 ft. to 15 ft. high, terminating in a vane. The spire, which has been finished during the present week, completes the external features of the enlarged building.

In connexion with the enlargement of the library, it may not be out of place to notice the memorial gates which have recently been erected at the south end of the gardens of the hall in memory of the late Colonel Brewster, formerly Colonel of the Inns of Court Rifle Volunteers. The fabric of these gates, which was designed in Belgium, is exceedingly light and ornamental. They consist of a large central gate, and two smaller side gates, and are formed mainly of screen work representing memorial flowers. On the top of the central gate are the deceased Colonel's arms, together with his name and date of his death, whilst on each of the other gates is the monogram of the Inns of Court Volunteers.

Considerable alterations and building improvements are about to take place in Lincoln's Inn immediately opposite to the east end of the library of the Hall. It is intended to take down the whole of the buildings on each side of the square, known as the Old Buildings-square, and erect upon their site new chambers of an architectural character. New chambers of a similar character are also about to be erected on the western portion of the square itself, having its frontage to Lincoln's Inn Hall, and within the last fortnight these have been commenced. When the new chambers now in course of erection in the square are completed, the old buildings adjoining will be taken down, and new chambers erected on their site.

THE GAS QUESTION IN LONDON AND THE PATENT GAS COMPANY.

UNDER the auspices of the London Gas Consumers' Association, a series of public meetings is being held in various parts of the metropolis, the objects of the meetings being, *inter alia*, to secure gas of improved quality at a reduction in price of from 3s. 9d. to 2s. 9d. per 1,000 cubic feet; and to take steps to place the gas-lighting of London in the hands of the parochial authorities, so that the profits may be applied to the reduction of taxation upon the plan adopted in Manchester, Glasgow, Leeds, Dundee, Rochdale, Bury, Aberdeen, and numerous other cities and towns. In connexion with this series of meetings a second lecture was delivered by Mr. G. Pittell, C.E., in Exeter Hall, on Tuesday evening last. The lecturer stated that the annual cost of gas in the metropolis last year exceeded 2,200,000*l.*, being 165,000*l.* more than in the previous year, showing that the consumption was increasing at the rate of doubling itself in about ten years. In Manchester the corporation applied canal gas at 3*s.*, and on a rental of 212,615*l.* applied 65,343*l.* to public improvements and the reduction of local taxation. If the lighting of London could be vested in the local authorities they would have a profit of at least 750,000*l.* per annum to dispose of for the advantage of the public. The London consumers had a right to demand gas of a much more pure and of higher illuminating power than that supplied to them, and at a price not exceeding 2s. 9d. per 1,000 ft. Eighteen-candle gas could be sold in London at a profit at 2s. 6d. per 1,000. The London gas was not only very bad in quality, but it was 40 per cent. dearer than in most of the other large cities and towns in the United Kingdom. That better gas could be supplied at a profit at a much lower price, was easily demonstrable. At Walsall, eighteen-candle gas was supplied at from 2s. 2d. to 2s. 6d. per 1,000, and this left a profit sufficient to light the street-lamps without charge to the public. The South Metropolitan Gas Company sold gas of excellent quality at 3*s.* per

1,000, in a thinly-populated district; but the Ratcliffe Gas Company, that lighted a densely-crowded part of London, charged 4*s.* 3d. per 1,000. The consumers had no redress, as the "distrieting" system had destroyed competition. They must take such gas as the company that had the supply of the district provided, and must pay for it what the company demanded, or go without. It was vain to seek legal redress as the companies could apply, without stint, the ample funds they had from violation of the Acts of Parliament that should bind them but did not. It was the interest of the local authorities acting on behalf of the ratepayers to apply to Parliament at once for an Act to enable them to buy up the existing companies at their fair market value. The directors would oppose this, as, in addition to their dividends, they paid themselves from 4*d.* to 8*d.* for every 1,000 ft. supplied to consumers. The directors of the 8*s.* gas company had 5*d.* on each 1,000 ft. supplied, and divided 10 per cent., which showed that gas could be sent out in London at 2*s.* 6*d.* per 1,000 ft. Important improvements had been effected in gas-making, and the public had a right to demand that the gas companies should adopt them, and give their customers the benefit. It was grossly unjust that the public should have to pay for inefficiency in their business, and profligate extravagance, that did not belong to and would not be suffered to exist in connexion with any other kind of business or manufacture. He thought the directors of the London gas companies should be sent to East Barnet to learn their business. He had been himself asked to go there, which he did with a mind prejudiced against the process of the Patent Gas Company. He found, however, that it was a great success, and that the invention of the company was one of immense value. He felt certain, that whether adopted or not by the London companies, the system would speedily find its way into the provinces and abroad. With the same quantity of the ordinary gas coal from which the companies made, by the common process, ten and twelve candle gas, the Patent Company made the same quantity of gas of eighteen-candle illuminating power. The adoption of the process would be an immense boon to consumers. The South Metropolitan Company, it appeared, from the *Journal of Gaslighting*, was about to give the Barnet system a trial on a working scale, having first made experiments, with which they were satisfied. The value of the process was readily apparent by a simple proportion calculation. If 9,000 ft. of twelve-candle gas, made from a ton of common gas-coal, is worth, say 3*s.* 9d., or 3*d.* per 1,000 ft. per candle, what is 9,000 ft. of eighteen-candle gas worth? The answer is, 5*s.* 7*d.* The extra cost of manufacture by the patent process was 3*d.* per 1,000 ft., and supposing the company were to charge, say 1*d.* per 1,000 ft. for the right to work the patent, this would make the net increased value per 1,000 ft. by the patent process 1*s.* 9d., or an increased value upon the production of gas from a ton of coal of 15*s.* 9d. But this was not all,—the gas companies making by the ordinary process are obliged to use from 10 to 12½ per cent. of canal gas, at 30*s.* per ton, to bring their gas up to even the low standard of twelve candles. This is equal to an addition of 3*s.* per ton on their coals all round, or a difference in favour of the Patent Company's process of 18*s.* 9d. in the value of the gas made from a ton of coal. This saving upon the consumption in the metropolis would amount, according to the lecturer, to no less than 735,000*l.* per annum.

BUILDING ON THE MILKWOOD ESTATE.

THE activity in building which has been going forward within the last few months on the estate which is known by the above name, and which is situated between Denmark-hill and Herne-hill, and bounded on the south-east by the Chatham and Dover Railway, is a striking instance of the new suburban neighbourhoods rising up in succession in different places around the metropolis. About the present time last year the greatest portion of the land forming the estate was occupied as market gardens, but the entire area has now been laid out in wide and spacious streets, all drained and paved, and provided with ample footpaths, and upwards of two hundred private houses and shops have already been erected and occupied, whilst a large number of new dwellings are at present in course of erection. The principal street on the estate, which has been named Milkwood-street, is a spacious thorough-

fare of about one mile in length, running parallel with the railway direct to Herne-hill, and having an outlet close to the railway station there. This street is intended to be the main business thoroughfare of the locality, and a large number of houses and shops have been built and occupied by tradesmen in different branches of business, whilst several other blocks are in course of erection.

When entirely built upon, it is estimated that the number of houses and shops on the estate will be about 800, with a population of not less than 4,000. The streets have been laid out by Messrs. Habershon & Pite, architects, of Bloomsbury, and the premises erected on the estate are subject to their approval.

THE LATE MR. THOMAS RIDER.

MANY of our readers will learn with regret of the decease of Mr. Thomas Rider, of the firm of Messrs. Rider & Son, builders, Union-street, Southwark, which occurred on Saturday last, the 14th instant, after a brief illness, we believe in his seventy-first year. Mr. Rider was the son of a builder of the same name, who by his industry and integrity raised himself from a humble position to one of credit and independence. His son was, as was usual in those days, apprenticed to his father, and served his time at the bench: he thus acquired a knowledge of the details of his business which was of the greatest importance to him in after-life. He had an extensive business, chiefly in the City of London, and was employed by many leading architects, by whom he was deservedly respected, from his scrupulous integrity, and the attention and practical knowledge he brought to bear upon business intrusted to him. Among the more recent buildings erected by Mr. Rider are the Freemasons' Hall and Tavern, Great Queen-street, under Mr. F. P. Cockrell's superintendence; and the premises of the British and Foreign Bible Society, from the designs of Mr. P. Anson.

REPORTED NEW COAL-FIELDS IN WEST LANCASHIRE.

IN the present dearth of the coal-supply, and the almost unprecedented high price of that commodity, any facts leading to a belief in the prospect of new sources of supply must be received with unmixt satisfaction. It is now stated that Mr. Edward Young, a mining engineer and geologist of Oughtifield, near Sheffield, says he has convinced himself of the existence of coal-fields in West Lancashire to the extent of from 400 to 500 square miles. Mr. Young's conviction is that the coal measures commence in the neighbourhood of Southport, and extend to Liverpool on the one side, and from Southport to Preston and Lancaster on the other. These districts, it must be borne in mind, embrace nearly the whole of south-west and north-west Lancashire, where coal has never hitherto been found, the existing Lancashire coal-fields having been mainly confined to the eastern portions of the county. It is also to be noted that the distance between the respective points in which it is now alleged coal is to be found is very considerable, the distance between Southport and Liverpool being upwards of 20 miles on the one hand, whilst between Southport and Preston and Lancaster, on the other hand, it is no less than 40 miles, thus giving some idea of the large area in which it is now asserted that coal is to be found. We learn that a number of persons interested in coal discoveries share Mr. Young's opinion that there is coal in abundance in the districts named; and it is stated that a meeting of landowners in West Lancashire is shortly to be held in Preston, at which Mr. Young will attend, and explain the reasons which have led him to the opinions he has formed. It is further said that several landowners have already announced their intention of contributing towards the large expense which boring operations will involve. A new railway, called the West Lancashire Railway, is about to be constructed from Southport to Preston; and in the event of coal being discovered in the locality, it must materially add to the prospects of the undertaking.

Mr. T. Mellard Read, of Liverpool, writes to the same effect, suggesting that it is worth consideration whether or not Liverpool people should try the experiment of sinking for coal under their feet. His letter goes into many particulars, which are interesting

to geologists, and essential for the substantiation of his argument. If coal is to be bored for by the Liverpool people in the neighbourhood, it should be on a spot where the lower red sandstone is thrown up to the surface. This being done, the depth to which they would probably have to bore before reaching coal would be 400 ft. or 500 ft. This would be in the upper members of the coal measures. Twelve hundred feet lower would bring them to workable coal, in the beginning of the middle measures; and such a depth as this is very slight compared with those which have been canvassed in estimates of the increased difficulty and costliness of meeting the industrial demand for fuel. The trial would not be a very perilous or extravagantly costly one. There have been previous attempts made, but they were on wrong spots, and bored wrong *strata*. Mr. Reade is for making the trial through the soft red sandstone by sinking a shaft near a fault.

THE VIENNA UNIVERSAL EXHIBITION, IN 1873.

THERE are many reasons why the United Kingdom should make an effort to be well represented in this approaching Exhibition, and we shall willingly do what we can to assist in bringing about such a state of public opinion as may lead to this. Other nations co-operated cordially with us in our Exhibitions of 1851 and 1862, to which we owe much; and it is but right that we in our turn should respond to their calls. Apart, however, from this, selfish motives point the same way. Foreign countries, we may even say all industrial states of the world, evince the greatest interest in this forthcoming Exhibition. In the East, as well as in the West, extraordinary preparations are being made to be well represented there. The East, more particularly, is desirous of sending its productions lavishly, and will make every exertion to compete successfully with the West. It is, therefore, highly desirable, and the wish of her Majesty as expressed in the Royal Commission, that England and her colonies should be well represented in art, science, and manufactures. The importance of the approaching Exhibition at Vienna can scarcely be over-rated, considering the essentially civilising influence of these gatherings. Hitherto these exhibitions have occurred only in the great centres of civilisation in the west of Europe, whereas the present Exhibition will take place on its extreme eastern borders. To the east of Austria there is a population of some twenty-four millions of semi-civilised peoples of European Turkey, including the Danubian Principalities, who in view of the considerable extension of railways in progress into those distant parts through Hungary and Transylvania, will have an opportunity not before known of largely benefiting by a more immediate contact with the Western civilisation in arts and sciences, in commerce, social habits, and customs. Besides that the great ends of national economy, of industrial and commercial speculation, will be greatly furthered by this enterprise, there is also a political importance attached to this Exhibition.

Looking back upon the results that have accrued to Great Britain and France from the Exhibitions of 1851, 1855, 1862, and 1867; the immense influx of strangers from far and near, the widened sympathies, the assimilation of new ideas and of foreign languages which resulted, it will be easy to conceive that the effects on the East of an Industrial Exhibition in the Austrian capital can hardly fail to be much greater even than those realised in England and France. Hitherto the sympathies with this Exhibition have been rather lacking, it would seem, in England, and yet British interests are deeply involved. There is a vast market to be opened in European Turkey for agricultural implements, machinery of all kinds, cheap cloths, hardware, and many other British manufactures, and enterprising capitalists would do well to direct their attention to the almost countless mineral treasures yet unexplored in Transylvania.

The situation of the Exhibition Palace is admirable lying in the heart of a park unpassed for beauty by any in Europe,—the Prater. The area apportioned to the Exhibition will embrace from four to five English square miles. The covered space available for the Exhibition will be about 1,150,000 square feet, being considerably more than that occupied by the Paris Exhibition of 1867. The Exhibition building will be 905 metres long by 205 metres

wide. We give a plan of the site and a view of the central building. There will be a main gallery or nave intersecting the whole edifice. This gallery has cross galleries or transepts on each side, which are so placed as not to obstruct the view from either end. Between the transepts and the nave lie the garden-courts, which will also be available for exhibition purposes, and each country will have one or more of these transepts allotted to it, together with the portion of the nave and the garden-court adjoining. A rotunda, shown in our view, will rise from the centre of the building, and divide the main gallery in the middle. This rotunda, when finished, will be the largest canopy-shaped edifice without supports which has ever been erected. It has a diameter of 102 metres, and its height is 79 metres. The whole is being constructed of iron, after a design by Mr. Scott Russell.

The main gallery will be 25 metres wide, and each of the transepts 15 metres wide and 75 metres long. The latter are separated by courts, which are designed for such objects as can be exposed in uncovered places. The number of square metres within the Exhibition building will amount to 103,000. East of the Prater Rondo, facing the main gallery, the Art Exhibition building will be erected, covering an area of 6,995 metres. Buildings of a permanent character, sufficiently protected, will be provided for the exhibition of works of fine art.

From the chief building covered galleries lead to a large conservatory, and to smaller pavilions which are intended for the exhibition of horticultural productions, aquariums, &c. A separate hall will be erected for machinery in motion, 800 metres in length, and 28 metres in width. In this hall will also be found hydraulic machines, diving apparatus, &c.

The Imperial Villa and the ball in which the jury will deliberate and make their awards will also be erected in the grounds, which will be laid out under the direction of a landscape gardener of great reputation.

Amongst other attractions, the council of the Exhibition have decided on having a permanent aquarium of considerable magnitude erected in their city, and plans have been submitted to them for their approval. Their choice of an architect has fallen upon Mr. Charles H. Driver, who planned and erected the aquarium at the Crystal Palace last year, and the works will be forthwith commenced.

Machinery, we need scarcely say, will form an important feature of the Exhibition, and we would call the attention of English manufacturers to the opportunity afforded to exhibit either fixed steam-boilers, fixed steam-engines, or portable engines, and also steam-engines and steam generators for service in the machinery hall. Machinery and apparatus specially adapted to the requirements of the Exhibition may also be supplied by exhibitors; and exhibitors supplying such machines and apparatus intended for special service during the Exhibition will enjoy special privileges, to be arranged between them and the director-general. If British makers lend cranes, hoists, boilers, and engines for use of British exhibitors, no fees will be levied by the Imperial Austrian Commission for the use of the same by British exhibitors; but if British exhibitors lend such machinery for the use of foreign exhibitors, arrangements will be made by the Austrian director-general to indemnify British exhibitors for the use of their machinery. The power required to set machinery and main shafting for driving machinery in motion will be supplied by the Austrian Commission, and exhibitors will in no case be charged for motive power supplied by the main driving-shafts in the machinery-hall.

Coals from the best Austrian and Prussian coal-mines, and feeding-water for boilers, &c., supplying steam-engines driving machinery in the machinery-hall, will be supplied by the Austrian Commission free of expense. Stockers will also be provided for the steam-boilers lent for service in the Exhibition; or, if the exhibitor should prefer to employ his own people, the wages of the latter will be paid by the Austrian Commission according to a fixed tariff.

The whole Exhibition-ground will be drained by a system of drainage-pipes, carrying water and liquids to the Danube, and every measure has been taken to have a sufficient supply of water in all parts of the Exhibition. Gas will be furnished by the Imperial Continental Gas Company, at the usual pressure.

There will be some work of importance to be done by steam road-rollers, and, in case of any

work performed for the installation by traction-engines or road-rollers, all expenses will be paid by the Austrian Commission. There will be competitive trials with steam fire-engines, and the jury and exhibitors are invited to send special engines for this purpose; such engines will be considered as objects of exhibition, and, if lent for use, fuel and care will be at the charge of the Imperial Austrian Commission. There will likewise be special trials held with agricultural machinery and implements, in fields in the neighbourhood of Vienna, or in such places as can be easily reached by the Exhibition railway. Agricultural machines will not be exhibited in the machinery-hall, but in a pavilion specially built for that purpose.

All machines intended for the Exhibition, will be admitted to the machinery-hall, from the 1st of February till the 15th of April, 1873, inclusive, and must be set up by the 25th of April. Machines and apparatus arriving in pieces, and consisting of heavy and bulky parts, must be set up by the 15th of April.

Slates is particularly desired to be sent to the Exhibition: the slate will stand a chance of being sold with advantage at the close of the Exhibition, the Austrian slate being only fit for roofing.

It is also desired by the Director-General that fittings, show-cases, cloth for the covering of walls, window-glass, &c., should be sent from England to Vienna: these would be considered as Exhibition objects, and sold at the close of the Exhibition.

Some time ago her Majesty, in pursuance of an invitation received from the Austrian Government, appointed a Royal Commission for the purpose of representing the British and Colonial exhibitors; and these commissioners have already held several meetings, and established their offices at 41, Parliament-street, where Mr. Philip Cunliffe Owen, the secretary, will receive applications for space, and give every information as to the forwarding, exhibiting, and returning of the objects of the Exhibition, in accordance with the regulations laid down. The Exhibition will be opened on the 1st of May, 1873, and closed on the 31st of October of the same year.

British exhibitors can communicate with the Austrian Commission solely through the Commission appointed for Great Britain and the Colonies.

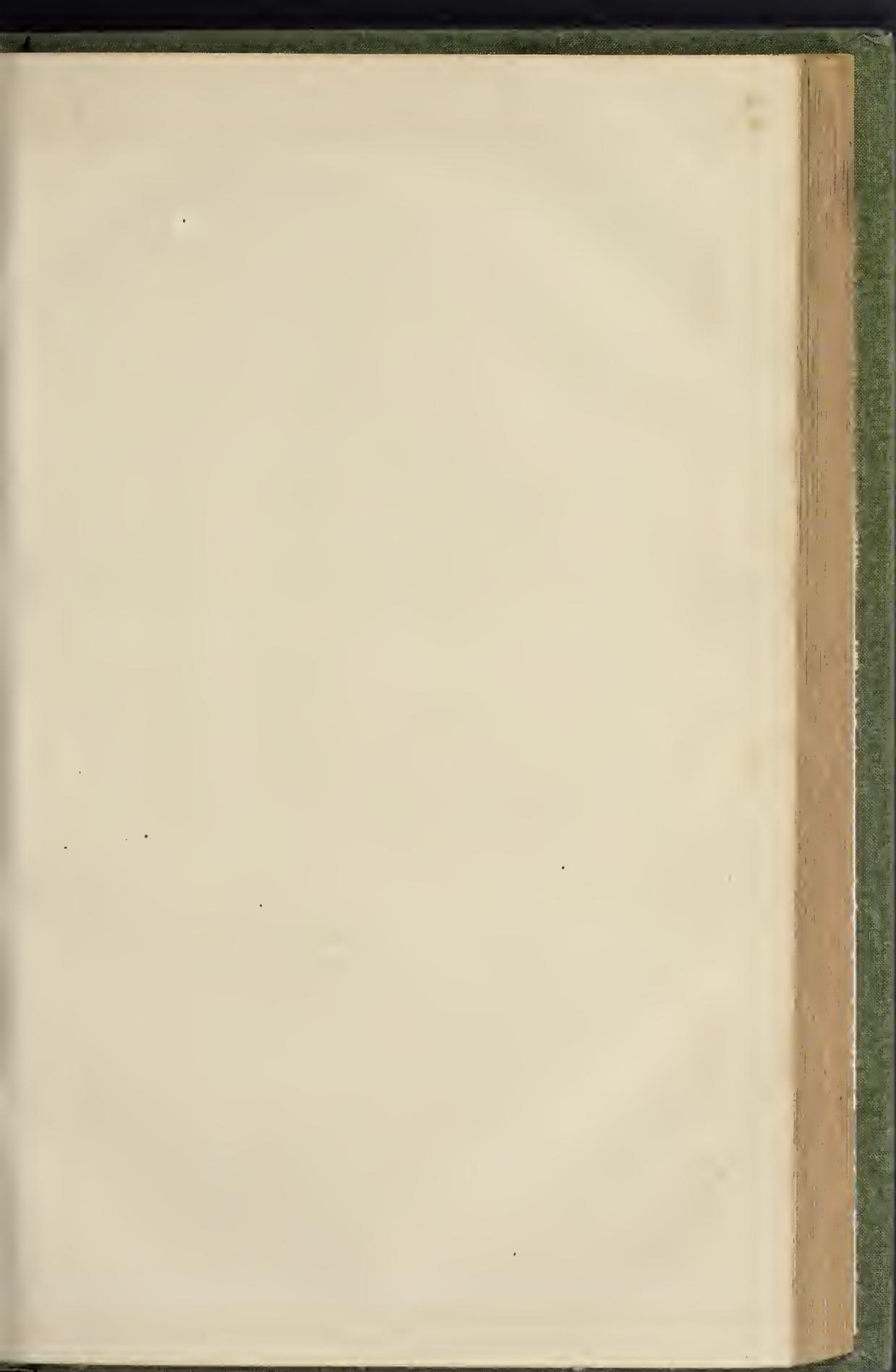
Lists of the intended exhibitors of the United Kingdom and the Colonies, as well as detailed plans, showing the space allotted, and of each single object to be exhibited, must be sent by the Royal Commission to the Director-General, Baron Schwarz, before the 1st of January, 1873, at the latest, so that the exigencies of the respective countries may be taken into account in organising the interior arrangements of the Exhibition buildings. As the total demand for space must depend upon the number of individual applications received, it is desirable that applications should be forwarded without delay to 41, Parliament-street.

The Director-General has entered into negotiations with the different railway and steam navigation companies of Austria and Hungary, and procured a considerable reduction of rates for the conveyance of objects for the Exhibition, and several of the English railway companies have already agreed with a praiseworthy spirit to offer the exhibitors from the United Kingdom similar facilities: other companies have the matter under consideration.

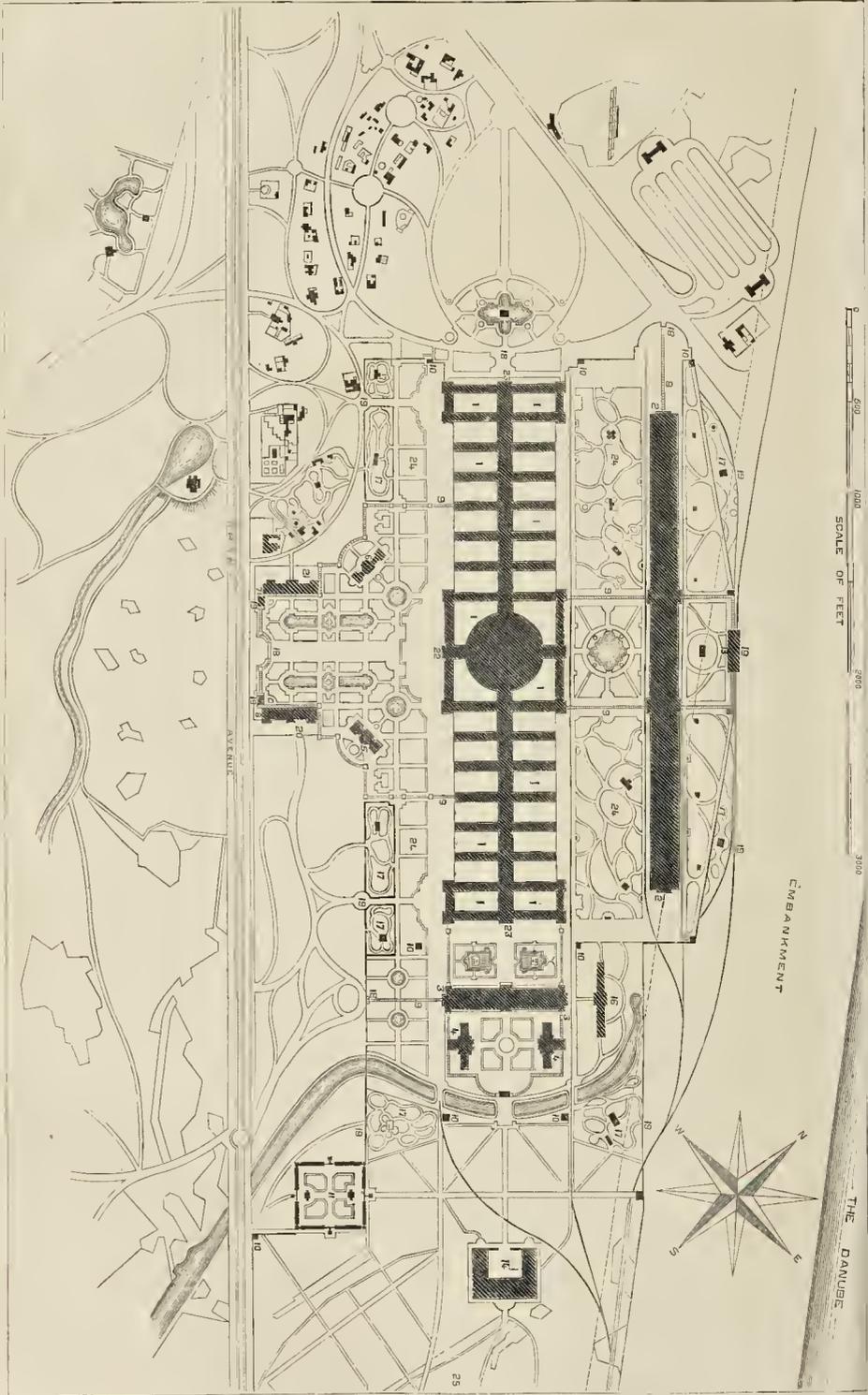
We will simply add, that the exhibitors of works of fine art are exempted from any charge for space.

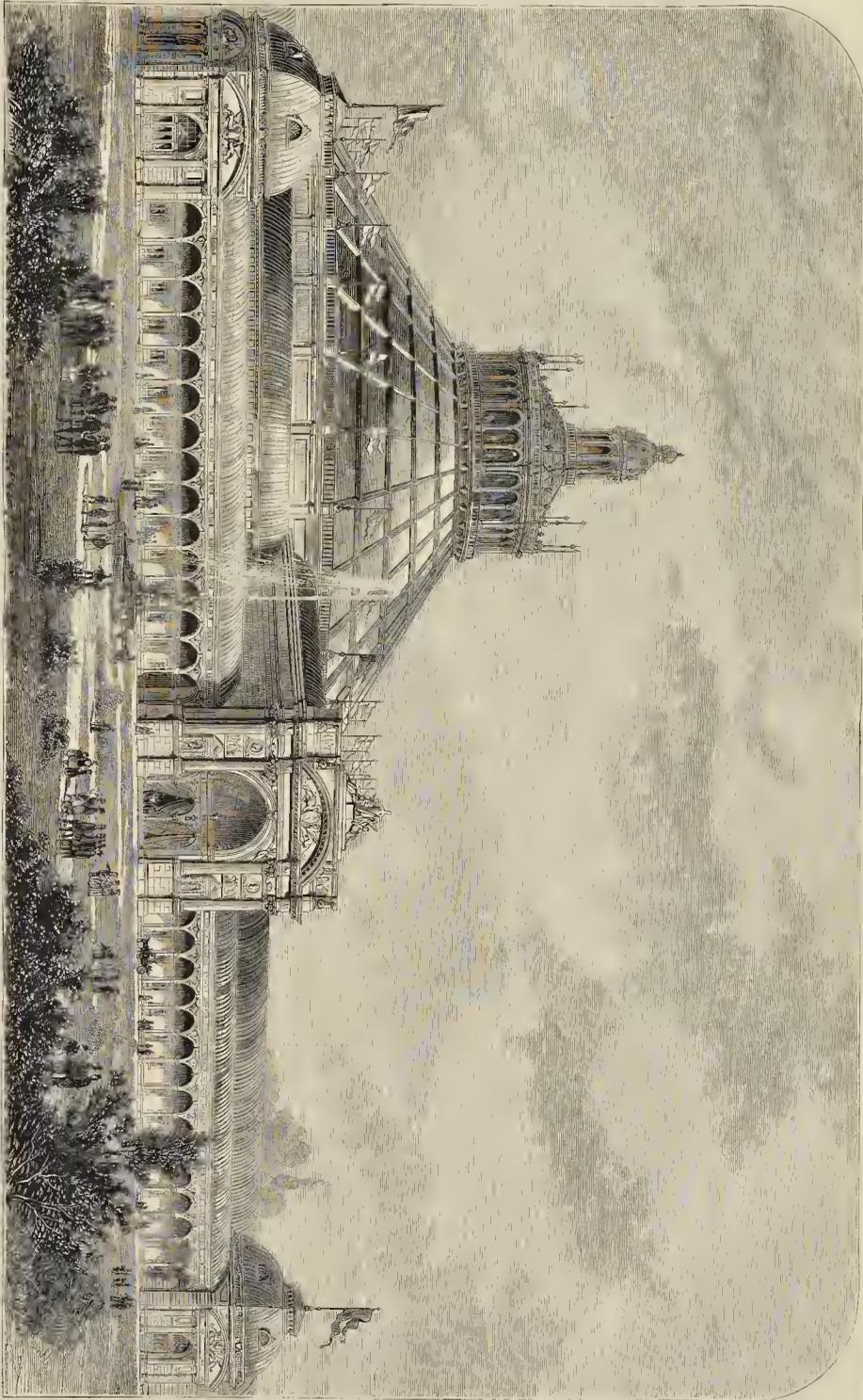
REFERENCES.

1. Palace of Industry.
2. Machinery-hall.
3. Gallery of Fine Arts.
4. Exposition des Amateurs. (Loan collection.)
5. Imperial Pavilion.
6. Offices of the chief manager.
7. Pavilion of the jury.
8. Post, Telegraph, and Custom-house offices.
9. Galleries of communication.
10. Guard-houses.
11. Barracks for the I. and R. Engineers.
12. Exhibition railway-station.
13. Exhibition of horses.
14. Place for hot-houses.
15. Place for Horticultural Exhibition.
16. Restaurants.
17. Principal entrances.
18. Lateral entrances.
19. Alley leading to the Imperial Pavilion.
20. Alley leading to the pavilion of the jury.
21. Principal entrance of the Industrial Palace.
22. Lateral entrance of the Industrial Palace.
23. Places for pavilions.
24. Park for the Agricultural Exhibition.

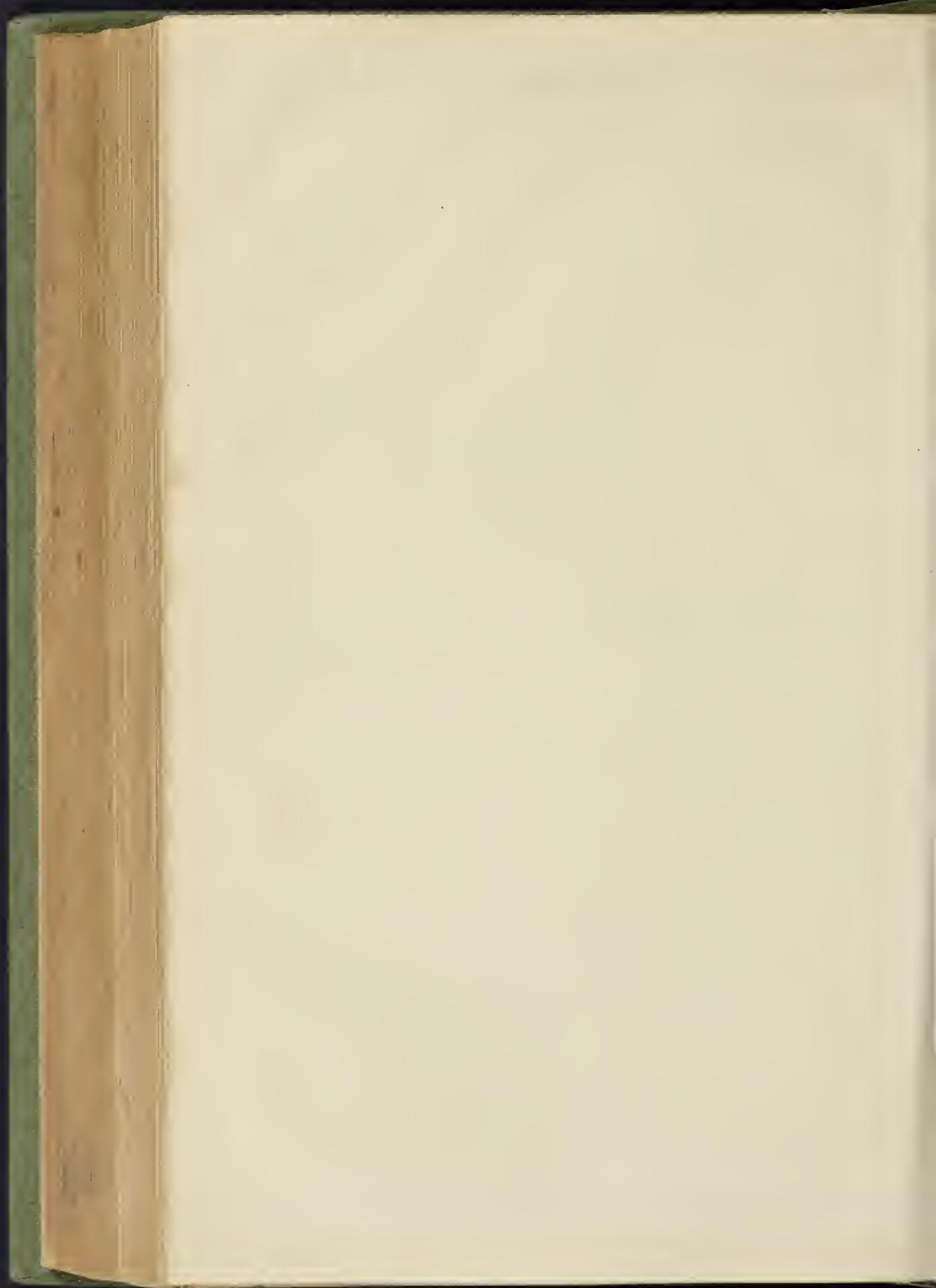


VIENNA UNIVERSAL EXHIBITION.—Block Plan of the Building and its Surroundings.





VIENNA UNIVERSAL EXHIBITION: VIEW OF THE CENTRAL ROTUNDA.



THE TRANSFER OF LAND.

SIR R. TORRENS, M.P., read a paper on the "Transfer of Land," in the Municipal Land Section of the Social Science Congress, at Plymouth, from which the following is abstracted:—

"The question of applying to estates and interests in land the principle of conveyancing by registration of title has frequently been discussed. I have undertaken to bring it again under review, with the additional light thrown upon the subject through the labours of the Royal Commission on the Land Transfer Act of 1862 (Lord Westbury's), and more recently by the Parliamentary returns, exhibiting the working of the corresponding Act in Ireland (Record of Titles Act, Ireland, 28 and 29 Vict.), and by the Blue Book, containing the reports of the governors of the Australian colonies, testifying the complete success of the same principle there, applied under a different method. I will commence by endeavouring to explain the radical distinction between 'conveyancing by deed,' and 'conveyancing by registration of title.' Title by deed can never be demonstrated as an ascertained fact; it can only be presented as an inference more or less probable, deducible from the documentary and other evidence accessible at the time being. This condition involves the employment of highly skilled, and therefore costly professional assistance. Secondly, an element of uncertainty through the admitted possibility of a wrong inference being drawn from the evidence given by the most skillful conveyancer (2), and from the difficulty of ascertaining beyond doubt that all the evidence is fully and clearly before him. Thirdly, this examination involves delay, sometimes such delay as entirely to frustrate the object of the party dealing; and, lastly it has the disadvantage of being cumbersome from the mass of documents that have to be preserved. In contrast to this, 'title by registration,' is a tangible ascertained fact. The entry in the record is conclusive. There is nothing to deduce or infer, or, in the conduct of ordinary dealings, to necessitate professional assistance. The time occupied in such dealings need not exceed that required for transacting the like dealings with railway scrip, or with property in shipping, and the instrument evidencing title would rarely exceed the size of a sheet of letter-paper. In contrast to this I would refer to the results of 'conveyancing by registration of titles' of which we have a perfect example in this country, and in this great commercial port. You need not, but walk down to the Custom-house, and there you may see an ordinary mercantile clerk, without any difficulty, and with perfect security, conducting transfers and mortgages of property in shipping, and the time occupied in this dealing with a vast property, such as that of the Great Eastern, would not exceed half an hour. A few weeks back a friend of mine expressed surprise at meeting a gentleman, whose arrival from Australia was not expected for some months. 'Yes,' said this gentleman, 'it is all owing to that admirable act of your friend Torrens that I am here so soon. Only two days before the packet sailed, I had an offer for my estate. The intending purchaser went with me to the Lands Title-office, and in less than an hour the business was transacted. I got a cheque for the purchase money, and he got an indefeasible title to the land, and so we did the business ourselves, the cost was only 3l. or 4l.' Again, a gentleman residing at Launceston, Tasmania, writes to me as follows:—'Your Act has proved a great blessing to us here. Recently I purchased a sheep station for my son, and being 5,000l. short of the purchase-money, I mortgaged some land for the amount. The transaction was completed in less than half an hour, and as I did the business myself, the whole expense was only 15s., which, under the old law, would have been 20l. or 30l., and I should have considered myself lucky if I got it done under a month or two.' Official duties connected with the transfer of property in shipping suggested to me, in 1850, the feasibility of applying the same method to dealings with land, though it was not until 1856 that, falling in my endeavours to induce any of my professional friends to take the matter in hand, I essayed what, to a mere layman, was a very formidable task, and brought out my scheme in the form of a bill—I confess a very defective one, as I too timidly followed the language as well as the forms of my model, the Shipping Act. This Bill, in an amended shape, was introduced into the Legislature of South

Australia in 1857, and became law. In May, 1857, the Royal Commission on Registration of Title made their report, and two years later Lord Cairns, being then Solicitor-General, introduced into the House of Commons Bills to give effect to the recommendations of that report, which Bills, unfortunately interrupted in their course by a dissolution, never passed into law. As no portion of the method which I have herein instrumental in establishing in the Australian colonies has worked with greater facility, or been productive of so great advantage to the community as that which relates to charges on land, I will here, as briefly as possible, describe that method. The old fiction of transferring the legal estate is abolished, and the object is accomplished by a direct instead of by a circuitous course. In the language of the Act, 'mortgage and encumbrance shall have effect as security, but shall not operate as a transfer of the land thereby charged, and in case default be made in the payment of the principal sum, interest, annuity, or rent charge thereby secured, or in the observance of any covenant, and such default be continued for the space of one calendar month, or for such other period of time as may therein for that purpose be expressly limited, the mortgagee or encumbrancer may give to the mortgagor or encumbrancer notice in writing to pay the money then due or owing on such memorandum of mortgage or of encumbrance, or to observe the covenants therein expressed, and that sale will be effected unless such default be remedied.' In such case the registered proprietor of the charge may proceed to sale, and should the sum bid be inadequate to cover the amount secured, he may foreclose without further expense or delay, by producing to the registrar evidence that the requirements of the law have been complied with. In either event, the registrar is required to register the proprietor of the charge, or his purchaser, as owner of the land. The Act further enables the proprietor of the charge, in such case, to distrain or enter into receipt of rents and profits. Charges are released by memorial entered on the appropriate folium of the register, and upon the certificate or other instrument evidencing title, which memorial the registrar is required to make upon production of receipt for the sum of money, annuity, or rent charge; or upon production of evidence of the decease of the annuitant; or that the circumstances or conditions upon the occurrence of which the charge was contingent, have ceased to be possible. These charges on land are transferable by endorsement in a simple form, printed on the back of the instrument, evidencing the charge, and as the title is indefeasible, the pass as freely as Exchange bills between parties acquainted with the value of the property to which they attach. The expense attendant on creating a charge is but 10s., the cost of transfer 5s., and of release 6s. Equitable mortgages for the purpose of securing cash credit, and advances, for fluctuating amounts, and also when parties desire secrecy, are created under this system with a degree of security and facility for realising unattainable under the English law of conveyancing, because the title is indefeasible; and so long as the banker retains the certificate of registration of that title no dealing therewith can take place without his consent. Should the banker desire further to secure facilities for realising on the contingency of the death or insolvency of his creditor, he may require 'contract for charge' duly executed on a prescribed printed form, to be deposited with the certificate, either specifying a fixed amount, or as is more usual, for such sum as may prove due on balancing accounts at some future date, and on the occurrence of either of the events above referred to, he can, by presenting these instruments at the registry-office, convert his equitable lien into a registered mortgage. The amendments really necessary in order to render this Act of 1862 a true embodiment of the system of conveyancing by registration of title, so as to put that system fairly on its trial, may be compressed in a very few words. I will enumerate them in the order of their importance. First, abandoning the attempted compromise between registration of title and registration of assurances, to repeal Clause 63, which makes property in land to pass upon execution of a deed or instrument, and substitute for it the corresponding provision of the Australian Act, which declares that estates and interests in land shall pass or be affected by entry in the register; and instruments, when executed, shall have effect only as authority to the officer to make such entry, and as contract between the parties.

Secondly, in order to facilitate the first placing of land upon the register, a relaxation of the stringency of the requirement of Section 5, so as to allow the recording officer to accept for registration "good holding titles," in the event of non-claim after service of notices and due advertisement. Thirdly, repeal of Section 14, in order to substitute the simple and effectual method of recording by one register-book, with instruments evidencing title to each separate estate or interest, upon the model of the Shipping Act, and as in operation in Australia; for the method by three register-books, with land certificates and special land certificates, as condemned by Colonel Leach and other witnesses, and admitted by Mr. Spencer Follet to be unsuitable for the conduct of business on such scale as would render it of sufficient public advantage. Fourthly, the abandonment of Section 32, so far as to exclude uses and trusts from being disclosed on the register.

Before concluding, the reader of the paper drew attention to a Blue Book, recently presented to Parliament, giving replies from the governors of the Australian colonies to a circular despatch of her Majesty's Secretary of State, calling for reports on the working and progress of the system of conveyancing by registration of title there in operation. The advantages derived from this system by the inhabitants of the colonies, he said, may be thus summed up. The procedure is so simple and ready of accomplishment that parties dealing for the most part transact their own business. A saving of 19s. in the pound sterling has been effected in the cost of conveyancing. The wealth of the community has been increased by restoring to its intrinsic value, as building sites, land, which, deprived of that special character by imperfect evidence and technical defects in title, lay waste and unprofitable. The value of land as a basis of credit has been raised by the extraordinary facility and security with which equitable mortgages and registered charges are effected, and the ease and rapidity with which the title may be transferred from hand to hand. Through the simplification of titles, so that each freeholder stands in the same position as a grantee direct from the Crown, the risks of Chancery suits have been reduced to a minimum, and a ready and inexpensive procedure in foreclosure and ejectment has been obtained. He earnestly desired to see those benefits participated in by the landowners of this country.

SCHOOLS OF ART AND SCIENCE.

Selby School of Art.—The first annual meeting of this school has been held in the Public Room, Selby, under the presidency of Sir G. Gilbert Scott, B.A. About a year ago an art class in connexion with the Science and Art Department, South Kensington, was established in this town, and has been so successful that the committee decided to commemorate the first anniversary by combining a *soirée* and an exhibition of prize and other drawings. They obtained the consent of Sir G. Gilbert Scott, to preside on the occasion; and contributions of works of art were so liberally offered, that a notable display was offered. So valuable a collection has never before been exhibited to a Selby public, and would itself be amply sufficient to form an instructive exhibition. In addition to this, the committee have been intrusted, by private owners, with some valuable paintings, which add greatly to the attractiveness of the exhibition.

Brighton and Sussex School of Art and Science. The fourteenth annual distribution of prizes to the successful students in connexion with this school has taken place in the Music Room at the Royal Pavilion. The Mayor, Mr. J. Cordy Burrows, presided. There was a very good attendance of the parents and friends of the pupils. In presenting the first annual report in which the Committee have had to record any proceeding in connexion with the Science branch, the Committee

"congratulate the subscribers to the institution and the public of Brighton on the great extension of their operations during the past year. It would be unjust (continues the report) if they did not state that this result is to be ascribed entirely to the capacity and energy of the headmaster, Mr. Alexander Fisher. . . . While there has been a moderate increase in the numbers, the improvement in results is much more marked. The Committee regret exceedingly to state that the insufficiency of the accommodation afforded by the room in which the school is at present carried on has caused the number attending the classes to have been very much less than they would otherwise have been. The Artizan Class would probably nearly double its present numbers if there were sufficient space. The Committee will use their utmost exertions during the ensuing year to obtain improved

accommodation. To attain success in this object, the co-operation of the public, of the local authorities, and of the Government is necessary. That of the latter is certain, conditionally on the two former being afforded: and when it is generally known that, notwithstanding the high rank the town now takes, both in reference to population and as the residence of the wealthy and influential classes, it possesses no School of Science at all, and a School of Art most meagre in its appointments, and probably more circumscribed in its capabilities than any in England; that at a time when the need of education, and especially of technical education, is being so fully recognised, numbers in Brighton, anxious to acquire this education, are actually driven away from the doors of the school for want of sufficient accommodation—it is confidently hoped that the efforts of the Committee to establish a Science and Art Educational Institution worthy of the largest and most important town in the south-eastern counties, will be so far seconded by the help of the municipality and the pecuniary support of the public as to meet with full success at an early date.

¶ *Maidstone School of Art.*—An exhibition of drawings and paintings executed during the past year by students of this school has been held, the works being arranged in the corridor leading to the concert-hall of the Corn Exchange. On the whole, both drawings and paintings seem to have been carefully and conscientiously executed, and several displayed signs of talent. The lady students hear off a fair share of the honours of the year, and they were particularly successful in carrying away the local prizes. The distribution of prizes took place at the Concert-hall. Mr. W. Hart Dyke, M.P., presided. The report says, "The committee, in presenting their fourth report, would call to mind that it is fast approaching five years since these art-classes were first commenced in Maidstone; and while they have to regret that the middle and upper classes do not continue to support the effort as they might, by sending their sons and daughters for instruction, they rejoice to say the artisans have shown their appreciation of the great advantages offered by well maintaining their numbers."

The Southampton School of Art and its Head Master.—There has for some time been an unfortunate misunderstanding between the council of the Hartley Institution and the head-master of the art-school, Mr. Baker, which has eventuated in a public meeting, at which Mr. Baker explained the causes of difference, and resolutions were unanimously passed, urging an inquiry into the present position of the Hartley Institution, and how far, as at present conducted, it meets the requirements of the town in respect to its foundation; thanking members of its council for their efforts; and pledging the meeting to use every exertion to establish a new school of art under Mr. Baker, in connexion with South Kensington.

LONDON SCHOOL BOARD.

In the architects' department the following appointments have been determined on:—One chief draughtsman at 200l. per annum, two senior draughtsmen at 140l., one senior draughtsman at 120l., four junior draughtsmen at 80l., and one writing clerk at 50l. per annum. The annual cost of this staff would be less than that previously recommended, by 26l. The committee obtained the necessary power to carry out their recommendation.

The following architects have been invited to submit designs in competition for the proposed building for the London School Board on the Thames Embankment:—Mr. Blomfield, Sir Digby Wyatt, Mr. G. F. Bodley, and Mr. J. O. Scott.

LEAD ON CATHEDRAL ROOFS.

WITH reference to the danger attending the use of solder for mending cathedral roofs, the clerk of works at Lincoln Cathedral says:—

"The method of laying on lead is to have the sheets of a reasonable size, which should never exceed 12 ft. long, and the narrower they can be conveniently put in, the better the work, and the less liable to be affected by sudden changes in the temperature. In the laying of gutters proper drips should be provided, not greater than 12 ft. apart; 8 ft. would be better. The mode of covering roofs is to use what is technically termed *tabs*; that is, square pieces of lead of about 6 in. These are nailed on to the boarding of the roof at the meeting of two sheets, having their edges turned up about 4 in. each. These edges are turned with the tabs into a roll, forming a complete protection to the roof below from the rain. The tabs used for steep roofs are more numerous than for flat ones, for the reason that the lead has a greater tendency to slide down.

In some recasting that was done early in this

year I took an account of the cost of the labour, and found that, with coals added, the cost was less than three-fourths of a penny per foot super. I am, therefore, satisfied that it is less expensive to have the lead taken off and recast whenever it becomes had than to endeavour to mend it with solder, for with solder there is a perpetual expense and a leaky roof."

WORCESTER CATHEDRAL.

It has been customary, for some years past, on the occasion of each returning Festival, to detail, for the information of readers, the architectural condition of the cathedral, and the progress of the work of restoration which has been so long in hand. Although we are not in a position to record the completion of the works, it is satisfactory now to be able to state that the year 1873 will probably witness the re-opening of the entire cathedral in its completely restored condition. Meanwhile we collate a few notes of what has been done in and upon the building since the last assembly of the three choirs in Worcester.

In the December following the Festival of 1869 the new peal of bells arrived, and were hoisted into position in the renovated tower. They were from the foundry of Messrs. Taylor & Co., of Loughborough, and their total weight is 221 cwt. 3 qrs. 22 lb., besides the great clock-hell, which weighs 41 tons. There are twelve bells which ring in peal, and a small extra bell for the quarter chimes. A new clock, from the designs of Mr. Denison, Q.C., manufactured by Mr. Joyce, of Whitechurch, has since been added; and to complete the arrangement in the tower, Mr. Ald. Lee presented a set of chimes. They have been manufactured by Messrs. Gillett & Bland, of Croydon, will play twenty-eight tunes, and will cost between 400l. and 500l. The chimes will be completed in two or three months. The cost of the clock and bells was nearly 6,000l.

Three years ago it was found that the execution of the contracts for the work already done had exhausted the available funds, and that after an expenditure of 50,000l. another sum of 15,000l. would be required to place the cathedral in a complete state of restoration. At this point Earl Dudley stepped in, and early in the year 1870 made the offer to complete at his own expense the entire restoration of the cathedral, provided that structure was never again used for the purpose of a musical festival. Earl Dudley's proposal was declined, after which his lordship made another offer, wherein he proposed to give 5,000l. towards the restoration, on condition that the remaining 10,000l. should be raised by the city and county during the next three years.

Within less than three weeks nearly 11,000l. were raised, besides Earl Dudley's donation. The amount was contributed by only 130 subscribers. Among the first works done in consequence of this successful movement was the relaying of the floors of the Lady Chapel and aisles with a new pavement of stone and marble, in large quatrefoil patterns. The next thing undertaken was the decoration of the choir-roof, which had been previously scraped till it presented the bare masonry only. Messrs. Hardman, of Birmingham, undertook this work. Messrs. Farmer & Brindley, of London, undertook the execution of the new stalls, screens, wood-carving, &c., of the choir. This work is not yet completed. This information we have condensed from the *Worcester Herald*.

The Lord Bishop of the diocese has presented an episcopal throne, at a cost of 300l., but this has not yet been erected, nor have all the choir-screens and grilles been raised. A pavement of Devonshire marbles, Greek green, and encaustic tiles, is now being laid down in the choir, by Messrs. Poole & Co., of London, at a cost of 1,100l. Mr. Skidmore, of Coventry, is supplying the metal-work.

At the close of the present festival, the work of repairing the nave and north porch will be commenced, and handsome gates will be erected in the porch. Gas will be introduced to the cathedral for evening service; it is to be laid on in string courses on the walls and piers of the nave, and lofty standards in the choir. A new organ, by Hill, of London, will be ready for the re-opening of the choir and nave. It is stated that Government has made a grant for the restoration of King John's tomb, and Prince Arthur's mortuary chapel.

Among the exterior improvements of the precincts, the visitor will be pleased to note the

clearing of the college yard of building materials, sheds, and rubbish; the levelling of the ground, and the appearance of a nicely-kept turf, which is by far the most appropriate setting for architecture. At the west end the old house, formerly occupied by Canon Benson, had been destroyed, and a better view opened for that end of the cathedral; but a portion of the remains, of Early Norman date, has been allowed to stand as a relic. A new pathway of stone has been laid down from the western entrance, communicating right and left with the college precincts.

SEWER GAS AND LEAD PIPES.

SIR.—It seems to me that soil-pipes should be made of pure lead, and not of the compound which is used in many lead-mills, and which contains a mixture of different kinds of old metal, such as old spoons, portions of what is called Britannia metal, zinc, &c., collected by marine-store dealers and many others who buy and trade in old metals. Many tons of this compound are melted and cast into pigs and other shapes, and sold to the lead-mills, where it is manufactured into pipes, sheets, &c. I do not doubt the efficiency of these sheets and pipes for ordinary water-pipes, gas-pipes, flashing, &c., where there is no chemical action; but I think the particles of zinc, &c., will be strongly acted upon by the gases arising. I have detected this in pipes made from this mixture of metals used in our paper works in this locality, which our plumbers have called being honey-combed; whereas the pipes made from pure, or what we call virgin lead, have not been so. I do not wish it to be understood that the mixture of metals named is used at all lead-mills, as many use lead direct from the mines or the smelters, and any of the lead-mills will supply sheets or pipes made from pure lead, if specially ordered, and which is certainly preferable to the compound before named. I should be glad to hear some suggestions with respect to a substitute for leaden soil-pipes. I am convinced by experience that iron soil-pipes are corrosive and offensive. A PLUMBER.

REMOVAL OF CITY CHURCHES.

THE old City churches are one after another disappearing under the influence of street improvements and other kindred causes. It is now stated that the Merchant Taylors' Company are about to deal with St. Martin's Church, Outwich, by removing the church, selling the site, and applying the proceeds of the sale, together with the tithes, to the endowment of churches where they are wanted; and that the Dean and Chapter of St. Paul's are dealing in a similar manner with St. Peter-le-Poer, the arrangement being that on the next avoidance of the rectory the income is to be paid towards the augmentation of the benefices of several churches in St. Pancras, and 125l. per annum to St. Mary, Charterhouse. All-hallows, Staining, is also to be removed.

OPENING OF THE NEW SOUTH YORK SHIRE LUNATIC ASYLUM.

THE spacious asylum erected in Wadsley Park near Sheffield, for the accommodation of the pauper lunatics of the West Riding, has been formally opened. The building is situated on the western slope of the Don Valley, half-way between Wadsley and Oughtibridge, and is one of the largest structures near Sheffield. It rises in three great blocks—a central edifice, with wings at right angles, which communicate with each other by corridors. The estate comprises about 163 acres, purchased at a cost of 23,000l., so that there will be ample ground for recreative purposes, as well as to afford the inmates healthful employment. The building altogether will cost fully 100,000l. Mr. B. Hartley, of Pontefract, the West Riding Surveyor, was the architect, and Messrs. Robert Neill & Sons, Manchester, were the contractors. The engineering work has been executed by Messrs. G. Haden & Sons, Trowbridge. Mr. Ryall has acted as general manager; and Mr. D. Kershaw as clerk of the works.

At a meeting of magistrates and others at luncheon after the opening, Mr. Stanhope, M.P., in proposing the health of the architect, referred to several improvements made in the internal arrangements of the building, the principal of which was that they had none of the old-fashioned gloomy passages, with rooms which

was impossible to light, opening from them on each side. Every room in the asylum had a window on one side and a fire-place on the other, and he believed that in the end was the most simple and cheap style of building that could be adopted, although the effect on the outside might be rather grand. Altogether, it was as cheap a building as could well be put together. They had been fortunate in getting hold of a satisfactory contractor in the person of Mr. Neill, of Manchester, a gentleman who occupied a high position in that city, and who had carried through the work most conscientiously. He deserved all praise. Mr. Neill, by the appliance of machinery, had been able to utilise the clay which was got in excavating the foundations of the asylum. The whole of the bricks of which the building was composed had been made out of the excavations, and there were a great many left over, sufficient to go on with another ward, which he feared would very shortly have to be put in hand. He proposed the health of Mr. Hartley, the architect, whose labours had been extremely great; and of Mr. Kershaw, the clerk of works, who had also efficiently performed his duty.

SOMERSET ARCHÆOLOGICAL SOCIETY.

The twenty-fourth annual meeting of this society has been held in the great hall of Taunton Castle. There was a good attendance of members and others interested in archaeology. The large room contained a considerable number of ancient and valuable manuscripts, historical relics, and other interesting objects, lent for the occasion by members and friends of the society. Mr. E. A. Freeman, D.O.L., took the chair.

The Provost of Eton proposed, and Mr. R. K. M. King, seconded, the election of Mr. W. A. Sanford, F.G.S., as president, and the motion was carried.

Mr. Sanford then took the chair. Mr. W. A. Jones, M.A., read the report of the council, which stated that the indexes to the three principal record-books at Wells Cathedral had been copied, together with the contemporaneous marginal notes, and published in the proceedings of the society. The council had appointed a committee to co-operate with the promoters of a legislative measure for the protection and preservation of historical monuments. The report having been adopted, the chairman delivered an interesting address, in the course of which he remarked that three great works of repair of their ancient monuments were approaching completion. First, the west front of their cathedral was sufficiently advanced to enable them to judge somewhat of the effect. He said, that in some respects this was at present disappointing. In the next place, the fair form of the spire of St. Mary Redcliff pointed heavenward over the bustle and commercial activity of the great city of which its parish forms a vital portion. It was a noble finish, and a noble work of repair honestly and patiently carried on through many years. The stone ceiling of the nave of the great church of St. Peter, at Bath, was worthy of the golden age of English building. After remarking that St. James's, Taunton, would now rise in simple and graceful imitation of St. Mary's, the chairman went into a long and interesting argument respecting geology and natural history, which was listened with great attention.

Mr. G. T. Clark followed with a paper on "Taunton Castle," in which he pointed out that the structure stands upon one of the many low mounds of gravel, often with a face of red marl, which rise out of the extensive fen lands of that singular district, and which, before agriculture drained the marshes, was more inaccessible than even the hill fortresses of the upper country. Upon the right bank of the river, whence the town derives its name—the celebrated leader and lawyer of the West Saxons was reported to have established himself in 702, being engaged in securing his frontier against the Western Britons, who still maintained a footing in the border-ground east of the Tamar, and among the Brendon and Mantock Hills, holding probably the camps which still remained but little altered by the lapse of 1,000 or 1,100 years. That seemed to have been the origin of the town of Taunton, as the sequel of his paper Mr. Clark gave some interesting particulars relative to the castle of Taunton.

Subsequently the castle, the Church of St. Mary Magdalene, the priory, and the Grammar-school were visited, and in the evening there was a luncheon at the London Hotel.

The evening meeting, on Tuesday, in the Castle Hall, was presided over by Mr. Sanford, and the body of the chief hall was quite thronged. Mr. W. Boyd Dawkins, M.A., F.R.S., gave an address, illustrated by charts, on the "Ancient Geography of the West of England." Mr. Freeman (the ex-president of the society) read a treatise upon the history and work of Ine, king of the West Saxons. Ine raised Taunton as a bulwark against the Britons, and gave the western part of his dominions the first bishop of their own, and placed the holy Eald-helm in the church of Sherborne, which he founded. He was the second founder of British Clonbury, and the first founder of English Wells.

On Wednesday the first excursion was taken. Hestercombe and the quarries of syenitic granite were visited. Mr. W. A. Jones, who is one of the hon. secs. of the Society, pointed out the junction of the syenitic granite with the Devonian strata. Mr. R. K. M. King read an account of the rock, written in in Corner's Geological Survey. Mr. J. H. Parker, C.B., pointed out fragments of the old hall of Hestercombe, constructed in the time of Henry VII. The minstrel's gallery and pictures attracted much attention. A paper upon the history of the family having been read by the Rev. T. Hugo, a move was next made for Kingston Church, which Mr. Parker described. Luncheon, in the adjacent schoolroom, provided by Mr. W. E. Sartes, having been partaken of, Norton Fitzwarren Church, and the camp lying above, were then inspected.

On Wednesday evening, Mr. W. A. Jones read a paper on "The Customs of the Manor of Taunton Deane;" the Rev. W. Tuckwell, head master of the College School, one "On the Flora of the Quantocks;" the Rev. J. Coleman, one "On the Old Register of the Parish of Stoke St. Gregory;" and the Rev. T. Hugo, one "On St. Margaret's Hospital, Taunton," huilt about the year 1270.

In reply to Mr. Paton's request that the next meeting might be at Sherborne, Mr. Jones promised the council's consideration of the point, but gave reasons why Wells should be selected.

STABLES IN WESTMINSTER.

EXTENSIVE stabling has been erected, with a frontage towards Buckingham-row, Westminster, for Lord Auckland, consisting of stalls, loose boxes, droms and single coach-boxes, and living-rooms for servants above. The elevation towards Buckingham-row, in the Domestic Gothic style of architecture, is built of white granite brick, with moulded strings, and relieving arches of yellow marble, having an entrance-archway, which is protected from the road by light wrought-iron gates. A small gablet rises above the entrance-arch, containing a floriated circle, in which are carved in bas-relief the crest and monogram of the owner. The gablet is finished with a top stone, surmounted by a light finial of ironwork. In the interior, pine, stained and varnished, is used for all skirtings, and the roofs are covered with Vieille Montagne zinc. The site of the present building formed the subject of a law-suit between Lord Auckland and the Westminster District Board of Works. That body, thinking it its duty to deprive him of at least 20 ft. of his land, and refusing him compensation, lost the day, both in the first case, before Vice-Chancellor Malins, and on the appeal, before the Lords Justices.

The contract was taken by Mr. Henry Wagner, builder, for 1,120l., and he has carried out the works. Mr. William Scott Champion is the architect.

THE INSCRIPTION ON THE TOMB OF THE BLACK PRINCE, CANTERBURY.

THIS inscription is ascribed by Dean Stanley and others to the Black Prince himself. Sir F. Madden writes to the Times:—

"What authority the Dean of Westminster may have for the above assertion I am ignorant, but I beg to point out (what has hitherto escaped notice) that the epitaph in question is borrowed, with a few variations, from the anonymous French translation of the *Chronicles Distinctes* of Petrus Alphonsus, composed between the years 1106 and 1110. In the original Latin work it may be found at page 186, part I. of the edition printed in 1824 for the Societè des Bibliophiles Français. The French version is of the thirteenth century, and entitled *Castolement d'un Pèrè à son Fils*. It was first printed by Barbaran in 1790, and more completely by Meun in 1806, in whose edition the epitaph may be read, page 196, under the heading of '*D'un Philoſophe qui passoit parmi un Cimetière*.' The Black Prince, however, is not the only distinguished personage who has availed himself of this inscription, for more than half a century previously it was placed in an

abbreviated form on the monument of the famous John de Warenne, seventh Earl of Surrey, who died in 1304, and was buried before the high altar in the Priory of Lewes. It is printed by Dagdale (not very correctly) in his *Heritage*, vol. I., p. 80, from the Lewes Cinerary, which is preserved among the Cottonian MSS. in the British Museum, Vespas. F. xxv."

SUNDERLAND SCHOOLS, AND COMPETITION.

THE Clerk said they had, in answer to their advertisement, received thirty-four architects' plans, competing for the prizes of 20l., 10l., and 5l. offered by the Board for the best designs for schools to be erected on a site in James Williams-street. The plans have been catalogued, and were now on view at the Grange School, where they would remain during the week.

The Chairman said he had examined all the plans very carefully, and he thought they had obtained a very fine collection. In awarding the premiums, they must, of course, consider what was best for their own locality and requirements, and, as far as he had seen, he thought there were eight or ten plans which would be found very suitable. He suggested that the Board should be divided into two committees of six each, one committee to decide on the best block plan, and the other on the best elevation. The chairman's suggestion was agreed to.

Sir,—Under the impression that the above extract may be of some service to you, as showing the manner matters are being conducted here by the local School Board, I would draw your attention to the parts in italic in the report of the meeting, with a view to the noticing of the absurdity of selecting separate elevations and block plans.

The plans have been thrown open to the public for inspection, and after careful review any person competent at plans may arrive at the conclusion as to the class of competitors who have contributed their efforts. In my humble opinion, it will be difficult to obtain three designs which meet the requirements of an elementary school, or that of the Commissioners of Education, so that the Board are likely to fall lamentably short of what they expected for their money. I have examined the plans, and find that the more showy or well got up are the elevations, the less are the plans belonging to them adapted to schools of the class required.

NON-COMPETITOR.

THE METROPOLITAN BUILDING TRADES MOVEMENT.

ON Saturday in last week the delegations from the London carpenters and joiners, who have had the carrying out of the recent movement and strike for the "nine hours and the ninepence," was virtually dissolved, and the central committee all retired from office, the treasurer, secretary, and the two auditors alone remaining for the purpose of bringing out the audited balance-sheet of the movement. One of the last acts of the central committee, however, was, unhappily, to declare that they looked upon the recent compromise between the masters' committee and their deputation, not as a final settlement of the claims put forth in their memorial, but more the nature of an armistice, leaving the trade free to renew its efforts in favour of the full terms of the memorial on the first favourable opportunity. The secretary was instructed to call together a new delegation from all societies, shops, and jobs, to assemble on Thursday evening in this week, having for its object the adoption of measures to enforce compliance with the terms of the new agreement in those firms—about forty in number—who continue working on the old system of 5½ hours, at 8d. per hour; the extension of the union organisation throughout London; and the laying down a plan of action for renewing the movement to obtain the 6l hours at 9d. per hour in the spring of next year, should the state of business justify such action being taken.

A serious complication has arisen between the Master Builders' Association and the Masons' Society. It appears that in the agreement made between the committee of masters' and the masons' deputation, they were to leave off work at 12 o'clock on Saturdays all the year round, but the agreement entered into with the other trades specifies 1 o'clock as the leaving-off hour on Saturday during the winter months. The masons' deputation made no distinct arrangement with the masters' committee as to payment for overtime, it having been a recognised custom in the trade that all overtime worked by masons beyond the regular working hours each day was paid for at the rate of time and a half for every hour up to 10 p.m., and double time up to 6 a.m. The agreements made with the carpenters and the other trades include arrangements for overtime, and its payment at the rate

of 1d. extra for the first hour after 5 p.m., at the rate of 2d. per hour extra for the next two hours, and time and a half afterwards. Thus the payment for overtime to be made to the other trades is considerably less than the amount now secured by the masons. The masters have called upon the masons to accept these terms as regards the hour for leaving off on Saturday and overtime payment, and to modify their agreement accordingly. This the masons' committee have refused to do, and have further informed the masters that any attempt on their part to tamper with the terms of the agreement, or to infringe upon the recognised payment for overtime received by the masons, would be resisted by the whole power of their society. A general meeting of the masons, held on Friday in last week, endorsed the action and letter of their committee.

As to the cost to the masons of the lock-out and strike, it appears from their balance-sheet that the three weeks' lock-out and strike cost the masons close upon 830*l.* A sum of 521*l.* 2s., being 2s. a day from 1 to 17 days, was disbursed for "dispute pay" amongst 428 members of the Operative Stonemasons' Society of England and Wales, most, if not all, of whom were also included in the 430 members who shared in three dividends, amounting in the aggregate to 151*l.* 5s. 6d. obtained from levies and subscriptions; and 191 non-members received 52*l.* 1s. 6d. from the same source. After the settlement with the employers on July 5th, 12 members and 9 non-members were "withdrawn" from work to enforce the new terms, the former receiving 6*l.* and the latter 8*l.* 13s. 4d. from levies, or 2s. 8d. a day, the time ranging from 1 to 18 days. The charge for collection and distribution was 89*l.* 19s. 7½d.—viz., executive, 43*l.* 4s.; deputations, 16*l.* 5s. 11d.; printing and stationery, 16*l.* 15s. 9d.; postage and telegrams, 3*l.* 1s. 6d.; hire of rooms, 2*l.* 7s.; newspapers, 13s. 11d.; and auditors, 7*l.* 11s. 6d. The receipts comprised 537*l.* 5s. 3d. from the C. C. (central committee) of the society; 112*l.* 19s. from levies of 3s. per week upon men working in the London district; 3*l.* 4s. from a sixpenny levy; and 162*l.* 17s. 7½d. from general subscriptions; making a total of 847*l.* 5s. 10½d. The number of men locked out and on strike embraced in the account was a little over 550. There are from 18,000 to 20,000 members enrolled in the society throughout England and Wales, and the masons are probably the most highly organised of all the branches of the building trade in London.

The turnout of the masons, bricklayers, plasterers, carpenters, joiners, painters, and labourers in the employ of Messrs. Corbett & McLymont, has suspended some of the building operations in the neighbourhood of West Brompton and Earl's-court, where for some time past residences of a superior class have been springing up in all directions. It was upon a part of this work the four hundred and seventy men and boys now on strike were engaged up to Saturday last. The firm had conceded the new terms as to hours and wages all round; but it withdrew the concession at the expiration of a week. There are seventy-eight carpenters and joiners amongst the turn-outs. The Operative Painters and House Decorators' Society have already taken action on behalf of the sixty-five of their trade who have "come out," and similar appeals are being made to their respective trade societies by the bricklayers, plasterers, and labourers who make up the rest of the workmen on strike at West Brompton. The members of the late (?) Central Committee of the Carpenters met on Tuesday at the Brown Bear to discuss this "Brompton" strike. Mr. Shipton advised that a deputation composed of representatives of each trade should seek an interview with the firm, to endeavour to persuade it to stand by the arrangement come to a week ago. With the exception of the plumbers, who were receiving 9½d. an hour, every one had turned out, and, upon second thoughts, seeing the unanimity that prevailed, the firm might be disposed to abide by the terms of the Masters' Association. While on the spot he was informed that a numerous meeting of master builders was being held at the Redcliffe Estate Office, where the firm transacted most of its official business, being the builders upon that extensive estate.

The members of the Builders' Labourers' Union have met in Pentonville-road, when Mr. Kenny, their secretary, argued that even 6d. an hour, which the labourers demanded, was not sufficient remuneration for them. He said he wished to see the employers have a fair return

for their capital, but he did not want them to retire from business after ten years, and take country mansions; while the poor labourer, after twenty-five years' hard work, had nothing left for him but the workhouse. Mr. Halloran stated that 250 men were being added to the union weekly. A resolution was adopted establishing an additional lodge, the members of which are to meet at Pentonville every Monday. The union now consists of fifteen lodges.

A correspondent writes to us that the statement that the "dividend" in the eleventh week of the strike was 13s. to lock-out men is an error, and that it should have been 10s. for that week; nor had it been more than 12s. on any week before the "settlement," that sum being paid only once (except to men from Brass's and Jackson & Shaw's).

SANITARY STATE OF BECKENHAM, KENT.

SIR,—Having lately paid a visit to Beckenham, I was entirely disgusted with the state of some of the old conveniences there. It appears that in the vicinity of Brackley-road there are existing at the present time some which have not been cleaned out for years, although Beckenham is, or is supposed to be, properly drained. Yet such a state of affairs is allowed. Why is this? Is there no sanitary inspector? or, if there is, why does he not perform his duty?

ONE WHO HAS EXPERIENCED THE NUISANCE.

SEWER GASES.

SIR,—It having become necessary for drainage purposes to empty a cesspool which probably had not been emptied for several years, this work was done at night, and the next morning when one of the men was engaged throwing lime into the pit to disinfect it, an offensive smell arose from it, and the man suddenly became pale, staggered, found great difficulty in breathing, and was some time before he recovered. The cesspool in question was about 7 ft. deep, and when a lighted candle was put down into it kept alight for a depth of 4 ft. or 5 ft., but when it was lowered to within a foot or two from the bottom it was immediately extinguished.

Will any of your readers kindly inform me what gases, if any, could cause these symptoms in the man and extinguish the candle? L. L.

EVERSHAM SEWERAGE.

SIR,—I wish to correct a statement reported in your issue of the 14th inst., namely, that my proposal involved an outlay of 49,000*l.*, while another estimate was only 4,000*l.*

I beg to say my estimate for sewerage and waterworks complete was 11,800*l.*, and that the one of 4,000*l.* was for sewerage works, and did not include waterworks. The population of Eversham being about 5,000, I think from your knowledge of such matters that you will agree in thinking that my estimate does not involve an excessive outlay for these works (sewerage and waterworks), and that the 4,000*l.* would be inadequate for the required purpose. JOSIAH FORSTER FAIRBANK, C.E.

THE ANT NUISANCE.

It would be a boon if any of your readers could prescribe an effective agent for the destruction of that troublesome little insect, the house ant; and tell us whether any, and if so what, special conditions favour its existence and reproduction. I have exhausted every nostrum known to me to be a destroyer of ants, and tried various original preparations, but all to no purpose.

At the present time I have a large, well-built house, the basement of which is literally alive with them, though every crevice has been carefully stopped, and the ceilings, walls, and floors, thoroughly saturated with various kinds of supposed specifics. Possibly a better knowledge of the habits and natural history of these ants might aid the discovery of a real antidote to their existence in our houses, though, doubtless, the only radical exterminator is the discovery and destruction of their nest or nests.

After many patient trials, I must frankly confess that to attempt to free a house from them by simply destroying those which infest the floor and walls, &c., seems to me much like trying to exhaust a well with an inexhaustible spring of water.

It is certainly important to ascertain whether these insects make their way into the building from the earth upwards, or whether they are introduced with the building materials, or how they do get into solid structures. B.

SCHOOL-BUILDING NEWS.

Bristol.—The foundation-stone of new schools for St. Silas parish has been laid. The schools are intended to accommodate 700 children,—200 boys, 200 girls, and 300 infants; and the site is a piece of ground adjoining the church. The school buildings will form three sides of a square,—the girls' room being on the left, the boys' on the right, and the class-rooms and the infant-school at the back. The quadrangle, which will form a playground for the infants, will be separated from the roadway by the boundary-wall of the premises. The boys' and girls' playgrounds will be behind their schools. The rooms for the girls and boys will be 68 ft. by 20 ft., and there will be a class-room of 16 ft.

by 20 ft. for each department. The infant school-room will be 75 ft. by 33 ft. The necessary accommodation in the way of cloak and bathtubs, lavatories, closets, &c., required by the Education Department, has been provided for. The building will be in the Early English style of architecture, and the material Pennant stone with freestone dressings. The roofs will be open-timbered, and covered with Bridgewater tiles, in patterns. Over the entrance to the infant-school will be a bell-tower. The contract has been signed for 1,500*l.*, but the school-fittings, and some extras for foundations will bring up the cost to 2,200*l.*, of which 500*l.* have yet to be raised. It is hoped that the buildings will be completed early in the spring. The architect is Mr. Joseph Neale, and the general contractor, Mr. R. J. Crocker, of Bedminster. The mason's work will be carried out by Mr. J. P. Stephens, who is engaged rebuilding St. Silas's Church.

Liverpool.—The plans of Messrs. Reade & Goodison, of Canning-chambers, South John-street, architects, for the public elementary schools in connexion with the School Board, in Church-street, have been adopted by the Sites and Building Committee of the School Board. The architects who have been successful for the Queen's-road site are Mr. Thomas Cook of South Castle-street, and Mr. John E. Reeve of Lord-street.

Catworth, Hunts.—Plans for these schools and master's house have been passed by the Privy Council, and the works are to be commenced at once. Mr. William Streather, of Ramds, is the builder; and Mr. John Ladds, of London, the architect.

Books Received.

Ancient Examples of Domestic Architecture in the Isle of Thanet. By J. P. SEDDON. 1872. John B. Day.

EVERY one who has walked in the Isle of Thanet with his eyes in his mind has noticed the specimens remaining of a peculiar mode of cottage construction, in brick and flint work, dating from the seventeenth century, the principal feature of which is a gable, mostly made up of portions of a circle, and usually coped with brick. Mr. Seddon has usefully brought together ten examples from Broadstairs and Readitt Street. They are somewhat roughly set forth, but answer the purpose.

VARIORUM.

"THE Dictionary of Practical Receipts. By G. W. Francis, F.L.S. New and improved edition by D. Francis. London: Allen, Ave Marlane." This volume contains upwards of fifty thousand receipts in trade and manufacturing domestic economy, artistic, ornamental, or scientific processes, pharmaceutical and chemical experiments, &c. It is not only alphabetically arranged, being a dictionary, but contains a copious index for still more ready reference and connexion of subjects. It is by no means likely that it is faultless: no such book ever can be so; but we find it correct so far as we have tested it, although in some cases wanting in freshness of information. It might have had something about magenta, for example, in receipts for dyeing processes; but no such heading as magenta exists in it. And, by the way, we may here suggest, for new edition, a simple receipt, which no freshener of information could have hitherto supplied, as has only been used in one case, so far as we know.

White muslin curtains can readily be tinted with a beautiful rose colour by magenta dissolved in water. A chilling's worth of magenta powder dissolved in barely as much water as to stain the curtains in completely, and then wring out tinted two pairs of large window-curtains after being starched, and another pair after they were done. The tint fades soon where much exposed to the sun, but it can readily be renewed where faded, by a soft brush, or by dipping anew. Our lady friends will thank us for this novelty in "domestic economy." There are various applications of it,—for example, to toilet covers, &c.—"The Royal Guide to the London Charities for 1872-73. By Herbert Fry, London: Hardwick." This is the tenth annual edition, an astonishing evidence of charitable feeling on the part of the Londoners, and painstaking of the part of Mr. Fry. It contains upwards of 200 pages of mere arranged titles of London charities, besides nearly 100 more of charitable advertisements!

Miscellaneous.

Canterbury and the New Public Health Act.—A meeting of the Canterbury Town Council was called for the purpose of taking into consideration the provisions of the Public Health Act. The town clerk said he was in doubt as to whether it was not necessary to hold a meeting of the Sanitary Authority within twenty-eight days of the Act, and that was the reason of his calling the meeting. He did not anticipate that there would be anything to do, as it would be better to defer the appointment of a medical officer till the regulations of the Local Government Board came before them. He read the 6th clause of the Act, which provides that the Local Board shall transfer all their powers to the body to be called the Urban Sanitary Authority, which in the case of boroughs (said the clerk) would be the Town Council. The clause also provided for the appointment of a medical officer of health and an inspector of nuisances, and the Local Government inspectors would have the power of being present at the meetings of the Board and exercising the same power as the Poor-law inspectors at boards of guardians. The meeting was ultimately adjourned till the 9th of October next.

Leicestershire and Northamptonshire Archaeological Societies.—The annual meetings of the members of these societies commenced on Tuesday last week at Lutterworth, with divine service in the parish church. Subsequently, the Rev. G. A. Poole (Welford) explained the principal features of this edifice. The company then returned to the museum, which had been fitted up by the local committee in the large room of the town-hall. Some illuminated manuscripts were shown of the thirteenth and fifteenth centuries. The Rev. A. Pownall read a paper on Medieval glass vials found at Lutterworth and South Kilworth. The excursion took place on Wednesday, when about fifty ladies and gentlemen started at nine o'clock from Lutterworth. The following places were visited:—Newham Paddock, the portraits by Vandyke and some interesting relics being shown; Monks Kirby Church, Brinklow (church and tumulus), Combe Abbey, site of a religious house of the Cistercian order, cloisters, rebuilt by Lord Harrington, temp. James I.; many pictures of the Stuart family and period; Wiltbrooke Church, and Claybrooke Church. This brought to a conclusion a very successful meeting.

The Statistical Congress in Russia.—The foreign members of this Congress have been hospitably entertained in Moscow as well as in St. Petersburg. The municipality provided them with accommodation in the best hotels, and with horses and carriages. They visited the Exhibition, and the monuments of the city, and were entertained by Prince Dolgorouki, Governor-General of Moscow, at a concert, ball, and supper. On the 4th instant they visited Warsaw, where a banquet was prepared for them by Field-Marshal Count de Bcrq, Lieutenant of the Emperor in Poland; and on the next day a review was held in their honour.

A Large Chimney.—The large chimney-shaft which has been in course of erection for some months at the alkali works of the Connah's Quay Chemical Company, was finished last week. As it is the largest square chimney in England, its principal dimensions will doubtless be interesting to our readers. The foundation, which is 28 ft. square, and 13 ft. 6 in. deep, is composed of 620 tons of stone and rubble. The chimney is 17 ft. 6 in. square at the base (inside measurement), and 7 ft. square at the top (inside measurement), and is 245 ft. high from the surface. The cap for the top, weighing 25 tons, is composed of fireclay and stone. The number of bricks used in building the chimney is 1,078,000, and the total cost a little over 2,000. The chimney will be provided with two lightning-conductors.—*Chester Chronicle.*

The Dublin Exhibition.—The executive of the Dublin Exhibition have been fortunate enough to secure for exhibition Lord Londesborough's valuable collection of arms and armour. It was formed many years since by the late Lord Londesborough, and consists principally of European arms and armour, and a choice selection of Oriental, derived from well-known sources; and it may be considered (now the Meyrick Armoury is dispersed) one of the finest private collections in Europe.

Gibbs's Hay-drying Machine.—A letter from Mr. Amersford, of Lake Haarlem, to Mr. W. A. Gibbs, Gilwell Park, Sewardstone, says,—"Your hay-drying machine proved the great attraction of the day. It had been announced by the Agricultural Society that grass could be made into hay by this machine in ten minutes. We had spared for this purpose a beautiful crop of Timothy grass and clover, in the immediate neighbourhood of the hay-dryer. It was cut by a workman with a scythe before the eyes of the assembled crowd. On the day before we had been able to dry it satisfactorily in exactly six minutes; the people now of course hindered the men a little in their work, but it was done in ten minutes, and I saw with satisfaction a great many farmers taking samples of the beautiful green but perfectly dry hay, to show it at home to their friends. After this feat was accomplished, we showed to the public the real work for which the hay-dryer is intended, taking hay that was half dry and drying it in three minutes ready for the stack, as will be necessary on wet days, when is the real use of the hay-dryer, as it was used frequently on my farm in the autumn of 1871."

Australian Meat.—We have reason to think that a dislike to Australian meat has arisen from the fact that there are purveyors who force upon the market meats which really deserve all the ill that is said of them. These meats, however, are of very different kinds from those got from the more respectable purveyors. A writer in the *Food Journal* says of Australian meats:—

"Against the ignorant, slipshod expressions which we hear now and then among us, such as 'I like to see the joint,' 'I like to know what I eat,' &c., we protest energetically; the question is a serious one, one which affects the well-being of millions, and deserves the serious attention of sensible beings. We like hothouse grapes, but we do not like to pay five shillings a pound for them; we like fresh green peas, but we like 'tinned peas' when we cannot get them green. We should like to see a leg of mutton or a side of beef of every family taken all the year round, but, as that is scarcely to be hoped for at present, we should like to see a good dish of Australian meat there instead."

One of the great obstacles to the general adoption of Australian meat is that unless eaten cold, when it is excellent, it requires some little knowledge of cookery to manage it properly. It cannot be roasted, or baked, or boiled like a fresh joint. Those who wish to get variety, to make the most of Australian meat, must take the trouble to learn how to cook it. To use good Australian meat is one of the best ways to obtain good English meat at moderate prices.

A Boston Idea.—A discovery is said to have been made and applied in Boston which, it is claimed, will reduce the cost of steam-power more than 60 per cent. It consists of a novel process by which the great amount of heat which escapes into the air in the waste or exhaust steam from engines is utilised by conducting it through the tubes of a boiler filled with the bisulphide of carbon, a fluid which boils at 110° Fahr., and at the temperature of exhaust steam gives a pressure of 65 lb. to the inch in the boiler. The vapour formed in this boiler [how does the bisulphide act upon it and all the other apparatus?] is used to drive an engine, instead of steam; and, after being used, is condensed by cooling, pumped into the boiler again, and used continuously, without loss. It is claimed that experiments prove that by this process the same fuel now required to produce 100 horse-power with the best engines in use will produce 250 horse-power. We wish the Bostonians could show how to utilise the waste noise of whizzing engines and rampant steam whistles. What a waste of active force there is in these!

Sanitary Report on Southwark.—The annual report of the medical officer of health for Southwark (Dr. H. Bateson) has been presented to the Vestry, and printed by their authority. The death-rate for the parish for the past year has been 25 in 1,000 persons living; and the parish, "which has been, far away beyond the remembrance of the present generation, a by-word and reproach, remains no longer so; it may no more take its rank as the lowest amongst the low and wretched parishes of London, in which disease and death hold high and continued carnival." It is notable that the Peabody Buildings have had a higher death-rate than was expected, namely, 23½ in 1,000 persons living, or 1 in 43. In other metropolitan model buildings a more favourable state of health prevails, the death-rate averaging only 17 per 1,000. Peabody's Buildings, the reporter remarks, were too soon occupied, and months afterwards he found many of the ground floors still very damp.

St. Louis, U.S.—The chief citizens of St. Louis, now the third city in point of population in the United States of America, have addressed to the inhabitants of this country an invitation to come and see the wealth, the fertility, and the resources of Missouri. The time suggested is during the twelfth annual Exhibition of the State Agricultural and Mechanical Association, which will begin on the 3rd of October, and will continue open for nine days. The invitation is contained in a letter to the People of Great Britain, signed by fifty-eight representative men of St. Louis. The signatures include an ex-Governor, and an ex-Lieutenant-Governor of the State of Missouri, bankers, merchants, newspaper proprietors and editors, and others. They urge their desire to establish a direct and profitable exchange of products between Missouri and the Mother Country. The city of St. Louis stands at the junction of the Mississippi and Missouri rivers, and enjoys advantages of position which ought to render it the centre and key to the commerce of the West. The St. Louis merchants ask, in short, for capital to develop their facilities for trade.

You shall not Save your Money.—So say the Driffield School Board to the ratepayers. Plans for a school having been submitted and examined at the last ordinary meeting of that Board, the clerk was instructed to communicate with Mr. Paul, the architect to the Board, on some suggested alterations in the plan, and to prepare the specifications so that the advertisements for tenders might be got out at once. Mr. Paul having recommended that the advertisement should appear in the *Builder* and other London papers, a discussion arose whether it would not be desirable to confine the advertisement to the local papers; and it was the opinion of the Board that the work for building the schools should be kept in the town as far as it was consistent with economy. It was ultimately agreed that the advertisement should be inserted only in the York, Leeds, Hull, and Driffield papers.—For fear, of course, some London builder who does not read a country paper should offer to build the school for a less sum than any of the country builders would ask;—clever, certainly!

A Substitute for Coal.—Great results are expected from some experiments which are being made by the Duke of Sutherland on the waste lands of Sutherlandshire. He is utilising surface peat by making it into composite fuel. The first attempt was made with a combination of sawdust and peat, which, being mixed by steam machinery and then dried in cakes, was found to be excellent fuel, sixty of the cakes being equal to 1 cwt. of best Sunderland coal, while the cost is 25 per cent. less. The coal composites are even a greater success, thirty of these being set down as of the strength and value of sixty of the sawdust peats. If the cakes can be dried by artificial means,—and there is no reason to doubt this,—there will, we are told, soon be abundance of peat fuel in Scotland, and the successful working of the invention will greatly facilitate the reclamation of the waste lands.

A Startling Occurrence.—An incident of a singular nature has taken place at Retford. In the Market-place, on the site of the old town-hall, there was standing a large iron pillar, which supported four gas-lamps. It has been completely wrenched from its hold, and flung down with such force that the surrounding buildings were shaken to their foundation. An iron slate at the base was broken, all the lamps were smashed to pieces, but the pillar, singularly enough, was not damaged, although falling with such a thundering shock. The real cause is at present unknown. Could it be from electric action between the earth and the air? The most probable supposition, perhaps, is that there was an escape of gas from some subterranean piping, and that it was accidentally fired by some one passing by, and exploded.

Pencils for Japan.—The steam-pencil factory of Messrs. Wolff & Son, of Great Queen-street, was visited last week by several members of the suite attached to the Japanese embassy now in England. They were attended by Mr. Brunton, engineer to the Government of Japan. Their visit lasted about three hours, and at its conclusion they not only expressed themselves to have been highly gratified with what they had seen, but also requested to be furnished with specimens of pencil-making in all the various stages of manufacture from the raw material, for deposit in the Imperial Museum.

The Monument at Dunrobin to the late Duchess of Sutherland.—Her Majesty has laid the memorial stone of a monument to the memory of the late Duchess of Sutherland in the grounds of Dunrobin Castle. There was a large attendance of subscribers and the public. Her Majesty said:—

"It gives me the greatest pleasure to testify on this occasion my love and the highest Duchesse, my valued friend, with whose children I am now staying. I wish to express my warmest thanks for the hearty and loyal welcome I have met with at Sutherland."

The monument is in the form of an Eleanor cross, with a bronze bust of the late Duchesse, and will be built of freestone from a quarry on the estate. It stands on a green terrace on the right of the principal avenue, and will be seen from the railway and the public road which passes by the Lichies.

Worcester City and County Fine Arts Exhibition.—The first public exhibition of pictures and works of art in connexion with the Worcester City and County Fine Arts Association, was held during the Festival week, the gallery being formally opened on Saturday by Sir E. Lechmere, in the absence of Earl Dudley, who is the president. The mayor (Mr. H. Willis) presided on Saturday, and called upon Sir E. Lechmere to manage the proceedings. The committee stated that arrangements would be made to have the exhibition open to the public in the evenings, the collection being on view for a fortnight. Among the paintings exhibited are several by the old masters, lent for the occasion by residents of the neighbourhood.

Galvanisation of Iron and Wooden Beams.—A discovery interesting to iron-builders, relative to the conservation of the iron beams used in hydraulic works, has recently, it is said, been made in France. It consists in the application of a chemical process, operated at once, without any particular tools, and at trifling cost. Supposing two beams have to be joined together, holes have to be bored, and next filled with some zinc-filling mixed with any fatty material, then the peg or screw is introduced in the ordinary way. A galvanisation is thus slowly produced, absolutely the same as when iron is dipped into molten zinc. This process can even be applied to timber. Experiments have been made, and are declared to be perfectly conclusive.

The Danger of Whitehall Stairs.—An inquest at the Guildhall, Westminster, has just been held, touching another death at Whitehall Stairs from accidental drowning. A juror pointed out that several fatal accidents had occurred at the place named, and he thought Whitehall Stairs very dangerous. He was of opinion that a railing ought to be placed down the side of the steps, to prevent persons falling therefrom into the river. The Metropolitan Board of Works ought to see that this place is protected. Several other jurymen recommended that the coroner should write to the Board on the subject.

South London Working Men's College. This institution, 91, Blackfriars-road, has reopened for the winter session with new classes in drawing, mechanical construction, history, grammar, and French. A new elementary and an advanced French class have begun this week, under Mr. Oswald. A night-school, of an advanced character, for men only, meets three nights weekly; and the members of this are admitted to the history and grammar classes without further charge. The secretary is Mr. Rossiter.

New Light at Buffalo.—The entire town of Buffalo, U.S.A., is now lighted by hydrogen gas, it is said, extracted from hydrate of lime, carburetted, and burnt with the oxygen extracted from the atmosphere. The cost of the hydrogen is about 1d. per cubic metre; that of the oxygen varies with the price of coal, and is estimated at the value of 6 kilogrammes (13 lb.) of coal, say 2d. to 3d. The oxygen is nearly pure, containing only about 3 per cent. of azote.

Trial of Electric Light again in Paris.—A wooden tower is being raised on the Battes Montmartre, Paris, of about 3 metres in height, and designed to receive an electric apparatus of great power, intended to light by night the whole quarter of the 18th Arrondissement, of which Montmartre is the chief seat. One light for a whole district, it is to be feared, will leave many deep shadows for thieves to skulk in, however bright and elevated it may be.

Roman London.—Within the last few days, in digging the foundations for some buildings in Queen Victoria street, distinct traces of what was known as Wall-Brook were reached. The spot is now surrounded for a good distance by houses, but at one time was known as "The Old Barge Yard." A mass of broken masonry indicates the course of the ancient stream, and a small portion of Roman pavement of not very rich design reveals the capabilities of the old workman. The specimen to which we refer was discovered at about 18 ft. below the level of the present street, and is surrounded by the clay that once formed part of the Brook's bed.

Iron Store at Chatham.—Workmen have commenced excavating for the foundations of a large store that is ordered to be built at the Chatham Gun Wharf. It has been found necessary to have a building erected in which to store the new gun-carriages and slides as they arrive from the manufactory. The building will be very massive, and will be constructed principally of iron. Messrs. Ford & Sons, Government contractors, Rochester, will be the builders.

Compliment to Surveyor of St. Olave's, Southwark, Board of Works.—As a recognition to Mr. Newman for his services in relation to the recent improvements in Tooley-street, effected without any call on the ratepayers as to it, the Board have unanimously resolved to present him with 100l., out of the surplus improvement fund.

Co-operative Partnership.—Messrs. Bell, Goodman, & Co., Walker Ironworks, Newcastle-on-Tyne, who have been working on the co-partnership principle for twelve months, have made a profit of 21 per cent., of which 10 per cent. goes to the firm and 10 per cent. on the wages earned to the men; thus a man who has earned 50l. in the year gets 5l. dividend.

Highgate Workhouse.—At the last meeting of the Holborn Guardians it was reported by the architect to the Board that the walls of the south-west wing of the Highgate Workhouse were cracked, and that the foundations had sunk. The Building Committee were instructed to take steps to secure the building, and also to investigate the cause of the subsidence.

Sanitary Appliances.—The Sanitary and Economic Manure Company of Manchester exhibited their closet arrangements at the Manchester and Liverpool Agricultural Society's show at Bolton, and were awarded the Society's silver medal for the advantages of their system.

The London International Exhibition.—For the general convenience of the public and of the exhibitors it has been resolved to keep the Exhibition open till Saturday, the 19th October.

TENDERS

For farm-house and offices at Runwell, Essex, for Mr. Thomas Kemble. Mr. F. Whitmore, architect. Quantities by Messrs. Curtis & Son:—

Gozett	.....	6,982 10 0
Brown	.....	891 0 0
Lart	.....	899 12 0
Letch	.....	763 0 0
Walsh	.....	746 3 0
Kennell	.....	737 0 0

For Greenham Viaduct, Berks, for the Rev. O. E. Sloocho. Mr. J. H. Money, architect. Quantities supplied:—

Harrison	.....	£3,313 10 0
Elliot	.....	2,790 0 0
Williams	.....	2,720 0 0
Cooke & Groom	.....	2,692 0 0
Adey	.....	2,683 0 0

For erecting paper warehouse, in St. Bride-street, Mr. L. H. Isaacs, architect. Quantities supplied by Mr. L. C. Haldet:—

Elkington (accepted)	£2,500 0 0
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For two mission halls, Poplar and Canning Town:—

Cawdon & Co.	£1,897 10 0
Gough	1,960 0 0
Darby & Son	.....	1,463 0 0
Hoskin, Brothers	.....	1,295 0 0
Turner	.....	1,273 0 0
Webb	.....	1,150 0 0
Ware	.....	987 0 0
Robbins	.....	893 0 0
Omer	.....	895 0 0
Mason & Bristy	.....	825 0 0
Christ	.....	809 0 0

For building new public elementary schools, Queenborough, Isle of Sheppy. Mr. B. Atkins, architect. Quantities supplied by Mr. T. T. Green:—

Bligh	.....	£1,693 10 0
Miller	.....	1,428 0 0
Shrubsole	.....	1,348 0 0
Naylor (accepted)	.....	1,167 0 0
Gamma	.....	1,158 0 0

For additions to floor-cloth factory, Manor-road, Rotherhithe, for Messrs. Rolfs & Sons:—

Aitchison & Walker (accepted)	£615 0 0
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For additions to the Pwllheli National Schools, Messrs. Roberts & Morrow, architects:—

Roberts	.....	£210 0 0
Williams (accepted)	.....	204 7 3
Humphreys	.....	199 0 0

For the enlargement of a mansion at Totteridge, Middlesex, for Mr. Shuttleworth. Quantities supplied:—

Scrivenor & White	.....	£1,729 0 0
Woodhall	.....	1,490 0 0
Thomas	.....	1,288 0 0
Gilmour (accepted)	.....	1,260 0 0

For alterations and additions to house, and building stables, &c., at Star Grove, East Woodhay, near Newbury, Berks. Mr. F. C. Dyer, architect:—

Cooke & Groom (accepted)	£1,560 0 0
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For the erection of hop warehouse and offices, Denman-street, Borough, for Mr. G. Gibbon. Mr. J. W. Reed, architect:—

Niblett & Son (accepted)	£2,790 0 0
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For the erection of four houses, with shops, Crouchend, Horsaey, for Mr. H. W. Elder. Mr. J. W. Reed, architect:—

Niblett & Son (accepted)	£2,690 0 0
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For alterations and additions to the Bank, at Horsham, for the London and County Banking Company. Mr. F. Chancellor, architect. Quantities by Messrs. Curtis & Son:—

Dearden	.....	£1,988 0 0
Potter	.....	1,888 0 0
Corder	.....	1,828 0 0
Mann	.....	1,815 0 0
Shankland	.....	1,794 0 0
Sharp	.....	1,780 0 0
Hill & Son (accepted)	.....	1,780 0 0

For re-building the Masons' Arms Tavern, Union-road, Bow, for Mrs. Wingham. Messrs. Jewell & Co., architects. Quantities supplied by Mr. J. S. Lee:—

Merritt & Ashby	.....	£3,466 0 0
Patman & Potheringham	.....	3,450 0 0
Newman & Mann	.....	3,435 0 0
Dewell	.....	3,390 0 0
Mark	.....	3,348 0 0
Sewell	.....	3,333 0 0
Sayer	.....	3,295 0 0
Cressall	.....	3,236 0 0
King & Son	.....	3,205 0 0
Lindfield	.....	3,198 0 0
Stentford	.....	3,150 0 0
Cohen	.....	3,010 0 0
Peare	.....	2,875 0 0
Lovell & Co.	.....	2,793 0 0
George	.....	2,697 0 0
Smith	.....	1,870 0 0
Cooke & Groom	.....	1,470 0 0

For the extension and improvement of Plumtree-court, Shoe-lane, for the Corporation of the City of London. Mr. H. Jones, architect:—

Wignone	.....	£1,599 10 0
Ritson	.....	1,585 0 0
Brown & Robinson	1,543 0 0
Hart	1,497 0 0
Carter & Son	1,467 0 0
Mowlem, Burt, & Freeman	1,450 0 0

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The Builder.

VOL. XXX.—No. 1547.

On Motive, in Architecture, Sculpture, and Painting.

IN the pursuit of every art, the student encounters a certain number of technical terms, which are as indispensable to the description, as implements are to the execution, of the several processes. Exact comprehension of the meaning of those terms is necessary to a clear intelligence of the art itself. When those words are unnecessarily used, the language degenerates into slang. It might not be difficult to point out writers who have endeavoured to establish a reputation as connoisseurs and critics in art by a copious use of this slang.

Again, there are words which are by no means of a technical origin, but which, in the course of time, have received special meanings with reference to particular branches of art. Among these are such expressions as "breadth," in painting, and as "colour," in engraving. Not only is it essential, in order to understand the language in which works of art are described, to have a clear and distinct understanding of such special uses of words; but, further, it may be of great service to the student to trace the usage to its origin, and thus, it may be, to find how some important canon of art has been treasured up in an epigrammatic form.

The word *motive* is one of those which are thus occasionally used. It is an important example of the class of terms to which we refer. For, rightly understood, it conveys in itself a lesson to the artist; and it involves a very distinct condemnation of many works, in architecture, in painting, and in sculpture, which not only meet with much ignorant admiration, but which have even been pointed out by writers as objects worthy of imitation.

The musician has long been taught, by the subtle elegance of the Italian language, to speak of the motive of a musical composition. Without entering into a subject beyond our province to discuss, we may yet remark how often the ear is struck by the frequent recurrence, in some magnificent passage of music, of the magical sequence of notes that forms the central idea of the piece, the veritable motive of the composer. Again, it has often fallen to our lot to be perplexed by a wilderness of sounds, strung together, it may be, with great mechanical skill, but in which the divine informing idea is absent or undiscernible.

In every organised existence may be recognised the embodiment of an idea. We are not about to quote Plato, or to touch the province of metaphysics, but we wish to bring out clearly the meaning of the term *motive* as applied to any live being. The scientific anatomy of the vegetable physiologist, indeed, carries back the unit of vegetable life, not to the plant, but to the leaf. In each leaf, in each petal, in each

anther, he recognises a distinct individuality, bound to its fellows by laws of intimate association, but representing in itself a distinct centre of vital energy. In a bud we may with more propriety recognise the features of separate individual existence. A bud may be excised from one plant, and grafted or budded into another, so as to thrive and flourish, and to produce from the wild stem a branch of its own cultured beauty. But however far we may push the analysis, none can deny that there exists a distinct, and an always recognised, individuality, in the plant itself. In the oak or the willow, the elder or the plum, we are conscious of the presence of an idea which is common to all individuals of the same species, under whatever different modifications they live it out. We may regard such a plant from very distinct standpoints. We may consider it as a producer of human or of animal food; as a means of re-oxygenating the air; as a mechanism for fixing carbon in the form of wood; as an element in the hygrometric condition of the soil on which it grows; or as a feature of pictorial beauty. But any or all of these functions are performed by plants of the same species in a manner different from that which characterises plants of any other species. There is a physiognomy which can at once be recognised,—a specific form, a peculiar fragrance, a special beauty,—which are peculiar to the idea or motive of the individual species.

Again, in animal life, as we rise from those obscure tribes which share with the vegetable kingdom the character of social or compound existence, as in the corals and polyps, we find the central idea of specific form to be more and more distinctly wrought out the higher we ascend in the scale. Special gifts are bestowed on different genera, and, in a subordinate degree, on different species. These gifts are in harmony with the habit and the structure of the animal. They are distributed in a manner that gives token of compensating justice. Thus, the mole, in which the visual power is reduced to a low condition, which to us would seem to be total blindness, is endowed with a muscular energy greater in proportion to its size than almost any other beast, with formidable and apt instruments for digging, and with a form and integument in every way suited to its humble subterranean life. Urged by a mighty hunger, by an appetite more insatiable than it is easy to parallel, this paragon of industry no doubt revels in a fierce enjoyment as he excavates tunnel after tunnel in pursuit of insect food. If we anatomise the mole we can have no doubt of the motive of the structure.

We might easily pursue the theme, and, indeed, the subject of the wonderful instinct of all the huddling tribes is one that would not unnaturally illustrate our pages. We could show how it has not been among the forms which are zoologically the most highly developed, not among the tribes which possess the most perfect mechanical power (enabling them to rise in the air), the most resplendent beauty of colouring, or the most pure melody of voice, that the motive of a reasoning, teachable being has been wrought out. But we have said enough if we have shown the presence of a distinct and appreciable motive in every material form. Thus, true art, which is not a mechanical reflexion, but a quasi-creative imitation of nature, must be impossible in the absence of motive.

Indeed, in the absence of some sort of motive it may at once be admitted that art is altogether impossible. In this seems to lie the great distinction—the barrier which is of kind rather than of degree—between man and his poor relations, the other animal tribes. Skill of the most exquisite and perfect character is possessed by many, especially of the winged species. The groups of arboreal birds contain genera that weave textile nests of a beauty that fingers cannot rival. The hymenopterous tribe of insects, and a few of the neuropterous genera,

contain those creatures which are, *par excellence*, the BUILDERS of our planet. But industrial energy applied under the guidance of a wisdom that, for want of a better term, we call instinctive, is the highest phase of non-human skill. The emotions may be, and to a far greater extent than we generally admit actually are, common to man and to other animal tribes. Industry in the provision, and even in the storing of food, and in the construction of abode, is displayed by the squirrel and the beaver, the ant and the bee, the weaver-bird and the social grosbeak; but the clothing of an idea with form, however rude, the slightest scratch inspired by the motive of the artist, has never yet been observed, in our world, except among mankind.

This being the case, it follows that the very central virtue of art is the dignity, purity, or beauty of its motive. It is, to external form, what the soul is to man himself. Thus we can understand at once the great charm which the works of, let us say, for instance, the early English ecclesiastical builders, exercise on the imagination. In pure technical ability of execution, the recent works of the Italian sculptors show that the human hand has attained a power and delicacy of execution such as have certainly never been witnessed since the overthrow of Roman civilisation by the invad of the northern tribes. We cannot doubt that, as regards manipulation, there are masons, stonemasons, and sculptors now to be found who can execute work of a boldness, as well as of a delicacy, which could not have been attained, or only with the utmost difficulty attained, in the reign of Henry III. or of Edward I. But can we for that reason excel the beauty of the architectural work of these reigns, as shown in Westminster, or Lincoln? Can we approach it? The fact is, that the earlier worker had a noble motive. With him work was a religious act. He meditated upon it long before it took outward form. He performed its humblest offices in a grave, earnest spirit. He was not chiefly occupied with the effort to secure at once the greatest number of pence per week, and the greatest number of unemployed hours. Working with his heart in his task, the motive ennobled the toil. It left its impress on the material wrought; and thus, with a rudeness, in some instances, of detail, is blended an elevation of character such as later times have failed to rival.

The motive or main idea of a building or work of art may be more or less clearly, elaborately, and successfully wrought out. Its development will depend not only on the genius of the artist, but on the civilisation of the period; the climate; the material afforded by the locality; and many other surrounding influences. At different eras, and among different people, the mode in which identical motives are embodied in artistic form will differ as widely as will the form of a poem, if translated into different languages. At times the language is so old as to have become absolutely lost,—or at least for a time as unintelligible as were hieroglyphics in the eighteenth century. At times the ruling motive is unmistakable, even when but the ruins of a structure remain. Thus if we find the plan of a hall, or one-chambered building, of certain dimensions, and in certain countries, the idea of a religious purpose is one of those which suggest themselves to the mind. If we find that the astronomical bearing of the building is perpendicular to the meridian, the idea is confirmed. If we trace the place of a *cello*, sanctuary, or chancel, to the east of, and somewhat smaller than, the main building, we become yet more confident. If further we detect the bases of columns, and the foundations of the walls of apsidal or lateral chapels, we become convinced not only of the ecclesiastical nature of the edifice, but even of the character of the rite for the celebration of which the structure was intended. On the other hand, that rite may be so ancient

and that structure so unlike any modern example, that while we may have grounds for ascribing a religious character to the building, we can go no further in our explanation. Our great megalithic remains may be cited as an example. On last Midsummer-day,—and we are told that it is an annual custom,—some thirty-five watchers had assembled before sunrise in the inner circle of Stonehenge, to see the sun rise over the large stone known as the Pointer, and strike its first rays through the entrance on to the so-called altar-stone of the ruin. To call this a proof of the astrological character of the builders of this magnificent relic of the past would be a hasty and ill-founded generalisation. Direction of a main line of the building to the point of sunrise on a given day has been held to be a mark of Christian architecture, the day indicated being that of the Saint under whose invocation, as it is called, the church was placed. But we find a like orientation in the case of the Great Pyramid. We find it constant in Persian, Syrian, and Grecian temples. Thus we may find the indication of a religious motive in the plan of a building, although of the nature of the cult we have not the remotest knowledge.

There is an expression which has attained a certain fashionable prevalence in art, to which we may refer as an indication of the very general absence of any true appreciation of motive, as an essential element, or rather rudiment, of excellence. People will talk of a bit, and when they put the monosyllable in turned commas they regard the expression with complacency, as an evidence of artistic taste and of the command of technical language. In plain truth, nothing can be more opposed to a correct appreciation of the subject. Every artist, who has to trust to his note-book rather than to his memory, is likely to have his own method of taking artistic memoranda. He will jot down the garbled form of a tree, the picturesque outline of a building, the profile of a beautiful face, the hidden gesture of a surprised figure; and in each of these records of incident he will have a hint for a detail of some future picture. But to take the hint for the idea itself, to present the public with the elaborate study of the trunk of a beech-tree, or with the arrangement of the pots and pans on a kitchen shelf, or the tiles and quarries of the floor, is not to study, but to abuse, art. The "bit" is only of value to the artist; and to him not for itself, but as an element for future utilisation. Purchasers who encourage the production of bits, *pro tanto* discourage the genuine progress of art.

The more distinctly we grasp the motive of any work, whether that of the sculptor, the painter, the architect, or that of the Great Architect of creation—the more accurately we are able to detect the presence of a genuine inspiring idea, even under imperfections of execution—the more shall we enter into the very *arsena* of art. We then contemplate those regions where spiritual and intelligent life strives to embody its conceptions. A powerful impulse may be given to that which is the highest phase of history, the philosophy of human life, by the intelligent study of motive. In regarding the works of art, and especially of the art of the architect, in the present or in past times, we shall be able to unfold, one by one, the successive developments of the primary motive, or the addition of new, and not always harmonious, elements to the original idea. We shall rise from plan to design; from expression, in artistic or industrial form, to primary intelligent motive.

Thus we trace in the architectural sequence of the form of the churches of our own and of other Christian countries the evidence of a great, though a gradual, change in the habits, the wealth, and the form of faith of the builders. Emerging from the gloomy catacombs in which the earliest symbols, visible in *graffiti* on the walls, are far older than the adoption of the cross as an emblem (although they recall the initials of Jesus Christ, or the declaration of belief in his nature which is implied by the words of which the mystic $\text{I} \times \text{O} \text{Y} \text{S}$ contains the initials), we find Roman Christianity, under the reign of Constantine, coming forth to take possession of the Basilica, or court of justice, for the celebration of its unnamed rites. As the records written by Pope Damascus, and by other Medieval historians of the Papacy, enable us to trace, step by step, the prolongation and formalisation of the services, so does the history of the external church,—the shell, as it were, of the ritual,—show an increasing complexity of structure. The small apse, or rather alcove, in which was placed

the chair of the presiding functionary, deepened into the semicircular or polygonal apse, or became transformed into the choir, or chancel, in emulation of the *cella* of the earlier temples. As more room was required for the worshippers, the building was made to reveal its purpose by its plan; and thus arose that beautiful feature, the transept. Ecclesiastical grandeur outran the state of acoustic science. Detailed commemorations rose to acts of worship; and thus around the original nave, the borrowed *cella*, the appropriate transept, nestled and clustered lateral and apsidal chapels; attaining their utmost development in a lady-chapel, which was to the church almost what the church was to the precinct; as in such instances as the abbey churches of Westminster and St. Alban's, the cathedrals of Canterbury and of St. David's, and many others. In all these examples, besides the archaeological knowledge that enables the student to fix the date of a moulding, or to trace the history of an arch, there is room for the application of that more philosophical inquiry which shall seize the motive of every modification of structure, and read, in the very structure of the church, an illustrated chapter of the progress of the human mind.

As we carry back this kind of inquiry into the remoter past, the philosophical interest far exceeds the technical or artistic interest. Thus in the plan of the great stone-girt Temple of Jerusalem, which in a few months will be unveiled to the world as regulated by distinct motives of the most unexpected and most unmistakable character, we shall be able to enter into the very council of the founder, whose name is yet a magic word in the East. In the explorations which have been made,—often brutally and ignorantly made,—of the most important of the Egyptian pyramids, a unity of plan has been discovered, as to the purport of which there can be no doubt. These enormous piles (the Great Pyramid itself contains three millions and a half cubic yards) were reared by the Lords of the labour of Egypt, each in turn, for the preservation of his mummied body, till his spirit should return to reanimate it, after the long year of its disembodied existence. The sepulchre of the dead, as far as we can trace it, is but a partial performance of the rite of embalment. It looks forward,—we believe universally,—to that return of the spirit to its former tenement, which many persons conceive to be the meaning of the phrase, the resurrection of the body. On the contrary, whenever we find, as in the *Via Sacra* at Pompeii, *columbaria*, or places for the deposit of urns (a new feature of Palestine, at which the research of the present explorers has unexpectedly arrived), we find the indication of a very different idea. The incineration of the body, which is attested by the use of an urn to contain its ashes, does indeed imply a belief in the immortality of the soul. But it is not as a re-embodiment, but as a shade, that the spirits of the races who consume their corpses by fire, are believed to live. In the elegant lyrics of Horace, and in the libations and flowers which the most cultured of the Greeks and Romans offered to the *manes*, is present the same conception which leads the savages of the Australian groups of islands to burn the war-clubs of their departed chiefs, and led our own ancestors to sacrifice a war-horse on the tumuli of their own.

It would be easy to extend our illustrations of the mode in which, by grasping and apprehending motives, we may glide from art into science, and from architectural study into that of philosophy. But the fact that the unity, purity, and dignity of motive are the noblest characteristics of art, is one that cannot be brought out in too high relief, or insisted upon with too much single-minded urgency.

THE ARTIST AND POLITICS: A QUESTION FOR THE FUTURE.

We are always ready to benefit by the wise annual utterances of the President of the Royal Academy, and it is a good thing at times to start with a good and well-defined idea, to examine it, and may be to profit by it. A year or two ago President Grant told the illustrious company then assembled before him that the Royal Academy and artists generally had and could have nothing to do with politics. Let us admit it, and even go a step further, and say that the less the artist has to do with other people's affairs, and the more he attends to his own, the better and the more profitable it must be for

him. If he be a true and a *bond-fide* working artist, he has and must have all his time and attention pretty well occupied without political puzzles to solve and questions to answer. Still, admitting all this, there is now going on in Europe a series of movements, slow though they may be, and to the multitude unseen and unnoticed, which will in the future have no small influence on art, not only out of the pale of the Royal Academy, but in it as well. It is a very wide and lofty question indeed, and a deep one as well, and some little attention is needed to get a good glimpse of it. We must steer well clear of prejudice, and come to see and admit fairly that there are more ways of doing things, artistic and otherwise, in this world than very many dream of.

Civilisation is a very hard word, and many people think they understand its full scope and meaning who never have even taken in its most common signification. Europe is civilised, and Asia is not; but what is "civilisation" in its abstract and most positive sense? We have but just been reminded that there is now going on in Europe a great contest between "civilisation" and what is called "nationality," and that they seem destined to fill up a large space in the records of modern history. The whole subject, comprehensive and profound as it is, is so far from being out of the pale, though it be political, of artistic inquiry and research, that it is of all others the most comprehensive and interesting, artistically, to the thoughtful artist; for in it is the great and, to say the truth, mysterious question, or questions, of the *future* of art and *art-action*. Let us, then, put the great question in its very simplest form, confining ourselves, of course, to its purely artistic aspect. Civilisation and nationality express the idea certainly, but with not a little vagueness. Civilisation is not confined to the *present* age. The old Roman, Cicero, surely was a civilised man, just as much so as a modern Westminster Hall advocate. The old Roman was a civilised man, not a savage or a mere barbarian. The man who wrote the Book of Job, the greatest of all "literatures," as we are told, surely he had in him a something very much like civilisation, if book-writing be a component and necessary part of it. The Greek was "civilised" when he built and decorated the Parthenon; and what would not the world now give if somebody like a Greek, civilised or no, could but go to work and do a little of such work among the monuments of St. Paul's, or Westminster Abbey? We must not too accurately define such a big word, or go into too much detail about it, for the fact is that it is of such very wide significance and comprehensiveness of meaning, that it may and does include almost everything and everybody that is not actually barbarous or savage. But we need not puzzle ourselves about it. There is no doubt whatever about what the word, as *now used*, signifies. Civilisation means simply and shortly *modern ways of life*, the shopkeeping, and housekeeping, and furnishing of the hour, just as we see it all about us. There are shops and houses in Algiers, and shops in Damascus, and even in "Yarkand"; but no one calls them, or those who serve in them, "civilised." It means, then, the modern ways of life of such places as London,—mighty brick-and-plaster London. There is indeed no word that defines civilisation, but the *fact* does, and with considerable accuracy. And this it is that brings us at once into the very heart of the matter; for the question then is, are there not fairly many and diverse "civilisations" expressive of different nationalities and orders of mind, and of different artistic instincts? In other words, may not civilisation have different and even *opposite* branches, one going one way and one going another and a different and opposite way; so that, looking at two of the opposite branches, many might doubt whether *both* could claim the same title. This is, indeed, the war of the age, above all asking of leave of great potentates or national councils. Surely it is a most happy omen for the future, far distant though it be, that there are powerful instincts and aspirations now at work, which are compelling some nationalities to a growth of their own; each to get, or to keep, a nationality of its own, and, we would add, a "civilisation" of its own, a refinement of its own, and, it is to be hoped, a *fine art* and an *architecture* of its own, and of arts subsidiary to it.

What a thought is this, and how opposite from the general European talk and present aspirations. The tendency of the time, truth to say, is to work the whole of diverse Europe into one

uniform whole. Telegraphs, railways, international coinage movements, building "improvements," may, free-trade itself; is, as we are so perpetually told, bringing all nations under one influence, and making all things in them common to all. It would, indeed, seem to be almost the instinct or passion of the time to do this, and as quickly as possible; but not only are all causes operating everywhere to do it, but actual political and social forces are needed to bring it about the more rapidly and entirely. But,—and it surely is a happy thing that this small world is here useful and necessary to the story,—nature is obstinate, and not a little obstinate sometimes; for such seems to be the force of the national instinct in some races that they will not or cannot accept this one "civilisation." The "Scandinavian and the Muscovite" have now equally learned to reject the Teuton and his "gifts," great as they may seem to be, and indeed are. It would almost seem as if the old spirits of the dead past had risen from their frozen graves to remind those who have succeeded them, and who occupy the ground on which they once trod, that they have yet a language and a nationality of their own, and a mental caste, and, may we say it, a *fine art* of their own. Material, social, and even intellectual and moral progress is becoming, nay is becoming, of less value in Northern Europe than *independent existence*. National pride and aspirations, and pride of race, are, as they ought to be, the predominating feelings. It is impossible to reflect on this magnitude of theme without a hope for the future. What, for instance, would it not be to see a new city,—let us say it boldly, a *new city*,—in the very heart of Scandinavia or Poland, or anywhere indeed wherein things are even but a little given to glory in their "national shortcomings," *i.e.*, as compared with things in other more fashionable and favoured localities, but which are yet unsuited to them. What an interest would there not be in such a course of things? Instead of as is now the case almost everywhere, from Naples and Venice to St. Petersburg, and from Paris to Moscow, in all the newly-built parts where the iron girder from Thames-street may be seen, cast, it may be, from the very self-same mould, and with the girder all that is necessary to make up a building. It is absolute uniformity,—and what the modern imperial statesmen are asking and trying for in reality, though perhaps they do not know it, already to be found in building and architecture! All building and architecture are getting alike all over Europe, and of one uniform type, as though the work of one firm. The style may differ here and there, but the *style-maker* is the same man, and the workman is simply a producing machine.

But, instead of this, suppose this new city to be built up of the thoughts and instinctive feelings and wants of the Scandinavian people, and expressive of them, as are their language and their legends and folk-lore. Of course, it is all but impossible to imagine such a city, or even a single street of it, or a temple, or, indeed, anything in it. Things are completely nowadays in the hands of the international trader. The time was, as we all know, when this state of things we are supposing would have been no novelty at all. It was the normal state of things, and had at all events this one advantage, that it fostered art and fine art, and allowed it to develop itself, each national art-centre doing its own work. And this was *real progress*, though not perhaps that progress of which we hear so much, and which is thought to be all that common humanity can possibly have been brought into this world for. *Progress*, indeed, is a difficult word to define. It was progress when the great Romanesque passed into the Early Gothic, but to be remembered that something was lost by the change as well as *gained*. Nature, be assured, *gives* nothing; a price is demanded for everything, even for progress. So that if it be progress to bring all Europe together, a something is lost by it,—that of the development of each "trihed unit," or European individuality, artistic and otherwise. Indeed, we may fairly say that the battle has fairly commenced, and the future can also show what is to be the loss and the gain. It cannot be *cheap* art. It cannot be infinite in amount, but it *will* be *real* and true, and it is surely better to have a little reality and truth to look at than whole floods of stupidities and falsehoods, and of some things that belong to nobody.

May we not confidently affirm, then, even on the strength of these few and hasty thoughts on a great subject, that *politics* are, after

all, most interesting to the artist, even from an artistic point of view? The tendency of the time is to equalise, and to level all things, and to make them alike; and if things go on for another generation or two as they are now going on, there will really be little or no difference between the look, and architecture, and "arts subsidiary" of Venice and London, or of St. Petersburg and Madrid! Where precisely the vast *factory* will be that is to distribute the ready-made and cut-and-dried bricks, and iron, and joinery, it might puzzle a good economical prophet to say, for things are getting into good order elsewhere than here for all these purposes. But of one thing we are quite sure, somebody will do it, and the perfection of the work done will consist not in its *variety*, but in its *sameness*. All will be alike, for such work becomes all the cheaper in exact proportion to its sameness. It all falls from some producing engine, as coins from a mill, and this is only to be accomplished by all things being alike and the same thing over and over again. But, as we have said, "politics" tell us that this is being sturdily resisted, even where it would least have been suspected. Cold Scandinavia will not take it. The "Slaves" even object, and think that there are two ways always of doing the same thing. Unfortunate Poland cannot but dwell on the past of its own, and the "Bohemian man" thinks that there may be a future for him, as well as a dreamy past—so full of romance and shadows!

FUNERAL ARCHITECTURE.

M. CÉSAR DALY has placed before French architectural circles an essay on "Society and Architecture apropos of funeral Architecture," of which our readers may like to see some account.* His first proposition is: Joy and grief have their expression in architecture. Our existence, he argues, is shared between joy and grief, for indifference is but a vegetable state of the soul, or a momentary suspension of sensibility. Sometimes man laughs, and sometimes he cries, manifesting physically, by a law of his nature, his sentiments of gaiety or chagrin; and art, the magic mirror of the human soul, renders visible, in like manner, emotions and passions, happiness and sadness. In literature, he continues, comedy laughs and tragedy cries; and architecture has its edifices of feasting and triumph, and also its monuments of grief and burial. Of all monuments, the tomb most readily brings to light the plastic talent and poetical sentiment of the architect. M. Daly then dwells upon the troubles of the esthetical instinct in our day. As a cry issues from the throat, sharp or sonorous, according to whether it is caused by grief or joy, or as the face contracts into rigid lines, or expands in gracious curves, according to whether the heart is filled with anger or sadness, so the post-architect, by a natural instinct, finds beneath his pencil forms expressive of the emotions of his soul; but in the course of the development of civilisations there occur crises, as in physiological development, in which all instincts have to submit themselves to the trouble or disarrangement of the general functions; and, he believes, we are now passing through a social crisis of this momentous description. Contemporaneous architects, he deploras, have fallen into a habit of copying, or of following a vulgar routine. They fail to set before themselves a clear idea, and to work it out with a warm heart and sincere faith. The public, far from being offended with their servility to the past, delights to inhabit a Gothic house, or a villa of the time of Louis XIII., with a *salon* of the date of Louis XVI., and a boudoir in the style of that of Madame Pompadour; or, after death, to repose under the shadow of a Greek *stela*, marked or not by a Christian cross, or, like the painter Delacroix, beneath the Classic tomb of Sélpio.

After investigating the cause of the alternative harmonies and troubles in question, and tracing it to the fact that we have not, like the great civilisations that have gone before us, a style of our own, but are content with a resurrection and *renaissance* of other styles, M. Daly proceeds to consider evolution as a reign of principle, and transition as a reign of expedients; and thence, passing to the embarrassment of architects of the present day, owing to the confused and com-

plex social condition, comes to the question,— "Is it possible, in the matter of funeral architecture, to furnish a guide to the contemporary architect?"

This query is answered in the affirmative. Three leading ideas, M. Daly asserts, should be enfolded in funeral architecture. First, the idea of death; then, the homage rendered to the dead, and also invocations in favour of the dead. It is impossible, he urges, to separate the first idea from the tomb. It may vary in its character according to the acceptance or rejection of the doctrine of the immortality of the soul and the resurrection of the body; but it must always be there. The two other ideas, the glorification of the dead and the invocation of celestial powers, are sometimes discarded altogether, and sometimes but partially admitted. Every specimen of funeral architecture he adds, may be classed under one of two sections. In the first may be grouped the monuments representing one of the three radical ideas, faith, death, glorification; in the second can be united those compositions expressing two of them or all three. Every tomb is the dwelling of the dead, and consequently the expression of an individuality; it is also a word of adieu addressed to the dead by the survivors, whose image is, thus, to some extent, also stamped upon it. In periods of evolution, this double expression has no inconvenience; every one has the same faith, and the tomb is a religious monument to all. But in times of social transition, of doubt and research, he asks—when, perhaps, the dead may have been a free-thinker (*un libre penseur*), and those who rendered him the last offices ardent believers—who shall determine whether the tomb shall be, or not be, an essentially religious monument? Architects, for the most part, accept the decision of those who are going to pay for the tomb; but though this plan is inconceivably practical, it is not precisely of the nature to satisfy serious souls. In conclusion, M. Daly avers that religious contests explain the troubles of funeral architecture in our days. All the architectural difficulties arise from diversity of doctrine. Death, the first radical idea to be expressed in a monument, to believers means a new life. Glorification of the dead, the second radical idea, has to be tempered by the fact that one of the Christian virtues is humility. Invocation of celestial powers, the third idea that he considers should find expression, is all in all to believers in its efficacy, but ought but folly to the sceptic. What M. Daly says on this head, of course falls dead in Protestant England. All three ideas he urges, are religious questions. In the middle ages, in the presence of a common faith, agreement in these matters was easy; but to-day it is often difficult. Religion has always been the synthesis of the state of the knowledge and sensibility (moral and physical) of the society that has embraced it, and architecture has been in all time the most complete scientific symbol of the society that has cultivated it. On the reconstruction of a social synthesis (scientific, moral, and material) depends the reconstruction of a collective taste and aesthetic unity, and consequently of the evolution, or *eloston*, of a new style of architecture.

It is an elegant essay, the result of thought, and likely to lead to thought in others.

THE ETHICS OF NATURAL LAWS.

"He that will learn them," says Carlyle, speaking of natural laws, "hold nature is on his side: he shall yet work and prosper, with noble rewards. He that will not learn them, nature is against him: he shall not be able to do work in nature's empire."

The first consideration in the application of natural laws to works of art, it need scarcely be said, should be the *purpose* to which they are to be applied. It is not enough that houses and churches and works of art in general should simply be composed of stone, or brick, or wood; each having some humanising mission to fulfil, should have its voice to speak, and having this should be made to speak the truth; and care should be taken that it does faithfully exercise these duties which it outwardly professes to perform: even the surface ornamentation of a building need never be destructive to this result.

The use of an iron lintel made to represent stone, stronger in its texture, and therefore, if it is to answer any purpose, less in its sectional area, does not conceal its falsehood by a coat of miserable paint. The weight of the superstructure and the width of a span expose a lie.

* De la Société et de l'Architecture à propos de notre Architecture funéraire. Par M. César Daly. Paris: Ducher & Cie. 1872.

It may be said that this is the result of comparative deduction; that we judge everything by theoretical comparison with something of which we have a previous knowledge; but I am disposed to consider that the appreciation of the harmony of natural laws received through the senses may be made to form a very large part of man's moral education, and it cannot do this if the principles of its subject are false.

The beautiful form of a flying buttress, however elaborately carved, obviously performs its duty in unison with the lofty Gothic roof from which it transmits the strain. Its ornamental details, therefore, although subservient to its use, should be as a garment clothing the human figure without destroying the grace of its curves, concealing the natural appearance of its strength, or destroying its physical action: anything, in either case, which is false is injurious in its moral result. Science by these means is allied to art, and art to poetry, and "the sermons in stones" preached by our *old masters of arts* have been handed down to us not only as records of history, but as inspired poems, appealing perhaps more strongly in the latter through their traditions. The spirit of a nation that prompts the destruction of its ancient landmarks arises from that poverty of thought which it perpetuates, and which is the foundation of its decay. "The hand of man," says De Lamartine, "is the only machine of the spirit." We have yet to know more of the vital energy of the mind as transmitted to the hand in the execution of works of art. As an orator can only move an audience in proportion as he feels himself, so an artist leaves behind him the intrinsic value of his work on canvas, or on stone, which finds a tongue.—

"When years have drifted onward,
And the stone is grey, and dim, and old,
And the hand forgotten that has carved it,
And the heart that dream'd it still and cold."

And whilst it is impossible to deny that the association with the supervision and companionship of machinery does give to the character a certain force and power, chiefly exhibited when action and presence of mind are most demanded, it has nevertheless a tendency to destroy the finer perceptions of man's nature, and weaken the sensitive reception of natural beauties, together with the more ideal conceptions which should appeal to man in what we call the leisure moments of his life; so that his faith is weakened in those things over which he cannot, by an effort of his will, produce a visible and tangible result. That this is the necessary consequence of the material age in which we live, science, though she owes so much to machinery, has no reason to assert. By the connecting link of art, she is allied to all that is poetically beautiful in nature, whilst nature herself is the great source from which all her materials are drawn. Happily, there appear to be those among us who seem to have recognised what I cannot but think is the demand of the age—the motive-power which can raise us above the dead level of materialism, and spiritual inactivity (which has successfully contended to a great extent not only against art, but against the higher purposes of man's existence), by giving to those whose constant occupation is an impediment to their seeking it, the opportunity of preserving the finer instincts of their nature, by bringing works of art and natural beauties more, as it were, into the highways of their lives.

The faculty which men of science tell you is known as "involuntary cerebration," highly as it may be esteemed as a term of philosophy, is a mental reception of that which is externally good or bad. Surround a man with deluding objects, and involuntarily his mind is quick to receive and fertile to reproduce them. Combine in harmonious relation the laws of nature, in forms of beauty, for his use and pleasure, and their reception is equally secure.

Every age should have,—we know, indeed, that it has,—the materials for its own representative art. It is for the artist, and for science, in the spirit and with the knowledge of the past, to realise, from its materials, with the facilities of the age in which we live, those forms of beauty that shall be to a future generation more even, if that be possible, than the past has been to us; valuing always that which is left us in the *hand-work* of antiquity, as breathing almost with the vitality of the old masters, and knowing, as we must, the inspired originality of their conceptions can never be reproduced by an *insensible machine*. The heart in the feeling and sentiment of their genius is developed in their work; and this, and this only, is that which must

make our work of value to future generations, so far, and so far only, as it speaks to the spirits of others, in the same language, of the truth in which it was conceived. BYNG GIRAUD.

THE ENGINEER AND THE DOCTOR.

WITH diseases in general we have but little concern; but with those which are preventible by proper structural works we have always claimed to be concerned equally with the medical profession—if, indeed, the question be not even more within our province than theirs. We therefore are not going out of our line in introducing Mr. Wolff's hook* to the notice of our readers. A consideration of the manner in which death usually occurs, he says, may be roughly divided into three modes:—

1. Natural death, or natural decay.
 2. Premature death, as when some organ necessary to life takes on an action of disintegration, and death ensues as a consequence, the other organs being healthy; and
 3. Accidental death, in which class are zymotic diseases. "All organs being healthy, and during the perfect performance of their functions, some cause external, and in a measure accidental, causes them to take on an action that is an interruption of their natural healthy functions, that disturbs the harmonious balance of waste and repair of the tissues."
- "Whenever it has been possible to trace zymotic disease to its commencement, we shall find such origin invariably marked by the presence of decaying organic matter,—of organic matter that is gradually undergoing a process of disintegration."

The various diseases which make up the class called zymotic, or rather the various forms which they assume, are named; but Mr. Wolff does not agree with those who say that each one is a specific disease—as typhus, enteric fever, cholera, small-pox, &c.; but says they only assume various forms accordingly as various parts of the body are brought into contact with decaying organic matter. These differences of opinion the doctors must settle how they may. They are agreed on the main point, that it is the presence of decaying organic matter in the atmosphere we breathe and the water we drink that causes zymotic disease; and the consideration for us is to inquire whence it comes, and to remove the cause of it, if possible. This is why we want in every town, small as well as large, and in every rural district, the services of a medical officer allied with those of the constructive engineer. Local rates must be levied to a sufficient degree to produce the funds with which all necessary works may be done; but we should never approve of large and costly works being undertaken for which an absolute necessity cannot be shown. We say that all works are absolutely necessary the effect of which is to prevent disease; but we go no further in advocating the levy of local rates, and making that levy compulsory. We should not, for instance, approve of a particular street being paved in an exceptionally expensive manner, except with the almost unanimous consent of the whole of the inhabitants; nor that a new town-hall should be screwed out of the pockets of those who are satisfied with the old one, unless they should be so few in number as to make the action a just one. There are, unfortunately, ill-conditioned and unreasonable people who would be content with anything at all, or nothing, if the execution of something better would require them to contribute to it,—men who have no *esprit de corps* or public spirit; and these we should think it quite within the limits of justice to leave out of consideration. At the same time, we think local rates should not be compulsorily levied for such works as we here indicate merely because a bare majority may be on some occasion got to sanction it. In respect of works, however, that can be shown by scientific reasoning to be necessary to prevent disease, in all alike, we do think that local rates should be levied compulsorily, and without hesitation. The day, happily, is gone by when it could be discussed whether the old form of cess-pools should be abolished,—those, namely, which received all the house-refuse, liquid as well as solid, and were ingeniously contrived to let out the liquid almost as fast as it went in, and so did not often require to be emptied. These do exist in places yet undiscovered by sanitary insui-

tion, but nobody can now defend them when discovered. Much the best way, as far as we know at present, of preventing exhalations of decaying organic matter into the atmosphere we breathe is to sluice it all away by means of drains and sewers to some place where the solid and useless parts of it may be retained, and land irrigated with the liquid part; but land is not everywhere to be had, and where land cannot be had it may not be at all impossible yet to construct dry cess-pits which shall give off no exhalation of decaying organic matter, and so contribute nothing to the cause of zymotic disease. We are afraid, however, that there is something else which contributes greatly to it in towns of much traffic, and which is not so easily to be dealt with. The horse-dung, we imagine, is a great contributor to the cause of zymotic disease, tritinated and blown about as it is. The engineer can prevent this, but the medical officer must take it upon himself to say whether the means to be adopted would or would not cause other evils as great as that to be done away with. Then, in overcrowded houses, or, indeed, in any house to some degree, exhalations from living bodies contribute their quota to the cause of zymotic disease. These, although we cannot prevent them, we can nullify to such a degree as to reduce their influence to harmlessness; but to do it we must have plenary power to pull down and reconstruct houses,—styes, or what shall we say?—which have been built or bought with the private moneys of individuals, and therefore have become personal property. How is this to be interfered with? Vested interests in anything that is for the good of the community, or, to say the least, that is not positively objectionable to it, may well be regarded with jealousy, lest an autocratic interference might do an injustice; but what shall we say of these wretched tenements wherein people, both good and bad, are crowded by their pecuniary necessities, to the destruction of their own health and to the filling of the pockets of speculators in this kind of thing? We can say nothing new: we can only reiterate that it is abominable and unjust, and that it is for statesmen to find a remedy, and to show how the health of the people of this country may be maintained and perpetuated.

Self-government is a great idea, and probably the ultimate form of any "government" whatever will be reduced to this form; but in the meantime let us own that we are in leading strings, as children are, in sanitary science, disguise it as we will, and we cannot afford to let pass unnoticed any contribution, such as this book, towards a better understanding of the subject. If it does no more than point to the kind of man we want for medical officer, it will do much. Those who happen to be acquainted with the kind of man, often appointed to this office by Poor-law Guardians, and who appreciate at the same time the vast importance of the office, will best appreciate the value of what we say. It is highly important that the colleague of the engineer who is to construct sanitary works, should be able to report with no uncertain sound upon what is necessary to be done.

We have said that Mr. Wolff attributes all zymotic diseases alike to the presence of decaying organic matter,—as, indeed, do other medical men; and that he says that the various forms they assume are not to be attributed to specific poisons, which produce specific diseases or forms of disease, but that the form assumed depends upon the part of the body brought into contact with it. He says, "climate has undoubtedly a powerful influence in determining the form that zymotic action shall assume. Thus, in India, the special home of cholera, scarlatina is comparatively unknown; and typhus is so rare, that it is even now a subject of debate whether it ever occurs in those climes. Egypt appears to be the cradle and favoured site of the plague. Ireland is known to be never free from typhus, whilst enteric fever is well known to be endemic in England. . . . Certain meteoric conditions, the precise nature of which cannot in the present state of science be explained, must be admitted as an additional determining cause, that has an immense influence in fixing the prevailing form that zymotic disease shall assume. Thus, for several successive years, the intestinal canal is the favourite structure affected by zymotic disease, and we see year by year the numbers of deaths from diarrhoea increasing until the cycle culminates in an epidemic of cholera. It has been remarked that the sum of deaths from all forms of zymotic disease is a tolerably constant quantity, whilst

* Zymotic Diseases: their Correlation and Causation. By A. Wolff, F.R.C.S. J. & A. Churchill, 1872.

the distribution of the sum amongst the various forms is a quantity constantly varying; and he quotes from the returns of the Registrar-General the number of deaths from all causes and from zymotic diseases from the year 1840 to that of 1867, distinguishing the various forms of small-pox, measles, scarlatina, diarrhoea, cholera, and typhus, by which it is seen that, excepting the two cholera years of 1849 and 1854, the whole numbers are nearly even, while the separate numbers vary greatly. This seems to confirm the author's views, and of course he adduces these numbers to prove his case; but why do we refer to them in the *Builder*? For the purpose of making the remark that we believe that all this slaying of thousands of healthy and upright people may be prevented. Death, of itself, is rather a blessing than an injury to the world, after we have done our work; but it is a beggarly and poor philosophy that would teach us to regard the killing of people as necessary because statistics do show that out of a thousand living a certain number have died; and this because of the neglect of those who can prevent it.

LEEDS.

ROUNDBAY PARK has been opened and the chief stone of the new Exchange laid by Prince Arthur.

The opening of the park; in presence of 50,000 people, preceded the laying of the stone, which was done on the day following. The park is situate about three miles and a half from the centre of the town, and was originally in the possession of the Cistercian Order of Monks; but after the dissolution of the religious houses it passed into the hands of several distinguished families. It possesses several objects of interest to the lover of nature, and also, what is indispensable to a park of any pretension, a lake, nearly three-quarters of a mile long, and more than a mile and a half in circumference, presenting an almost unbroken expanse of 33 acres, and a depth of about 60 ft. It occupied ten years in its formation, and cost the late proprietor 15,000*l.* There is a cascade formed by the water of the lake, rushing over an embankment of stone into a leafy dell some 50 ft. below. There are various other objects of interest, such as the ivy castle, rustic bridges, and the many picturesque views which strike the eye at almost every turn. The park was purchased by the people, and had to be paid for by money raised on the security of the rates. Originally the park consisted of 733 acres of land, a considerable portion of which had been laid out by the former owners as a park, with gardens and the extensive lakes, at a great cost. From 300 to 400 acres are devoted to the purposes of the park, and the remainder of the land not required for park purposes is sold for villa residences and gardens, which will provide a considerable sum towards the cost of the park, which will be 139,000*l.*

The style selected for the Exchange, which will occupy the site of the old Commercial Buildings, Boar-lane, is Perpendicular Gothic, picturesque in outline, and in harmony with the architecture of Mill-hill Chapel, which adjoins the site. The building will consist of four stories. Over the principal entrance, which will be at the junction of Boar-lane and Park-row, there will be an oriel porch, composed of three arches resting on polished granite shafts. Over this will be an oriel window, and above this again a two-light window with broad mullions. A prominent feature will be the tower, surmounted by a spire which will reach the height of 178 ft. from the ground. In the upper stage of the tower provision is made for an illuminated clock. Facing Park-row there will be an oriel window, and the angle of the block next to Mill-hill Chapel-yard will be surrounded by a turret, with conical spire, rising to a height of 84 ft., and covered with slate. The roof will be covered with green Coniston slate. The Exchange will be in the centre of the block, and the news-room on the same level to the left. The Exchange, according to the present designs, will be circular in form, its diameter being nearly 60 ft., and the area will be increased somewhat by a large semi-circular bay. Round the room there will be an arcade of twelve arches, composed of brick and stone, and resting on pillars with curved capitals and corbels. From the corbels will spring ornamental iron trusses to support the roof, which will be 56 ft. from the floor at the highest point, and divided into hexagonal panels. Over the

arches will run a panelled course in stone and brick, and the walls to a certain height will be of bleached ashlar stone. A large glass dome in the roof will throw light into all parts of the hall, but it has been thought desirable to make the lighting still more effective by windows overlooking the chapel-yard. The floor of the Exchange will be formed of Bennett's fire-proof concrete, and covered with encaustic tiles. Beneath will be the basement, which will be of nearly the same dimensions as the Exchange, excepting in point of height, that being 17 ft. from floor to ceiling. It is intended that the apartment shall, if possible, be let as a restaurant, with a separate entrance from Boar-lane. It will be lighted by lofty windows, also facing the chapel yard. Under the news-room, on the basement, will be a room of proportions equal to those of the restaurant, and this it is intended to devote to the purposes of a billiard-room, the light to be obtained from Park-row. The news-room will be 45 ft. by 24 ft., and in height 17 ft. 6 in. It will be lighted by large windows looking into Park-row and the Chapel-yard. Over the news-room will be a suite of apartments suitable for a club, the entrance to be from Boar-lane. The cost of the erection of the entire pile is estimated at 18,000*l.*, including fittings. The designs of the building have been prepared by Messrs. T. H. & F. Healey, architects, Bradford. The clerk of the works is Mr. J. T. Brown; and the contractors for that portion of the building now in progress are Messrs. Bookman & Broomhead.

The first side of Leeds New Bridge, on to which it is intended to divert the traffic now passing over the temporary bridge, slowly approaches completion. It is some time since six girders which span the river, and fifty cross-bracings by which they are united, were completed, and for the last few weeks the buckle-plate flooring has been proceeded with. The ornamental parapet is also nearly complete. In the centre of the parapet, on each side, there will be a pediment, supporting a pillar, which will contain three glazier lights, and some progress has been made with one of the pediments. On the top of the buckle-plates it is intended to lay down bituminous concrete to the thickness of several inches, and above that will come the wooden pavement which, we understand, it has been determined to lay down. A portion of the concrete has been laid. It is expected that the portion of the bridge now going up will be sufficiently advanced to allow of the diversion of the traffic about the end of next month. The completion of the whole, it is estimated, will be attained about March or April of next year.

A fatal accident has occurred at the stonework adjoining to Messrs. Ackroyd, adjoining the New Dock Basin, near Crown Point Bridge, Leeds. An immense block of stone, weighing eight or ten tons, had been consigned thither on a wherry from Birstall, in order that it might be sawn into slabs; and whilst it was being removed from the wherry by means of a Goliath crane, one of the large parallel beams on which the crane travelled broke in two, and with the pieces fell the ponderous crane itself. Three men were meanwhile standing on the small platform surrounding the crane, having been engaged in heaving up the huge block, and they were also precipitated from the elevated position to the ground, which was covered more or less with stones of similar dimensions. One of them was killed on the spot, a portion of the crane having fallen upon him; and the other two were seriously injured. At the inquest, the jury, after an inquiry which lasted for three hours, found a verdict of "Accidental death," and recommended the periodical examination of cranes, which, in their opinion, should be of wrought iron. Mr. Ackroyd said, if the same crane was again used, the girders should be of wrought iron.

In connexion with the improvements in Market-street, Call-lane, and other parts of the town, a number of building sites have been offered for sale by the corporation. Only eight of the sites offered were sold, the others being withdrawn. The following were among the lots sold:—Building site, at the corner of Park-cross-street and St. Paul's-street, containing 73 square yards, at 10*l.* 1s. per square yard; a plot of land, with part buildings, at the corner of Park-square and St. Paul's-street, containing 84 square yards, at 7*l.* per square yard; a plot of building land, adjacent to the last-named lot, containing 54 square yards, at 5*l.* 7s. 6d. per square yard; a plot of ground and buildings thereon, at the west end of Brunswick-place, containing 138

square yards, at 2*l.* 10s. per square yard; three dwelling-houses, near to the Cattle Market, containing 464 square yards, at 4*l.* 5s. per square yard; a site in connexion with Regent-street extension, containing 180 square yards, at 12s. per square yard.

The new building of a music publisher, in Park-row, now completed, has the principal front towards Park-row, and has been designed to work harmoniously with the adjoining building recently erected for the Royal Insurance Offices. It has a frontage of about 53 ft., and the height from the street to the apex of the centre gable is 65 ft. It is entirely of stone, with granite shafts to the windows. The ground-floor front is divided into three bays, the centre one having 13 ft. clear width, containing the shop entrance, which is deeply recessed and flanked with side windows. The side-bays have 12 ft. clear width. These bays are all 16 ft. high from the causeway. This story is flanked on each side by a stone pier, formed into three shafts, with moulded bases and carved caps. The piers are carried up above these, corbeling out to form the ends of the balcony. Each of these has the figure of an angel projecting boldly from the pier, one holding a harp and the other an organ. A balcony runs the whole length of the shop front, immediately over it, the front being formed by a wrought-iron railing, which, however, is not yet fixed in place. The first floor has a range of six windows coupled, with polished granite pillars dividing them, and deeply-moulded circular arches and carved hood-moulds. The pillars and the jambs have moulded bases and carved caps. The second-floor windows are of similar character, a triple window being in the centre and a double window on each side. The centre window has a stone balcony, projecting on corbels, and with pierced panels and carved dados. A corbel-course immediately over these windows divides them from the windows of the top story. These are three dormer windows, the centre one double, with pillar between; the side ones single. The staircase is placed between the saloon and the Royal Insurance building, and is carried up to a level with its cornice, and finished with a pavilion roof, so as to break the transition from the higher to the lower level. It has an entrance-door from Park-row, and windows of varying character. The saloon extends from Park-row to Basinghall-street, and is 105 ft. in depth, and in width varies from 40 ft. to 49 ft. The ceilings are coffered and enriched in plaster. The whole is painted and decorated in quiet colours, by Wood & Son. Mr. James Wood, of Leeds, is the contractor for the woodwork throughout. Various woods are used in the fittings,—pitch pine, American walnut, mahogany, and bands of inlay. The floor of the front part is laid with parquet, by Arrowsmith, of London. The gas brackets and standards are by Charles Smith & Son, of Birmingham. The carving throughout has been done by Mr. Mawer, of Leeds; and the stonework by Mr. John Wood.

CO-OPERATIVE BUILDING.

ONE result of the strike in the London building trade has been the formation of a London Company of Builders, established, in great measure, at the instance of Mr. Hughes, M.P., and Mr. Morrison, M.P., to test the principle of co-operation as a preventive of strikes. In connexion with this movement, a meeting has been recently held at the Co-operative Hall, Castle-street, Oxford-street, when its objects were explained by Mr. C. R. Roberts, the secretary. It was stated that the experience of the past few years has satisfactorily proved that the only remedy for strikes,—"disastrous alike to employers, workmen, and the community at large,"—consists in securing, in one form or another, the personal co-operation of the workmen, and that this can obviously best be effected by their becoming, in a greater or less degree, capitalists themselves. Allusion was made in the prospectus to the success which has attended the co-operative movement in the North of England; stress being especially laid upon the case of the Rochdale Pioneers, whose capital has risen from 28*l.* to upwards of a quarter of a million in twenty-five years. The nominal capital of the building concern is 10,000*l.*, and the company gives each employe an opportunity of becoming a shareholder, and employs any shareholder, if suitable, in preference to one who is not a member. They also propose dividing amongst

all employes one-half of all surplus profits after paying 10 per cent. on the subscribed capital. Mr. Roberts stated that fifty of the London workmen have already become connected with the committee, and that on the last pay-night 40l. of their money were received. With the exception of Mr. J. S. Laurie, of the Inner Temple, the directors are working men, and, in addition to that gentleman, Mr. T. Hughes and Mr. Morrison act as trustees.

JERUSALEM: MASONS' MARKS.

The last quarterly publication of the Palestine Exploration Fund includes a plan of the Church of the Knights of St. John in Jerusalem, drawn by Herr C. Schick, after explorations of the site made by him in connexion with the Prussian Government. A number of the masons' marks found on the stones of the building accompany the plan, and are seen to be precisely similar to those that we have given at different times from various other countries.—England, France, Germany, Spain, Portugal, Belgium, Switzerland, &c.,—including particularly the five-pointed star (formed of a continuous line), and the hour-glass shape. These marks would have served to show, had it been necessary, that the builders were European and Christian. There is yet more to be said about these symbols and the occurrence of exactly the same marks in many countries between the eleventh and sixteenth centuries. A belief in the usefulness of the inquiry has grown since the conductor of this journal first pointed out, now many years ago, the wide-spread existence of masons' marks, and published a collection in the *Archæologia*.

The report contains also some interesting communications from Mr. Tyrwhitt Drake, in which he gives a lamentable account of the physical and mental condition of the fellahs. The heat at the time of writing (June, 1872), was intense, and justified, he thought, the fitting, though somewhat coarse, expression a fellah used to him,—“A gate of hell is open to-day.”

DANGEROUS SUBSIDENCE AT JARROW.

An extraordinary destruction of property has occurred at Jarrow-on-Tyne. Within recent years extensive chemical factories have been established there, and large extensions have been made to them during the past two years, especially in carrying the works well out into the river upon wharfs. One of the largest of these chemical factories belongs to Messrs. Kemmish. It occupies a site on Jarrow Quay, a short distance from the Tyne General Company's landing, and it has a river frontage of from between 150 to 200 yards. The works are continued up to an old ballast-hill. Along the quay-wall were erected a number of warehouses and chambers, the chambers being appropriated to the manufacture of carbonate of soda and bleaching-powder. These last erections rose in tiers to a higher portion of the works, the ball-furnaces and acid-chambers being erected upon the ballast-heap. The River Tyne Commissioners have been deepening the river in the neighbourhood of Jarrow. The chamber on the wharf nearest the river seemed lately to have a tendency to fall over. It was noticed that a slight fissure ran along the “tank” upon which the outside of the acid-chambers stood in a line with the river. Work, however, was resumed at the factory as usual; but, as the tide ebbed, it was clear that those portions of the works situated between the quay and ballast-heap were settling down, and the men withdrew to a place of safety. One by one the erections connected with the bleaching-powder department tumbled down in ruins, and the massive levels of tank gradually broke up and subsided into the ground, until the whole of the erections covering the area of the entire length of the works, and for some 60 yards or more backwards, were one mass of ruins. The chamber, which was the first to give way, was soon followed by that of the general warehouse built on the east end of the quay, the crystallising-house, the still-house, the bleaching-powder chambers, the lime-house and lime-kilns, the dissolving-house, and a new bleaching-powder chamber of extra size, which had only that morning been packed for the first time. The large range of pyrites furnaces escaped with comparatively slight damage at the east end; but the whole of the dissolving-pans, immediately in front of the range of furnaces, have sunk completely out of sight, and a quantity of bleaching-

powder, packed in barrels ready for shipment, has disappeared also. The sinking of the ground seems to have been greatest midway between the quay and the top of the ballast-heap, where the ground has subsided fully 30 ft. Near to the extreme west end of the works a crane on the quay has also been demolished. At the extreme west end of the works the subsidence becomes gradually less, until it assumes the appearance of a mere ordinary crack. The total extent of the main fissure from east to west is about 300 yards, and the damage done may be roughly estimated at about 20,000l. In the departments which have suffered there were employed between 200 and 300 men. The cause of the slip is differently accounted for. One theory is that the deepening of the river has caused the sand to wash out from under the foundation, and that the excessively wet season has so weighted and softened the surface as to cause it to break in. Another is, that the workings in some old Jarrow coal-pits have shrunk, and have caused the subsidence of the surface and the immense destruction of property. About a fortnight before there was a slip on the works of Messrs. Sheldon & Co., at Hebburn, fronting the river, and 3,000l. damage was done. The quay wall remains sound, and that it has been more a subsidence than a slip is manifest from the incline of the wrecked buildings, those next the river falling landward, and those next the land falling riverward. We are disposed to ask if an architect was employed in the erection of the warehouses?

THE PIPES OF THE HYDRAULIC PRESSURE COMPANY.

The Wharfs and Warehouses Steam-power and Hydraulic Pressure Company are about to lay down their pipes along Blackfriars Bridge, having obtained the consent of the corporation to do so, and the work is to be executed under the direction of the City architect. It appears, that had the company not been permitted to lay down the pipes along Blackfriars Bridge, they would have been unable to complete a circle of pipes, which they are empowered by Act of Parliament, to lay down. The pipes, which are 6 in. in diameter, will be laid down under the carriage-way, near the footpath, as they cannot be carried along outside it. It was suggested that the pipes might burst, and that if they did so under the pavement on such a crowded bridge, a number of persons might be blown into the river; but in answer to this it was stated that Mr. Haywood, the engineer, had given it as his opinion that there was no danger.

AMERICAN FINANCES AND CREDIT.

COMMENTING on the financial condition of the country in its relation to the Presidential contest, the *New York Herald* states some interesting facts:—In all civilised nations the foreign commerce of a country is the method by which its commercial standing is measured. In this respect Great Britain is and has been pre-eminently the first nation. Her foreign commerce has steadily increased until the enormous figure of 3,000,000,000 dollars has been reached. This result has been accomplished by wise statesmanship and the most liberal support by the Government of all enterprise looking to the extension of British commerce. Besides, the Chancellor of the Exchequer is in constant and daily communication with the leading tradespeople and representative commercial men, attentive to their wants and suggestions, open to instruction, and never attempts to force a policy upon the country against the protest of the commercial body. France, in point of foreign commerce, is the second nation of the world; the annual value of her foreign commerce being now about 1,500,000,000 dollars. The United States have made rapid strides in commerce during the last two decades. Notwithstanding the interruption caused by the rebellion—and our improvement in this respect is remarkable,—our total foreign commerce in 1852 was 422,000,000 dollars, which was increased in 1860, at the outbreak of the rebellion, to 762,000,000 dollars. From that period to the close of the war our foreign commerce passed through many vicissitudes, and one year ran down as low as 435,000,000 dollars. After the close of the rebellion there was a rapid improvement, until for the fiscal year ending June 30th,

1871, our foreign commerce reached a total of 1,100,000,000 dollars. For the fiscal year which closed last June the official figures have not yet been made out, but it is estimated the total will reach 1,200,000,000 dollars, the largest in the history of the country, which, when we consider that this result has been accomplished in the face of virtually hostile legislation, presents an evidence of commercial progress and greatness of which any people may be proud. It is interesting to note the steady increase of railroad mileage there. In 1850 there were twenty-three miles of railroad in operation in the United States; in 1845 there were 2,218 miles; in 1850, 9,921 miles; 1850, 30,635 miles; and in 1871, 60,852 miles. The gross value of the internal commerce of their railroads during the fiscal year ending June, 1871, is stated in round numbers at 15,000,000,000 dollars, greater than the entire foreign commerce of the whole world.

LONDON SCHOOL BOARD.

At the usual weekly meeting, on the 25th, it was stated that the Works Committee had found it desirable in many cases, not only of sites scheduled, but also of sites which it was proposed to secure by agreement, to call in the aid of an experienced valuer of land before determining on the amounts to be offered or paid for interests in the various sites. In consequence of this, the committee asked the authority of the Board to appoint such a valuer in such cases as they may think necessary.

The authority asked for was at once granted. A resolution was passed by the Board on the 19th of June last deciding that a competition of four architects should be held for a school to be erected on the Northgreen Sawmills site. As no architects had been communicated with in this case, the Works Committee recommended that the plans be prepared by the architect of the Board, and that the previous resolution be cancelled.

It was explained by Mr. Reed, chairman of the Works Committee, that this would effect a saving of money.

The recommendation of the committee was approved of.

Since the previous meeting of the Board the Works Committee had considered the reference in which they were instructed to make the necessary selection of officers for the architects' department, and they now recommended that the following be appointed by the Board, at salaries mentioned below, subject to one month's notice on either side:—Chief draughtsman: Mr. T. J. Bailey, salary 200l. per annum (appointment to date from September 18, 1872). Senior draughtsman: Mr. Jas. Howes, salary 140l. per annum (appointment to date from September 20, 1872); Mr. A. Edwards, salary 140l. per annum (appointment to date from September 30, 1872); and Mr. Edward Rake, salary 120l. per annum (appointment to date from September 1, 1872). Junior draughtsmen: Mr. Arthur Harland, salary 80l. per annum (appointment to date from September 17, 1872); Mr. James Lackie, salary 80l. per annum (appointment to date from September 1, 1872); Mr. W. A. Green, salary 80l. per annum (appointment to date from September 17, 1872); and Mr. A. W. O. Burton, salary 80l. per annum (appointment to date from September 17, 1872). Writing clerk: Mr. George H. McFarlane, salary 80l. per annum (appointment to date from September 1, 1872).

THE ADMIRALTY AND BUILDING AT GREENWICH PARK.

WITHIN the last week or two, a strong feeling has been manifested in Greenwich against a proposal by the Commissioners of the Admiralty to let, for building purposes, the land adjoining the vicarage, known as Park Lodge, and which, it appears, was given by Act of Parliament for the use of the seamen of Greenwich Hospital; but which, it is now contended, it is illegal to build upon, inasmuch as it is “dedicated to the people by a king, in holy commemoration of the death of his queen.” The land in question immediately adjoins the park, and forms part of what is known as the Greenwich Hospital lands. Last week, two special meetings of the vestry were held, for the purpose of protesting against the proposals of the Admiralty Board. At the first of these meetings the Rev. Canon Miller, vicar of Greenwich, presided, and the proceedings were of an excited character, in consequence of a per-

positional alteration between the vicar and Mr. Pook, which induced the former to leave the chair, and the meeting broke up without coming to any decision. It appears that the vicar's house is built upon land immediately adjoining the land now proposed to be built upon, and that he has since entered into an agreement with the Admiralty for about 20 ft. of land to be added to his premises. At the meeting in question the vicar observed that, as the land had been given by Parliament for the use of the seamen of the hospital, there could be no question that it was at the disposal of the Lords of the Admiralty. This was denied by Mr. Pook, who added, that the vicar's house had no right to have ground built there, and that the addition of the 20 ft. more to his premises was the result of a hole-and-corner movement. Hence the vicar's leaving the chair, and the breaking up of the meeting. At a second meeting held, which was numerously attended, a more unanimous feeling against the proposals of the Board of Admiralty prevailed. One of the churchwardens presided, and several speeches were made strongly commending the attempt to build upon the land. One of the speakers said it was the hounden duty of the inhabitants to prevent it, and they should do all they could to get the land thrown into the park. He added that it was purely a question of Greenwich Hospital v. The Public, and it was quite clear the Hospital must give way. A resolution was proposed and carried to the effect that the vicar, churchwardens, and certain members of the vestry seek an interview with the Lords Commissioners of the Admiralty, to protest strongly against the proposed leasing for building purposes of certain land adjoining the park, the same being contrary to former action, and opposed to the wishes of the people of Greenwich.

THE COAL AND IRON TRADES.

The prices of coal and iron seem now to be clearly pointing to a fall. Coal and iron are becoming more abundant at the northern furnaces; and at Wolverhampton on Wednesday last week the tone of the market was decidedly in favour of purchasers. Bars were offered at a reduction of 3l. per ton without finding buyers. The unprecedented prosperity of the malleable iron trade in Lanarkshire, however, is threatened with a sudden collapse in consequence of the continued rising of the prices of pig iron and coal, and the slackness of orders this month. Two large works have already given their men the usual fortnight's notice. With regard to coal, it may be stated that the last alleged rate of 3s. 6d. per ton appears to have been a dodge on the part of some of the agents who have bought heavily.

There is much foreign competition, both in iron and in coal. Belgium is making girders far and near at low quotations; and Germany has just secured a good order for railway tools which had been previously offered to firms in this country. Our coal-owners and iron manufacturers seem to be killing the goset hat lays their golden eggs, and while plundering the public unmercifully, they are destroying their own business.

A Dumfries coal-merchant writes, pointing out what appears to him to be the chief, if not the only, cause of the present extraordinary state of the coal trade. Speaking of the high rate of wages, he remarks that the men have only got 9d. per ton more than they had last year, when coal was 6s. a ton. Since that time coals have risen enormously. "Last month," says our correspondent, "I was charged 17s. per ton nett at the pits, and the carriage costs 4s., making in all 21s. Thinking that a change might soon take place, I sold the same coal for 20s., thus losing 1s. per ton, and all my labour. More recently I have had an intimation that 2s. 6d. has been added to the price at the pit." It seems a little foolish to sell coal at a loss. The fact of his doing so, however, is not quite pertinent to the argument: so we pass on.

"Do the coal-masters," he asks, "pay more than they did formerly for the leases of their pits? No; for they know to a certainty that they have leases for fifteen, twenty, and thirty years, and I should like to know how many of these expired within the last twelve months, and if any were increased in price on renewal. Again, the price of coal at the pits in September, 1871, was 6s. per ton, less 23 per cent. for cash in a month. Out of this sum they paid the lord of the manor, the colliers, and the whole working expenses. They were very anxious to take orders at that price; so, I presume, they made a profit. Turning now to the present trade, I add 9d. for the increase of wages, which gives 6s. 9d. per ton. This 9d. is all that the coal-masters can show as a reason for the present extravagant rates. They must, therefore, be making profits of 10s. 3d., 12s. 9d., and 13s. 9d. on the three

qualities of coal which they sell at present at 17s., 19s. 9d., and 20s. 6d. Moreover, the 23 per cent. discount which was formerly got for cash payments is not now allowed, and that itself must represent a considerable sum."

A joint-stock company is now being formed in Titusville for the manufacture of pig iron by means of petroleum oil in place of coal. At present rate the fuel for making a ton of charcoal iron costs 17 dollars, while it is calculated that the oil for making an equal quantity of iron would cost only 7 dollars. The Lake Superior ore can be laid down at comparatively little cost almost at the mouth of the oil-wells, which will thus be invested with a new and increased value.

LEICESTER SCHOOL BOARD.

The Architects' Committee submitted a list of the tenders received for the erection of the school on King Richard's-road; and recommended the Board to accept the lowest tender, namely, that of Mr. Thomas Bland, subject to its being sanctioned by the Education Department.

The committee also recommended that the school be erected with hollow exterior walls, the nature of the locality making them in this instance especially desirable.

	Extra for hollow walls	Amount of tender.
Brown	£199 0 9	£2,982 1 0
Fast	133 7 0	7,729 0 0
Foster	109 0 0	6,799 0 0
Winkles	98 0 0	6,738 0 0
Hutchinson & Son	98 0 0	6,685 0 0
Lovely	109 0 0	6,574 0 0
Osborne Brothers	74 0 0	6,507 0 0
T. & H. Herbert	90 0 0	6,349 0 0
Neale & Son	135 0 0	6,095 0 0
Bland	120 15 0	6,060 0 0

These tenders do not include the cost of the internal fittings. The report was adopted. The Architects' Committee recommended Mr. Jackson's plans to the Board (subject if necessary to some minor modifications) as the most suitable for utilising the site in Oxford-street for 876 children, in accordance with the resolution of the Board of August 19th, 1872. This recommendation was also approved of.

SIR JOHN BOWRING ON THE VALUE OF STATISTICS.

In course of the paper read by Sir John Bowring, at the last Congress of the Social Science Association, he said:—It may be doubted whether there is any topic of social or individual interest which is not in some way or other to be tested by statistical and economical results; at all events, it may be contended that when such results are attainable they will tend much to the elucidation of any and every controversy. Every argument is strengthened if it can take a mathematical or arithmetical shape, and the tendency of all inquiry is to subject every contingency to some law of harmony or order. The great controversy of the day is, whether any event in the wider regions of space or time does escape, or can escape, from the irresistible despotism of an universal law. Thoughtful men are beginning to test the great workings of Providence, once deemed inscrutable, as they would test the working of any instrument produced by the hands of man. If they look at the machinery of a watch they would judge of its excellence from the absence of aberration, that it went well, and recorded the progress of days or hours, or minutes or seconds, with unvarying accuracy. If it failed, they would properly deduce from its failures the imperfect hand of the watchmaker. It is not necessary that they should be personally acquainted with the watchmaker to assist the conclusions at which they would arrive; nay, it would be utterly impossible for them to trace the various parts of the complicated work to their origin; and so in the infinite variety of the machinery of creation. May not the study of statistics have a moralising effect upon public opinion? May it not influence sovereigns and legislators when the cost of great national evils, and sometimes of great national crimes, is taken into account? Ask, for example, the returns of the waste of human life, of the sacrifices of money, which we owe to the devastations of war,—though these sacrifices are not confined to statistical tables, but ramify into all the researches of human suffering; and it is hoped that the startling figures in figures which have been published connected with international hostilities may not be deemed inappropriate, as they certainly cannot fail to be instructive. It is obvious that a refer-

ence to a friendly and well-constituted tribunal for the settlement of matters which have so frequently led to the "outspit of the dogs of war," could not but greatly serve the interests of economy and commerce: nothing can be more opposed than war to the cultivation of brotherly affections nor to the extension of trade. Civilization has done something,—much less than it ought to have done,—for the suppression of internecine quarrels; it has more effectually broken down the barriers which separated town from town, district from district, province from province, which are now almost universally allowed to trade with one another. Every reason which justifies the removal of local restrictions applies to the custom-house codes of nations; and if not for the adjacent present, we may anticipate for a remoter future the abolition of tariffs grounded on a supposed hostility of interests,—a hostility which has no foundation in fact.

PRIVATE DWELLING-HOUSES AT THE VIENNA EXHIBITION.

It has been already noticed in the newspapers that at the Universal Exhibition to be held in Vienna in 1873 the private dwelling-house will have the importance of forming a group to itself. This group has been destined to help to solve one of the most important questions of social science of the day. Its object is not to exhibit a collection of ethnographical objects, neither is it to show how most of the private dwelling-houses are built and arranged in different countries; but to show how the private dwelling-house can and ought to be built in order best to fulfil its purpose, taking into consideration the climate, local circumstances, and mode of life of the different peoples, as well as their wants and habits.

One very common error, for instance, hitherto, in undertakings with the special object of providing houses for working men, has been the construction of huge nests of brick and mortar, in which there is no private ownership beyond the two or three rooms enclosed within a separate door, and a right of way down a common staircase. Whatever may be the architectural or economical advantages of this kind of building, it has one fatal fault,—it is not liked, and there is no reason to suppose that it ever will be liked, by the persons who are intended to benefit by it. It is very doubtful whether the flat system has any future in London, even for the richer classes. The experiment begun in Victoria-street has not been often repeated.

The group destined to represent the private dwelling-house, firstly, by models, drawings, and finished buildings; and, secondly, by drawings, models, and examples of thoroughly furnished apartments, at the Vienna Exhibition will show the rooms, the kitchen, the cellar, &c., with all the requirements of housekeeping and all most approved arrangements, as a whole and ready for immediate use; and thus it is hoped present to the visitor an arrangement which cannot by any other means be exhibited in so complete or clear a manner, and which imagination can never represent to itself.

This Exhibition will enable the architects of all civilised nations to exhibit the private dwelling-houses which suit best the climate and habits of their country, and also enable visitors who give their attention to this problem to make instructive comparisons, and to adopt the arrangements which may be suited to their own country and customs. It is intended that the houses exhibited, besides being fully and completely furnished and decorated, shall be likewise, as far as practicable, inhabited.

One particular feature of prominent interest to English manufacturers and exhibitors deserves to be specially noticed in connexion with this group. Iron constructions are almost unknown in Austria, and it is believed that if introduced by enterprising firms (and such are not wanting in England) they would meet with a ready sale. Even a very profitable investment might be made by erecting several of these iron houses previously to the opening of the Exhibition; for it is a well-known fact to residents in Vienna that at present there is not enough accommodation for the resident population, and that in consequence rents are enormously high.

By the exhibition of these iron constructions the manufacturer may derive a double advantage. In the first place, he will be receiving rent for the houses whilst they are inhabited, and, secondly, it will, perhaps, do more to convince Vienna capitalists and building societies of the

practicability of iron houses, than all the advertisements in the world.

The houses which are mostly required at Vienna, are not those enormous ten and twelve-story structures which are familiar to every one who has visited Continental cities. The most urgent want of the people there is a good transportable dwelling for working men, containing from two to four rooms, and others with one room and a kitchen, only suitable for a man and wife. Such buildings are almost unknown in Vienna, and considering that the town has a very large labouring population, they are as much needed as elsewhere. To men employed in large manufactories a dwelling of this kind would be specially acceptable, for, on account of want of good accommodation, and the very high rents which prevail in a densely-populated district, the Austrian artisans and mechanics have often a distance of three or four English miles to walk morning and evening. Summers and winters in Austria are more severe than in England, and hence the greater need of a decent dwelling nearer the man's daily work. Many of the manufactories there have plenty of spare ground which they now appropriate to depositing rubbish, but which, in many instances, would be available for the erection of constructions as heretofore suggested.

Ordinary building materials are very dear at Vienna; bricks cost from 30 to 35 florins (50s. to 60s.) per 1,000, and other materials are in the same proportion. In the interest of working men and the poorer classes, the co-operation of manufacturers in England, France, and elsewhere, in the direction above indicated, is earnestly solicited by the Austrian people.

CIVIL ENGINEERING AND ARCHITECTURE AT THE VIENNA EXHIBITION.

A CORRESPONDENT from Liverpool asks to be informed as to the works admissible. The following extract from the programme will answer the inquiry, and probably be useful to others:—

"CIVIL ENGINEERING, PUBLIC WORKS, AND ARCHITECTURE."

- (a.) Building materials; processes and apparatus for quarrying, brick-making; iron girder work; preparation and preservation of wood; artificial stone, terra-cotta work, &c.
 - (b.) Materials and appliances for foundations (pile-drivers, screw-piles, cofferdams, caissons, pneumatic and diving apparatus).
 - (c.) Contrivances and tools for earth-works (excavators, dredging machines, apparatus for raising, carrying, and transporting earth and materials).
 - (d.) Materials and apparatus used for roads and railways (road rollers; railway superstructure, switches, crossings, turn-tables, traversing-tables, inclined planes, lifts; pneumatic and other modes of propelling; water stations and their apparatus, railway station buildings of all kinds, and systems of railway signals).
 - (e.) Hydraulic engineering works, excluding sea works (river works, canal works, dikes, locks, dams, &c.).
 - (f.) Models and plans of viaducts, bridges, and aqueducts, &c.
 - (g.) Plans, models and drawings of public buildings, dwelling-houses, barracks, penitentiaries, prisons and hospitals, schools and theatres, labourers' cottages; apparatus for lifting and moving heavy weights in buildings, as lifts, &c.; plans and models of cheap dwelling-houses; tools and implements of artisan builders.
 - (h.) Apparatus and inventions for health, comfort, and convenience in buildings (for lighting, water supply, drainage; water-closets, lightning conductors, &c.).
 - (i.) Agricultural engineering; plans for culture, fencing, draining; farm buildings; buildings for cattle breeding; stores, stables, manure tanks, &c.
 - (k.) Industrial buildings; spinning-mills, weaving-mills, grinding-mills; distilleries, breweries, sugar manufactories; warehouses, saw-mills, and docks, &c.
- Finished buildings, models, and drawings of farmhouses of the different nations of the world."

Let us add that the buildings to which architectural drawings, &c., relate must have been designed, commenced, or finished since 1863. Architectural drawings and designs which have gained the Travelling-Studentship of the Royal Academy, the Gold Medal of the Royal Academy, or the Soane Medallion of the Royal Institute of British Architects, within the preceding five years, will be considered admissible without other question than that of sufficiency of space. It is desired that each architectural work should bear the name of the architect who designed, as well as that of the artist who drew or painted it.

Gas Referrees.—Professor Tyndall, Mr. Augustus G. Vernon Harcourt, and Dr. William Pole, have been appointed gas referrees under the City of London Gas Companies Acts, 1863, for one year, at a salary of 200l. each.

SEWER-GAS AND LEAD PIPES.

Sir,—I agree with your correspondent, "A Plumber," at page 750, in his advocacy of pure versus adulterated lead. I cannot, however, agree with him when he states that "iron soil-pipes are corrosive and offensive," for I consider that, especially where hot water flows through them, iron soil-pipes, if properly put in and of a proper size and thickness, are preferable to lead. It is an every-day occurrence to come across old lead soil or waste pipes with holes eaten through them, but the same as regards cast-iron is *vera vis*,—at least in my experience. When iron pipes are put in only about 1.16th of an inch thick on one side and 1.6th of an inch on the other side, we often find them split up, rusted, and broken; but then such thin iron pipes should not be used, especially for soil-pipes. Cast-iron soil-pipes, $\frac{1}{4}$ in. thick, and $\frac{1}{2}$ in. or $\frac{3}{4}$ in. internal diameter, give great satisfaction if properly fitted up and supported, and also ventilated. As to the ventilation of soil-pipes, I think it not far off the mark to say that in ninety-nine cases out of every hundred the soil-pipes are not properly and efficiently ventilated.

ANOTHER PLUMBER.

LANDS THAT WANT HANDS.

Sir,—I am pleased to read in the *Builder* that the Land Question has been revived. I would beg to say that a plan something like "E. G.'s" proposal was started about twenty-four years ago, in this way:—An active friend of the working class, an M.P., started a land scheme, in shares, for working men, at four shillings per month. When there was a certain sum in hand, inquiry was made, and part or the whole of an estate was purchased; then the land allotted to two, three, and four acres each, with houses of three and four rooms: a fair price was fixed upon them, and, when ready for occupation, the members who had paid certain sums in subscription, drew by ticket. After some time, three or four estates were thus established. One estate, that only employed three or four hands, was divided so as to locate thirty families, but, through opposition, the scheme failed.

G. STUBBINGS.

NEW ZEALAND ADVANCING.

On the 13th of April last, a stream of emigration commenced to flow from the United Kingdom to this important colony, sometimes spoken of as the Great Britain of the Southern Hemisphere, that is destined to exercise the most important influence upon both colony and mother country. On the date named the ship *Shehallion* left the port of London, with a large number of carefully-selected navvies and agricultural labourers on board, destined for Wellington, the capital of New Zealand, whence they were conveyed to Picton, in the province of Marlborough, to commence operations in the construction of a system of railways to be made in New Ulster, or North Island, and in New Munster, or Middle Island, the main portions of the colony. New Leinster, South or Steward Island, small and sterile, uninhabited and uninhabitable, is left out of consideration.

The New Zealand railways are to be made by Messrs. John Brogden & Sons, under contracts with the Colonial Government, and five contracts have already, as a commencement, been entered into between the firm and the Government. There is no surplus labour in the colony to be relied on for the execution of such extensive and important works, and Messrs. Brogden have accordingly to send out their own work-people. Navvies and agricultural labourers are not of the classes that have a balance at their bankers, and the employers are necessitated to pay the passage-money and provide the clothing outfit of most of the emigrants, taking promissory notes for repayment of the amounts thus advanced from wages earned in the colony in Messrs. Brogden's employment. The conditions under which the labourers engage are fair and liberal on the part of the employers, and the engagement indicates their possession of faith and courage in no mean degree, as must be manifest from the fact that they will have invested, on the security of these promissory notes, from 30,000l. to 40,000l. for passage-money and outfits, before the "first sod" has been turned in the colony. The first ship has been followed by the *Halcione*, also for Wellington; the *City of Auckland*, destined for Auckland; the *Ballarat*, for Port Napier, Hawkes Bay; the *Bebbington*, for Otago;

the *Lady Jocelyn*, for Canterbury; the *Christian McAusland*, for Otago; last week the *Ohite*, for Port Napier; this week, the *Jessie Beadman*, for Wellington; with the *Zealandia* to follow for Port Bluff, in the Province of Southland, and other ships afterwards for that and other ports. The contribution already made by Messrs. Brogden to the population of the colony, or the emigrants that they have despatched thither from London, numbers no less in men, women, and children, than 1,300 souls. The employers are required by Government to include a certain proportion of females in each batch of emigrants, but the obligation to send an absolute equality in numbers of the sexes would be to impose a burden too heavy to be borne, and the disturbing element of an inequality in the number of males and females applies in this, as in all other instances of emigration, the males being always in excess, more or less. The proportions in 932 emigrants sent out by the first seven ships were 660 males to 272 females, or roughly as 7 to 3. Applications for employment are made from all parts of the country, and not a few Warwickshire agricultural labourers have taken advantage of this fortunate opportunity for bettering their condition. The *Ohite*, that sailed last week took a number of emigrants from Cornwall and Dorsetshire. The natural probability, as we learned from the ship's doctor, is that three more names will be added to the passenger roll before the ship reaches Port Napier. The additions will be of natives of the somewhat extensive parish of the Pacific. Advice has been received of the safe arrival of the *Shehallion*; and the other ships, it may be hoped, have either reached their respective ports, or are pursuing their peaceful and pleasant voyage.

The qualifications for employment on the New Zealand railways are strength and health, a certain maximum age, and the being, or having been, a *bonâ fide* navvie or labourer. The emigrants are guaranteed not less than two years' work at such wages as may be agreed on from time to time, or as may be settled by some person to be appointed by the Governor of the colony, but such wages are to be not less than five shillings per day of ten hours. The employers take power to retain a fifth of the wages of the employed for repayment of passage-money and outfit, but the men may repay the amounts of their promissory notes as quickly as they please, and when these have been fully paid they may work where and for whom they choose, for such wages as they can command. It need scarcely be said that from England, with its present rates of wages and prices of provisions, to New Zealand, with 5s. a day and beef and mutton at 2d. and 3d. a pound, promises to be a stride in the direction of comfort. The ship outfit of the emigrants is provided by Government, to be repaid if advanced by Messrs. Brogden; it includes the necessary mattresses, bed-clothes, pannikins, and other utensils, which, much to the satisfaction of the emigrants, remain their property on arrival in the colony. In the first instance, the immigrants will be lodged in the Government barracks, from which they will move to the locality in which they are to be employed, and be lodged in roomy and comfortable wooden huts, that are being provided by Messrs. Brogden. These huts are to be portable, and as one section of a line is finished, they will be taken to pieces and transported to other localities, where they will be re-erected.

The lines of railway to be first constructed by Messrs. Brogden, have their termini at, or near, ports widely apart from each other, from Invercargill, near the southern extremity of New Munster, in about 47° S. lat., to Auckland, near the northern part of the mainland of New Ulster, 37° S. lat. Three of the lines contracted for are in the middle island, and two in the northern island. The three southern lines are from Invercargill, Southland, to Mataura, 42 miles; from Dunedin, Otago, to Clutha, 34 miles; and in Cook's Strait, from Picton, Marlborough, to Blenheim, 19 miles. The lines in the northern island are from Auckland to Waikato, 41 miles, and a short line of 8 miles from Wellington to Hull. The lines aggregate about 150 miles, and the five contracts about 512,000l., the average cost being a trifle over 3,500l. per mile. One line of 42 miles, the Invercargill and Mataura, will only cost 2,047l. per mile. These figures, however, exclude rails and rolling stock.

The lines now contracted for are only a small beginning of a great enterprise pregnant with stupendous material and moral results. Experience so dearly bought at home, in the construction of duplicate lines and unprofitable extensions,

in the elaboration of a railway system that is "a maze without a plan," will doubtless be avoided in New Zealand, where the system of railways will be system worthy of the name. The colony is rich in natural productions; in forests principal of valuable timber; in farms produce, flocks, and herds; in fertile valleys and succulent pasture-grounds; in mines, easily accessible, of coal, iron, copper, gold, and other mineral and metallic treasures. The intention of the Government, in the first instance, is to carry the railways into, and to tap, the mining districts. The Auckland and Waikato line will pass through a district in which excellent coal abounds; the Dunedin and Clutha lines takes the direction of the gold regions in the valley of the Clutha, and it is the same with the other lines laid out. Future contracts, it may be expected, will be for lines from Clutha to Mataura, which will provide continuous railway communication between Invercargill, Southland, and Dunedin, Otago. A line is in contemplation from Nelson to Westport and Greymouth, in the province of Nelson, and embracing extensive coal fields; another is projected, we believe, from the Wellington and Hutt line, through an exceedingly fertile country to Port Napier, in Hawke's Bay. The introduction of railways will hasten the advent, if anything can do so, of Maori's native—a native New Zealander, in the same sense as Stanley is a native American—who is to perform the sketching feat on the ruined arch of London Bridge. Centuries will probably elapse before St. Paul's and London Bridge fall into ruins, if they are ever allowed to do so, and generations may possibly have to come and go before the railway system of New Zealand is completed, considering its great extent, and the present sparsity of its population. It is not within the power of one generation to construct a railway system to permeate the necessary points of regions that are more than 1,000 miles in length, with a mean breadth of about 200 miles, and enclosed in a coast-line of 1,000 leagues. As regards the present population of the colony, its numbers forbid, if not render impossible, a very rapid construction of railways. In 1872 the colony had only 256,167 white inhabitants and 85,510 aborigines, or together less than a tenth of the population of London; so that a heavy "passenger traffic" on New Zealand railways will be impossible for yet awhile. Nothing can be more certain, however, than that the railways and population will act and react upon each other. As the resources of the country are opened up by railways, population will be attracted, and as population is increased and dispersed, more railways will be required. A few generations hence will doubtless see a wonderful modification of the contrast now presented between Lancashire and Cheshire, with a population of 1,082 persons to the square mile, and New Zealand, with no more than the odd two persons for each of its 122,000 square miles of territory.

The streams of emigrants to New Zealand, and the important works they are sent thither to execute, are doubtless sources of satisfaction, but the good is not unmingled. A large number of the applicants for employment are ineligible, being either loafers, broken-down men, or deficient in physical stamina. There is not any prudence exercised in scrutiny of the moral character of applicants, but the line must be drawn somewhere; and they may be rough, but they must not be known as rogues. The exodus brings Goldsmith's lines unpleasantly to mind. Many of the emigrants are really of the "old peasantry, their country's pride." They leave for the good of the colony, and for their own good, but not for "their country's good" in the sense in which the phrase is sometimes used. They take with them strong arms, and iron tools and sinews, the rogues and vagrants, the aged and infirm, being all left at home to prey upon, or to be provided for by, the workers that remain.

A number of single young women accompany the emigrants, professing to take "domestic service" in the colony. In numerous instances it is expected that an interesting ceremony will be performed soon after arrival in the colony, between certain of the gallant young bachelor navies and the fair spinsters that accompany them. The single women, by going out as such, save ten pounds on their passage-money. They are under the superintendence of a matron on the passage out. The single men are herded in the fore-cabin and fore-hatch, the married couples in the middle hatch, and the single women in the

after-batch. The arrangements for the comfort of the emigrants, as we saw them in the *Châte*, had nothing that could be complained of, and left little that could be reasonably desired.

PARIS PROMENADES.

The view we give of the *café-restaurant* on the Ile de Bercy, in the Bois de Vincennes, is from a recently-published part of the fine work, "Les Promenades de Paris," now in course of publication by M. J. Rothschild,* and to which we intend to make early reference.

This restaurant is constructed in wood, after the fashion of a Swiss *chalet*, and covers an area of 525 metres. It was bought for the purpose by the City of Paris, at the Universal Exhibition of 1867, and cost, when erected in its place, 1,600l. Around the *chalet* there is an extensive platform, planted with trees, to receive the tables for customers.

OFFICES OF THE LIVERPOOL UNITED GASLIGHT COMPANY.

A HANDSOME and commodious building has been completed for the Liverpool United Gaslight Company, in Colquitt-street. The style is Franco-Italian Renaissance.

The building comprises, on the principal or ground floor, a general office, 65 ft. by 75 ft., placed at the rear, lighted on three of its sides by large, lofty windows, and, in addition, by a dome-light over the centre of the room. This office is intended for the transaction of general business with the public, and access to it is obtained from the principal entrance. The general office is fitted up with a range of counters on the two sides, and at the end opposite the public entrance, the centre part of the room being intended for the public use as a waiting-hall, whilst the space behind the counter is fitted up with desks and seats for upwards of 100 clerks, collectors, and other officials. Communicants to the general office, and placed conveniently for access from the chief entrance, is the manager's private office, adjoining which, within the general office, is the office of the chief clerk and his assistants. In the basement beneath the general office are two large strong-rooms, fitted to receive the books and cash-safe. A hydraulic hoist is provided to raise and lower the books, safes, &c., to and from the general office to the strong rooms. There are also beneath the general office a cloaks-room, extensive lavatory accommodation; large stores for fittings, and a kitchen and dining-room for clerks. The whole of the basement of the building is lighted by external windows, which open into wide areas, affording means of access from the yards and workshops to the basement offices and the dining-rooms. The front part of the building comprises a basement story, containing offices and storerooms.

On the ground-floor are two show-rooms for fittings, one on each side of the main entrance, with a corridor of communication and manager's rooms. From the corridor access to the yard is obtained at each end of it, and the chief staircase to the board-room and engineer's offices on the floor above is approached from the entrance-hall. A workmen's staircase is also placed in this part of the building, from the basement to the upper floor, near the engineer's office. On the first floor are the board-room, ante-room, engineer's office, and engineer's clerks' drawing-office and plan-room, forming a suite of rooms the extent of the Duke-street frontage, and behind these rooms is a corridor of communication; from the corridor access is obtained to the staircases, and a photometer-room and engineer's room for experiments. Above the suite of rooms last described is an attic story to be used as stores and offices, and for storage of books and documents. The building has a frontage towards Duke-street of over 120 ft.; the depth from front to back is nearly the same. The Duke-street front and its two flank return walls are built of Cefn stone. The front cornice comprises a central pediment in coupled fluted columns with responds, and a flight of six steps to the main entrance door. The building has its ground-floor about 4 ft. above the street level at the centre. The wing walls to the steps cross the area towards Duke-street, and the area is divided from the street by a parapet wall and balustrade, with handsome gas pillars and lamps on the chief piers.

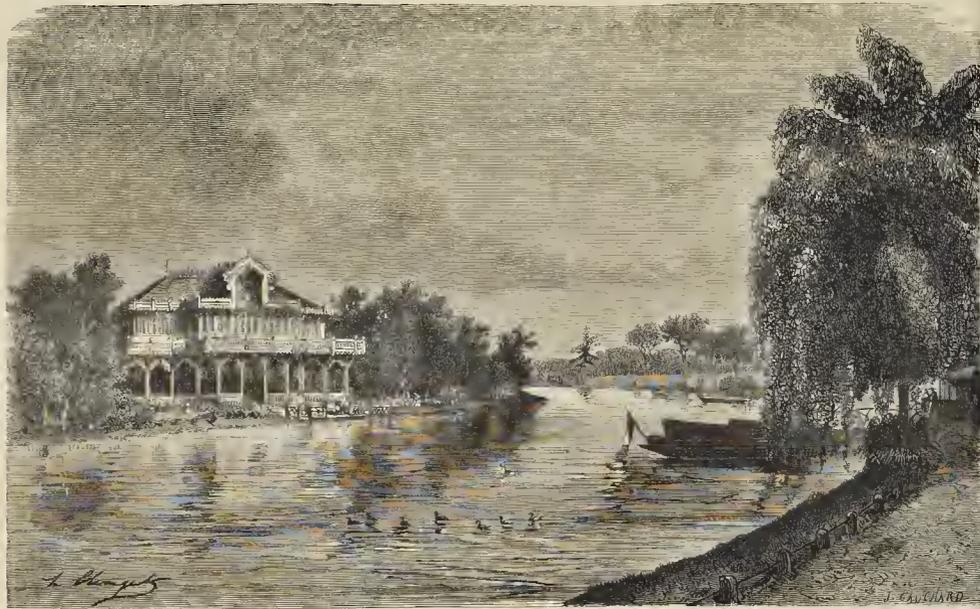
Above the basement, the front is divided

* 13, Rue des Saints Pères, Paris.

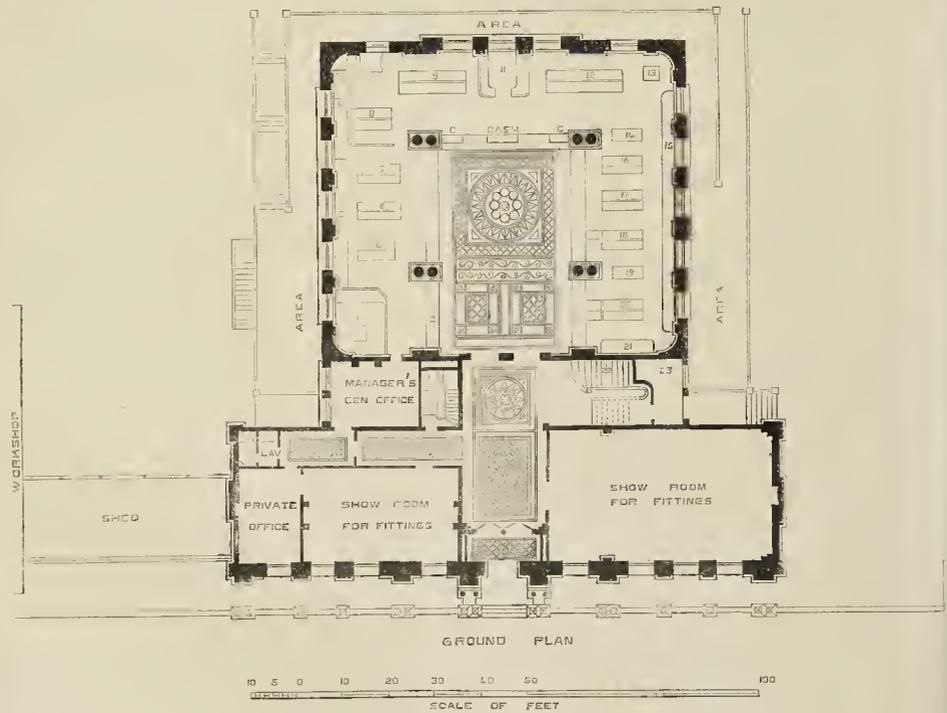
horizontally into two orders, or stages, each having continuous subbase and dado, and entablature, the upper order being surmounted by a bold cornice, supported on consoles, which are accentuated over the pilasters by being repeated there. Above the main cornice is an open balustrade parapet, broken in the centre by a large dormer window, carried to the height of the main ridge, and flanked by shafts on the pedestals of the parapet. Similar shafts are placed on the angles of the parapet, and they contain flues for ventilating the different rooms. The ground-floor has, on each side of the entrance, four square-headed windows, with boldly-moulded architraves, divided by pilasters, the intermediate wall-piers being rusticated. The base and entablature of the pilasters are continued along the front and flank walls, and thus mark out the ground-story. The division of the first floor is similarly arranged: its windows have semicircular archivolts, enriched by carving. The centre window over the main entrance is similar in character, with side-light, forming a Venetian window. The capitals of the fluted pilasters of this story serve as impost to the archivolts, and a moulded and carved string, corresponding with them, is continued on all the wall-piers of the front and flank of the building; and the pilaster, dado, and base are similarly continued, excepting that in the window-openings the dado is filled in with balusters. The same line of base is broken round the portico in the form of a balustrade, with pedestals and terminals at the angles, forming a parapet to the flat over the portico, which may be approached from the central window, which opens to the floor. The building is of a substantial character, and, with the exception of the Duke-street front and its flank, no attempt at embellishment has been made to the exterior of the building.

Internally, the general office has a richly-panelled ceiling divided into compartments by moulded beams in plaster work. The centre and largest panel has within it a dome, 17 ft. diameter, filled with stained glass divided into sections by ornamented ribs. The drum of the dome is panelled, and busts of life-size figures are placed beneath the ribs of the dome, which springs from the flat of the ceiling by an enriched cove. A ring of triplet gas-jets encircles the dome at its base. The ceiling is supported by eight Corinthian columns of polished stone, fluted, each with its pedestal 25 ft. high placed beneath the junctions of the main ceiling beams in couples, and on the walls are corresponding pilasters. The windows on the three sides of the room have circular heads, and their arches spring from a continuous enriched impost moulding. The desks, counters, and other fittings are of oak of a serviceable character, and in design to accord with the style of the building. Each desk is in communication with the manager's office by a bell-signal on the atmospheric system. The apparatus was furnished and fitted by Messrs. Barr, of Leeds. The painted decorations of the room, and of the building throughout, are purposely of a quiet subdued character, and subordinated to the purpose for which the building was designed. The floors of the halls and corridors are of tiles. The building is heated by warm water, the apparatus being furnished and fixed by Mr. J. Combe, of Glasgow.

The general contractors for the building are Messrs. Jones & Son, of Pleasant-street, Liverpool. The undernamed contractors have executed the various branches of the work for them, viz.:—Messrs. Wells & Son, the masonry; Mr. J. Hook (the late) brickwork, &c.; Mr. Thomas Jones, the plasterers' work; Mr. Radcliffe, the plumbers', glaziers', and painters' work (all of Liverpool). Messrs. De Bérge, of Manchester, furnished the iron girders; Messrs. Chatwood, the safes, &c. The fitting of the ground-floor was done with Maw's tiles by Messrs. Rutter, Powell, & Co., of St. George's-crescent; and that on the upper floor with Minton Taylor's tiles, by Mr. R. G. Powell, of Duke-street. The wrought-iron and brass work, and the chief gas-fittings, were furnished by the Midland Art Metal Works Company, of Coventry; the hydraulic hoist came from Messrs. Richardson & Boyd, engineers, of Preston. Mr. T. S. Trumble, of Liverpool, did the internal painting and decorating. Mr. J. Kitchin acted throughout as the clerk of the works. The building was designed by the late Mr. Charles Lucy, of Liverpool, and was partially erected under his superintendence. Since the death of Mr. Lucy, the works have been carried out from drawings furnished by Mr. Henry Littler, of Manchester, and under his superintendence the works have been completed.

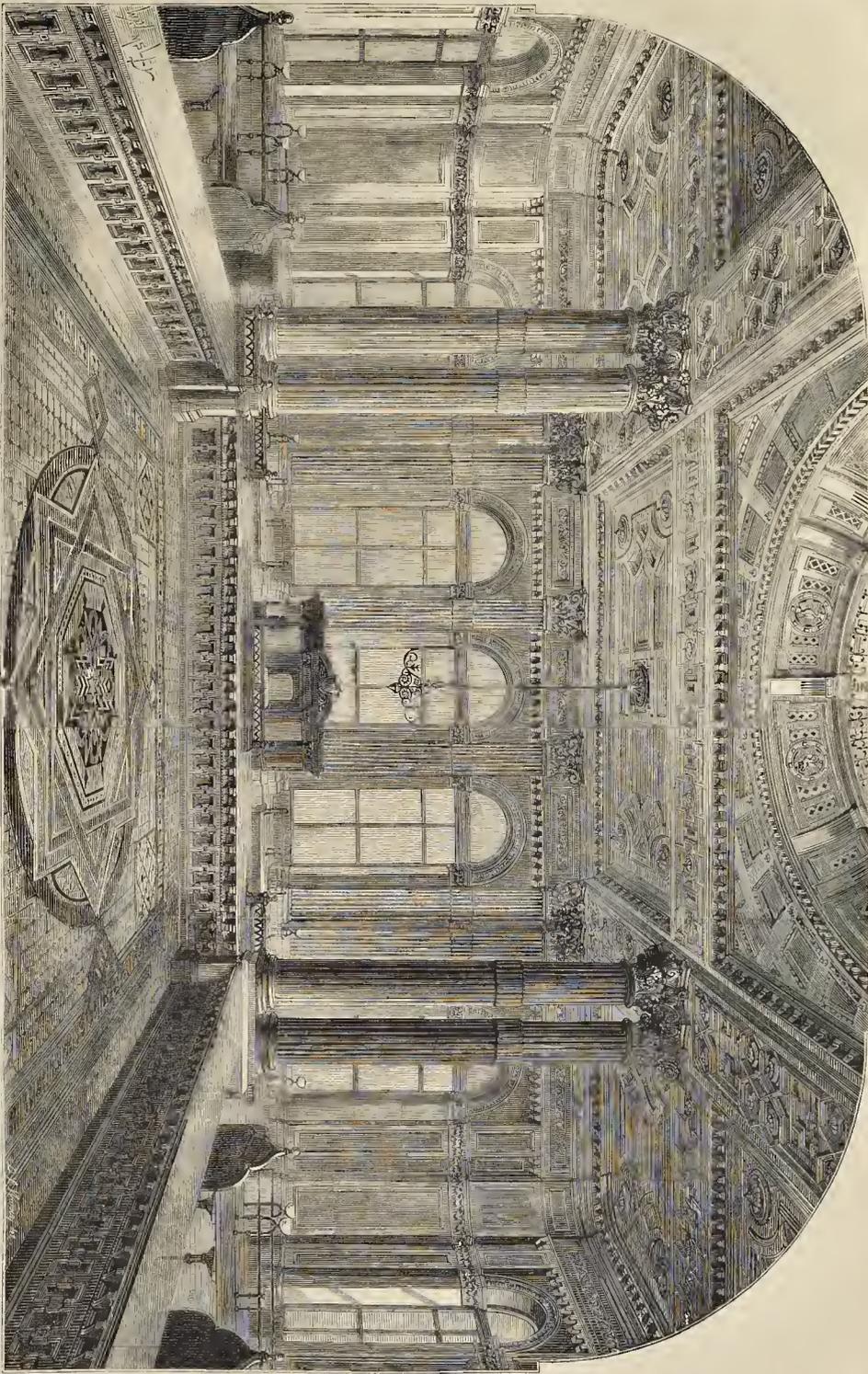


THE "BOIS DE VINCENNES:" RESTAURANT ON THE "ILE DE BERCY."



- | | | | |
|------------------------------------|---|----------------------------|-------------------------------|
| 1. Staircase for workmen. | 10. Staircase to basement. | 14. Collectors. | 19. Book-stands. |
| 2. Counter. | 11. Counting-office. | 15. General clerks. | 20. Deposit and orders. |
| 3. Chief clerk and his assistants. | 12. Collectors. | 16. Collectors. | 21. Book-stand. |
| 4 to 9. General clerks' desks. | 13. Hydraulic lift from strong rooms below. | 17 and 18. Fittings bills. | 22. Staircase to first floor. |
| | | | 23. Room for bad-light men. |

OFFICES OF THE LIVERPOOL UNITED GAS-LIGHT COMPANY.—Plan of Ground Floor.



OFFICES OF THE LIVERPOOL UNITED GAS-LIGHT COMPANY.—Mr. Henry LITTLE, AND THE LATE Mr. LLOYD, ARCHITECTS.

SCHOOL DESKS.

SIR.—Mr. Robson does not deal with the question of space, which you raised, when giving us his opinion in favour of Mr. Moss's desk, and as against "convertible" desks, in your issue of the 14th instant. Will he tell us what superficial area is required to seat, say, 100 children in a mixed school, on the plan of Mr. Moss's dual desks, and what space for the like number is required on the parallel-desk plan, in groups, which alone is sanctioned and set forth by the Educational Department of the Privy Council in their "Instructions to Architects"? The question of space is a material matter; because if Mr. Moss's plan necessitates a larger school-room area extra cost is involved in the building, and this, though of little consequence to a school board dealing lavishly with rates, is of great import to the numerous voluntary schools erecting throughout the country. In the one case a thousand pounds may be easily obtained, while in the other the promoters have great difficulty in scraping together a hundred.

Mr. Robson states that "convertibility" is the very thing which no one now wishes to see adopted. It may be some information to him, as his attention may be concentrated on the school-buildings in charge of great school boards, had to your readers, when I state that, owing to the indefatigable exertions of Archdeacon Lamilton, there has not been occasion, so far, for the formation of a single school board in his archdeaconry,—that of Lindisfarne,—comprising fifty-eight parishes, and extending over the best half of the county of Northumberland, and including Berwick-on-Tweed. In his archdeaconry there are 126 church schools, providing for 11,648 children; and in most of those recently built and now erecting, the voluntary principle, with the aid of the Privy Council, "convertible" desks are being generally adopted. In my own practice these desks were introduced on the suggestion of the promoters in large schools which I erected in a parish, three years ago, where they have answered so admirably that I am instructed to use them in another school now building in the same parish, and I propose to use them in four other schools building elsewhere. The "convertible" desks, while they in no way interfere with "the best shape and disposition of a school, in reference to its educational use," and with the system of the parallel desks in groups required by the Privy Council, also afford the opportunity of adaptability to school-treats, lectures, concerts, and literary readings, and entertainments, though referred to somewhat slightly by your esteemed correspondent, are, in rural districts all over the kingdom, not only helpful to the education of parents as well as children, but their only mental recreation in the long dreary winter evenings. Until, therefore, the Privy Council recognise the dual desks in their "Instructions to Architects," and consequently rescind their present regulations, or more forcible reasons for their use are put forward, I, for one, can certainly not adopt them for voluntary schools.

FREDK. R. WILSON.

Adwick.

SANITARY MATTERS.

Sanitary Work on the Thames.—It is somewhat fortunate, says the *City Press*, that the exact limits of "the Port of London" have not been fixed. At present the term is applied for other purposes to a district comprising about seventy miles of the river Thames, with a mile and a half of the land on each side; but it is obvious at this area cannot be looked after by the staff set forth in the Act, consisting of a medical officer and an inspector of nuisances, so that one of the first things to be done will be the settlement of the boundaries within which the work committed to the corporation is to be performed. Probably the "Port of London" will ultimately be taken to imply the district between Gravesend and London Bridge; and if the efforts of the new authority are confined to this sphere, all that can reasonably be expected may be accomplished. The great thing will be to intercept all infectious diseases at Gravesend, and carry out there such a system of extinction as shall prove of service to the entire metropolis.

Mortality of the Children of Burslem.—The chief Bailiff of Burslem made what he very justly regarded as a "startling" statement, at a recent meeting of the local Board of Health. Referring to the deaths in the town, he said that of 787 deaths in the year, 421 were of children

under five years of age. This mortality is more than "startling,"—it is frightful. Some of the causes, no doubt, are on the surface,—crowded houses, bad drainage, absence of pure air, improper methods of treatment, and, above all, the employment of mothers at work away from their homes. Some of these causes are capable of removal; but, after all is done that authority can do in this direction, the evil will not be completely met. There must be other conditions, discoverable only by the help of local knowledge, to account for such an excessive loss of infant life.

THE LAND LAWS.

MR. McNEEL CAIRD, of Stranraer, writes:—If an enterprising farmer erects farm buildings, or labourers' cottages, or executes drainage or other permanent improvements, the law is prompt to punish him for his rashness. The house is no sooner built—the moment the improvement is executed, the law takes the ownership of it from the man who built it, and transfers it without compensation to the landlord. The high priests of the law pronounce the formula, *in edificantium solo, solo cedit*, and every tenant must bow his head and submit, so potent is this mystic phrase in the work of his own hands. It contains a dogma of the legal creed which lawyers generally accept with unquestioning reverence. In plain English, it just means, "What is built on the land belongs to the land." It is an assertion, not a principle or even an argument—an assertion not always supported by fact or reason. We are told in God's law, "The sea is His, for He made it," but in man's law the reading is reversed; the house is the landlord's, though he did not make it. That is the law of Scotland. Is it reasonable? Is it just? Is the law to cast the balance always and irreversibly against the tenant? Our Yankee brothers have adopted the opposite principle for their unoccupied lands in the West. They call it the homestead law, and it is one main secret of the amazing growth of that great country. Its principle is, "Where a man builds his house and settles, the land shall be his." It is a wise and noble law for an unappropriated country. So, you see, the rules of law are capable of being adapted, as they ought to be adapted, to the circumstances and wants of society.

With the exception of the commons, all the land in this island is appropriated, and our circumstances therefore require a rule regarding buildings different from the American rule, as well as from that which has hitherto prevailed in this country. I hope to see Parliament establish some such rule as this,—what a tenant builds shall be his, and he may take it away unless he is paid for it. That would be just to both landlords and tenants. Our law, in spite of the big words which enshrine its theory of property, is so accommodating as to allow half the houses in this good city of Edinburgh to be sliced horizontally across into flats. In the High-street there may be twelve or thirteen flats built in tiers one on 'another, each of which may belong to a separate owner, not the owner of the soil. So there can be no inherent difficulty in making the slice a few feet lower down, so that all that is below the surface shall belong to the landlord, and all that is above shall belong to the man who put it there, to be sold (if he be the tenant) when his lease is out to the landlord or incoming tenant, or to be taken away if they do not choose to buy it. If such a rule were established it would lead to the improvements being generally valued over at the end of a lease; for it would not be the landlord's interest to let substantial and suitable buildings be pulled down, and it would be the tenant's interest to make them so. A right to have improvements valued over, when suitable to the holding, is really the practical result; and that, I think, is the result to which Parliament is likely to come.

In examining some statistical papers a few years ago, I came on facts which made a very painful impression on my mind. I have not had any opportunity of lately verifying the notes which I then made, but according to these, there were in one county—the wealthy county of Ayr—more than 18,000 families, not fewer probably than 80,000 persons, living in houses of one room; and in all Scotland more than a million of human beings—actually above a third of the whole population—living in houses of that miserable kind. Of these, about 8,000 families, or from 30,000 to 40,000 persons, live in houses of one room without a window, lighted only by

the door, or by an opening in the roof or side-wall serving both for window and chimney. Who will stand up to justify such a state of things as this? Our law of strict entail disables, our law of settlement disinclines, a great many landlords to do much for the labourer's dwelling. And the labourer's employer, the tenant farmer, his natural ally, who is most deeply interested in his well-being and well-doing, and who would gladly do something to lift him out of his degraded position, is sternly prohibited by law from improving the house—accommodation of his people under the pain of having his expenditure confiscated to the landlord. If the people of Scotland were not an enduring and law-abiding people, the empire would have been ringing with the wrongs of that million of silent sufferers.

DEAD LOCK AT THE BOARD OF WORKS.

SIR.—On this, the day of the publication of your journal, the members of the Metropolitan Board of Works will meet after six weeks' vacation. Nothing very unusual in that, will be said. But what I wish to ask in a few temperate words is, why should matters in the building line—such as desired alterations and improvements,—be entirely stopped during these six weeks, to the loss of fine weather, and to the inconvenience of families returning from the country. I speak from personal experience of certain works requiring the sanction or approval of the Board, which could not be obtained until after,—and no one could say how long after,—the six weeks. I know the want of trust or jealousy vestrymen have in one another, but surely in such a constituted Board as this the members ought to have sufficient confidence in one or two who might receive full authority to act during the vacation, to sanction such matters as might be required, rather than cause delay for six weeks. If there be no such members in whom confidence can be placed, a re-constitution of the Board would seem desirable.

AN OLD BUILDER.

THE ANT NUISANCE.

SIR.—I consider that your gratuitous admission of questions of personal interest in your columns is a great public benefit; and having to thank you for such occasional favours on my own account, have much pleasure and satisfaction in replying to your correspondent "B." on this subject, if you think proper to afford my experience an insertion in your next number. Some years ago, when in business, I let a mansion of importance (which I need not particularise), belonging to a man of title, to a lady of title, whose people discovered what I had not, that the kitchen department in the basement was infested with white ants. The lady declined to occupy it, nor did the owner wish her to do so, until this evil was remedied, which I undertook to accomplish. They abounded in millions, yet singly appeared like grains of dust, hardly perceptible without the aid of a microscope, yet in a few minutes coated any article of food with a white appearance. We first tried baits of ravenant, which were speedily covered with them. These we rinsed off in hot water and relaid. Two men were actively employed for two days in this operation without any apparent diminution of quantity, or affording any trace of their haunts. I then had all the woodwork stripped from the walls of the kitchen, scullery, and larder, where we found abundant evidence, and immediately, not only gave the walls a good dose of fresh hot lime whitening, but also the back of the old woodwork, which was considerably decayed, before it was broken up to be burnt, and afterwards fumigated those places with sulphur for three or four days, to destroy any stragglers. We then coated the brickwork with compo instead of woodpancing, leaving no crevice in the wall or in the joints of the stone flooring, to afford a future harbour, and yet after this they seemed as abundant as ever. Being then convinced that the chimney and fireplace were the only inlets left, I had the jambs and mantel removed, where we found them in great abundance, dosed the whole event to the rubbish, with quick lime, and then restored all carefully, so as not to leave any crevices or spaces.

This was an effectual remedy, and I never heard of any complaint afterwards. I have referred to the cost, which I find was 26l. 15s.,

and it was accomplished in a fortnight, to the great satisfaction of all parties.

At that time I heard of one or two houses in the same locality being similarly infested with white ants; but the owners seemed indifferent to the nuisance or thought it irremediable. These are the only instances of house-ants that I have ever met with. I believe they were generated in the decaying woodwork, and found haunts for themselves afterwards. W. B. Kensington.

P.S.—Since writing this letter, I have been informed on good authority of some almost new London mansions being infested with ordinary black ants, which I apprehend must come from the earth. Were the case mine, I should try sulphur fumigation; then well stopping all crevices and painting; but I hope "B.'s" grievance may be white ants, and that the knowledge of my experience may be useful on the subject.

IN ANSWER TO "B." arsenic and honey, mixed and placed here and there, prove very effective in the destruction of ants. A.

SIR.—If your correspondent "B." would persevere with scalding water wherever he sees the ants predominate, as the best remedy, he would eventually be free of them in his house. A SUBSCRIBER.

THE LATE THOMAS BRASSEY, CONTRACTOR.

The life of any man correctly sketched will be of interest to other men, and may be of use to some. Biography requires the greatest intellect and art, just as portrait-painting requires the greatest intellect and skill. Any generation which produces one first-class biographical writer, and one true portrait-painter, is endowed with enduring fame. The man to describe and the man to delineate must have that touch of nature which makes the whole world kin. Men are not made giants, either by mental or by bodily training; they are from their birth gigantic. Hercules strangled the serpent in his cradle, and in maturity performed his celebrated labours. No academy imparted to him this strength. This fact (or myth) is not remembered by those who deal in superlatives when writing of men. "Some men are born great, some achieve greatness, and some have greatness thrust upon them." Our biographical writers do their best to thrust greatness on the men whose lives they should describe truly. Sir Arthur Helps does not escape this charge in his elegant and kindly biographical notice of Thomas Brassey, late railway contractor. A life it is not. To describe a man, he must be known to his biographer, as Shakspeare knew the men he described; the entire man must be present to his mental vision. Shakspeare saw the men Hamlet, Lear, Macbeth, Othello, and Falstaff in their entirety, and measured their ambition, their passions, their virtues, and their vices, through the range of their natures; hence such accuracy in the sketches given. To describe what Shakspeare saw and did not write would require an intellect greater than Shakspeare's. When such a man lives he will, however, do his work without straining effort. God-like power will be used in god-like manner. He will see where others grope, he will walk where others stumble, he will describe where others caricature.

Thomas Brassey, railway contractor, was by nature a great and good man. He was honest; he inherited a sound mind in a sound body; the work he set himself to do was a pleasure. Prosperity did not elate—misfortune did not depress. He was hopeful, cautious, and enduring. He never broke his word. Thomas Brassey worked to make money, but he did not worship money. Business did not trouble him—did not spoil his digestion, and, consequently, did not sour his temper. He made money, and he lost it, in far greater proportions than most men. The result of his entire life's labour did not give him 5 per cent. on the contracts executed, and during his career he lived unostentatiously and moderately. He made his bankers his bookkeepers, and for the earlier years of his life was his own secretary. He could abstract himself for correspondence in the midst of company, and could explain his views and wishes tersely. Any room he occupied was, for the time, his counting-house, any table his escritoire, and his despatch-box was a large breast-coat pocket. He believed

in the honesty of men, and men believed in him. He was cautious, and begot caution; he confided, and begot confidence; he trusted, and begot trust; he was truthful, and begot truth; and he was generous, and begot generosity. Men who served under him learned truthfulness and self-respect, whilst they bettered their worldly fortunes. A man cannot be praised for a sound constitution, but he may have credit for preserving it. Nature gives him a good digestion, and he does not tamper with it. He devotes his life to labour, and pursues it to the end, acquiring wealth, respect, and honour. Such was the man Thomas Brassey, late railway contractor. Long may England produce such men and such contractors!

BEDFORD.

At St. John the Baptist's Church, the whitewash which had accumulated upon the tower of this church for centuries has been all removed, and the walls are re-pointed. The tracery of the belfry and west windows is partly new also. In the niche there has been placed a figure of the patron saint, and in a square sunk panel just underneath has been carved the Agnus Dei,—lamb and flag. The figures are by Mr. Harry Hems, of Exeter. The whole of the contract has been carried out by Mr. John Hinton, of Bedford, from the designs of Mr. Wing, of that town.

A new shop has just been erected in the High-street, from the designs of Mr. John Usher, architect. It is of Gothic character, and the whole terminates in a crocketed gable, which in itself forms a conspicuous feature in the skyline of the main thoroughfare in which it stands. The materials used are red brick, with dressings of Hare Hill and Bath stone. The shop is supported by columns of iron-work, with foliated capitals in the same material, picked out with gold and colour. A sprinkling of carving is scattered about the front. Two dogs, carried in Portland stone, and each about 3 ft. 6 in. high, sit upon dwarf columns, one on either side of the spring of the upper gable. The whole of the works have been carried out by local tradesmen. The carving here also is by Mr. Hems.

THE BREWSTER GATES AT LINCOLN'S INN.

SIR,—In the article entitled "Improvements at Lincoln's Inn," in the *Builder* of the 21st inst., the Brewster Memorial Gates are stated to have been "designed in Belgium." This is not the case. They are an adaptation of the design of a grille, bearing date 1576, in the town-hall of Lüneburg, in Hanover, and were executed in Coventry. They were intended to be placed across the terrace-walk of the Temple Gardens (close to the Thames Embankment), and to form part of a boundary-fence between the gardens of the Inner and Middle Temple. The complete design includes the armorial bearings of those two Inns of Court, one on each of the side-gates. After the work had been executed, it was determined to throw the two gardens into one, and the memorial was thereupon erected (minus the lamb and winged horse) in its present position at Lincoln's Inn.

A BARRISTER OF LINCOLN'S INN.

THE BUILDING TRADE.

THE position of affairs at Messrs. Corbett & McClymont's, West Brompton, remains, we are very sorry to say, the same as it was last week. The general committee of the Central Association of Master Builders met on Thursday, to receive the report of the sub-committee appointed to draw up the rules for the permanent organisation of the society, which is intended to take up the ground occupied by the General Association of Master Builders, prematurely dissolved after the great strike in 1859. According to the prospectus, "workmen's trade-unions are so well organised and so extensive that the only possible way of meeting the various demands continually being made by the men is an extended combination of the employers of labour." It is therefore proposed that the reassociated society shall consist of any employer connected with the building interest in England, Scotland, or Ireland, who should be approved by the committee, the subscription to be one guinea annually. The main objects

to be attained will be the collection of statistics and other information useful to the trade. The association will be in communication with all the other kindred societies throughout the country, and will endeavour to secure by its organisation the prevention of unjust strikes against individuals, or oppressive demands on the part of the men.

BRISTOL.

New schools for the parish of St. Gabriel, Upper Easton, Bristol, were opened on Monday, under the presidency of the mayor, Mr. Proctor Baker. The schools will accommodate 550 children, and the buildings have cost 1,260l. Messrs. Wilkins & Son are the contractors. The sum of 90l. was allowed for the foundations, owing to the loose nature of the soil; but on making excavations it was found necessary to expend 350l. on this part of the work.

Another "British Workman Institute" was inaugurated at Bristol, on Monday evening last, under the most auspicious circumstances. The locality selected is the Broad Plain, St. Philip's, and the building is a substantially-built house that had apparently at one time been occupied by people of no mean position. On the ground-floor is the coffee and reading room, capable of seating upwards of 100 persons, and here newspapers and periodicals will be kept for the use of those frequenting the institute. On the first floor is a spacious club-room, suitably furnished, and large enough to accommodate from seventy to eighty persons. A smoking-room is on the same floor, and will contain bagatelle and chess boards, and other means of amusement, and the rooms above are set apart as bedrooms.

SANITARY CONDITION OF NEW HOUSES.

SIR,—I should feel obliged if you could give me a small space in your columns to describe to your readers the sanitary condition in which many of the houses are in the north-west district of London. I shall only take one house as an illustration which equally applies to many. The one in question is of a block of good-looking houses recently erected by a once celebrated speculating builder. On entering one of the principal rooms, which is of large dimensions, lofty, with large windows, I remarked to the tenant as to a bad smell which he said was "the answer was," "That it proceeded from the next house; the drains were out of order. That answer not being satisfactory, I raised the window-cash, and found, not 12 in. from a window-sill, a stack-pipe, with rain-water heads to receive the water from a back roof, which pipe was connected to top of lead bend from W.C., which lead bent ran into a cast-iron pipe, and discharged itself into a catch-pit at bottom. Presuming that there is a trap at the junction with the main sewer, which is many feet distant, the serious and crying evil arises from the fact that in any way; hence the external air gets in at these apertures, and causes a current of poisonous gases to rush upwards and discharge themselves into our rooms and the surrounding atmosphere. Have the public authorities no power to put an end to such poisonous arrangements? A PRACTICAL MAN.

BUILDING IN BITUMEN.

SIR,—Referring to statements made with reference to Norton's Patent Bituminous Building Construction, at the formation of a "limited" company to work the same, I should wish before investing to make one or two observations and inquiries; and if you will allow me to do so through the medium of the *Builder*, the answers might interest numerous readers. I may premise that I have seen some specimens of his work as Mr. Norton had shown recently in Manchester.

First, as to its combustibility. All bitumens, when found, burn readily in atmospheric air. Italian bitumen is no exception. For many years past inventors have been striving to produce a non-combustible material with which to build, and they have succeeded, and houses are now built which cannot be burnt down by any fire originating inside them; but here we have a proposition by Mr. Norton, not only to use a highly combustible material, a cement, but actually to use the same material to build bricks with. Would not walls so constructed be highly inflammable?

But Mr. Norton says bitumen is a most excellent conductor of heat, and gives as a proof the surprising fact that a 9-in. wall having a thin partition of asphalt between the outer and inner halves, and a thin coating of plaster on the inside, resisted the action of an intense coke fire for five weeks, while the wall on the outside was "comparatively cool." How am I to reconcile this with the statement in "Masprati's Chemistry," that Italian bitumen softens at 210° Fahr., and fuses completely at 234°? Does Mr. Norton mean to say that bitumen will not melt at a red heat? And if the bitumen melted (as most undoubtedly did), what held his wall together? Such an event would place the wall completely at the mercy of the wind, and I do not see that that would help him much. The softening of the asphalt would allow the superincumbent weight to come into play, and the wall would settle or sink, such an event would place the place by the burning of furniture of a single room, especially if the walls were lined with wood boarding, as Mr. Norton proposed.

Coming now to the question of cost, as compared with ordinary brickwork with mortar, I observe that Mr. Norton states 1,600 bricks are necessary to build 1,000 square feet of 14-in. work with mortar joints, whereas 1,200 bricks fill the same space with asphalt. These bricks are all of the same size, the difference in

thickness of the joints must be equal to the contents of

of the mortar. Mr. Norton allows only 7s. 6d. for the necessary
phosphate in 100 ft. of 14-in. work, which as I have shown
the mortar plus 28 feet cube: a sum obviously
Again, 1,200 bricks, 8½ in. by 4½ in. by 2½ in., are made
the necessary mortar just sufficient to make 100 ft.
14-in. work. Mr. Norton says 1,600 are necessary, and
and penalises the cost accordingly. If these 400 bricks are
dusted,—as I maintain they must be,—it will make a
Revenue of 13s. 6d., together with their mortar and cost

Then, again, we are told that under the present system
bricklayer can lay some 700 to 800 per day only, whereas
the new method he can lay between 3,000 and 4,000 per
day. The first statement is near the truth; but Mr.
Norton must not expect any practical man to believe the
ter. So far is it from the truth, that as face-boards
be fixed on both sides of the work, scaffolding to
fixed, bricks to be carried up, asphaltic melled, carried,
and poured, and the boards removed, and wall pointed,
is reasonable to suppose that the man will have done
prospects state that "assuming in getting 500 bricks
position, instead of over 3,000. For the whole
these operations to 100 ft. of 14-in. work Mr. Norton
works the magnificent sum of 5s. 7d., the workman to find
own coal and tools, and all other labour and carriage
materials necessary to complete the work. I should
to ask how it is that Mr. Norton is very much to secure
out at such a scandalously low figure, because if I take
a licence to build in this way, I very much doubt my
ity to get it done for less than tribute the money he
ows for the operations.

Not only is it stated to be the intention to license
holders to use the patent methods, but the company pro-
be to become builders and contractors themselves, and
prospects state that "assuming the company only
construct 90,000 rods of brickwork per annum—
tionally trifling quantity—it would earn a profit of
1000." I should like to ask what data Mr. Norton has
such a sum? Why 40,000 rods of brickwork
annum must be a very large part of all that is done,
this country at least, seeing that its value would be
out a half-million of pounds. What are the licensees
of those who will still build with mortar and cement
do?

A BUILDER.

THE RECREATION GROUND FOR
WARRINGTON.

It was glad to read in your publication of the 14th
inst., a letter signed "M.D.," upon this subject, showing
the utility of the proposed purchase, both as re-
spects price and locality.

can fully endorse every word of "M.D.'s" objections,
since the appearance of his letter, I have seen what it
is seen almost every day—viz., the proposed recreation
and almost enveloped with smoke and malarial eman-
ations from the various works contiguous to it, fully bear-
ing out the statement of the right Hon. John Lubbock
Patton himself said of it, more than two years
—viz., "that it was no longer a place fit to reside on."
yet with an unaccountable perversity, the corpora-
of Warrington deem it advisable site for a recreation-
ground for the people.

I am in hopes that the attention of the local Govern-
ment may be drawn to "M.D.'s" letter before re-
ferred to, in your valuable publication, and institute an
impartial inquiry into the whole subject. It is worth
to be here to remark, that while Leeds has just purchased
"park" or "recreation-ground" for 100s. per acre in
a similar situation, the extravagant corporation of this
city have actually agreed to give (subject to the approval
of the local Government Board, of course) 1,000s. per acre.

SEXES.

PREMIUMS AWARDED BY INSTITUTION
OF CIVIL ENGINEERS.

The Council of the Institution of Civil
Engineers have awarded the following pro-
grams:—

- A Telford Medal, and a Telford Premium, in Books, Bradford Leslie, for his "Account of the Bridge over the Gossai River, on the Goaldoo Extension of the Tern Bengal Railway."
- A Telford Medal, and a Telford Premium, in Books, Carl Siemens, for his paper on "Pneumatic Despatch Boxes."
- A Telford Medal, and a Telford Premium, in Books, William Bell, for his paper "On the Stresses of Rigid Beams, Continuous Beams, &c."
- A Telford Medal, and a Telford Premium, in Books, John Herbert Latham, for his description of "The Venkatesa Canal of the Madras Irrigation and Canal Department."
- A Telford Medal, and a Telford Premium, in Books, George Gordon, for his Paper on "The Value of Water, and its Storage and Distribution in Southern India."
- A Telford Premium, in Books, to Frederick August Abel, F.R.S., for his Paper on "Explosive Agents for Industrial Purposes."
- A Telford Premium, in Books, to Bashley Britten, his Paper on "The Construction of Heavy Artillery."
- The Manby Premium, in Books, to Charles Andrews, his Paper on "The Somerset Dock at Malta."

THE FALL OF A GRAND STAND

AT OUTLAINE, NEAR HUDDERSFIELD.

Our readers will remember the fall of a grand stand at certain athletic sports and races near Huddersfield last month, and the injury of be-
neen sixty and seventy persons. An inquest on
death resulting in one case has been held, and
verdict is as under:—"We, the jurors, unanim-
ously find that Harriet Widdop came to her
death on the 15th of September, from injuries
received by her by reason and in consequence of
fall, on the 25th day of August last, of the

grand stand at the steeplechase and athletic
sports at Outlane, in the township of Longwood.
We also unanimously find that the said grand
stand fell in consequence of defective construc-
tion, but that such defective construction does
not amount to criminal negligence on the part of
any person or persons. And we are unanimously
of opinion, and strongly recommend, that grand
stands and platforms at all public entertainments
should in all cases, before being used, be care-
fully examined, and certified as properly and
suitably constructed, by a competent architect
or surveyor.

CHURCH-BUILDING NEWS.

St. Michael, Eaton Hastings (Berks).—This
interesting little church, containing, specimens
of Early English work, and a fourteenth-century
roof intact, is undergoing restoration of the
nave (the chancel having been previously re-
stored, at the expense of the rector), under the
superintendence of Mr. W. Scott Champion,
architect.

Margate.—St. Paul's Church, with parsonage,
has been commenced, under the direction of
Mr. R. H. Blessley, architect, Eastbourne, the
site being on the Cliftonville Estate, given for
that purpose by Mrs. T. D. Reeve and Mr. J.
Andrews. The contract has been taken by
Messrs. Cook & Green, of London, for the sum
of 8,500l., inclusive of boundary-walls. The
church will be spacious and lofty, measuring
internally 89 ft. long and 56 ft. wide, and the
roof is to be carried through a uniform height of
51 ft. The chancel measures 22 ft. by 31 ft.
The nave is to be of six bays, with arcade arches
springing from circular columns, with clearstory
windows over. Arches divide the north and
south chapels from the chancel, designed for
vestry and organ-chamber. The church is to be
built of brick, faced with random-coursed Kentish
rag stone. The dressings to the doors and win-
dows will be of Box-ground Bath stone. The
aisles will be paved with encaustic tiles, as well
as the chancel. The reredos, pulpit, and font
are to be of Bath stone. The tower will be 80 ft.
high, and will contain a peal of bells. The style
adopted is the architect's Early Decorated;
and there will be accommodation provided for
800 people. The roofs are to be open-framed,
and stained, as well as the seats, and the whole
building is to be heated with hot-water pipes.
The clerk of works is Mr. Mark Davison. The
foundation-stone was laid on the 14th inst. by
the bishop suffragan of Dover, and it is expected
the church will be completed by the middle of
September, 1873.

Maldstone.—The works connected with the
new church of St. Faith are being rapidly com-
pleted, and the church will be consecrated on
the 20th inst., by the Archbishop of the diocese.
The building is of Gothic construction, and the
details are wrought out under the Early English
Decorated style. The internal arrangements
comprise a nave 68 ft. 3 in. long, and 30 ft.
wide; aisles 13 ft. 4 in. wide, and chancel about
30 ft. each way. The pillars at the sides of the
nave have a basement of Bath stone, the rest of
the work being done in red Mansfield stone, sur-
mounted by carved designs, exhibiting natural
foliage conventionally treated. The representa-
tions include oak-leaves, ivy, lilies, columbines,
strawberry-leaves, roses, and ferns. The pulpit,
which is placed at the left-hand side of the nave,
is supported by Peterhead granite pillars, and
is principally formed of white Caen stone, carved
and inlaid with red and green marble. It is
reached by four steps leading from the chancel,
which is slightly elevated from the body of the
church. From the sides of the chancel, figures
representing Praise and Adoration are extended,
and others bend over the communion, holding the
emblems of the Sacrament in their hands. The
whole of the carving has been performed under
the personal direction of Mr. E. Whitehead,
sculptor, London. There are seven windows at
the east end of the building, ten at the north
and south sides, and two large ones, of the lancet
shape, at the west end, which are surmounted
by a rose-window, and a smaller circular one.
There are besides several lights in the upper
portion of the church, and these, in common
with the rest, contain cathedral glass. The
building will be capable of seating 600 persons.
The oak polished seats are open at the ends.
The flooring of the nave aisles, and east end, is
tessellated with Staffordshire tiles. In the outer
western wall a niche is cut for the reception of a
figure of the patron saint, St. Faith, but means
are wanted in order that the statuary may be

procured; a similar need prevents the erection
of the contemplated steeple. The architect of
the building is Mr. E. W. Stephens, and his
designs have been carried out by Messrs.
Clements & Walls, contractors. It is proposed
to enclose the church within iron railings, and to
convert the "green" into a spot more worthy of
its name. When this is done, the neighbourhood
of St. Faith, including the Brencley gardens,
will form one of the most pleasing features in
the town of Maldstone.

Lincoln.—The font has been placed at the
west end of the interior of the new church of
St. Martin. It is a curved octagonal stone font,
standing on a shaft of red Marlston column.
The givers were Messrs. Huddleston & Son.
The seven apse windows have also been put in.
The centre one represents Our Lord as the
Good Shepherd holding a lamb in his arms.
This is the gift of Mr. Robert Dawber, jun. On
the right hand is Our Lord blessing little chil-
dren—the gift of Mr. Charles Allison. On the
left Our Lord as the guardian of children—the
gift of Mrs. Johnson, Newland. Next, Christ
walking on the water—the gift of the late dean.
Opposite to it is Christ knocking at the door—the
gift of the young ladies of Mrs. Roome's
school. Then two decorated windows—the gift
of a friend of the vicar. There are yet the larger
west window, and a nine arched window to be put
in shortly. The whole of the glass is furnished
by Messrs. Hughes & Ward, of London, and will
cost about 600l.

Tattingstone.—The church here has been re-
opened. The funds at the disposal of the com-
mittee were limited, and compelled them to
confine their attention to the repairs which were
absolutely necessary, and to the reseating of the
church. The advice of Mr. Henry Hall, archi-
tect, London, was sought, and upon the report
and designs, and under the supervision of that
gentleman, the restoration has proceeded. Upon
examining the plaster ceiling the architect found
that it covered an open-timbered roof, and this
has been restored so far as the funds allowed,
but the panelling has only been completed in
the easternmost bay. The roof, which is a
double hammer-beam roof, is divided into five
bays by oak trusses, with moulded and curved
bricks springing from carved corbels, and having
angels carved at the ends of the hammer-beams.
The figures had been a good deal mutilated, but
what remained was enough to serve as a guide
for the restoration of the remainder. There is
no chancel arch; a truss is placed at the junc-
tion of the nave and chancel, with crowned
heads at the ends of the hammer-beams, and in
olden times there was a roof-screen. The com-
pleted bay is panelled, the panels being divided
by moulded oak ribs, with bosses at the inter-
sections. The whole roof is boarded with pitch
pine. Vertical pieces, with tracery between,
are placed above the wall-plate. The roof of
the chancel is wagon-headed, and the plaster
having been removed, it has been boarded in a
similar manner to the nave roof, with moulded
ribs having carved bosses at the intersections.
The floors of the nave and chancel are on
the same level, and are now covered with
light open benches, in place of the old pews.
The seats have a slight incline towards the
sloping backs. In removing the old pews some
of the original bench-ends were discovered, and
these have served as patterns for the new ones,
some of which are of a conventional type, whilst
the others have been carved with fruit, flowers,
corn, leaves, &c. The backs of the benches are
panelled. The pulpit stands at the north-east
corner of the nave, and is placed upon a stone
base. It forms four sides of an octagon; is
made, like the benches and roof, of pitch pine;
and has open tracery, with spandrels and patera
in the cornice, carved. The hemlock of the
chancel is similar in character to that of the
nave, and on the north side the old organ, which
has been repaired, and fitted with a pine case
and gilt front, by Mr. Green, of Ipswich, has
been placed, the heavy gallery at the west end
in which it formerly stood having been removed,
and thus opening out the west window. The
space within the communion-rails has been laid
with Minton's encaustic tiles, supplied by Messrs.
Simpson & Son, of London. The stone reredos
is divided into panels. The ground space of the
tower, which was not formerly utilised, has
been slint off from the nave by a screen of
pitch pine, so as to form a vestry. The north
porch, which is that chiefly used, has been re-
paired and restored by the present incumbent,
and a new two-light Decorated window has been
inserted in the north wall of the nave, on the

west side of the porch, the corresponding window on the east side having been lengthened. The roof has been re-tiled throughout. The whole works, the cost of which is about 700l. or 800l., have been carried out by Mr. H. B. Smith, of Ipswich. The peal of five bells has been re-hung by Mr. Naunton, Ipswich. At the re-opening services, these bells were rung by the company of ringers of St. Mary Tower, Ipswich.

Hastings and St. Leonards.—Alterations are going on at St. Mary Magdalen Church. The most noticeable portion of the improvements are the enlargement of the chancel, and the erection of an organ-chamber on the north-east side. A new and larger window of stained glass, representing the Life of Christ, has been placed over the communion, by Messrs. Clayton & Bell. All the details of the alteration are not yet completed. A reredos is still in course of preparation. There are other minor improvements, which have been carried out by Messrs. Hughes, by whose firm the church was originally built. A special re-opening service has taken place.

Keyworth.—The parish church has been reopened. The improvements that have been effected may be briefly summarised. The loft has been removed, the pews replaced by chairs, a new roof has been erected, new windows put in, and accommodation provided for about 270 persons. The work has been done by the day and not by contract, Messrs. Bodley & Carner, of London, being the architects. The east window is by Messrs. Burlinson & Crylls, of London, and the other windows were supplied by Mr. Sollory, of Nottingham. A number of ladies formed themselves into a committee, and to their efforts the insertion of an east stained window is due. A sum of 80l. was collected, and with this money the window has been purchased. The subject is the "Crucifixion." The interior of the chancel is in need of further fittings, and there is a deficiency in the building fund that will have to be met.

Heene.—The foundation-stone of a new church has been laid. It is to be built on the site of the old one. Messrs. E. Nash & Co., of Brighton, have undertaken the contract, at about 2,000l. The style is Gothic, and the edifice will be faced with flint on the outside, and cased with brick on the inside. The west wall is so built that it can be taken down at any time to enlarge the church. The seating accommodation is for 350 people. The size of the nave is 49 ft. in the clear—the chancel will be about 32 ft. The chancel arch will be of red moulded brick, and all the arches will be of the same material, moulded by special design. The inner moulding will be in chalk. The pews will be stained and polished, with sloping backs. The windows, with dressings, and the columns, will be in Bath stone. The chancel will have a fancy cresting, with slate roof, the timber being stained and varnished. The architect is Mr. E. E. Scott, of Brighton.

Darlington.—The Church of St. Paul, North-road, Darlington, opened a short time ago by special licence, has been consecrated by the Bishop of Durham. The edifice stands on a prominent site, and is the only architectural ornament of which that portion of the town can boast. Its style is Early Decorated. It has a nave, 75 ft. by 26 ft.; chancel, 28 ft. by 22 ft.; aisles, each 7½ ft. by 14 ft.; vestry, organ-chamber, and a tower and spire at the south-west angle of the nave, 130 ft. high. The west end, which faces Durham-road, has a spacious doorway in the centre, with a large three-light window over it, the end of the north aisle being relieved by a two-light window, and the end of the south aisle being finished by the tower. The sides of the aisles are pierced by two-light windows, separated by buttresses, and a lofty clearstory is similarly arranged. The east end is filled by a large four-light window, and the sides of the chancel by long two-light windows, and each gable is surmounted by an ornamental cross. The tower is divided into four stages, the first being a porch; the second, the ringing-chamber; the third, the clock-chamber; the fourth, the heltry, and a lofty spire surmounting the whole. Internally the nave is separated from the aisles by five arches on each side, springing from pillars of red stone, with moulded bases, and caps of white stone, which is relieved by a little carving. The roof of the nave is open to the ridge, that of the chancel wagon-headed or arched. The seats are all of pitch-pine, open, with low slanting backs, and moulded ends, accommodation being provided for 600 adults. The floors of the chancel and passages are all paved with mosaic tiles. The pulpit and

font are of Caen stone; the reading-desk, of oak; the communion-rails, of iron and brass. The windows are all filled with cathedral-tinted glass, having coloured borders. The woodwork is stained and varnished. The church is warmed by Lewis's patent warm-air apparatus, and lighted by gas-standards. The whole of the works were carried out from the designs and under the superintendence of Mr. Pritchett, of this town; and the total cost, including iron railing, lighting, warming, and professional charges, is about 4,000l., exclusive of site.

DISSENTING CHURCH-BUILDING NEWS.

Hebden Bridge.—A new Wesleyan chapel has been opened here for divine service. The edifice is in the Gothic style, from plans by Messrs. Whitaker & Russell, of Rochdale. The woodwork is of pitch-pine. The following are the contractors for the several sections of work:—Jonas Kershaw, mason's work; Kershaw Smith, Mytholmroyd, joiner's work; plastering, Messrs. Sugar & Son, Heptonstall; plumbing, gasfitting, warming apparatus, Walsh, Halifax. The chapel will provide accommodation for 300 persons, and has cost 2,000l. It is 55 ft. long and 35 ft. 9 in. wide, with schoolroom the same size underneath. The chapel-floor is reached by a flight of stone steps, terminating at an entrance-porch. The whole of the chapel is fitted with pews, affording accommodation to 300 persons. The schoolroom under the chapel is well lighted and ventilated, and will accommodate about 200 children. There are four class-rooms, formed by partitioning off one end of the schoolroom, and every convenience for holding meetings has been provided. The stone used in the building is all from local quarries, and the exterior is faced with pitch-faced parquits in regular courses, the asblar dressings of the windows and doors being of a somewhat lighter colour. The gables are finished with plain coping, with moulded apex stones at the top. The roofs are covered with Welsh slates and red Brossley ridge cresting. The roof is ceiled half-way up the gable, the principal timbers are exposed, and on each side there are curved braces resting on moulded corbels. The whole of the timber exposed to view, and the pews, and other inside woodwork, are in pitch pine, varnished. The windows are glazed with glass of a simple pattern and tint. The chapel and school are warmed by hot-water pipes.

Pendleton.—The new United Presbyterian church at the junction of West High-street and Seedley-grove, Pendleton, has been opened. The new edifice, which is after the Gothic of the thirteenth century, has been built by Mr. E. Johnson, of Manchester, from designs made by Mr. W. H. Ward, Birmingham. Sitting accommodation has been provided for 500 or 600, and schools attached to the church will hold 300 children. The cost of the building has been about 3,000l.

Clavering (Essex).—The chapel which was opened last week for the Congregationalists consists of the chapel proper, fronting the high road, and several rooms behind, required for week-day services, classes, public meetings, and the Sunday school. Facing one on entering, at the farther end of the chapel, is the preaching platform,—the lower stage for the communion-table and the upper for the minister. It is formed of turned and pierced woodwork, stained and varnished, as is also the whole of the woodwork of the chapel. The galleries surround three sides of the chapel, and are supported on iron columns, coloured and gilt, and the front is framed of wood, fitted in with ornamental iron panels decorated in colour. Sitting accommodation is thus provided for over 370 people. The principals of the roof are exposed to view, but the common rafters are plastered. During cold weather the building will be warmed with a Curney's stove, sunk under the floor. On each side of the platform is a pointed arch door, that on the right leading to a minister's vestry, and on the left to a large class-room. In the rear of the vestry is a scullery, &c., for use at tea-meetings, and a separate entrance. Above these rooms is a large room, with open-timbered roof, for the use of the Sunday scholars, and for public meetings. It is approached by a separate stone staircase from the exterior, and has doors leading into each gallery to enable the children to enter the chapel without going outside the building. The walls of this room are left without any plaster, and have bands of coloured brick worked in as ornament. The

chapel itself is plastered, and it is intended if the course of next spring to decorate the walls and roof with painting and stencilled ornament in ditto temper colour. The building is of Early French character, simply treated. The walls generally are of white Cambridge bricks, relieved by red and black in bands, arches, &c., and by Bath stone and red Mansfield in the tracery of the window shafts, bases, &c. The entire cost will be about 1,800l. The works have been carried out by Mr. Cornwell, of Bishop's Stortford, builder from the designs of the architects, Messrs. Sulman & Rhodes, of London.

Walker (Newcastle).—The new Wesleyan chapel is completed and opened. It is closely adjacent to the old building in which for many years the Wesleyan Methodists have performed service. The chapel consists of a central nave, 72 ft. length, with two side aisles, 50 ft. long, with entrance porches at the west end of the latter. At the east end of the building is a minister's vestry with the singers' gallery over it, and when full will permit it is intended to add a large vestry with rooms over for the residence of a chapel-keeper. Accommodation is provided for about 400 persons, and in the gallery for nearly 600 more. The pulpit platform, surrounded by the communion space, is placed against the east wall separating the minister's vestry from the body of the chapel. The contracts for the building were taken by Mr. Stewart, of Walker, furnaces and bricklayers' work, Mr. Aiston, North Shields, for carpenter and joiner work, Messrs. M. Johnson & Sons, plasterers; Mr. P. Paton, plumber; Messrs. Danler, slater; Mr. Frazier, painter and glazier; and Mr. Somers for iron-founders' work. The whole of the work has been carried out under the superintendence and direction of the architect, Mr. F. R. N. Hill, well, of North Shields. The ground on which the building is erected was presented by the late Mr. Cutburt Hunter.

Leicester.—The memorial-stone of a new Particular Baptist chapel has been laid in Erskine-street. The building will be in the Italian style of architecture, of brick, with stone dressings. The size of the chapel will be 61 ft. by 44 ft. It will be galleried all round, and will accommodate 650 people, exclusive of children. There will be a schoolroom below, the same size as the chapel, and 12 ft. high, 5 ft. of which is below the ground line. The total cost is estimated at about 4,500l. Mr. R. J. Goodacre, the architect, and Messrs. Hewitt & Sons, are the contractors.

Reading.—The Wesleyans have found the chapel in Church-street inadequate to accommodate their congregation, and have determined to erect a more commodious building in the Queen-road. The site selected is at the corner of Watlington-street, and has the advantage of three frontages,—to Queen's-road, Watlington-street, and South-street respectively. The design is Early Gothic, and the chapel will be constructed of red bricks, with white stone dressings. It will furnish 900 sittings, and schoolroom, 60 ft. by 31 ft., will be built on the South-street side. The cost, including site, will be over 7,000l. The work will be executed by Mr. Woodroffe, under the supervision of Mr. Morris, architect, and will be at once commenced. Nearly 3,000l. have been already promised.

SCHOOL-BUILDING NEWS.

Brentwood.—During the past twelve months the building has been gradually approaching completion in Rose Valley. It has been opened as a middle-class commercial school. The school-house itself is a large and commodious structure capable of accommodating 120 boys. The front of the road is of stocks, with bands and dressings of coloured brick and Portland. Projecting windows on either side of the main front and a bell-tower and flagstaff break the outline. The ironwork on the bell-cote is more than 70 ft. above the ground. The schoolroom is a lofty building measuring about 50 ft. by 20 ft., having a high pitched roof, while abundance of light and ventilation are provided. Beneath is an asphalt playground, for use in wet weather. A plot of land opposite the school premises has been secured as a playground. The dining-hall is 11 ft. in height, and nearly in the centre of the building on the ground-floor. The principal dormitories are about 50 ft. in length by 10 ft. in height, and are fitted with a separate spring bedstead for each scholar. The lavatories are supplied with water upon a recent patent, preventing waste or overflowing. A bath-room,

which hot and cold water is always at hand, is provided. Gas is laid on to every room in a house. The school is within two minutes' walk of the railway station.

Templecombe.—New church schools have been opened at Henstridge, near Templecombe, near, by the Bishop of Bath and Wells. The new school stands in a picturesque and central position, within a short distance of the celebrated Henstridge Ash, the tree beneath which, according to local tradition, Sir Walter Raleigh smoked tobacco. The buildings consist of a schoolroom and a teachers' residence, attached to which are boys' and girls' playgrounds, and a garden for the master. The exterior is forest marble, rock-faced, with gilding and dressing. The total cost is about £200, including site, &c. The schools are calculated to accommodate 136 in the large room, and in the infant room, being the full number for which accommodation is required by the Education Department.

PROVINCIAL.

Wavertree.—The foundation-stone of a town for the ancient village of Wavertree, near Liverpool, has been laid by Mr. J. A. Picton, surveyor of the local board of the district. The site of the hall is in high-street, in close proximity to the existing public offices, which have lately been sold to the Roman Catholic community for the purposes of a church and schools. The general character of the front elevation of the building is to be Italian, and it will be built of stone from the Cefn Quarries, the lower strata being Rancorn redstone. The entrance porch will be carried up the two stories, and finished with a pediment, the cornice being carried across the front and surmounted by a balustrade. The lower part of the porch will be supported on columns having caps of an Ionic character, the upper part being somewhat of the Corinthian type. The window in front will have an architrave, the lower ones having engaged keystones, the upper ones carved gilloche capitals, and supported on trusses. Between the windows engaged pilasters, corresponding to the columns, will be placed with suitable intervals. The whole of the ground-floor will be finished with rusticated ashlar, the upper portion being plain polished work. On the ground-floor situated the offices of the board, the board-room, a strong room, &c. The public hall will be situated in the rear, having lavatories, and a large dining-room attached thereto, access being given to the back of the hall and retiring-room through a private corridor for the use of "proprietors." This hall will be 60 ft. long, 34 ft. wide, having an ornamented and enriched ceiling in an elliptical form carried by an ornamental cornice, supported by pilasters having ornamental capitals. The heating of this room will be by hot-air pipes carried above the floor behind the chimney. The lighting of the room by day will be by means of large windows on one side, and at night by tripod lights placed all round the room on the top of the cornice. Attention has been paid to the ventilation of this room. On the first floor are placed officers' residences and a secondary board-room, also additional retiring-rooms for the use of the large hall. At the rear of the township yard, having a separate access from Chesnut-grove, for storage of coal and carts. Messrs. Okills & Morrison, of Wavertree, are the sole contractors. Mr. Reeve, of Liverpool, is the architect.

FROM AUSTRALIA.

VICTORIA.

Melbourne.—The new Temperance-hall, erected by the Melbourne Total Abstinence Society, has been opened. The front of the building is to be in the Italian style of architecture, with the entrance in the centre, between two shops: it is 9 ft. wide, laid with marble tiles, and has pilasters on each side supporting festooned trusses. At the end of this front are polished cedar pedimented doors opening into the lesser hall, 43 ft. by 33 ft., which will accommodate 250 persons, and will be used for ordinary meetings or smaller assemblies, at right and left are the main staircases leading to the large hall, which is 76 ft. long, 36 ft. by 33 ft. in height. It is finished with ornamental pilasters, with enriched moulded brackets, frieze, and cornice; a gallery runs round three sides, with a light ornamental iron

railing. The hall, with its gallery, accommodates 1,000 persons. The building is of brick, and the front is stuccoed. There are three rows of windows, although there are only two floors. The two uppermost rows light the floor hall upstairs. The foundation-stone of the hall was laid by Mr. M'Pherson, as Mayor of Melbourne, on the 30th September last. Mr. Ellerker was the architect, and Mr. Lockington the builder. The hall, with its fittings, will cost about 6,500L. Towards this 5,000L. have been raised on mortgage at 6 per cent. Melbourne will soon be well provided with public halls sufficient for its demands. In a few months' time the Mechanics' Institute will have its alterations completed and the new hall built. A sum of 6,200L. is to be expended in transforming the institute into an improved building.—The foundation stone of the new hall in connexion with the Melbourne Mechanics' Institute has been laid. The building, which will cost about 6,000L., is being rapidly proceeded with. The erection of a new synagogue for the St. Kilda Hebrew congregation, at Charwood-grove, St. Kilda, has also been commenced.

Keew.—A Jesuit college is about to be erected here on an elevation whence the entire of Melbourne and suburbs will show as a panorama. The architect is Mr. T. A. Kelly, of Elizabeth-street. The style selected is Classic, such as that of Southern Italy. The main block consists of a parallelogram, with projecting central and side blocks crowned by dentilled and moulded pediments, and connected by overhanging eaves of a similar character. The wings are connected on the different floors with the central portion by broad verandahs to each floor. The hall runs transversely, and is 12 ft. wide, and opening off it are broad corridors running the entire length of the building. At the termination of these corridors the main staircases will be met; these are carried up in towers which rise to a total height of 100 ft., and terminate in a low flat pointed roof. To the right, on the ground-floor, are the play-rooms, class-rooms, and study; while on the left will be found the parlour, private rooms, and refectory, this last 42 ft. by 24 ft. This floor is 17 ft. high. On the upper floor are the dormitories, infirmaries, lavatories, bath-rooms, and chapel; the larger dormitory is over 60 ft. square. To the north will stand in a detached block the kitchen buildings, their usual adjuncts, and the offices for the service of the college. The projecting wings are pedimented, and enriched by moulded freestone quoins springing from a moulded blue-stone base, and are pierced with windows having the usual freestone dressings. The general character of the building is similar, the principal entrance consisting of projecting and recessed circular-headed doorways, flanked by small similar windows. The towers are pierced by windows similar in character, and divided at the different stages by projecting cornices. The roof springs from the eaves, and, sloping back all round, forms a large lead flat, centrally protected all round by a wrought-iron balustrade. The verandah all round is supported by coupled iron columns resting on bluestone bases, and enriched with fancy ironwork of classic design. The contemplated expenditure will be about 16,000L.

Wages at Melbourne.—The following wages for skilled labourers and other tradesmen are without rations, unless where specially mentioned.—Stonemasons and plasterers receive 10s. per day; carpenters, from 8s. to 9s. per day; slaters, 10s. to 11s. per day; bricklayers, 10s. per day; labourers, from 6s. to 7s. per day; pick-and-shovel men, 6s. per day; the day's work is eight hours. The average earnings of cabinet-makers, for good workmen, are 2l. 15s. per week; and for second-class workmen, from 40s. to 45s. per week.

Miscellaneous.

St. James's Park.—The Westminster District Board of Works have just carried out of their own expense, aided by a contribution of 160L. from the residents in the neighbourhood, an excellent local improvement in the construction of a carriage-way from the Birdcage-walk, in St. James's Park, to Queen-square, and the demolition of unsightly railings which have for many years separated Park-street from Queen-square. This will enable the Metropolitan Board of Works to get rid of one of the "Park-streets" of the metropolis.

The Choir-Screen, Exeter Cathedral.—Our readers will remember a sharp discussion that occurred as to the retention or otherwise of the choir-screen in Exeter Cathedral, at the time the restorations were commenced. One party advocated its removal, and the other insisted upon its retention. The dean and chapter were averse from the removal, and Sir Gilbert Scott strongly opposed it, intimating that if it was intended to pull down such an interesting relic of antiquity, another architect must be employed in his stead. Both with the chapter and the architect the propriety of piercing the screen was allowed to remain an open question, but at last the matter has been settled. While adhering to their determination to retain the screen proper, and to the belief that the organ cannot be placed in a better position than where it is, at the top of it, they are agreed that the general appearance of the building will be improved, and the convenience of the worshippers be increased, by the perforation of the unsightly stone and rubble wall of separation against which the return-stalls of the choir rested. The inner arches, now filled up by rough masonry, will, in fact, be cleared out, and the open stonework, similar to that which runs down the north and south aisles, from the pinnacles to the screen, will be extended across the back of the screen, and against it the western walls will stand. This piercing of the screen will afford a partial view into the choir from the nave, and will enable people in the nave to hear the service, and probably the preacher in the choir. Sir Gilbert Scott approves this plan of dealing with the screen, because the principle of preserving what is worthy of preservation is adhered to, and the objection to the complete cutting off of one part of the building from the other by a thick wall is surmounted.

Institution for the Blind, and the Deaf and Dumb, at Stockport.—The foundation-stone of a new institution for the blind, the deaf, and the dumb, at Stockport, has been laid by Miss Louisa Walthew, the eldest daughter of the mayor of that borough. The new building will occupy a central position in the town, in St. Peter's Gate. It is estimated that it will cost over 3,000L. It will be built in the Italian style of architecture, will consist of three floors, and will have a stone frontage. On the first floor will be the committee-room and a work-room; and on the two top floors will be other store and work rooms. Accommodation will be provided in the whole of the building for from 60 to 100 patients, but none of these will reside in the institution. They will go day by day, and work at several light trades, for which they will receive remuneration in accordance with the trade tariff. A library and reading-room will be established. The building is being erected by public subscription, and about two-thirds of the amount required for its completion have already been obtained. The architect is Mr. T. H. Allen, of Stockport; the contractor, Mr. Adam Goddard, builder, Stockport; sub-contractors, for the stonework are Messrs. Hulme, Brothers, Stockport; and for the brickwork, Mr. H. Barlow, Stockport.

Optical Errors in Painting.—The *Revue Scientifique* contains a paper on this subject by Professor R. Liebreich, ophthalmologist, who went to visit the National Gallery on purpose to study the Turner collection, and, after viewing the first works of that artist, was surprised to find in his later works, posterior to 1830, quite a different, nay, a morbid manner of treating his subjects. While in his earlier productions the solar disc is clearly defined, and the rays proceeding from it are equally diffused all round, in his later paintings every luminous point is transformed into a vertical line, the length of which is proportional to the intensity of the light. Thus, for instance, houses situated on the brink of a lake, or people in a boat, are so completely mixed up with their reflection in the water that the horizontal line of demarcation between the two elements is completely obliterated, and all becomes an agglomeration of vertical lines. All that is abnormal in the shape of the objects, in the design, and even in the colour of the pictures of this period, may be explained by this vertical diffusion of light.

Ephesus in Bloomsbury.—Since the publication of our notice and illustration of the sculptured column from the Ephesian Temple of Diana, Messrs. Mansell & Co. have issued photographs of other deeply-interesting relics from the same site referred to in our article.

Gas on Board Ship.—The problem of the manufacture of gas on board sea-going ships has, it is said, been solved by Messrs. J. T. B. Porter & Co., of London and Lincoln. The gas will be manufactured from oil. The apparatus consists of three sections, viz., retort-stack, washers, condensers and scrubber, and gas-holder: the whole being contained in a space of 1,600 cubic feet, or 22 tons measurement space. The washers, &c., for the purification of the gas after it leaves the retorts, are provided with overflow pipes, so arranged that, however heavily the ship may roll, the water will be maintained at a uniform level. The holder is a combination of tank and holder. The holder is so guided in ascent and descent as not to be affected by the motion of the ship. The regulator or governor, like the holder, is also unaffected by it. Every precaution is taken against the possibility of danger from explosion: each section is separated from the others by iron bulk-heads, and every portion of each section is isolated by shut-off and bye-pass valves, so that any one or more of them may be thrown out of use, for inspection or cleansing. The gas produced is pure and bright, a jet burning 1½ to 2 cubic feet per hour being equal to eleven or twelve wax candles. The large saloon of a steamer, when lighted with thirty or forty of these jets, presented a brilliant appearance.

Drawing.—We learn from the *School Board Chronicle* that the Legislature of Massachusetts, in order to facilitate the further culture of its artisans, has issued a law by which the State is authorized to establish schools of design in every village, and compelled to maintain at least one of such schools in every town of 10,000 inhabitants.—The committee of the Berlin Women's Association for the Encouragement of Kindergärten, &c., invites essays on the following subject:—Demonstrates the necessity of instruction in drawing for all grades of the national elementary school, and indicate a method of teaching drawing such as is applicable to the national school, and based on the writings of Fröbel and his followers, as likewise on experience gathered in the Kindergärten. The essay pronounced to be the best is to receive a reward of six Friedrichs d'or (over 5*l.*), and the second best an honourable mention. Every essay must be signed with a motto of some kind, and the same motto, with the name and address of the author in a sealed envelope, is to be addressed to Herr M. C. Luther, Melchiorstrasse, 10, Berlin, on or before December 31, 1872.

A New Ventilator for Railway Carriages.—The Queen's saloon carriage on the London and North-Western Railway has had affixed to it a new description of ventilator. Outside the carriage are three little projections on the roof right over where the lamps are generally let in. These protrusions are what are called the caps of the ventilator. The movement of the train causes them to work and keep up a thorough ventilation inside each carriage to which it is affixed. The arrangement in the interior of the roof of the carriage is nothing more than an ornamental grating. Between the grating and the cap outside there is a cavity for the lamp. The cap is so constructed that ingress to wind and rain is wholly prevented. The cap rotates without noise, and by a mechanical arrangement creates an upward current which carries away all impure gases that may be generated. This little appliance can be fixed upon any railway carriage without disturbing present arrangements. It can be fitted into omnibuses, holds of vessels, as well as railway carriages.

A Mechanics' Institute for Carlton.—The foundation-stone of a mechanics' institute and workmen's club has been laid, by the Earl of Carnarvon, at Carlton, near Nottingham. The village of Carlton forms a portion of the estates which belonged to the Chesterfield family. The institution is intended as a memorial of the late Lord Chesterfield and the Hon. Sophia E. Forester, and is to be erected at the sole cost of the rector of Carlton, Gedling, and Stoks, the Hon. and Rev. Orlando Forester, who built new schools and renovated the parish church. The institute, or club-hall, will be erected near the church schools, and the architects (Messrs. Goddard & Son, of Lincoln) have prepared the plans in accordance with the general style of the schools. The building will have a frontage to the main road, and will include a newsroom, 22 ft. by 20 ft.; a lecture-room, 32 ft. by 22 ft.; together with the other rooms necessary for such an institution. The site has been given by Lord Carnarvon.

An Aquarium for Great Yarmouth.—Under the name of "The Great Eastern Aquarium Company," a scheme has been started, having for its object the establishment of an aquarium at Yarmouth, similar, in some respects, to those at Brighton and the Crystal Palace. The capital of the company is 40,000*l.*, in 20,000 shares of 2*l.* each. The plans and elevations of the proposed building have been prepared by Mr. E. Welby Pugin, who is the architect to the company, and amongst other things a central hall is talked of, capable of containing 2,000 people, and restaurants for providing refreshments for visitors. The site selected is on the north side of the Britannia Pier, commencing in a line with the north side of Prince's-street, and extends northwards 800 ft., and is 350 ft. wide. The western boundary will be in a line with the original Marine Parade, and the eastern boundary will be about 130 ft. eastward of the present Drive, and opposite Norfolk-square.

Restoration of St. David's Cathedral.—The Building Committee met at St. David's on the 13th instant, the Dean in the chair. The financial statement showed that the total receipts amounted to 21,487*l.*, and the total expenditure to 21,460*l.* A letter from Mr. King (Sir Gilbert Scott's assistant) was read, which certified that all the works connected with the first contract had been completed at a cost of 17,253*l.* 1*s.* 4*d.* The repair of the roof of the nave, with its beautiful carved ceiling, and of the south side of the nave, has been very nearly completed, but at a greater cost than Sir Gilbert Scott anticipated. The Committee resolved to repair and make perfectly water-tight the roof of the north aisle of the nave, leaving alone for the present the restoration of the parapet. They also resolved to floor the whole of the nave with concrete. The amount required for the completion of these works is 3,400*l.*

Sheffield Architectural and Archaeological Society.—The last excursion for this summer of the members of this society took place on Thursday before last, when a large party started by train to Worksop, where carriages awaited them. They immediately drove off to Clumber, accompanied by Mr. White, of Worksop, and were kindly permitted to go over the house, gardens, and pleasure-grounds, after which they proceeded to Thoresby. Here, also, by the kindness of Earl Manvers, they were permitted to examine the new house and garden, accompanied by Mr. Horncastle, the Earl's agent. They then proceeded to Edwinstowe, where, after visiting the church, the president (Rev. J. Stacey) read a paper upon "Sherwood Forest and Neighbourhood." After visiting the "Major Oak," the party returned to Worksop, and had tea at the Lion Hotel, before leaving for Sheffield. The weather was excellent.

Ancient Mural Paintings in South Leigh Church.—The parish church of South Leigh, near Oxford, was lately re-opened, after restoration, for divine service, by the Bishop of Oxford. The church has been entirely re-seated and re-floored, heating apparatus introduced, walls and windows repaired and partially rebuilt, roof-screen repaired and painted, and other renovations carried out. The paintings on the roof-screen and new altar have been executed by Mr. Sidney Gibbs, of Great Russell-street. On taking off the many coats of white-wash on the walls of the church, some wall paintings of the fifteenth century came to light. The paintings (in distemper), though faded, were quite capable of recovery, and Mr. Sibthorp undertook the charge of the work. The oldest are "The Resurrection" and the "Weighing of Souls." About 1,000*l.* have been already spent on the restoration.

Fatal Accident at Littleborough.—An inquest has been held at Littleborough, before Mr. J. Molesworth, touching the death of Sarah Stott, Jane Elizabeth Harrison, Elizabeth Hannah Mason, and Mary Devine, who were killed by the falling of a wall 70 ft. high at Frankfort mill. Mr. Heap, the manager of the mill, stated that about twenty minutes past five the weather was windy, and he saw a very bright flash of lightning, thunder following a few seconds after, and then he heard a noise which lasted a second. At once he opened the iron door, and found the east end gable had fallen. He went down and discovered that it had gone through the floor of the bottom room, and that six workpeople were buried, and then got assistance to release them. The inquest was adjourned.

Columbia and Farringdon Markets.—Deputy Fry asked the chairman of the Mark Committee, at the last meeting of the Comm. Council, if he would explain the present state of Columbia and Farringdon Markets. Mr. Friel, the chairman, replied that as to Columbia Market the committee had lost no time in procuring evidence as to the practicability of making tramway into the market; that the matter was still under consideration, which had been somewhat interrupted during the recess; and that meanwhile, the market continued unoccupied. The question of making Farringdon Market an institution worthy of the City was also under consideration, but it was an important subject, and involved many interests. We think the Corporation will find Columbia Market "white elephant."

Spontaneous Combustion of Wood.—At the opening sitting of the Paris Academy of Sciences, a letter was read from M. Goussier, describing a case of spontaneous combustion of wood. A manufacturer, M. Watlier, of Ribemont in the Aisne, happening to be in his yard one noon, on one of the hottest days of the year, perceived a wall, emitting a very slight curl of smoke. It had been standing there many days, and there was nothing that could have set it on fire. On blowing upon it at a point where it was in contact with some old boards, a glimmer perceived through a thin film of ashes that had been formed on the surface,—in short, the wood was being consumed by this superfluous ignition, which, when observed, appeared to have lasted several hours.

New City Library.—The new library-museum for the City are rapidly approaching completion. The opening must depend on circumstances not altogether within the control of the committee under whose superintendence work has been carried out, but it certainly cannot be far distant. The main edifice, comprising in the basement the museum, strong-rooms for the safe keeping of deeds, documents, and the library above, with adjacent reading-room, committee-room, &c., are all actually completed. They are now receiving final touches, and in the course of a week or two will be ready for the reception of the library and archaeological treasures.

The Historical Medals of the Loan Corporation.—At the last meeting of the Common Council, a letter was read from the librarian of Trinity College, Cambridge, expressing a hope that the corporation might be willing to augment the collection of the college. A grant of copies of the several medals struck by the corporation in commemoration of various important events in its history. The application was well received by the Court, and referred to the Library Committee to consider and report, and Mr. J. T. Bedford took care to say that it would be a graceful act on the part of the corporation to distribute copies of a fine collection of medals among the various Continental towns and universities.

Free Library at Rochdale.—A free public library and a reading-room for the borough of Rochdale have been formally opened. The collection of the library is in the town-hall, and the books have been classified, removed to the proper places in the library-room at the town-hall, and all the necessary arrangements completed. The total number of books purchased for the library is 11,274, at a cost of 1,916*l.* These various donors have added 496, making the total 11,770, divided thus:—Reference department, 3,738; lending department, 8,032. The specifications of patents have been arranged. There are also some interesting early specimens of the typographical art, of the dates of 1484, and 1520.

Opening of a New Miners' Hall, Chesterton.—The corner stones of a new Miners' Hall have been laid at Chesterton, in Staffordshire, by Sir C. B. Adderley and E. M. Buller, the members for North Staffordshire. The hall is to be capable of accommodating a thousand people, besides having a room for reading-room, library, &c. After the first stone has been laid, Sir C. B. Adderley and E. M. Buller addressed the vast assembly to witness the ceremony.

School Grate.—A silver medal has been awarded to the "Manchester School Grate" for its domestic and other purposes, at the Great International Show.

Surveyor's Report, Montreal.—The report of the city surveyor of Montreal, Mr. P. Macdonald, of the various works executed by the 1st department of the city during the year 1871, has been presented to the council, and read in a printed form. New sewers are being laid in various streets, and the surveyor recommends that all service-sewers from main sewers should be of clay pipe, trapped, and constructed by men employed by the corporation. Great St. James-street is to be paved in wooden blocks, by Mr. D. McNevin, contractor. Tar composition is being laid on foot-boards. Inspectors of contracts are advised.

Proposed Memorial Hall, Chesterfield.—Effort is about to be made on the part of the Chesterfield and Derbyshire Institute of Engineers to erect a public hall to the memory of the late George Stephenson, who resided at Tapton House, and was buried at Chesterfield. It is proposed to purchase a piece of ground, and to appeal to the whole mining district, comprising the town of Chesterfield as the metropolis of the eastern midland mining districts, asking for support towards the erection of a large institution for lectures, meetings, &c., and a training school of mechanical and mining instruction.

Reduction in the Price of Copper.—Messrs. W. & A. G. Parson, & Co., of Birmingham, in their circular, remark:—"Copper has to-day been sold reduced 10l. per ton, making present prices—Tough ingot, 93l.; best selected, 95l.; sheets, 100l. per ton." Messrs. Sims, W. & A. G. Parson, & Co., announce present quotations as follows:—Copper, official reduction; manufactured (strong), 100l. per ton; ordinary ingot, 93l. per ton; heat selected, 95l. per ton; locomotive plates (plain), 102l. 10s. per ton. Yellow metal reduced 2d. per lb.; sheet-lead and bolts, 81d. per lb.; composition nails, 1l. per lb.

Improved Cabs.—The Council of the Society of Arts have issued a paper announcing their intention to give a prize of 60l. for the best improved cab of any description; two prizes for next two best, and two prizes of 10l. each for the next two best. The competing cabs must be exhibited at the International Exhibition to be held in South Kensington in 1873, and on or before the delivery at the Exhibition buildings, to be certified to the satisfaction of the judges. It has been in regular use in the streets of London, or other city or town of the United Kingdom, for three months previously. They will be delivered on or before the first Saturday in April.

all of Part of a Chimney-stalk at Aylth.—A brick chimney-stalk, in connexion with a new wind-mill, at Aylth, in Scotland, is at present under erection, and when the men left the work on Tuesday, at dinner-time, it had been raised to the height of 25 ft. On the return of the men, one of them was being pulled to the top, when about 10 ft. from the ground the apparatus gave way, and several feet of the brick-work fell amongst a group of people at the bottom. Two of them were struck by the falling mass, and severely injured. Considerable damage was caused, and the work will be retarded.

Lirkbeck Literary and Scientific Institution, Southampton-buildings, Chancery.—This institution has just issued its programme for the winter session. Numerous courses in language, history, mathematics, physics, and mental science, art, &c., are open to ladies and gentlemen. A legal department has been added, comprising equity, conveyancing, common law. Arrangements have also been made by which a complete course of technical instruction can be obtained. This will be available for students preparing for the examination for the Whitworth Scholarships.

Working Men's College, Great Ormond-street.—We would direct attention to the programme for the new term, just now issued. There are six art-classes under the direction of W. Cave Thomas. The Rev. Dr. Barry, principal of King's College, will deliver the inaugural address on Wednesday, October 2nd, at 4 p.m. Several courses of lectures are announced.

Salver.—The Rock says it is proposed to erect a district church at Salver, as a memorial to the late Rev. George Fisk, the much-respected minister. It is estimated that the cost will be 10,000l.

Money-making Underground.—A huddler at Ashton writes:—"Whilst my workmen were engaged getting up the foundation of some cellaring at Winson Hill House, Soho, on Friday last, they came upon some large coiners' heating furnaces, in a fine state of preservation, totally hidden from view, and fully 5 ft. under the surface. They were bricked up in their furnace head, and had no apparent opening thereto. They were found under the second or false floor of the ground-floor closet, and had no doubt been in that position more than a hundred years."

Workmen Abroad.—At a moment when the high price of provisions and the unsettled state of the labour market make the position of the working classes in this country somewhat uncertain, the appearance of a blue-book containing further reports from her Majesty's diplomatic and consular agents abroad respecting the condition of the industrial classes and the purchasing power of money in foreign countries, is opportune. It gives a general survey of the condition of the workman in the leading countries of the world.

National Monument to Robert the Bruce.—The local committee appointed to carry out the erection of the above monument met in the Council Chambers, Stirling. Mr. George Cruikshank's model was highly approved, and it was resolved that it should be publicly exhibited in a shop in King-street. The site granted by Government on the esplanade of Stirling Castle was cordially approved. The committee determined at once to raise the necessary amount of funds, which the chairman stated would not exceed 1,500l.

Proposed Statue of the Prince Consort.—On the motion of Mr. George Shaw, in the Court of Common Council of the City of London, the resolution of the 2nd of May last, referring it to the Improvement Committee to obtain a design for the pedestal of the statue of the late Prince Consort more suitable to the site, and considered with a special reference to the proportions of the statue, was rescinded, and it was referred to the committee to provide a suitable pedestal at an expense not exceeding 2,000l.

The New Law Courts.—An Act was passed in the late session to make considerable improvements in the Sale-street and Carey-street, fronting the new Courts of Justice. The contemplated alterations, with the improvements, nearly completed in Lincoln's-inn, will form important metropolitan improvements. A company, called the Metropolitan Estates Company, has been dissolved, and a new company has been formed, with 300,000l. capital, by which a new class of buildings for the legal profession will be erected.

Remains of Old Westminster.—In making the foundation for St. Stephen's Club, at the corner of the Victoria Embankment, the workmen, after cutting through the road to the old bridge, and clearing away the accumulated rubbish and made soil of ages, reached in the maiden earth, at a depth of 20 ft., a thick wall built of stones of great size, and standing upon piles about 8 ft. long, topped with thick planks. The wall inclosed a considerable space.

A Strike in Paris.—A strike (says *Galignani*) has just broken out amongst the journeyman stone-cutters employed in the works of the new Palace of Justice, in Paris. The movement was at first insignificant, but has now become more serious, owing to an attempt made by the malcontents to deter others from their labour. Warrants of arrest have been issued against ten of the leaders.

Proposed Extension of the Factory Act.—Sir John Lubbock has, it is stated, undertaken to introduce a Bill to extend the provisions of the Factory and Workshops Act to all shops open for the manufacture, sale, or repair of any article, or part of an article, throughout the United Kingdom.

TENDERS

For new parish church at Reading, Berks. Mr. Wm. Allen Dixon, architect. Quantities supplied:—	
Masley & Rogers.....	26,736 0 0
Wicks & Bangs.....	6,689 0 0
Nightingale.....	6,146 0 0
Staines & Son.....	5,876 0 0
Mann.....	5,739 0 0
Gibson, Brothers.....	5,685 0 0
Aitken & Walker.....	5,595 0 0
Niblett (accepted).....	5,462 0 0

For extension of offices for the Imperial Gas Company, at John-street, W.C. Mr. Francis Edwards, architect. Quantities by Mr. Cubitt Nichols:—	
Manbridge (accepted).....	23,439 0 0

For Blackburn Congregational Church. Messrs. John Tarring & Son, architects:—	
Ives & Son.....	218,923 0 0
Neill.....	18,829 0 0
Cooper & Tulks.....	14,825 4 7
Higson.....	13,728 0 0
Abbott.....	13,439 0 0
Peto, Brothers.....	12,136 0 0
Cook & Green.....	11,993 0 0
Luscombe (accepted).....	11,437 0 0

For alterations and additions at No. 43, Leman-street, Whitechapel, for the East London Shoe Black Society. Mr. John Hudson, architect:—	
Sparks.....	21,747 0 0
Read & Son.....	1,734 0 0
Little.....	1,688 0 0
Outwaite & Son.....	1,679 0 0

For warehouses and shops for the Co-operative Society, Lincoln. Messrs. Bellamy & Hardy, architects:—	
Chappell.....	27,690 0 0
Bluns.....	7,057 0 0
Martin & Sims.....	6,843 0 0
Hobson & Taylor.....	6,797 0 0
Sharpe.....	6,690 0 0
Closs.....	6,547 0 0
Brooks.....	6,508 0 0
Barnes & Wright.....	6,471 0 0
Huddleston & Son.....	6,258 0 0
Readall.....	6,247 0 0
Young.....	6,225 0 0
Singsby.....	5,831 0 0

For alterations to the Crown and Castle, Kingsland, for Mr. Hammond. Mr. R. Cotton, architect. Quantities not supplied:—	
Chaps & Co.....	21,125 0 0
Kelly, Brothers.....	1,940 0 0
Brown.....	847 0 0
Jenkins.....	825 0 0
Bishop.....	789 0 0

For a pair of cottages on the Woodbridge-road Estate, Guildford. Mr. Henry Penk, architect:—	
Strudwick.....	4,339 0 0
Mason.....	3,398 0 0
Swayze & Sons.....	3,212 0 0
West (accepted).....	315 0 0

For erecting Clarendon Lodge, Maidstone Vale. Mr. H. M. Burton, architect:—	
Howard.....	21,782 0 0
Cannon.....	4,725 0 0
Nightingale.....	4,582 0 0
Mitchell.....	4,509 0 0
Thorn.....	4,458 0 0
Tinswell.....	4,380 0 0

For new schools at Pewsey, Easton, Wilts. Mr. S. Overton, architect:—	
Dyer.....	2,544 0 0
Nightingale.....	479 0 0
Pearce.....	402 0 0

For Western General Dispensary, Stafford-street, Marylebone. Mr. J. Savills, architect:—	
Dove, Brothers.....	25,375 0 0
Howard, Brothers.....	5,998 0 0
Hill, Keddell, & Waldram.....	5,940 0 0
Sharrington & Cole.....	4,983 0 0
Bayes & Ramage.....	4,900 0 0
Henshaw & Co.....	4,890 0 0
Roberts.....	4,854 0 0
Adamson & Son.....	4,823 0 0
Gill.....	4,777 0 0
Nightingale.....	4,777 0 0
Longmire & Burgess.....	4,754 0 0
Jackson & Shaw.....	4,682 0 0
Perry & Co.....	4,659 0 0
Cranwell & Garrad.....	4,568 0 0

For new residence and stables at Horsham, Sussex, for Miss Paget. Mr. G. E. Street, architect. Quantities by Mr. C. Poland:—

	Residence.	Stables.	
	Local Stone.	Local Stone.	Bath Stone.
Dowdney.....	25,733	25,763	2,669
Bushby.....	5,647	5,492	965
Sharrington & Cole.....	5,527	5,239	687
Simpson.....	5,500	5,475	650
Dove, Brothers.....	5,475	5,475	685
Garruthers.....	5,375	5,375	665
Adamson & Son.....	5,353	5,161	695

For fittings, fixtures, &c., at the New Lambeth Work-house, Kennington-lane. Messrs. B. Parris & T. W. Aldwinckle, architects. Quantities supplied:—	
Mills.....	24,124 0 0
Carter & Sons.....	3,887 0 0
Sharrington & Cole.....	3,600 0 0
Nightingale.....	3,588 0 0
Trebble & Morley.....	3,580 0 0
Ennot.....	3,559 0 0
Elliot.....	3,505 0 0
Mitchell.....	3,500 0 0
Crockett (accepted).....	3,459 0 0

For the erection of school-houses, &c., at Old Ford-road, Bow (eastern site), for the School Board for London. Messrs. Henry Jarvis & Son, architects:—	
Newman & Mann.....	27,336 0 0
Williams & Son.....	6,783 0 0
Dove, Brothers.....	6,715 0 0
Roberts.....	6,690 0 0
Marsland.....	6,590 0 0
Hill.....	6,499 0 0
Henshaw.....	6,263 0 0
Tarrant.....	5,987 0 0

For alterations, &c., 109, Fleet-street. Messrs. Arding & Bond, architects:—	
Pritchard.....	2,633 0 0
Nightingale.....	555 0 0
Banford.....	380 0 0

For erection of pair of villa residences at Hammersmith. Mr. Wm. Paice, architect:—	
Taylor.....	21,150 0 0
George.....	1,100 0 0
Cook.....	1,080 0 0
Hendall.....	1,008 0 0

The Builder.

VOL. XXX.—No. 1548.

What are we Doing for Public Health?

On the 7th day of September, now expired,—that is to say, within twenty-eight days after the passing of the "Act to amend the Law relating to Public Health," which bears date 10th August, 1872,—it was enacted by clause 6 of that measure, that "the first meeting of a sanitary authority under this Act shall be held; or," it adds, "at such other time as may be directed by order of the Local Government Board."

We have failed to notice accounts of these important contemporaneous meetings of the new local authorities. One remarkable exception, recorded in our pages on the 21st ult., serves but to prove the rule. The

question arises, how was the provision to be enforced? In what practical manner are the inhabitants of every or of any sanitary district, urban or rural, drained or undrained, improved or unimproved, really affected by the passing of the law?

Remembering the extreme degree of interest that was developed in many instances by the election of members of the school boards, on the passing of the Educational Act of 1871, it strikes us as somewhat ominous that hardly a single sound should have fallen on the public ear as to the proceedings ordered to take place on the 7th of September. It may be urged that the education boards were new creations, and that the sanitary boards are but the old union or borough authorities, with powers that are not new, although they are transferred or concentrated. But that consideration hardly tends to increase confidence in the unreported activity of the sanitary movement.

It will be evident to those of our readers who have either consulted the abstracts given in our own pages, or studied the actual words of the Act to amend the laws relating to public health, which was the fruit of the past session, that general sanitary reform is as yet only in what may be called a permissive state. We cannot even see in the new law such a machinery for individual action as was proposed in what, by a remarkable distortion of the English language, was spoken of as the "permissive prohibitory" condition, with reference to another class of reform. The one sole element which is provided by the Bill to spur, or to check, the action of the new Board, is the authorised interference of the Government inspector. But this, also, is only permissive. It is not even promised. There is no method provided by which a medical man, or other person deeply interested in the health of a district, can readily grease the wheels of the slumbering law, or call the attention, except as a matter of personal favour and responsibility, of an inspector to even the most urgent danger.

It must be clear, and can hardly be too loudly urged, that the Administration has thus incurred a large amount of serious responsibility. We shall not be accused of making any querulous or hasty complaint. We urged our friends to

support the small measure for which alone time was found. We did not carry with us the full sympathy of some of the oldest supporters of sanitary reform in thus urging that half a loaf was better than no bread. But we felt that there were certain conditions which limited the possibility of action. It was certain that time would not be given by the House of Commons, considering the work actually before it, adequate to allow of the consolidation of the law during the session of 1872. And it was also clear, to our view, that the matter was in the hands of a Minister fully aware of its primary importance, able and willing to grasp the question with a masterly hand, and not unconscious of the ultimate fame that would attach to the successful combating of the two master evils of poverty and disease.

But the more confidence has been placed in the wisdom and the energy of the Government; the more readily the House of Commons passed the stamp of the Bill; the more hopefully sanitary reformers, in and out of Parliament, looked for the beneficent development of the one active element of the measure, the power of inspection, set in motion by the Administration,—the more necessary is it to watch the commencement of this activity. There is one alternative clause, as we mentioned in our first paragraph, under the shelter of which we very strongly suspect that the greater part of the new district authorities are taking a convenient slumber. "Or," says the Act, "or—at such other time as may be directed by order of the Local Government Board." Is the care of the health of the country waiting for the construing of a legal sentence?

It is past question that if the various local authorities, urban and rural, to whom, under a new name, the exercise of already existing powers has been attributed, had felt any real desire to take care of the public health, they had abundant means of showing their disposition before the passing of the Bill. But it is notorious, and it is to a great extent natural, that the reduction, or at all events the non-increase, of local taxation, is the main motive that actuates many members of those Boards. To call a man a sanitary authority, instead of a burgess or a guardian, will not instil into his mind one grain more of that dread of pestilence which is the ultimate motive power as to sanitary measures. Dread of rates, which are a tangible evil, will, in the minds of nine-tenths of the new authorities, assume a much more positive form than dread of fever, of cholera, or of consumption.

This great, ugly fact did not escape the notice of the framers of the original Bill. A complete organisation was apparently contemplated by its provisions,—which is, indeed, possible under those of the present Act, but which is far less probable,—which, in fact, has become highly improbable,—except from centrifugal pressure. Thus, the Bill says, "It shall be the duty of every urban sanitary authority, from and after the expiration of three months from the commencement of this Act, to appoint a medical officer of health." As far as we can understand the language of Acts of Parliament, we apprehend that this meant that such officers were to be appointed at the end of three months from the passing of the Bill; that is, the Act being dated the 10th of August, every district of England was to have its proper medical officer by the 10th of November. But what says the Act? "It shall be the duty of every authority to appoint from time to time an officer." When does that render action imperative? We are fully aware that while the words of clauses are liable to be "amended" by every one of the 656 members of the House of Commons, no minister is altogether responsible for verbal changes of this nature, however important they may be. Still it is highly necessary to look the actual fact in the face.

A body of medical officers, spread over the country, must consist of men subject to the infirmities of humanity, and liable to be influenced by its lower motives. That they may be, and we believe as a rule are, far more readily influenced by the best and noblest motives, is our unfeigned belief, founded on a more than ordinarily extensive acquaintance,—that is to say, compulsory acquaintance,—with physicians and general practitioners in this country and in Ireland. But in all legislative measures we ought in wisdom to regard the motives of self-interest rather than those which are disinterested.

In this case, the wisdom of the arrangement depends upon the propriety with which the term "body" can be used. If measures are taken for establishing a common bond among these medical officers; if, by quarterly meetings, by being required regularly to report to a superior medical authority, or by any other form of mutually informing and supporting action, an *esprit de corps* be encouraged, we shall have established a very efficient medical police, and the Government will be able to lay its finger on the pulse of the country.

If, on the other hand, we have nothing but the appointment of a medical officer, quite isolated from his brothers, under the sole authority of the local board,—we do not say that there is one who will not do his duty, but we do say that, in nine cases out of ten, that duty will conflict with his interest.

On the plain words of the Act, then, the appointment of a medical officer is left much to the good pleasure of the ratepayers,—a rate regulation; and his post, when he is appointed, is one in which he has more encouragement to do nothing than to exert himself.

While one of the branches of the care of public health,—that is to say, medical inspection,—is thus so far from being placed on a thoroughly efficient footing, what are we to say as to the other, and not less important, part,—the physical aspect of the case? The aid of the doctor is, to a limited extent, invited, but nothing is said as to that of the engineer.

It is very certain that the medical officers of health have neither the time nor the mechanical education which should fit them to be removers as well as inspectors of nuisances. Throughout the whole of our urban districts the question of sewerage is assuming every year fresh importance. The question is one within the province of the engineer. It is exactly one of those questions which most loudly demand thorough and effective superintendence by men specially educated and accustomed to the subject. It is so from its very simplicity, as well as from its wide range. If a man wants to make his will, he sends (if he has common sense) for a lawyer. If he has to grapple with an attack of disease, he sends for a doctor. But if he wants to put in a drain, or if his house becomes pervaded with noxious gas, he does not send for an engineer. He thinks any one can put in a drain-pipe,—at all events, the builder's men may be trusted to do so. The subject is uninviting in every way. Cost is deferred,—that is to say, money cost,—as long as possible; and then the cheapest rule-of-thumb man is set to work. It is such a trifle,—a rain-water pipe that has a close, unpleasant smell proceeding from it,—mere fancy, perhaps, or disagreeable, indeed, yesterday, but not perceptible to-day; when, moreover, *paterfamilias* has a slight cold. A trifle, no doubt; and so is the death of a child a trifle,—to the Registrar General. It is only one unit in that grim sum which he is perpetually adding up. But what is it to the parents? Even so the amateur drainer or non-drainer of his own house may be the sower,—as we have only very recently seen to be the case in India,—of the fertile seeds of a disease that shall devastate a province.

The engineering inspector is a man as neces-

sary to the health of the country as the medical inspector. The latter is the eye (and indeed the nose), the former is the hand. We are not arguing that it needs the presence of a Brunel to lay down every drain-pipe, or even to superintend the outfall of every town. But we do insist that each and every link in the great water circulation of the country should be closed only by hands amenable to educated supervision; that there should be an officer responsible for the sanitary engineering of every district,—one to whom the builder and the negligent or ignorant creator of a nuisance should be responsible; or at least a man who should, as a matter of duty, set in motion the remedies provided by law.

As we rise from the very smallest details of the daily service of our domestic water supply and sewage to the consideration of the questions which are now pressing for solution in every urban district in England, the need, not only of local surveyors, but of some method of combining the local information, and of making any engineering district that is planned or carried out subservient to the thorough drainage and sanitary, as well as economical, distribution of the water supply of the whole kingdom, becomes more imperative. Powers are given by the new Act to enable one local district to drain, by mutual agreement, into the carriers of another. Such an arrangement, instead of being facilitated, ought to be rigidly forbidden by the law, except on proof that the drainage of the recipient, as well as of the contributing, district was not only adequate, but so laid down as to be consistent with the ultimate drainage of the whole country in the most efficient manner. No one can have any practical acquaintance with such works as, for example, the carrying of a railway through a town, without becoming aware of the extreme complexity, cost, and danger to health that are incurred by the ill-considered location of drains. That their cost is thrown away is the least evil. Every drain that is not built with a proper relation (intentional or not) to the general system of ultimate effectual drainage of the district in which it is situated, is a source of expense, of delay, and of danger. And as water will not wait, and commuted supplies work their own means of exit, the importance that a thoroughly scientific direction, in the first instance, should be given to every sanitary work, is paramount. In fact, efficient engineering inspection is a want in every way as urgent as efficient medical inspection.

What do we see throughout the country? Puzzle and alarm. Costly experiments, conducted everywhere on the most gigantic scale, because primary principles have not been laid down in the first instance. The costly sewage of Liverpool, on which so much skill and money has been expended for nearly a quarter of a century, relies on the swift current of the Mersey for its outfall. It may be remembered that the Mersey has a bar. It must also be noted that the death-rate of Liverpool is still the highest in England, being equal to that of Manchester, and nearly a sixth higher than that of London; while the infant mortality of that borough presents the frightful proportion of 39 per cent. (not per thousand) in the first year after birth! Is the question of the disposal of the sewage of London settled? What says the Government inspector, Mr. Rawlinson, in his "Report upon Inquiry into the Truth or otherwise of certain Allegations contained in a Memorial from the Vicar and other Inhabitants of Barking, in the County of Essex, calling Attention to the Pollution of the River Thames by the Discharge of Sewage through the Northern Main Outfall Sewer of the Metropolitan Board of Works?" The memorialists "call attention to the present dangerous condition of the river Thames—dangerous alike to navigation and to the health of the inhabitants of Barking, and of all the populous and industrial towns below London, consequent upon the concentrated discharge of sewage through the main outfall sewers of the Metropolitan Board of Works." Mr. Rawlinson reports that "the allegations in the memorial have been only partially proven;" that "the Metropolitan Board have objected to the admission of sewage into the Thames from towns above London, and therefore inferentially justify the objections to river pollution below London;" that the river Thames is polluted by metropolitan sewage, and that that pollution may be prevented. There is a world of menace in Mr. Rawlinson's very temperate and judicial report, sentences of which only we extract.

What is the spectacle presented by Birmingham,

played like a shuttle-cock between the Court of Chancery and the House of Commons? What shall we say to the experiments at Bishop's Stortford, where acres of country are subjected to the play of permanent fountains of sewage water, roughly filtered through faggots, and conducted through a system of pipes which, not to mention any other objection, involves a cost of thirty shillings per acre per annum for interest alone!

Again, in criticising the Bishop's Stortford process, a writer, evidently not new to the subject, urges that it is from its mineral contents that sewage derives almost its sole agricultural value. In the estimated theoretical value of 2s. per ton, ascribed to ordinary town sewage, undiluted by storm water, half is set down to the value of the organic matter, which one of the most practical investigators of the subject proposes to burn—a step that, at all events, will make sure that it shall not propagate. This organic matter constitutes 4.6 per cent. of the undiluted sewage poison. Of the remaining matters, chemical analysis gives 1.8 per cent. of gaseous to only 7 per cent. of mineral elements. The latter includes soda, potash, lime, manganese, silicon, phosphorus, sulphur, oxide of iron, and chloride of sodium. The mineral ingredients of the sewage, therefore, other than those which exist in the form of soluble salts, must be almost entirely due to the road-scrappings and other detritus brought down by the storm waters. The excessive cost and cumbersomeness of conveying matter of this kind to the fields, by mixing it with sewage, need hardly be pointed out. In fact, it is difficult to find any of the thousand schemes proposed for extracting gold from our drainage, that will stand before the pitiless logic of arithmetic. The great demand of agriculture is for concentrated, portable manure. The mode generally adopted in conveying sewage to the land, commences with diluting it to an unmanageable degree, and often proceeds on the supposition that, by adding other matters, we are adding to the value more than we do to the cost, the very reverse being generally the case. Here again the whole country is looking for guidance as to the best course to adopt.

The town clerk of Canterbury, referred to in our recent number, may no doubt be taken as a fair representative of the legal advisers of the new sanitary authorities. He was in doubt as to the necessity of calling a meeting, on which point he took the safe side. "He did not anticipate that there would be anything to do." He waited for the regulations of the Local Government Board. We re-read the Act with care, to discover the cause of this hesitation. We could find nothing to justify it. But here is a fresh and a most significant proof of how patiently the country is awaiting the initiative of the Administration.

Again, the omission from the Act of the prohibitory and penal clauses contained in the Bill is a matter that throws a great onus on the Local Government Board. By this insertion in the Bill it is plain that it was the deliberate opinion of the Government that they were necessary. Their withdrawal from the Act was in consequence of want of time for full discussion of the measure. But the fact renders it all the more intelligible how the country is looking to the Government for a vigorous and comprehensive initiative. Had the original Bill passed, and proved ineffective, ministers would have been fully justified in waiting till they could refer the matter afresh to Parliament. But not so as it is. The real gist of the matter is this. The Government said, in effect, "We have no time this session to do more than enable local action to commence. We have a definite plan of our own. We require some time to complete our organisation. But we take power, vague but comprehensive, to enable us to organise. With the inspectors to whom you give powers by clause 15, we shall quietly, rapidly, and thoroughly block out the normal plan for the entire country. See what our organisation is, and we will come to you again, when you have more leisure, to consolidate the law."

Such, unless we are much mistaken, was the understanding with which the House of Commons passed, without hesitation, the measure of last session. Such, we think there can be no doubt, is the expectation of the country. Parliament has entrusted to the Minister of Public Health a power all the more complete from the vague terms in which it is accorded. The public expect to see this power in visible, effective, beneficent action. Every day adds complexity, delay, cost, loss of life, to the difficulties of the

case. Every sanitary reformer is looking anxiously for the sight of an action that shall begin at the beginning, by organising the medical and the engineering system to which the whole country has to conform. Isolated action, in this case, is worse than idle; for it may clash with systematic action. Every opponent of sanitary movements will rub his hands, and do nothing. Right or wrong, the country is looking to the Government for the signal. That extreme constitutional delicacy which has so often hampered efficient action, is out of place in view of a great danger and a great difficulty. We trust that the Government will feel that the general consent of the country will strengthen their hands in a prompt, efficient, and well-advised treatment of a problem which is medical in its indications, but engineering in its practical treatment. Happily, this vital question has not hitherto been seized upon as a party question. England is in earnest about it. The proof of science has been said to be the power of prediction. This has, indeed, been mainly confined to astronomy. Our readers will have seen, in the marked rise in the price of coal, a proof that engineering science is not altogether to be excluded from the category of predictive knowledge. It remains dependent on the fact whether the machinery for improving the public health be based, from the beginning, on sound engineering science or not, whether the Act of 1872 shall prove a wise step in the path of civilisation, or a deplorable failure.

NEWS FROM EDINBURGH.

The clearance of the congeries of densely-packed houses to the north-east of the High-street in order to form the new thoroughfare, to be called Jeffrey-street, is nearly completed, and from amidst the mass of *débris* appears the substitute for the ancient Trinity College Church, like "the new moon with the old one in its arms." So far as at present appears, the amalgamation of part of the ancient structure with the new work is not particularly happy.

In connexion with the city improvements, the lofty gable which surmounted the piazza at the north end of Blackfriars-street has had to be pulled down, owing to defective construction; and a movement is on foot to have the piazza done away with altogether.

The centre portion of the Museum of Science and Art is now finished so far as regards the stonework. To complete the facade, the west wing is still wanting. The portion just erected embraces the central entrance, consisting of three lofty arches. Keystones have been used in these arches, and the spandrels are panelled, which imparts to this part of the building a different character from the remainder, where such features are not used. If we mistake not, the original design has been departed from, and it would have been better had it been adhered to.

The restoration of the choir of St. Giles's is being rapidly pushed on under the superintendence of Mr. William Hay, and it is expected that operations will be completed in the course of next month. The stonework seems to have been of an inferior description, necessitating a more liberal use of cement than is desirable. Now that an idea can be formed of the interior as an architectural work, it strikes us as greatly inferior to many others of the ancient churches in Scotland. The arcade, with its octagonal shafts, is heavy; and the clerestory very bald; but in a city having so few ecclesiastical remains, it is deserving of careful preservation.

The competition for the new Apostolic Church to be erected in East London-street, which we referred to in a former notice, has been decided in favour of Mr. Robert Anderson, of Edinburgh. The design, according to the instructions, is Norman in style, and consists of a spacious nave in the form of a double cube, with an unusually deep chancel, terminated by an apse. The chancel is flanked by aisles, in one of which is to be placed the choir organ; and the other, which terminates in an apse, is to be used as a chapel. The grand organ is to be placed in a gallery in the tower, which occupies the centre of the west elevation; under this is the main entrance, from which diverge passages leading to the baptistery on the right, and a hall to the left. The window lights of the nave are placed well up from the floor, and slender attached shafts run up between them to support the beams of an open-timber roof of very simple character. Severity and dignity of effect have

been aimed at, and, if carried out in its entirety, the building will form a marked feature in the city.

Messrs. Macgibbon & Ross are the successful competitors for the new Free Church at Morning-side, which is to be erected at a cost of about 3,000l.

A hall in connexion with a new United Presbyterian church in London-road, from the designs of Mr. Starforth, has just been completed. The site of the church is occupied by a temporary one, and the congregation will use the hall as their place of worship till the permanent church is completed.

In Grove-street a new mission-house, with small chapel in the rear, in connexion with the Barclay Church, has been erected from the designs of Messrs. George Beattie & Son. It is a heavy example of the chamfer and splay Gothic sort.

On the sloping bank to the south of the Castle new quarters for married soldiers are to be erected, at a cost of 8,000l. The building is to be three stories in height and 250 ft. in length, similar to what is usually produced as artisans' dwellings. Each couple will be provided with a room 16 ft. by 14 ft., and other conveniences are supplied for the general use of the inmates.

On the east side of St. Giles-street, new premises are being erected for the *Edinburgh Cowart* newspaper, from the designs of Mr. David Bryce. The design is a highly ornamental one, in the Scottish domestic style of street architecture. The windows of the first floor are richly decorated in a quaint manner, and the sky-line is broken by gables and moulded chimney-shafts.

In the rear of the Merchant Company's School, in Archibald-place, a hall for lectures, exhibitions, and examinations is to be erected in harmony with the classical design of the school.

The erection of the new Royal Infirmary is proceeding in a very laudable manner. The basements of all the pavilions, twelve in number, have been contracted for and are nearly completed, but it is said that the funds in hand are insufficient to meet the cost of the superstructure of all of them. If such is really the case, the wiser course to have followed would have been to complete only such a number of the pavilions as the funds allowed. The present state of the matter does not appear satisfactory in any sense; for, from the disposal of the building, we do not anticipate that the architectural effect will be happy.

The very picturesque statue of Dr. Livingstone, the African traveller, by Mr. D. O. Hill, of which we gave a description at the time it was exhibited in the rooms of the Royal Scottish Academy, is now exciting some attention. Proposals are now broached for producing it in bronze both for this country and America. It would form a marked contrast to the generality of public statues now produced, the costume and general treatment being very unlike the usual conventional style of such.

The sketches by the selected sculptors for the statues to be placed in the Scott Monument have been examined, and half-sized models have been ordered for the approval of the committee. In addition to the statues already ordered, Mr. Currie, of Darnick, is commissioned to prepare a statue of "Old Mortality."

No decision has yet been declared regarding the cathedral designs. We have received statements of odd gossip on the spot, but it is unnecessary to print them.

NEW SCHOOL OF ARTS, EDINBURGH.

The new School of Arts, the foundation-stone of which is to be laid with full Masonic honours on the 9th of October, stands in the centre of Chambers-street, now being opened up by the Improvements Trustees, and is immediately opposite the centre of the Industrial Museum. It will thus form a prominent feature of the north side of the street, and the site seems in every respect peculiarly suitable for what has long been looked upon as the firmly-established technical college for the working classes in Edinburgh. Its close proximity to the various collections connected with art-manufacture forming the Industrial Museum, may reasonably be expected to be of much advantage, both to teachers and students, in illustration of the lectures and classes of the Institution; and, if for no other reason, this, we think, makes the site selected a very fortunate one for the purpose.

The School of Arts has been in full prosperity

and success for upwards of half a century, and its reputation is at this moment higher than it ever was before. Indeed, it has gradually developed itself into a great and valuable national institution, with every reason to anticipate that when this new building is opened it will enter upon a still higher and more extended sphere of usefulness and prosperity than it has hitherto enjoyed, great as that has been.

The building being at the west side of the extended open space in front of the centre compartment of the Industrial Museum, has the advantage of a front both to the south and the east. The south, or Chambers-street front, is rusticated on the ground-floor, having balusters under the first-floor windows. The first-floor windows have architraves, trusses, and cornices, except in the west pavilion, where the building goes up an additional story, ornamented with pilasters at each side and decorated windows.

Over the first floor is the main cornice, having dormer windows over, which are intended as a feature in lighting a richly-decorated cove in the larger lecture-hall.

There is a projecting porch at the main entrance under the pavilion at the west end, a novel and effective feature of which is the statue of James Watt, removed from Adam-square, which will sufficiently mark the building as the Watt Institution, while at the same time it will be a thoroughly appropriate feature of the School of Arts.

The great entrance at the west end is by a hall and staircase leading to the various lecture-halls and class-rooms. The whole is spacious, and well suited for what is now required; and, indeed, ample for what may be anticipated as the wants of the Institution for many years.

There is a lecture-hall, 53 ft. by 33 ft.; and a smaller one, 34 ft. by 33 ft.; with a chemical class-room, 33 ft. by 23 ft.; and also a chemical laboratory and apparatus-room for mechanical philosophy. The other class-rooms are also of ample size for their respective purposes; and there are a library, directors' room, master's private room, with all the minor accommodation for lavatories, &c., and a keeper's house.

The architect is Mr. David Rhind, Edinburgh; and the contractors are Messrs. David Sutherland & Son, Edinburgh.

POLLUTION OF THE RIVERS OF SCOTLAND.

DR. FRANKLAND and Mr. MORTON, who, since the death of Sir William Denison, form the commission appointed to inquire into the best means of preventing the pollution of rivers, have given their report on the rivers of Scotland, dated June 29th, 1872.

The Tay, the Dee, the Don, and some other rivers, are purer than the standard recommended by themselves as a test of non-pollution; but the Tweed, the Clyde, the Irvine, the Esk, the Water of Leith, and the Almond, with their tributaries, are very much fouled. The watershed which divides the basin of the Tweed from that of the Clyde runs nearly north and south, and throws the Tweed waters into the North Sea, and the Clyde waters into the Atlantic.

The Tweed basin is in shape a somewhat rounded oblong area, containing 1,870 square miles. "From its edge, on all sides, inwards, there is a wide margin of grassy hills, many of them upwards of 2,000 ft. high, occupying a large proportion of its surface. Unbroken slopes of green, for the most part above human habitation, constitute the very ideal gathering-ground for the water-supply of towns; and the pastoral regions of the Cheviots on the south, the hills surrounding Biggar on the west, and the Lammermuirs upon the north, send the abundant rainfall of those upland districts, almost as pure as they receive it, into the Tweed and its tributaries. Below the margin of these grassy uplands there are, indeed, extensive cultivated tracts; but these are occupied by a comparatively scanty agricultural population, and the rainfall on them is but little fouled on its way to the drainage-channels of the district." These two areas, together, form about two-thirds of the whole area, and the water flowing from it is represented as free from pollution; but the lower third portion, occupied by the manufacturing towns, is very bad. The Commissioners say that, notwithstanding the obviousness of the change in the waters of the Tweed ensuing immediately on their passage

through or near the manufacturing towns, some attempt was made by the manufacturers to attribute the altered condition of the Tweed during the past twenty or thirty years somewhat to the altered agricultural practice of the country during that period. It was declared that the drainage from heavily-manured or recently-limed land is deleterious; and it was also said that the great extension of land drainage of late years has had the effect of shortening floods, and thus intensifying the mischievous effect of a consequently longer time of drought. "The latter allegation is, no doubt, true. The water which was formerly held in marshy grounds, from which it trickled gradually and continuously, until once more replenished by the rainfall, now flows directly to the river. such reservoirs have in fact, been drained, and the condition of the river, therefore, answers more immediately than it used to do to the character of the weather. A flood in the river channel now begins and ceases almost as abruptly as it begins and leaves off from the clouds. It is, indeed observed, that land which has been deeply drained withstands a drought better than a wet soil; but that is not so much because a deeper and larger sponge, as it were, has been thus provided in which water can be stored for the use of plants, and from which it may be expected very gradually to find its way to the stream, as because land-drainage so facilitates the operation of husbandry that an earlier seed-time becomes possible, and thus the cultivated plants have time to acquire deep-seated roots, which are well established before the summer drought arrives."

Woolen manufacture is the staple industry of the district, and at Galashiels there are sixteen mills, in which nearly 3,000 persons are employed, and upwards of 3,000,000 lb. of wool manufactured in a year, worth about 600,000l., with a consumption of coal of 16,350 tons in the year 1870. At only one of these mills is any attempt made to remedy the nuisance occasioned by the liquid refuse of the woolen manufacture. But with all this and much more refuse from other mills in other parts of the district, the Commissioners say, "There is not, except for a mile or two below Galashiels, any instance in the whole of the Tweed basin of such an entire destruction of river beauty and utility as we have witnessed in the basins of the Mersey and the Ribble, in Lancashire, or in those of the Aire and Calder, in Yorkshire." On the whole, the Tweed is not yet seriously injured, and the Commissioners say that it is most desirable that remedies be at once applied, by which, without serious injury to the important interests of the manufacturers on its banks, the charm and usefulness of a beautiful river may be retained unspoiled, or restored to their original perfection.

The remedy recommended by the Commissioners for the purification of the waste liquids from woolen works is, first, to separate the foul wool-scouring and dye-vat liquors from the comparatively harmless washing-water. By the adoption of this simple precaution, the volume of polluting water requiring remedial treatment would be reduced to a minute fraction of the total discharge from the works; and its purification would be to a corresponding degree simplified, since the washing-water, which constitutes the great bulk of the total discharges, can easily be kept within the standard. This separation being made, the rest is to be purified by intermittent filtration, at the rate of about six gallons in twenty-four hours per cubic yard of filtering material, the liquid being first treated with lime, so as to precipitate most of the solid matter. The Commissioners have experimented on this process for twelve months, from the beginning of 1871 to the beginning of 1872, and they find that in all cases when 5-6 gallons of the liquid per day are apportioned to each cubic yard of filtering material, the result is to reduce the impurities much below the standard. "There are, doubtless, woolen manufactories situated in towns in which intermittent filtration would be inconvenient, perhaps impossible; but it is precisely in such localities that this process would not be required. The strongly polluting liquors kept separate from the comparatively clean washing-water would form a suitable and moderate contribution to the sewage of the town, to be cleansed along with that sewage at the outfall, by irrigation or intermittent filtration; whilst the washing-water would be at once restored to the river in a condition fit to be used by other manufacturers and riparian proprietors lower down the stream."

The Clyde has its origin near that of the

Tweed, but on the opposite side of the watershed. It is one of the most beautiful rivers in Scotland for about two-thirds of its length downwards, but below that its character is wholly changed. At about three-fourths of its length is situated the large manufacturing city of Glasgow. About eleven miles above Glasgow the Clyde receives the smaller river North Calder, into which drain paraffine-oil works, iron works, coal workings, paper-mills, and print works, a succession extending almost from its very source, besides the sewage of the large population in and around Airdrie and Coatbridge. At three of these paraffine-oil works 18,000 tons of bituminous shale are annually distilled, the quantity of coal consumed amounts to 30,000 tons a year, and the volume of crude paraffine and paraffine-oil produced exceeds one million gallons annually. At the Caldercraix paper-mill, near Airdrie, 1,200 tons of rags are used annually in making 800 tons of fine packing-paper. It is, however, to Glasgow itself that the principal pollution of the Clyde is due. "Owing to the enormous water-supply, Glasgow is more perfectly washed out than any other city in the island; so that, notwithstanding the very laborious and productive operations of the scavenger, a large proportion of the personal waste of its population—one half, according to the estimate of Mr. John Carrick, Master of Works and City Architect,—together with all its industrial waste, is sent directly and completely into the river." The water supply of Glasgow is alone more than half the estimated minimum flow of the Clyde as it passes through the city, being twenty-seven million gallons daily. In order to allow larger ships to come up to Glasgow, the river has been deepened from time to time, all the way down to Greenock, and the effect has been, of course, to lessen the velocity of the downward course of the stream, so that when the sewage of Glasgow is poured into the river it is almost like pouring it into a cesspool. By experiments with floats, made in 1857 and 1858 by Mr. Bateman and Mr. Bazalgette, it was shown that sewage which entered the river at the centre of the city when the natural volume of the river was small, did not travel more than 2½ miles in a week. "In summer weather the time during which the river is thus made to loiter on its way to the sea is more than sufficient to establish in full operation those processes of putrefactive fermentation—inevitable whenever the thermometer exceeds 13° C. (55° Fahr.)—to which the formation of sewer gas and other filthy products of this fermentation is due."

On the south-west of the Clyde basin lies that of the Irvine, and about seven miles inland stands the town of Kilmarnock, in which nearly 23,000 people are engaged, chiefly in various woollen manufactures. Kilmarnock water, which joins the Irvine just below the town, "is a striking example of most of the evils connected with neglected river economy to which our attention has been directed in the course of this inquiry." The effect of the more perfect land drainage of the river basin has been perceptible here, as elsewhere, in the greater abruptness of floods, and the longer duration of droughts; but, "formerly, these consequences were alleviated by the operations of Loch Goin, a reservoir of about 140 acres, holding 300 million gallons of water, in which flood-waters were, to some extent, impounded, being allowed to escape during dry weather." This reservoir is situated at the head of the river basin, and belongs to one proprietor, who leased the use of it to the millowners below; but as soon as the lease expired, its renewal was refused, and the water was drained off, "the owner declining any longer to incur the risk to which his attention had been directed by the then recent disasters produced by the bursting of the Holmfrith and Dale Dyke reservoirs in Yorkshire. The evil of an unequal river flow, to which this reservoir had opposed a very efficient remedy, is thus felt at Kilmarnock with all the force of the contrast between the present and the recent past."

According to a section of the bank of this reservoir given in the Report, its proportions are excellent in point of stability, the slopes being for about half the height 4 to 1, and above that 3 to 1 inside, and 2 to 1 outside, the height being 18 ft. and the top of the bank 4 ft. above the top-water level. It is difficult to understand the reluctance of the proprietor to continue the use of a reservoir with such a bank as this. Nearly all the banks of such reservoirs in England have slopes of not more than 3 to 1 inside and 2 to 1 outside, for their full height, that height being in most cases much more than 18 ft.

Messrs. Gregory, Thomsons, & Co., worsted spinners and carpet manufacturers, of Kilmarnock, who employ 200 hands, suggest to the Commissioners, "that the reservoir at Loch Goin should be maintained, and the flood water there impounded, so that, as formerly, an equal flow might be allowed to pass daily down the stream, and the water in the river be in a comparatively pure state." They further suggest "that manufacturers, town authorities, and others, be strictly prohibited from casting solid and liquid refuse into rivers and streams; that proper regulations be enforced for conserving rivers, and that inspectors be appointed by Government for enforcing those regulations, such inspectors to be entirely free from all local influence." Rather strong language this for a local manufacturer; very sensible, and probably is shared in by many more manufacturers than we know of or hear anything about; but to suggest it to a Royal Commission with the hope of any practical result is about as effectual a proceeding as that suggested by the Rev. Sydney Smith—to tickle the dome of St. Paul's to please the dean and chapter.

SILICA PAINTING AND SILICA CASTS.

In the Seventh Cantor Lecture on Silicates, Professor Barff said:—On the evening of my first lecture I received a letter, without a name to it, in which I was asked to explain how it was that the famous painting by Maclise, "The Meeting of Wellington and Blücher," in the House of Lords, was coated all over with an apparent mildew. I did not notice the letter then, because that was not the time for me to speak upon the subject, but I have borne it in mind, and now I will tell you how it has happened. This particular difficulty has been experienced by most who have tried silicious painting. Silicate of potash usually contains an excess of alkali. It is acted upon by the air, and then carbonate is formed, and as this goes on, a certain quantity of silicic acid is set free. You remember I showed you an experiment in which carbonic acid precipitated silicic acid; so that in the case of a quantity being contained in a vessel, there will be more silicic acid in the lower portion of the silicate and less in the upper portion. Now, Mr. Herbert, who was intimate with Mr. Maclise, has told me that Mr. Maclise was continually painting with the top of his silicate and not the bottom, and the consequence was he was using an insufficient quantity of silica in the silicate. There was also no doubt some sulphate in the silicate. When the picture was finished, the sulphate and carbonate came out. I fancy you all know that if you take a lump of common washing soda, and leave it for a time, it becomes covered with white powder; this is called efflorescence. If you show it with moisture, you will find it will soon destroy itself again as the soda dries. The soda will keep on efflorescing. That is what is going on in the picture by Mr. Maclise. In the other picture,—that of "The Battle of Trafalgar,"—you do not find this to be the case; there is only a little efflorescence in one or two parts. Now that picture was differently painted. It was painted with much better silicate, and with much greater care. My authority for this statement is Mr. Herbert, and he and Mr. Maclise were perpetually together while the work was going on. In the "Battle of Trafalgar" a large quantity of zinc white, was used, and that prevents efflorescence. One reason why I introduced aluminate of potash along with the silicate of potash was to prevent this efflorescence, and it does so effectually. If you will coat a wall with this material you will never get efflorescence on that wall.

There are methods, no doubt, by which this efflorescence may be got rid of in existing pictures. At present my idea is that the proper thing would be to wash them over with some salts, which would convert the efflorescent salts into deliquescent ones. I hope to be allowed to try an experiment on a small part of one of the pictures some day. My idea is that some acetate, say acetate of baryta, would do; for when applied to the picture, sulphate and carbonate of baryta, which are insoluble, would be formed, and deliquescent acetate of potash. I believe some such method as that might be employed, so that we might have that beautiful picture without its present disfigurement.

I will suggest a method in which silicious painting may be used in conjunction with oil or varnish painting. It is the custom to admire an old painting, and especially the works of certain

old masters, though oftentimes very little of their own work is seen. For my part, I care not whether a picture is painted by an old master or not, if it does but truly represent nature, and if the principles on which it is treated will bear the test of scientific investigation; for what is not true cannot be beautiful, and the artist's imagination and creative powers have limits set to them by nature. Some time ago I was asked by Mr. Leighton to examine a piece of a picture by Tintoretto. I did so, and analysed parts of it very carefully. I removed, little by little, all the varnish, and whatever came between me and the canvas, and I found that the whole of the picture was painted up to a high degree of perfection in distemper. It was not painted in oil at all at first. Not only was it painted in whites and greys, but painted in and shaded up to a considerable amount of finish, and all this was done in distemper. The vehicles used were size and starch, and no oil whatever; and then afterwards the painting was painted with oil or varnish, I cannot tell which at this distance of time. The glazings were put on with some resinous substance. Certainly this method of painting has wonderful advantages. When an artist puts a touch on a canvas with such materials he knows exactly what he is doing, and never depends upon chance effects. There is no running together, there is no "cessing," as in oil, in the use of this material, with which it is quite clear the old masters did produce some wonderful effects, as we see when we come to clean their works, for this Tintoretto was almost invisible before the covering of varnish was taken off, but when it was, the extreme beauty of his work was manifest.

Now, the silicious method of painting may be used up to a certain point. Supposing an artist wants to glaze with lake, he cannot do it with silicious painting, because the potash will not allow of it. But there is not the slightest reason why he should not use the lake as a glaze, providing he does it with the knowledge that in years to come the lake, being fugitive, may disappear. There is nothing to prevent the use of silicate, and then of resinous vehicles upon that silicate. You can have the first painting done in silicate, which will be more enduring than distemper, and then afterwards you can glaze it with transparent colours used with resinous vehicles.

I have two other masters to speak to you about, and will, therefore, pass on to them, for they are of importance in the applications of silica. I have here lying on the table some blocks of excessively hard material. You can examine them for yourselves after the lecture, and you will find that they are as hard as granite. Here is some of the same material pressed into moulds, showing that it is capable of being moulded. Now, this is used for paving; and a piece of pavement of this material has been laid down opposite the Mansion House, and I have been informed by the patentee, the Rev. Mr. Highton, that the pavement is standing and wearing better than the Yorkshire flags. I feel interested in all applications of silicates. For the last twenty years I have been working upon them; and upon this very subject also have I been working, though not with the success with which Mr. Highton has done, for he has hit upon a plan of doing the thing in an economical way, whereas my method was rather too expensive to be generally used. You here see a lump of material which is called Farnham sand, and some of this lump is here crushed to a fine powder. This Farnham sand contains 50 or 60 per cent. of what is called soluble silica. Ordinary sand must be melted with soda or potash in order to convert it into glass prior to making it soluble. This Farnham sand requires nothing of the kind. If you put this into silicate of potash the soluble silica will be dissolved, even in the cold, by any excess of potash which may exist in the solution of silicate of potash. These blocks are made in the ordinary way. They are made of granite chippings, mixed with Portland cement, and cast into this form. The blocks are piled up, one upon another in a tank, and the whole is filled in with silicate of soda, and the silica from the silicate of soda goes into these blocks and forms silicate of lime with some of the lime which is in the Portland cement. The carbonic acid that is taken up by the silicate of soda also leaves the soda and goes to the lime, so that the caustic soda is able to dissolve the soluble silica of the Farnham sand, which is added in quantities. You remember an experiment I showed you, to the effect that lime can take carbonic acid from carbonate of soda. From the hardness of this

block you will see there is penetration throughout nearly the whole of it. Now an invention of this kind is useful in various ways. There are certain wall decorations which it is perfectly admissible to repeat, and which may be cast in moulds. I should not advocate its being used in the place of carving, but it might fairly be used for certain purposes outside of buildings where cement is now used, and it would not be acted upon by damp. The use of silicate of soda and silicate of potash, together with other materials, as a protection for stone, has been before the public for a long time; but the difficulty that one has had to contend with has been this, namely, we cannot get it to penetrate the stone to any depth, and when we do get it to do so it will not hold the disintegrated particles together and bind them into a solid mass. I tried an experiment upon some old stones which were crumbling away, and I found that the decayed portions must be removed before the application of the silicate. There is a great deal yet to be done before soluble silicates can be used with much success in coating stone. At present we only get them in just skin deep; but if soluble silicates are to be used they should be used with some such substance as the aluminate of potash, which causes a rapid hardening, and prevents efflorescence.

SCHOOL BOARDS.

Norwich.—The General Purposes Committee recommended the Board to adopt the tender of Messrs. Downing & Webb, for £,163*l*. 17*s*., for the erection of the Board schools, on the Heigham-street site. The Rev. Hinda Howell moved the reference of the tender to the Tender Committee for reconsideration. He said that when in the first case the specifications were placed before the Board a considerably smaller sum was named as the amount that would be required to build a school for 500 children. After some procedure, Mr. Brown (the architect) said that the former estimate was for 2,650*l*. The rise in building materials and labour, he said, would account for a good portion of the excess. The Rev. A. C. Copeman said that the Board had been anxious to get to work upon the schools. They had been impatient of delays. When the estimate was first brought forward it was distinctly stated by Mr. Brown that it was only a rough one, as the trade was in such a state as to render it almost impossible for any man truly to determine what would be the cost. Mr. Brown's explanations had brought up the estimate to within 73*l*. of the lowest tender. The tenders were 4,630*l*., 4,316*l*., 4,815*l*., 4,286*l*., 4,227*l*., and 4,163*l*. What object could possibly be served by a reference to the sub-committee? Were those who tendered to be called to account, or was the architect to be taken to task? Every work the architect had specified had been carefully examined, and everything was considered to be absolutely essential. That being so, what purpose could the reference serve except delaying the works? It was possible that the works might be less expensive by delay, but it was upon that contingency alone. Mr. Pinder calculated that the estimate would give 300*l*. above the 6*l*. per child; and suggested that reductions should be made to that amount. Mr. Birkbeck said that it ought to go forth, in justice to Mr. Brown, that the rise in prices largely accounted for the difference in the estimates. If the reference were to be made with a view to save expense to the city, he should support the motion. The resolution was then agreed to.

Newcastle.—At an adjourned meeting of the Board, it has been resolved, on the recommendation of the Science Classes Committee, to give 15 guineas to those classes, instead of 5 guineas, as last year. Mr. Casse moved that the plans of the three new schools, which had been before a committee of the board, be received. The motion was carried unanimously. Mr. Casse moved that the plans be adopted, and sent without delay to the Education Department for its approval, stating that 17,973 children were to be schooled, and there was only accommodation for 15,044, leaving 2,929 unprovided for. After a long discussion, the motion was carried, with the addition that a requisition he asked for.

Dronfield.—At a meeting of this board, the following resolutions were passed:—

"That the architects to the board be instructed to prepare plans and estimates for the erection of a school and master's house at Dronfield Woodhouse, including all fittings and furniture for the school." "That Messrs. H. May & S. Lucas be requested to examine plans, &c., for school buildings at Dronfield Woodhouse."

Portsmouth.—At the last meeting of this Board

held on the 26th ult., it was resolved to adopt the following recommendation of the Sites Committee, viz:—

"1. That Messrs. Alexander & Henman, of Stockton-on-Tees, conjointly with Messrs. Henman & Harrison, of Bedford-row, London, be appointed to furnish the design and superintend the work for the proposed school in Fratton-street, provided that their plans, having been approved by the board, are likewise satisfactory to the vendor of the site and the Education Department.

"2. That Messrs. Mileham & Kennedy, of 40, Great Marlborough-street, conjointly with Messrs. Davis & Emanuel, of Finsbury Circus, London, be appointed to furnish the design and superintend the work for the proposed school in Keut-street, Portsea, provided that their plans, having been approved by this Board, are satisfactory to the Education Department, and that such appointments be made subject to such conditions and details as may hereafter be resolved by this committee."

Newport.—Mr. Benjamin Lawrence, of the firm of Lawrence & Goodman, has been appointed architect to the Board, and a new mixed school for 210 children will be commenced forthwith. The plans prepared by him, and selected by them, have been approved by the Education Board, and the buildings will comprise a school-room, 50 ft. by 24 ft.; a class-room, 24 ft. by 17 ft.; with lobby, 24 ft. by 7 ft. between these; at the end of which will be a lavatory, and entrance by an inclined way to the playground in the rear. Beneath the schoolroom will be a covered playground, and there will be a separate entrance by an inclined way from the street to the playground. The building will be Domestic Gothic, in brick-work, with Bath stone dressings, and covered with slate.

Proposed Congress of School Boards.—At the London School Board meeting a letter has been read from the Liverpool Board suggesting that the London School Board should take the initiative in calling a congress of delegates from all the school boards throughout the kingdom. This letter was referred to a committee.

HORNSEY NATIONAL BOYS' SCHOOLS.

The parish of Hornsey has long suffered in consequence of inadequate school accommodation, and it was not until the Government grant had been withdrawn that an effort was made to secure a more eligible site and raise funds to build a large schoolhouse. About six months ago an application was made to the Bishop of London for permission to erect the schools on the glebe lands, and the request was readily complied with, his lordship being well acquainted with the requirements of the parish, having been four years minister of Muswell-hill Church, twenty-six years ago. At that time the Hornsey National Schools, small though they be, were the only public schools in the parish, and to them all the children in the parish had of necessity to attend. Since that time the parish has more than doubled its population; and if building operations be carried on with as great vigour during the ensuing six years as in the past, the population will have quadrupled. The new buildings are situated at the western boundary of the glebe lands, which surround the parish church, and are close on the main road. The structure does not possess any striking features in architecture, and is planned more with the view to utility than architectural beauty. The building, which is of stock brick, is interlaced with ornamental purple brick. The walls are 16 in. thick, with a hollow of 2 in. through the entire length of the building, and are bound with iron ties. The roof will be high-pitched, covered with red tiles, having an ornamental ridge or cresting. There is a porch at the north-west gable, over which is the turret with the bell. There are two large school-rooms, about 59 ft. long, and a class-room, leading off the principal school-room. The building will be ventilated with Ching's patent talc-flap turret ventilators fixed in the ceilings. The walls inside will be lined with white brick. To the east is the house intended for the schoolmaster, which consists of a parlour, kitchen, and offices on the ground floor, and three bedrooms above. There will also be a yard to the master's house, independent of the schools. To the south-west of the building is the lavatory. The schools will accommodate about 300 boys, and the cost of the building is 1,900*l*. The old site has been sold for 1,000*l*.; 317*l*. have been received from

the School Commissioners, 37*l*. from the National Society, and 800*l*. have been subscribed by the parishioners; the schools will therefore start free of debt, and the plans having been approved by the Government inspector of schools, the teacher will at once be entitled to the grant. It may be observed that the playground to the rear of the school will extend back several hundred feet, and form the boundary of the glebe lands. The architect is Mr. H. Martineau; and the contractors are Messrs. Manley & Rogers, Regent's Park.

THE NEW GOODS DEPOTS OF THE MIDLAND RAILWAY COMPANY IN LONDON.

AMONGST other new works and buildings now in progress for the Midland Railway Company, along the line of country through which their railway passes, the company are about to erect and open new premises in different parts of the metropolis. We understand that the company have secured the site upon which Whitecross-street prison until recently stood, and that they are about to erect upon it an extensive goods depot, and receiving-house for the district around the east end of the City. We are informed that the buildings in question will cover an unusually large area, and be of great magnitude. They are further about to construct a coal and goods depot, of enormous dimensions, at Wandsworth, on land which they have purchased from the London, Chatham, and Dover Company, to the extent of 10 acres. They have also secured a portion of the buildings now in course of erection at the junction of Fleet-street and St. Bride-street, for Messrs. Cook & Son's tourist offices. The portion of these premises taken by the company, includes the basement and the two shops forming the ground-floor in St. Bride-street, which will be fitted up as goods and parcel receiving offices for this district. The large new premises just erected by the company, in High-street, in the borough, for a similar purpose, at a cost of 15,000*l*., have just been opened. This depot covers an area nearly 2 acres in extent, the building itself, which has its main frontage to High-street, and which is three stories in height, being a prominent architectural feature in the neighbourhood, and containing the offices and store-rooms, with two large and handsome shops which the company intend to let. The depot, where the goods are received and forwarded to the main goods station at St. Pancras, is at the rear of the building, and is approached through a spacious gateway at the west end. The principal portion of the area of the depot, which is nearly an acre in extent, is covered over with a glass roof, supported by iron columns and girders, and on the east side is a large platform raised about 4 ft. above the ground level, on which the goods are deposited, the rest of the space being set apart for marshalling the company's wagons and trucks. Immediately in the extreme rear beyond the goods depot, large and commodious stables have been erected for the company's horses. These stables, which have stalls for 50 horses, are constructed on two heights, one above the other, the upper stables being approached by an inclined plane.

VALUE OF BUILDING LAND IN WALTHAM.

THE twentieth letting by auction, for building purposes, of land on the Waltham Common Estate, took place on Monday last, at the Elephant and Castle Tavern, when there was a very large attendance of builders and others interested. Messrs. C. Stuart Barker & Son officiated as auctioneers, and Mr. Barker, in opening the proceedings, made some interesting preliminary remarks as to the value of the land on the estate, and the houses which had already been erected upon it. He stated that about 1,000 plots of land had been disposed of up to the present time, and an equal number of houses and shops erected, the present estimated population consisting of persons residing in houses belonging to the estate being about 8,000. The plots let on Monday, on leases granted for a term of eighty years, comprised sites for the erection of twenty-six private houses, containing an average area of 17 ft. by 62 ft., together with a site for a tavern at the junction of Thurloe-street and Faraday-street, 68 ft. by 57 ft., containing an area of about 560 square yards. The

sites for the private houses were all readily let at an annual rental of from 5l. to 7l. each. The site for the tavern, which was described as one of the most valuable plots on the whole estate, commanded an active competition, and was eventually let at a yearly rental of 270l. The result of the day's letting amounted to an annual rental of 428l. 15s. The aggregate rental of the plots on the estate let up to the present time is upwards of 6,800l. per annum.

THE COAL AND IRON TRADES.

The force of combination has been taught by the trade-unionists, and, above all, by the building trade-unionists, to others besides the working classes proper; and we now have those engaged in trade or commerce, as well as proprietors and capitalists, combining, virtually or purposely, to raise prices to heights dictated solely by their greedy desire to make money, and only limited by the impossibility to extract more from the public purse. The principle of competition in this respect is a failure,—for the present at least; and the question is, what sort of principle is to supersede it? Co-operation has been considered the proper antidote or remedy for the evils of competition; but what is combination but a kind of co-operation? Coal-owners combining are just coal-owners co-operating; and so it is with coal-dealers who follow suit; so is it with iron-owners and dealers. The poor coal-workers force their masters to raise their wages 9d. per ton, and forthwith the price of coals is raised 9s. A host of intermediaries are attacked by the epidemic, and act upon a like principle; and by the time the coal reaches the consumer, 9s. are by no means the whole increase on the price. No one is satisfied with his previous profits; each must have more; and it is only the absolute inability to get more still, that arrests the price at last. The price of hutchers' meat has no doubt been increased in a similar way by intermediaries or middlemen; and no wonder one bears, as the writer of this happens to have done, of a mere hand-over of cattle, or small salesman, earning 15l. on a single transaction, and another paying 30l. for diamond earrings for his wife (who has absolutely become insane, and raves about millions of money, in consequence of her husband's extraordinary prosperity).

Whether coals will fall in price during the coming winter seems very doubtful: in the meantime, a mania appears to have seized upon the coal-owners and traders.

At a meeting of West Yorkshire colliery proprietors, held at the Queen's Hotel, Leeds, it was unanimously resolved to maintain the present high prices for coal.

Some uncomsolable wretches in the north have announced another rise of 5s. a ton. It is to be hoped they will have just the same sort of success as if they had insanely called it 55s.

Meantime, other countries are benefiting by the British coal mania; and so are our own colonies. The finest quality of steam coal (equal to the best Lanarkshire) is now being sold free on board at New London, Nova Scotia, at 8s. sterling per ton of 20 cwt. The same quality of coal is now selling free on board at the Bromielaw, Glasgow, at 21s. per ton of 20 cwt.

The search for more coal still continues, and with success; but are not the searchers bitten with the coal mania themselves? And will they not just charge "the market price" to the public, as do others? Or will the principle of competition induce them to forego the powerful influence of combination or co-operation amongst their fellows? Coal consumers are working the co-operative principle in self-defence. A co-operative society is being organised at Leicester among the working classes. A committee reports that coal could be bought at the pit's mouth at 10s. per ton, and good household coal at 8s., being from 10s. to 12s. per ton lower than the prices demanded in Leicester! The committee recommend that the coal be conveyed by canal instead of by rail.

Much good may be done in economising fuel, as by the *Builder* fire, now coming to the front again, on the small or domestic scale, and also by other means on a larger scale. The manufacturers of Sheffield, goaded to make experiments in the way of discovering new sources of fuel supply, have been pleased by a new process, which has been immediately adopted,—a process of burning engine slack into coke. Seeing that coke cannot be had under 30s. or 35s. per ton, the discovery promises to be exceedingly valu-

able, and is being very generally tested in all directions.

Speaking of the hardships of the coming winter, the *Sunday Magazine* for October says:—

"Food is dear, fuel is dearer, the potato crop is diseased, and much—only sufficient to be an excuse for an outrageous rise of prices, perhaps; struggles of labour and capital become more intense; the English labourer, slowest and most immovable of men, has begun to agitate; the whole under-stratum of society appears to be heaving. What is to be the result? Or to look only to what is immediate, how is the winter to pass over? If the upper and middle classes will feel a difference, and if the working classes will find that nearly all that they have gained in higher wages is taken back in higher prices, what will become of that class whose incomes, fixed and unelastic, can undergo no improvement? What will become of the clergyman and the teacher, the clerk and the annuitant, the widow and the invalid, who find it so hard to make ends meet even when the times are favourable, and who cannot but be chequered when prices suddenly rise? It is a strange experience to come upon us in the heart of a spell of such unwonted prosperity. It will at least serve to give scope to the thoughtful benevolence of those who are not satisfied with appeasing the outcry of the noisy, but would fain contribute to the adjustment of more honourable claims."

There seem to be symptoms of a decline in the prices of iron, which bid fair for a fall in coals also. The following prices are quoted by Messrs. Underhill, the leading iron merchant firm of South Staffordshire, at Wolverhampton:—We have this day (1st October) reduced the price of iron as under, from our list of July 12th, 1872:—

Bars, hoops, and strip.....	2l. per ton.
Sheets and plates.....	3l. per ton.
Thin-plates.....	3s. per box.
Iron wire.....	1s. per bundle.

The iron trade still displays an upward tendency in Belgium, but prices are rather uncertain, and vary considerably from day to day. Merchants' iron makes from 12l. to 12l. 16s. per ton; refining pig, from 5l. to 5l. 12s. per ton; and plates, between 17l. 4s. and 18l. 8s. per ton. Rails average about 12l. per ton. Some works show little inclination to undertake fresh rail contracts, but others display a readiness to accept even lower rates than the average quotations. Old rails have advanced from 7l. 4s. to 8l., and in some cases to 8l. 4s. per ton. The French iron trade continues in rather a feverish state. No. 1 rolled iron has been dealt in at the Haute-Marne at 12l. 16s. per ton. In the Meurtbe-et-Moselle pig remains in great demand, and it is very difficult to obtain deliveries with punctuality, as there is scarcely any disposable stock. The export iron trade of France is considered to be extending to Germany, Italy and Russia have forwarded the most orders of late. The production of Bessemer steel is also increasing in France; the Denain and Auzin Forges Company has concluded a contract with the Northern France Railway Company for 80,000 tons of steel rails, to be delivered in the course of the next ten years. The French coal trade remains in much the same state; neither merchants nor proprietors of works have been able to lay in all the supplies which they require. In common with their Belgian *confères*, French colliery-proprietors complain of a great scarcity of working miners. There is still much activity in the Belgian coal-mining districts.

THE IRON AND COAL TRADE IN THE NORTH-EAST OF ENGLAND.

ERECTION OF NEW FURNACES.

The iron trade in the Durham and Cleveland districts is in such a state of activity that the erection of new blast furnaces is necessary. The district at present contains 136 blast furnaces, against 127 erected in August, 1871; and those are reported to be producing 162,808 tons of pig iron per month, or nearly 2,000,000 tons per annum. But increased furnaces are required, and seventeen are now being built, which will give an increase of 15 per cent. on the present productive power. Of these new furnaces the Luckerby Company are building two near Eston; and Bolekov, Vaughan, & Co. one at the same place; Cochrane & Co. one at Garro Fleet; W. Whitwell & Co. two at Stockton-on-Tees; the Consett Iron Company, one at Consett, near Durham; the North of England Coal and Iron Company one at Carlton; the Rosedale and Ferry-hill Iron Company two at Ferry-hill; Downey & Co. two at Coatham, near Redcar; the Tees Bridge Iron Company two at Stockton-on-Tees; Robson, Maynard, & Co. two at Redcar; and Messrs. Thomas Richardson & Co. two at West Hartlepool.

In connexion with the coal trade of the dis-

trict new mines are being opened in several parts of it. A new shaft is being sunk at Crook Hall, near Durham, and at Waldrige Fell preparations for opening two pits are in progress. The owners of the Byron Colliery are sinking a shaft near South Edmonstone; and at Acon Close another shaft to work the Hutton and Busby seams is in course of construction near the Charlow Colliery, whilst at Sacriston a large number of workmen's houses are being built, as well as 400 new coke-ovens. A company is also being formed consisting of practical men to re-win the Hutton seam in the county of Durham, Mr. J. Lishman being the engineer, and also one of the proprietors of the undertaking. It is said that the Beaupark Company have come across the Hutton seam, and will soon have coal in the market. The Chilton mines are also about to be worked on an extensive scale. The whole of the mining property in this district is reported to present a scene of great activity, and it is said that as the royalties are opened out and worked, there must, beyond all doubt, be an early decline in the price of coal.

THE PURCHASE OF THE BRIDGEWATER CANAL.

The purchase of the Bridgewater Canal, which amongst its other ramifications, traverses the part of Lancashire between Manchester and Liverpool, is a somewhat gigantic enterprise for two gentlemen to be engaged in their private capacity. It appears that the purchase has been negotiated by Sir Edward Watkin, chairman of the Manchester and Sheffield, and by Mr. Price, chairman of the Midland, Railway Companies, but that the purchase is the private speculation of the two gentlemen in question, and is in no way connected with the two railway companies which they respectively represent. The Manchester Chamber of Commerce appear, however, and no wonder, to be incredulous on this point and have passed a formal resolution to the effect that "it concurs in the opinion of the Select Parliamentary Committee of last Session that waterways should not be absorbed by railways, and hereby expresses its opinion that the transfer of the canals between Manchester and Liverpool to certain railway directors is adverse to the commercial interests of the two towns." It is stated that one object of the purchase is so to alter the canal as to adapt it for steamship traffic, which would doubtless have a most important effect on the freight of cotton and other merchandise between Liverpool and Manchester.

THE GREAT FIRE IN THAMES-STREET.

Most of our readers will have heard of the great fire which took place at 118, Upper Thames-street, on Friday evening in last week, whereby nearly the whole of Mr. George Mitchell's valuable stock of marble mantelpieces, stoves, and sculptured work has been totally destroyed. Although Mr. Mitchell has in consequence lost property to the extent of between 5,000l. and 6,000l., which is only partly insured, we are happy to say that the loss is not ruinous. The circumstance of this fire is only one more striking incident in a very singular career.

From a book which has recently been published, "The Romance of Peasant Life in the West of England," by Francis George Heath, we learn that about twenty-eight years ago Mr. Mitchell was a poor farmyard boy in Somersetshire, earning 4s. a week in the employ of a hard and cruel master. He possessed, however, a singular amount of energy and perseverance. At nineteen years of age he left his native village,—Moutacnte, near Yeovil,—and although he could not read or write, he came to London. He had previously picked up some knowledge of the stone-mason's trade. We extract the following from the book to which we have referred:—

"The remainder of George Mitchell's career may be told in a few words. During the twenty-five years that he has been in London he has exhibited a truly remarkable amount of perseverance and ability in the prosecution of his business. From step to step he slowly and surely advanced. From a mason's lad he became a journeyman, and from a journeyman a small proprietor; and from the position of the small proprietor he advanced to that of the rich and prosperous merchant; and I am assured that at the present time his business is one of the most prosperous of its kind in England. 'But,' said Mr. Mitchell to me, 'in my great prosperity I have not forgotten my former condition in life. My heart bleeds for the poor farm labourers in my native village, and I have told them that if the farmers will not better their condition, I will guarantee to find employment for a number of them in connexion with my own trade in London.'"

Mr. Mitchell has taken a very active part in the agricultural labourers' movement, and his time and his money have been expended upon the cause. We are glad to know that the present loss will not in any way interfere with his business. The Upper Thames-street branch is now being temporarily carried on at 1, Duck's-foot-lane; his show-rooms in the Brompton-road are full of stock; and his works in Walton-street, Brompton, are in full activity.

CONSECRATION OF ST. GILES'S PARISH CHURCH, READING.

St. GILES'S, Reading, has been enlarged and restored, and is now open for divine service. The work of restoration and enlargement embraced the demolition of the former chancel, vestry, sham arcade, and the whole of the roofs throughout, the nave being now lengthened out eastward some 22 ft., and new north and south transepts, each 22 ft. by 28 ft., added on either side, thus increasing the area of the body of the church to the extent of 1,870 square feet. An entirely new chancel, 42 ft. by 22 ft., has been erected, with a vestry on the north side, 32½ ft. by 18 ft.; a chancel aisle for children on the south side, 26 ft. by 18 ft.; and a porch at the south-west end of the south aisle, 12 ft. by 10 ft. internally. The interior dimensions of the church now are:—Extreme length from east to west, 126 ft.; width across nave and aisles, 70 ft.; width of nave and transepts, 85 ft.; height to ridge, about 42 ft. The new walls are built of brick and rubble stone, with flint facing on the outside, Donling stone being used for all exterior dressings, including the tracered windows, which are mostly of large size. Gorsham Down stone has been used for all the dressings on the inside, including the sedilia, with polished granite shafts, piscinas, &c.; the various steps, kerbs, and landings being of Forest of Dean, York, Pennant, &c. The new roofs, constructed chiefly of pitch pine, are of high pitch and open-timbered, having principals at frequent intervals, of the collar-beam type, with moulded ribs springing from the wall-plate, forming a series of pointed arches, which, with the great number of curved wib braces introduced in the sides of the roofs, are effective when viewed from below. These roofs are covered with local tiling, of the manufacture of Messrs. Wheeler Brothers, of Reading, the ridges being formed with ornamental red tiles, supplied by Mr. Cooper, of Maidenhead. The church is seated throughout with low pitch-pine benches of simple design, fixed to board-pitches. The remainder of the floor-space is paved with 6-in. tiles, of three colours. The chancel floor, except a portion occupied by choir-stalls, is also laid with tiles of a richer design. Seats of wainscot oak are placed in the chancel for the accommodation of the choir, with prayer-desks at the west end for the clergy. The pulpit is of wainscot oak, semi-octagonal in plan, having six panels round the sides filled with tracered heads, and carved paterae along the cornice. The pulpit proper rests on a base of rubbed white Mansfield stone, approached with four steps of the same material. The nave arcades consist of four wide-spreading pointed moulded arches on each side, resting on three somewhat slender pillars, with deeply-moulded caps and bases; these pillars being small in diameter and few in number obstruct the view only to a small extent. The chancel arches, with their moulded members, carved capitals, and clustered shafts of polished red granite, have an effective appearance, improved by the metal screens on each side, with gas-jets along the top (by Mr. Leaver). A low metal screen and gates separate the chancel and nave; these stand on a low wall of wrought and moulded stone, with three central steps leading up to the chancel. The portable furniture of the church, such as the Litany-desk, font-cover, vestry-table, &c., are executed in wainscot oak, from the architect's designs; the communion-table is made of old English oak, selected from the old timbers of the former church, by the clerk of the works.

The walls throughout the interior are plastered with trowelled stucco, and the spaces between the rafters of all the roofs are lathed, plastered, and whitened. The warming and ventilation of the church have been carried out by Mr. Woodcock, of London and Paris, and are on the "hot-air" principle, a special vault being provided for the apparatus under the vestry, and small lids have been formed in the wooden floors under the seats,

for the purpose of assisting the warming and ventilation of the whole church. The spaces under the floor are concreted over to the thickness of 6 in., and the concrete and the whole of the floor timbers have been washed over with a chemical solution to prevent the growth of fungus and the spread of dry rot. These precautions are due to the architect, and were included in the contract.

The works to the tower, which consist of a new stago and a lofty stone spire, are matters for a second contract, now entered into by the Messrs. Davis, but certain works to the lower stage have already been done. These consist of a new west doorway, a new tile floor and steps, sundry repairs to the walls, and a screen of pitch-pine under the tower arch. The ceiling of the ringing-floor has been caased with pitch-pine boarding stained and varnished, and collected with old oak ribs and bosses from the former work. The porch at the west entrance has been removed, and the approach generally improved. The carving has been done by Mr. Earp, of London; some of the heads in the arcades, &c., are quite works of art, and reflect the highest credit on the carver, whose abilities have a wide and enduring reputation. The whole of the works of the restoration and enlargement of the church have been carried out by Messrs. J. & T. Davis, of Banbury, builders, at a cost of between 7,000, and 8,000*l.*, from the designs of Mr. James Piers St. Aubyn, architect, London, under the immediate supervision of Mr. Robert Dampier, as clerk of the works.

The whole of the gasfitting arrangements were done by Messrs. Wright & Shackel, of Reading. Twenty polished brass Gothic standards were so arranged in the church that an equal light was everywhere observable. Two brackets with triple lights were fixed in the entrance porch, a small Gothic standard to the pulpit, and corona for the vestry.

An improvement has been effected in the exterior by taking down the high iron fence, which rendered any good view of the church almost impossible. This has been reduced about 2 ft., and re-fixed in a more modern style by Messrs. Wright & Shackel.

Among special gifts may be enumerated the east window, representing our Lord in glory, presented by the Misses Hulme, and the two-light window, also in the chancel, presented by Mr. O. G. Maurice, and Mr. Lowndes; both these windows were executed by Messrs. Glayton & Bell; the reredos, executed by Messrs. Powell, of London, in "opus sectile" mosaic, the joint gift of the Revs. A. A. Gameron, B. R. Body, G. R. Honey, and the Misses Hulme; two-light window, by Ward & Hughes, replaced with additions by Lady Dukinfield, in memoriam; two-light window by Hardman, in memoriam, presented by Mrs. Sherwood; one light of a painted window, given by Messrs. Gladden & Son, which will be fixed as soon as a second portion is provided.

PARISH MORTUARIES.

THE St. George's, Hanover-square, Committee of Works having been requested by the vestry to consider the necessity or otherwise of having a mortuary or mortuaries in the parish, together with a suitable site, and the cost of erection, the surveyor reported that, in pursuance of instructions, he had written to forty parishes and district boards on the subject, and received twenty-six replies. The St. Pancras Vestry returned for answer that they have no mortuary, but there is a dead-house in the work-house, which, however, is seldom used, but for paupers. St. Saviour's had no mortuary, nor had Mile-end Old Town, or Old St. Pancras, or the Plumstead and Westminster District Boards of Works. The Strand District Board of Works had no mortuary, but dead-houses in the different parishes of the district. Rotherhithe had a dead-house in the churchyard for the reception of dead bodies found in the Thames, but no mortuary. Hampstead had a dead-house, under the control of the guardians, which they considered quite sufficient, without a mortuary. Gambervell had no mortuary, but a dead-house in the cemetery, which was in the parish. Kensington has no mortuary, but the vestry have the subject under consideration. Shore-ditch had at one time no site for a mortuary, but it now possesses one at the rear of the Vestry-hall. St. George the Martyr's has no mortuary. The Wandsworth Board of Works has six parishes in the district each of which possesses a dead-house. St. Mary's, Newington, has a mortuary

in Manor-place, which the authorities invite the surveyor to inspect. The Chelsea Vestry have replied that they have two mortuaries,—one for the poor entirely. From Fulham the answer was that the mortuary was seldom or never used. St. George's in the East had no mortuary, but a dead-house, where bodies were taken to await an inquest. The Hackney authorities have had a mortuary since 1866, used considerably, and by respectable people. During the past year 158 dead bodies were deposited in the mortuary. St. Olave's, Southwark, had no mortuary, but a dead-house, available for casual street deaths. The Islington Vestry have a mortuary, under the control of the guardians, in the grounds of the chapel of ease. Here were taken the bodies from the workhouse infirmary, and bodies awaiting an inquest; but it was seldom used by the poor. Clerkenwell has had a mortuary since 1866, but it was not extensively used. There was a dead-house at the workhouse for dead bodies and bodies awaiting a *post-mortem* examination. Paddington Vestry replied that they had a dead-house in St. Mary's Churchyard which had been improved so as to be almost as good as a mortuary, and was used twelve times last August. St. Martin-in-the-Fields has a mortuary. The City authorities sent an account of the mortuary in Golden-lane; while the St. James's, Westminster, Vestry had no mortuary, and no site. Mr. Mitchell considered it necessary to have a mortuary,—a decent place, and not a receptacle for contractors' coffins,—and he would, therefore, move that the Vestry be recommended to erect a mortuary. Mr. Glickman seconded. Mr. Walker thought there should be a mortuary somewhere near Hyde Park-corner, as no mortuary was not sufficient for St. George's parish. Mr. J. Morris did not think the mortuary necessary. The Chairman thought there should be a postponement, as there was not sufficient information. Mr. Barlow said it would be advisable, perhaps, to ask undertakers if they ever had applications to receive corpses into their houses. Mr. Walker said corpses had to be removed from St. George's Hospital, shortly after death, into undertakers' houses; and he knew of a case where a person who had died of the small-pox lay in a coffin in an undertaker's room, and a man made a coffin by the side of it. The suggestion of the Chairman as to the postponement of the question was adopted.

LINCOLN.

ON Monday, 30th ult., the town council of the city of Lincoln held a special meeting, as a local sanitary authority under the provisions of the Public Health Act, 1872, and reappointed the officers of the late Local Board, at the following salaries:—Clerk, 250*l.*; treasurer, 60*l.*; surveyor, 120*l.*; medical officer, 20*l.*; waterworks manager, 275*l.*; inspector of nuisances, 100*l.*; they also decided to advertise for a sub-surveyor, a new appointment rendered necessary by the corporation having taken most of the sanitary work of the city into their own hands.

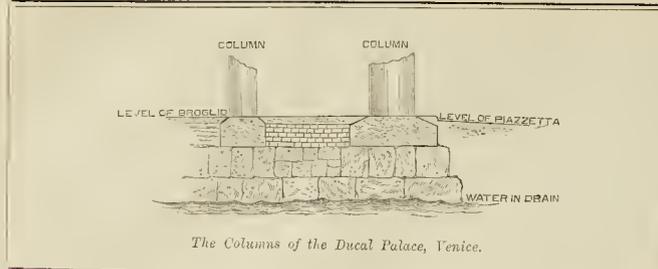
"WANTED."

SIR,—It may suit the ideas of the powers that be to retain the testimonials of unsuccessful candidates for appointments advertised in your paper, and never so much as think that the said unfortunate people deserve a reply.

Possibly, ideas of economy have something to do with this practice; but would it not be well for parties advertising for professional men to remember that, although the returning of an unsuccessful candidate's testimonials may cost 2*l.* of postage-money, the said candidate had the same amount to disburse, plus an excessive amount of time, trouble, and inconvenience, happily unknown to the advertisers. In many points, and especially so in intellectual capacity, we assert our equality with those who "want" us. Apart from that, on the ground of common courtesy alone, the trouble we are put to deserves some sort of recognition. And we have simply to assure the class of advertisers we refer to that where they retain our testimonials, and neglect to tell us whether or not we have been successful, they are guilty of behaviour anything but honourable.

DOUBLE ELEPHANT.

* * * Our advice has long been that candidates should send copies of testimonials, not the originals.



The Columns of the Ducal Palace, Venice.

THE COLUMNS OF THE DUCAL PALACE, VENICE.

WERE the columns (of the lowest tier of arches) of the Ducal Palace any longer originally than they are now? This question has been put to me constantly by travellers of all kinds, when I have replied,—“I do not believe they were longer than we now see them, for, to my mind, they would be out of proportion, judging from existing work of the same date at Verona and other places.” I have been met thus:—“But ‘Murray’ says they were.” What says Murray’s “Guide to Northern Italy,” p. 391, edition of 1869:—

“The columns of the lowest tier of arches are partly embedded in the pavement, the level of which was raised (1732) about a foot, in consequence of the inundations to which the Piazzetta and Molo were subject, which gives them an undesired appearance of clumsiness. They stand, however, not upon bases, but upon a continued stylobate, as discovered some years ago, when the Piazzetta was repaired.

It appears from observations made with care, that the mean level of the sea at Venice has risen about 3 in. in every century; so that, as these columns have been erected five centuries, about 15 in. of the lower part of them are now concealed, owing to the repeated and necessary elevation of the pavement.”

Now what is the fact? About two months ago the south-west angle of the Ducal Palace was covered in, so far as the lower story is concerned, for the purpose of examination, and the removing three or four capitals, which have become so ruinous as to endanger the existence of that part of the palace. The superintendent of the works gave me permission to go in and make what observations and sketches I wished.

When the pavement was removed, I found that the bottoms of the columns were precisely on a level with the existing pavement of the Broglia, which is about 4 in. raised above that of the Piazzetta. The columns rest upon blocks of Istrian stone, the upper one but a trifle larger than the diameter of the column, and rough-hewn, so that they never could have been finished bases. The edges of these upper blocks have been cut away in a slanting direction, to allow the close-fitting of the paving-stones just up to where the column rests upon the block, neither covering the joint nor below it.

These blocks are, in the opinion of the superintendent, the original foundation of the building, and they seem to-day as perfect and good as when placed there. The space between each column, or rather the group or tier of stones on which they stand, is filled in with red bricks and rough stones. Three layers of blocks were seen, the water (which rose and fell with the tide coming into the drain which carried off the rain-water) covered whatever there was below; but, I believe, so far as I could judge by feeling with a stick, that under the water there was also solid stone.

It was not possible to insert even the point of a penknife between the column and the stone below, so sharp and close-fitting are they.

JOHN BUNNEY.

THE TRADES MOVEMENT.

London.—On Wednesday last Messrs. Corbett & McClymont were waited upon at West Brompton by several gentlemen desirous of ascertaining what were the prospects of a speedy settlement of the dispute. The deputation were frankly told that it rested entirely with the men themselves how long the conflict lasted, as the firm had sufficient hands, and had no intention of receding from the position it had taken up. The

feeling of the public was adverse to the firm; but its friends, who were acquainted with the facts of the case, quite approved of the course it had adopted. The reason why the increased wage was withdrawn, had not yet been accurately stated. The firm had never objected to pay a mechanic 8½d. an hour, or even more, no matter what branch of the trade he belonged to, provided he was worth the money. On the occasion of the recent arrangement with the Master Builders’ Association, the foremen of the various departments were directed to make the halfpenny increase wherever it was deserved. Before, however, a week had elapsed, dissatisfaction arose, because all had not been treated alike, and placed on one and the same footing. The firm thereupon resolved to return to the old system, and the strike took place solely and simply on account of its refusing to pay good, bad, and indifferent alike. The 52½ hours there was no objection to what, over; but, at the same time, it should be understood the firm did not occupy the position of ordinary builders and contractors who regulated their prices by the ruling or standard wages of the day; but more resembled an independent gentleman employing workmen to build on his own land. No matter what he paid, he could get no more than a certain rent for his houses, and was fully justified in purchasing his labour cheap if he could, without reference to the custom or regulations of the trade.

Ten years ago, Mr. McClymont added, he and his partner Mr. Corbett came into possession of the Redcliffe Estate, when they commenced operations with fifty houses, and year by year since had gone on building roads, squares, terraces, and crescents, until the property had arrived at its present state of prosperity and extensive proportions. During that time they had got around them a great body of workmen, whom they were now sorry to part with, but whom they had never ceased to classify or pay according to merit and ability. They never had, and never would recognize any hard and fast rule, placing all men on an equality as mechanics, and reducing the highly skilled to the same level as the lesser skilled operative. That being so, Mr. McClymont thought the men might have been a little more circumspect in some of their statements; while, as for Mr. Matkin, the carpenters and joiners’ secretary, pretending to speak contemptuously of middlemen, he should like to know what would become of the workmen if there were no middlemen, in the building trade especially. He had himself risen from the ranks, and perfectly well understood that part of the question, and his opinion was it would be a poor look-out, indeed, for labour if there were no enterprising men of that kind.

The closing meeting of the Amalgamated Building Trades’ committee, which originally represented the masons, carpenters, joiners, bricklayers, plasterers, painters, smiths, and labourers, in the late struggle, has been held in the Sutherland Arms, St. Martin’s-lane, when the following resolution, moved by Mr. Coulson, bricklayer, and seconded by Mr. Sainsbury, plasterer, was passed, viz.:—

“That this Committee, having accomplished the work for which it was constituted, shall be and is hereby dissolved. At the same time we express our willingness to co-operate with all other bodies should any difficulty hereafter arise which may affect the general interests of the building trades.”

After a vote of thanks to the chairman of the evening, and to Mr. George Shipton, the secretary, the committee was formally declared dissolved, and the meeting broke up.

A settlement has taken place at Messrs. Gillin’s firm, and the joiners have resumed work on condition of working fifty-three hours per week, with the usual time for breakfast and dinner, leaving off at one o’clock on Saturdays.

A large builders’ labourers’ meeting has been held at Kingston-on-Thames. Messrs. Kenny & Halloran addressed the meeting, and the following resolution was proposed and carried unanimously:—

“That in the opinion of this meeting of builders’ labourers of Kingston and the adjoining districts, we pledge ourselves to unite with our brother labourers in London in any steps they may take to obtain 6d. per hour for our labour, which we think is little enough to enable us to procure the common necessities of life, at the present increased prices.”

Another builders’ labourers’ meeting has taken place at Chelsea New Bridge. The meeting was addressed by the same speakers, and a similar resolution was passed.

Birmingham.—A meeting of the glass and china decorators of Birmingham has been held at the Shakespeare’s Head, Livery-street; Mr. Griffiths in the chair. Mr. Biddle referred to the indifferent attitude of several employers, which, he believed, was calculated to bring about serious complications. After some remarks from other workmen present, a deputation was formed to wait upon the Brassworkers’ Society, with a view to combination, and the meeting was adjourned.

Edinburgh.—An aggregate meeting of the Edinburgh joiners has been held in the Waverley Hall, to consider “the present condition and future prospects of the trade, with reference to the rate of wages, and on the position necessary to maintain the balance of power between capital and labour.” Mr. Rintoul was called to the chair. The meeting was first addressed by Messrs. Goodfellow and Boveridge. Mr. Ramsay moved:—

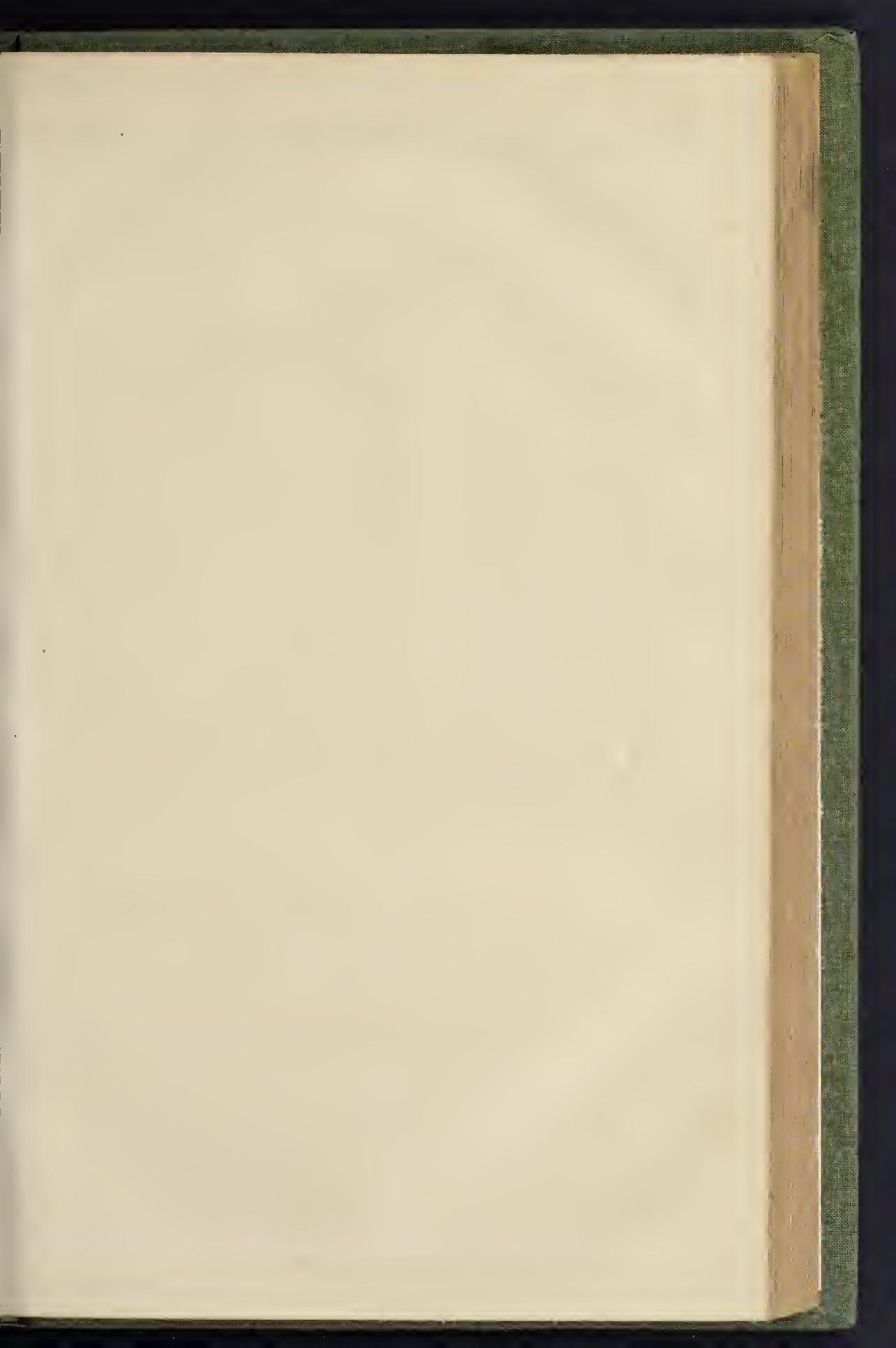
“That this meeting, being convinced that we, as a trade, are not in a properly consolidated position,—the result of which being that we do not, and cannot, in our present position, receive that remuneration for our labour to which we are entitled, and that we are not in this respect on an equal footing with the other trades connected with building,—and that in the past we have been guilty of a great dereliction of duty,—we therefore resolve that for the future we shall use all lawful and constitutional means of a practical kind within our reach for our pecuniary advancement, which, of necessity, includes our moral, social, and intellectual elevation.”

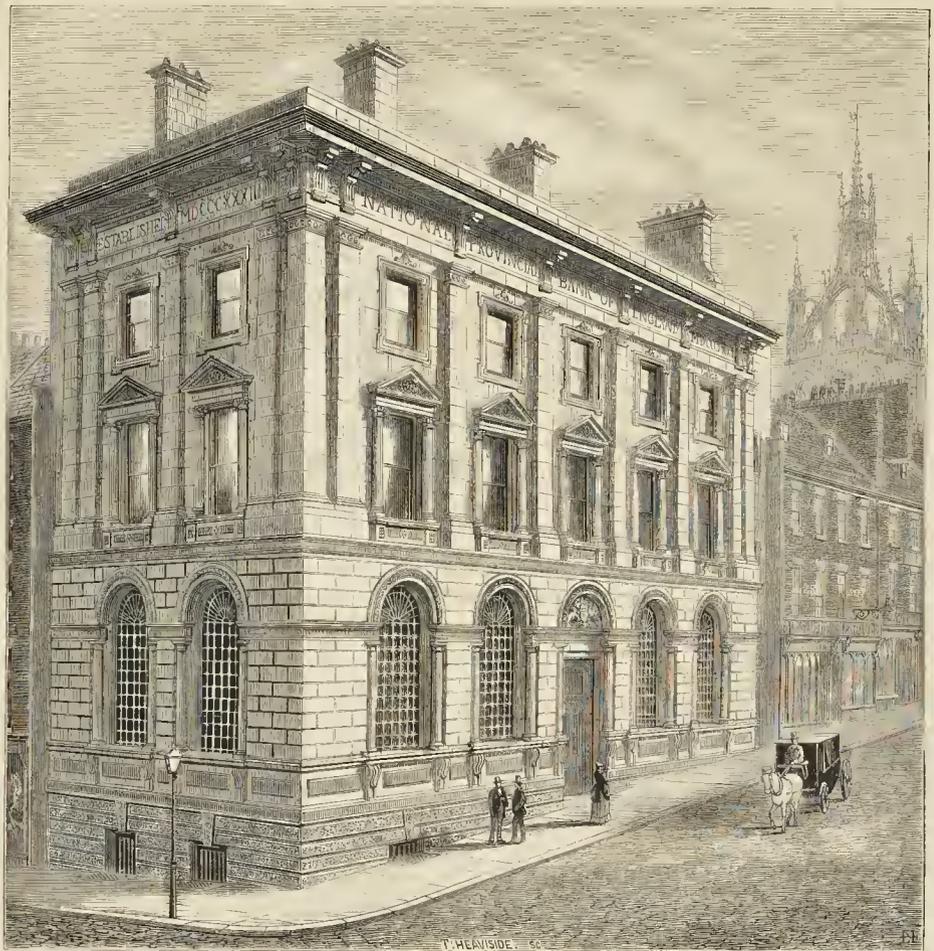
Mr. George Baird seconded the motion, and it was unanimously adopted. In respect of the second part of the programme of the business, Mr. Paterson gave a statement as to the present condition and future prospects of the trade. He said that the trade in Scotland never was better; and though in Glasgow it might not be so good this winter as in the past winter and spring, in Edinburgh it would be equally good with what it had been recently. He thought the trade should press for an advance, and that there could be no question that they were underpaid. Mr. Thom, seconded by Mr. Nisbet, thereupon moved that they should give their employers notice of a demand for 1d. per hour increased, pay to begin on the 1st of March next; and of another 1d. per hour to begin three months later. As an amendment, Mr. Vallance, seconded by Mr. Stewart, moved that the demand should be for 1d. per hour, to begin on 1st of March. A further amendment, that only ½d. per hour should be asked to begin on the same date, was moved by Mr. Baird, and seconded by Mr. McKay.

The second amendment only received 14 votes, and was set aside; the first amendment and the motion were next put together, and the amendment adopted by 136 votes against 24. It was thereupon unanimously resolved to support the demand for 1d. per hour of increase. A proposal to take up the subject of weekly pays was negatived as at that meeting, which was then adjourned.

Mr. Lowe on Strikes.—On the question of strikes, Mr. Lowe argued at great length, in Glasgow lately, against the prevalent impression that strikes permanently increased the value of commodities, or could be of lasting benefit to the working classes. Just as prices increased most the demand be diminished, unless substitutes were found. If the demand were diminished, a certain proportion of workmen must lose their employment. The rest might, indeed, gain higher wages, but that increase would be lost as improved machinery, or other agencies, reduced the cost of production. One class would be sacrificed, and the other would gain nothing.

Monumental.—A memorial cross has been erected in the grounds of Sir Percy Shelley, at Boscombe Place, to mark the intended burial-ground of the family. The design is by Lady Shelley, and consists of a sculptured base of rock-work, from which springs a rough fir-tree, nailed in the form of a cross. Three nails pierce through the cross. The inscription on the rockery is in solid lead letters, the words being “The resting-place.” The work has been executed by Mr. S. Hornor in white marble, under the personal superintendance of Lady Shelley. The four huge statues erected at the two ends of the Pont du Carrousel, Paris, have been entirely repaired, and covered with a coating of some composition to protect them against the weather.





NATIONAL PROVINCIAL BANK OF ENGLAND : NEWCASTLE-ON-TYNE BRANCH.

MR. JOHN GIBSON, ARCHITECT.

NATIONAL PROVINCIAL BANK OF
ENGLAND :
NEWCASTLE-ON-TYNE BRANCH.
STRONG ROOMS.

Our view of the above building is drawn from a photograph, which also shows the upper part of the well-known tower of St. Nicholas Church. Adjoining the churchyard is the resident clerk's and messenger's entrance to their apartments.

The front in Mosley-street is 85 ft. in length, and in Dean-street 36 ft. The height of the building averages 65 ft.

The walls generally are built of brick, the two street fronts above-named are faced with Kenton stone. The building is constructed fire-proof on the Dennett system.

The banking-room on the ground-floor is entered from Mosley-street, and is 72 ft. long by 28 ft. wide; its height being 22 ft. It is lighted by seven large windows; the ceiling, being coved, is grained to receive their semi-circular heads: the glass is embossed, and protected externally by elaborate wrought-iron grilles in lieu of shutters. On each side of these windows are polished red granite shafts. These are altogether well designed, and on another occasion we will give a view of one of the windows at large.

The artificial lighting is by three sunburners

with ornamental zinc gilt pendants, which act as ventilators; the field of the ceiling being panelled.

The warming apparatus, contracted for by Phipson, is a hot-water one; the warm air being admitted into the banking-room through flues in the walls above the level of the desks, and by other gratings in front of the counter.

The fittings are of Honduras and Spanish mahogany, contracted for by Sopwith & Co.; the public space being laid with Minton's tiles. The entrance has two sets of doors,—a folding pair on the outside, screen doors on the inside; and the outer doors are enclosed by night doors lined with iron.

The strong-room which contains the treasury is formed in the middle of the building, having another strong-room immediately underneath; its walls and arching are lined with $\frac{1}{2}$ -in. iron, and it is completely fitted for deeds, securities, vouchers, and so on. The treasury itself is placed within this room, and is 6 ft. 6 in. square by 7 ft. high. It is constructed throughout of three thicknesses of wrought iron, with non-conductors of heat between. The door to this, as well as to the outer chamber, is hard steel plated: into the lock of the latter a night-bolt passes from one of the residents' rooms; there is also an iron gate on the inner side of the door last-named. There are about nine tons of metal employed in the

construction of the above, which was contracted for by Chubb & Son. In addition to the above-named, but below the banking-room, are two strong-rooms reached by a distinct staircase: one of these rooms is 41 ft. long by 13 ft. wide for hooks: the end of this grilled off is a strong-room for the use of customers. It is inclosed with fireproof walls and arching, and is fitted with a centre rack and side shelving. Adjoining is a store for stationery. The other strong-room is in the rear of the building, and is of smaller dimensions,—it is also fireproof; and all are warmed by the bank apparatus, and have distinct ventilating shafts.

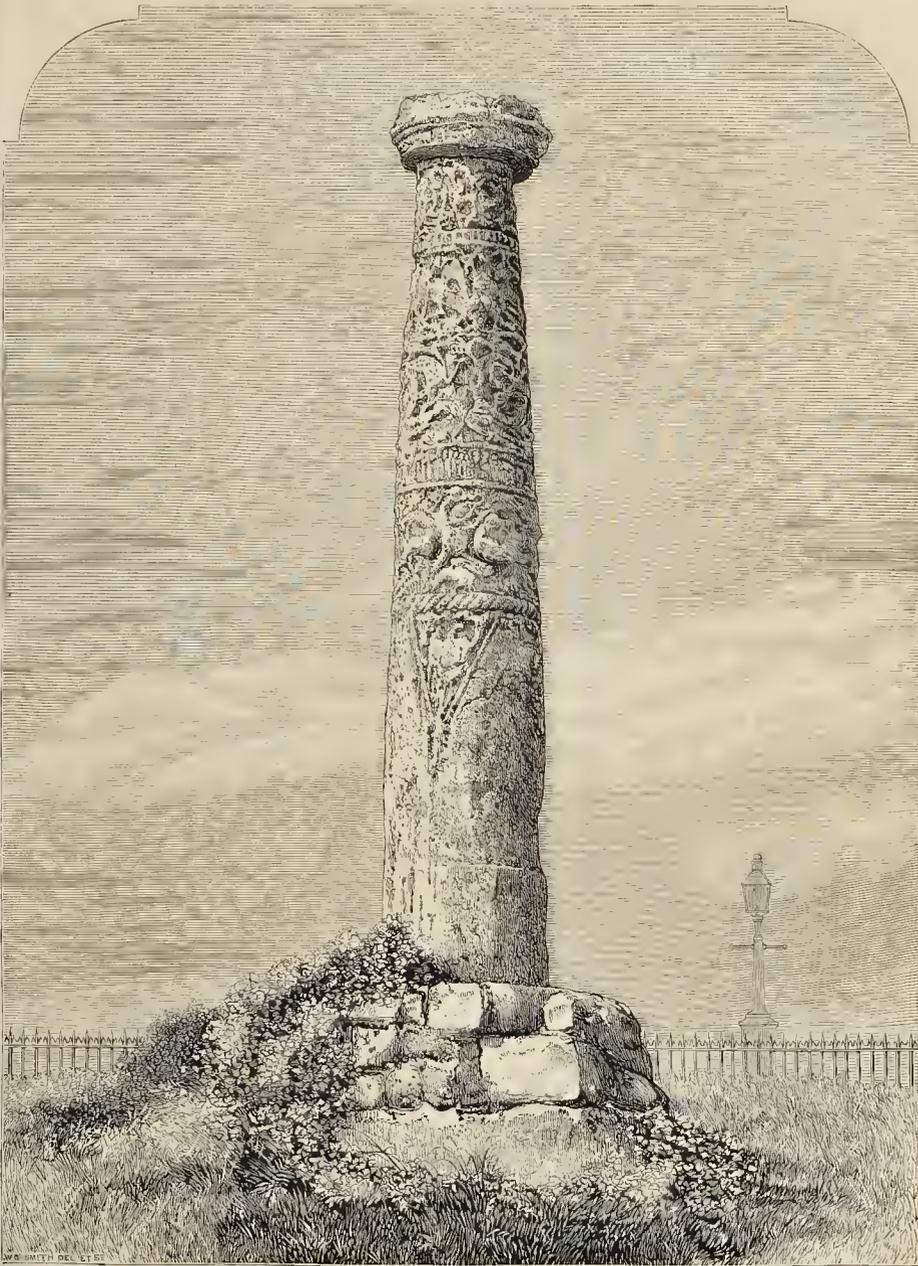
A hoist communicates with the banking-room. At the end adjoining Dean-street is the clerks' luncheon-room, lavatory, &c. The remainder of the basement consists of kitchen and other offices.

The two upper floors of the rear portion of the building are occupied as dwelling-rooms by the resident clerk and messenger.

The two upper stories of the main building are occupied for commercial and legal purposes, and in the attics are rooms for a messenger.

Mr. John Gibson, of Westminster, is the architect; Mr. Joseph Elliot the contractor for the building works; and Mr. Glover the clerk of works.

The cost of the building and fittings has been about 14,000l.



ANCIENT PILLAR IN WOLVERHAMPTON CHURCHYARD.

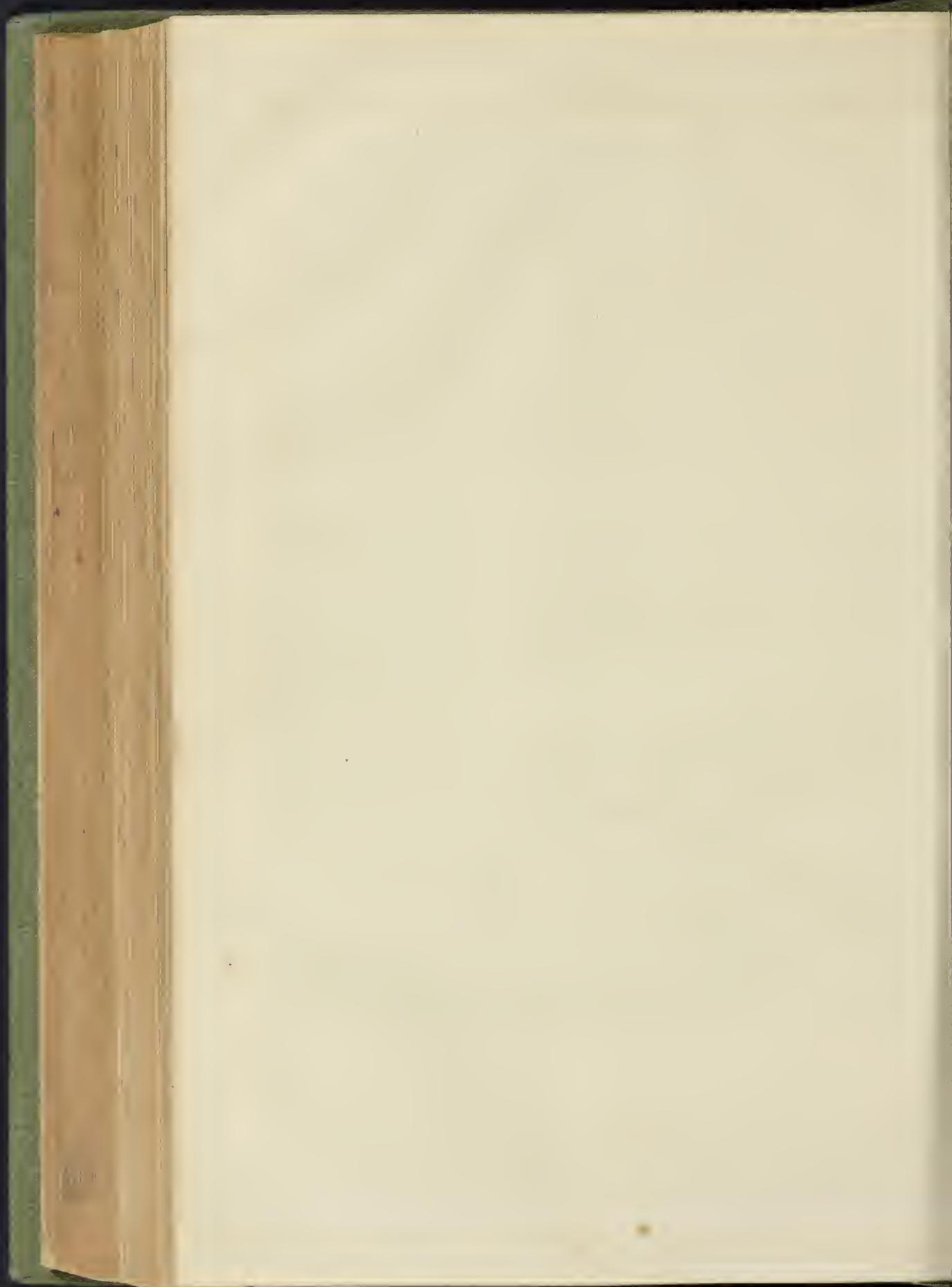
THE ANCIENT PILLAR IN WOLVERHAMPTON CHURCHYARD.

WHEN the British Archaeological Association visited Wolverhampton in August last, much interest was excited by the ancient pillar-stone or cross which stands on an elevated spot in the churchyard there, on the south side of the church, and its probable date was discussed with

much amusing pertinacity on several occasions during the visit. In our notice of the meeting we mentioned something of what had been said as to this very interesting monument, and promised that we would give a view of it on another occasion. We fulfil this promise in our present issue, and shall be glad if it enable some of our correspondents to throw light on its date by comparison with other monuments or other-

wise. We shall not scruple to repeat part of what we have already printed so as to bring together the various opinions expressed.

It has been long called locally "the Danes' Cross." Mr. Levien, on first introducing the subject, said it was so named from the remains of what were supposed to be the figures of ravens sculptured upon it; ravens having been held in great veneration by the Danes as the



of their god Odin, as eagles were believed to be those of Júpiter, the owl tho' attendant of Minerva, and the dove of Venus. The Danes had two emblematical ravens—one indicative of victory and the other of defeat; and the inscription was which of these two ravens seen by some on the pillar were. It was known that the Danes committed excessive ravages in Mercia, and it was thought on the one hand that this pillar was put up to commemorate some victory by that people, as it was not usual for people to commemorate their defeats. The Saxons, on the other hand, were quoted to show that the Danes suffered an enormous defeat in his part of Mercia; but that was the Saxon version, while there was no doubt that the Danes succeeded in firmly establishing themselves there. The cross, he thought, might have been erected to commemorate some victory; but whether of the Danes or Saxons remained undecided.

In a report on the church made some years ago, Mr. Christian says, he thinks the pillar may be called Norman work, and that it may have formed the shaft or pedestal of a cross, the upper part of which has been long destroyed. The material of which it is composed being sandstone, and the block being set contrariwise to a quarry bed, the weather has greatly acted on its surfaces, and, by plunging them out in grooves and holes, has produced marks and indentations which have so much the appearance of the carver's work, that at first sight it appears much more richly wrought than a closer examination proves it to have been. The upper step circular in form, and is a single block of stone 18 in. in diameter. Other steps, continues Mr. Christian, probably he buried beneath the efface, the soil having been much raised in this part of the churchyard. This supposition as to buried steps, let us say at once, has been disproved. A hole was dug and no other steps were found. The pillar is in this respect as it is originally placed.

Mr. Gordon Hills, in expressing his opinion as to the date of the monument, said it was well known that in ancient times crosses were erected as landmarks. Without any idea of a religious character, the Romans raised crosses as landmarks; in fact, it was one of their rules, when surveying a country, that crosses should be erected at special points. It was very probable that a cross, occupying the position which this did, belonged to very ancient times; its date depended very much upon what meaning they attached to the words "very ancient." He had no hesitation in saying that the cross was of great antiquity; but he failed to discover anything known of the Danes upon or to see anything of the ravens of the Danes about it. They would observe certain openings in the lower part, and then certain figures the form of half a lozenge. Five of these could be traced half-way up, leaving five spaces over for a figure under a canopy. In one of these spaces there were distinct remains of a figure. The figures to be traced above those spaces showed that it could not be a Danish, but that it must be a Christian monument. He believed he saw in one of the ox of St. Luke; in a second, the angel of St. Matthew; in a third, the ox of St. Mark; and in a fourth, the emblem of St. John; while the fifth was filled with scroll-work. This showed that the design was to give symbols of the four Evangelists, and from these they could venture to hazard a notion of what filled the spaces below the canopies; and in the absence of symbol in the fifth canopy, they could venture to assume that in the fifth one the Crucifixion was represented. The niches above were merely scroll-work, with various animals, griffins and others, represented in grotesque form and of monstrous description. He had examined the top of the monument, and found evidence of provision for the ornament and fixing of another stone, probably a cross. He had no doubt it was Norman work, and belonged to the twelfth century.

Mr. Godwin, when an opportunity occurred in evening, said he felt bound, in consequence of an inquiry addressed to him, to say that he could see no reason whatever why the pillar should not be of the Saxon period. His outline, which had the *entasis* of an antique column, was not Norman work of the kind that he had seen, and this outline, with the hands which were around the column, made it approach that of a later form which was generally understood to be the work of an earlier people than the Saxons.

Mr. Edward Roberts was at first disposed to consider that the work had been executed by

Saxon workmen, just before or after the Conquest; but afterwards came to the conclusion that it must be a work of the Norman period, dating from about the year 1185 to 1190.

Speaking on a later occasion, Mr. Hills said, that by the observations he had made, he had not intended to combat the question whether the pillar was Norman or Saxon. The point to which his remarks were applied was as to whether the origin of the pillar was Danish, as had been believed by some persons,—whether it owed its origin to Christianity or Paganism. He thought that any one who studied the matter, and tested the different opinions that had been expressed with regard to the pillar, would have no difficulty in arriving at the conclusion which he had arrived at with regard to it, and which it appeared Mr. Godwin had arrived at, viz, that it owed its origin to Christianity. As to whether it was of Saxon origin, that required a close examination, and a careful comparison of the carvings upon the pillar with other carvings, which were known to be Saxon, before coming quickly to any definite conclusion. He had often endeavoured to show in his arguments that the Saxons had more to do with architecture and monuments than for many years past it had been the custom to allow them. Still he thought that if any one would carefully look at the pillar, particularly at the scroll ornaments upon which he might term the second tier, he would be forced to the conclusion that it belonged to the twelfth century, for there was a decided tendency to Early English work in its carvings. That was his belief. The Danish theory was perfectly untenable. There might be something said in favour of the Saxon theory, but he thought the balance of argument was established in favour of a still later period.

We see nothing to discredit the belief that it is of Saxon workmanship, and are ready to believe that, having been erected by that people to commemorate a victory over the Danes, it became known as the Danes' Cross for the same reason that we call Mr. John Bell's fine work in Waterloo-place the Circian Monument. The cap, as it seems to us, if original, can scarcely be in its original place. This pillar is a most interesting relic, and we trust that it will be carefully preserved by the people of Wolverhampton. We are almost inclined to suggest the erection of a sort of umbrella, as rain and frost are gradually destroying it.

THE SEWAGE PROBLEM AT BISHOP'S STORTFORD.

The local board having decided to establish an irrigation-farm, plans were prepared, and Messrs. Lawson & Manser were contracted with to carry out the necessary works for 10,000. About 90 acres of land were required, situated far enough outside the town and having a sloping surface, so that the effluent water could run into the Stort. A main drain was laid down, conveying the sewage to a suitable point, where screening-tanks and pumping-engines were erected. A portion of the farm was marked out and prepared with open carriers and drains for flooding; and the ground this year is bearing its first crops, while the work of remodelling the drainage of the town is in active progress and approaching completion.

The principle acted upon in draining the town is that of keeping the rainfall and surface-water separate from the sewage, the former being discharged into the river. Two 15-horse power horizontal engines are at work forcing the manurial liquid up to the irrigation fields, the highest part of the undulating ground exceeding an altitude of 80 ft. above the level of the outfall tanks.

During the progress of these operations, Mr. James Odams, of the Grange, Bishop's Stortford, an active member of the local board, has devoted much attention to the whole question of the disposal of town sewage, and, after personal inspection of the working of many different systems, has arranged, in connexion with the works just described, a practical exposition of what he believes to be the most economical solution of the sewage problem. The *London Daily Chronicle* gives an elaborate account of Mr. Odams's plan, which essentially consists in screening the rough sewage with faggot-bundles (easily slashed afterwards), and so separating the worst of the sediment; using behind the faggots a vertical screen of copper wire-gauze of 50 meshes to the lineal inch, so that the fine scum is caught on its surface, to be also cleaned

by a douche, as the faggots are. The bad odour is thus nearly removed. The cleared liquid then runs through perforated lead piping over the ground of the farm in gentle showers forced by the steam-pump to a height of 10 ft. to 15 ft., distributing it equally over the entire surface of the field in drizzly showers, the arching jets of spray spanning to 20 ft. on each side of the perforated pipe, and leaving no spot unvetted.

"The great advantage claimed for the new system is that, by artificial showers, it applies the fertilising liquid with the utmost economy, as well as in the manner most natural and beneficial both to plants and to the soil. Not a particle is wasted, unless it be by evaporation, which is not considered to be serious in amount. But in the flooding system, the water being its own carrier, and flowing upon the surface of the land, must of necessity saturate or overdose the nearer portion of each bed or slope before it can wet the farther side; while it is most difficult, if not impracticable, to give a full dressing to the side of a bed furthest from an open feeder, without a portion of liquid running over into the waste drain. On the fountain-system no less arises from streams sinking into cracks and fissures flowing away in the subsoil drains. The gentle showers are suitable for all crops, and may be given during any period of time, by night or day, in cloudy weather or in sunshine, as found advisable; and there is neither soaking of the roots and stems of plants, nor neglect of portions of the ground with inevitable detriment to its mechanical texture and condition.

The crops of grasscut upon the acre of old meadow land now under experiment at Bishop's Stortford certainly tell wonders in favour of this good imitation of natural irrigation.

It should not be forgotten that this new system is a mechanical improvement upon the very earliest practice in sewage irrigation: the marvellous products of Canning Park and Myre Mill, in Ayrshire, and of Tiptree Farm, in Essex, having been obtained from surface application to the growing plants by manual distribution with pipe and hose.

We understand that the entire outlay for the lead piping amounts to somewhat less than 30*l.* per acre. This, indeed, exceeds the general cost of preparing land for ordinary flooding. For though the cost of preparation at Aldershot was 4*l.* to 5*l.* per acre, and that for Merthyr Tydfil is said to have been very much more, the work at Bedford, including the covered earthenware pipes, was executed for 10*l.* per acre; and from the experience at Lodge Farm, Barking; at Mr. Hope's Breton Farm, near Romford; and at other places, the average expense of laying out may be considered to be about 15*l.* per acre. But there is this important consideration—the lead remains at all times marketable at about three-fourths of its original value; and, what is a great saving, no manual labour or attention is required to keep the field apparatus in order, as with carriers, gutters, drains, stops, hatches, &c., in overflow irrigation.

Another application of Mr. Isaac Brown's invention, we may add, may also be seen in operation at Stortford. Some of the principal streets for a length of 1,000 yards are watered by fine jets from lead piping, laid down in the foot-pavement just on the inner side of the kerbstones, the little gutter in which the pipe is inserted being filled up with asphalt, excepting, of course, where the springing-holes are exposed, these places having small iron caps or shields to prevent injury of the pipe while giving free egress to the upward-shooting jets. It appears that by directing the jets in arches no higher than horses' legs, or by watering half the width of the roadway at once, there need be no hindrance to traffic, or discomfort to passengers in open vehicles. Objections made to this system when tried at Hyde Park are said to be here obviated; and we observe that the London authorities are urged by one of their own members to try a similar system in London.

The operations at Bishop's Stortford, both in sewage utilisation and street-watering, Mr. Odams, we understand, will be happy to show and explain to gentlemen on any Saturday during the next few weeks.

CHELSEA EMBANKMENT.

The Chelsea Embankment Committee have recommended the Chelsea Vestry to negotiate for the purchase of the Cremorne Wharf freehold property for the sum of 13,000*l.* In the vestry, Mr. Fisher moved the adoption of this report, and recounted the various previous acts of the committee. First of all they negotiated with Mr. Simpson, of Cremorne, whose freehold price was 20,000*l.* They then tried the Thames Conservators, who wanted a scheme carried out in connexion with the wharf which would have cost 20,000*l.* exclusive of compensation. There were two other schemes, one of which would have involved an expenditure of 30,000*l.* or 40,000*l.* They could borrow the money required for sixty years, and the freehold wharf would save the parish 1,000*l.* a year. Mr. Cobb denounced the idea of giving 13,000*l.* for land which a few years ago was going a hogging, and he could not vote for this extra burden on a poor grogging parish like Chelsea. Mr. T. Symons reminded the Vestry that at one time the rates were 4*s.* 6*d.* without the police rate, and now all the rates were only 2*s.* 1*d.* Mr. Davidge said that both

the Thames Conservators and the Metropolitan Board endeavoured by every way to shut them out from access to the river. Mr. F. Jackson said 13,000l. was the price of the land only, and before the land was ready for wharfage purposes 20,000l. would be spent. The working expenses, too, would be considerable. The recommendation of the committee was adopted, and the committee instructed to negotiate for the purchase of the land.

THE PARK-LANE SEWER.

The great Park-lane sewer question has just been settled in a rather unexpected manner, and by the sewer itself, and stranger still in favour of H.R.H. the Duke of Cambridge, in dead opposition to the St. George's Vestry. For after H.R.H. had consented to have the sewer in Park-lane opposite Gloucester House altered, at his own expense of 140l., the surveyor, Mr. Tomkins, informed the St. George's, Hanover-square, Committee of Works that during the progress of the 3 ft. 9 in. by 2 ft. 6 in. egg-shaped sewer in Park-lane, a portion of the old sewer cracked and fell in, thus rendering a new sewer necessary the whole length (about 200 ft.), so that instead of 120 ft. of old sewer and 80 ft. of new invert, there must be a new sewer of 200 ft. Mr. Tomkins thought this new sewer would be a benefit to the parish, though one of the committee entertained a different opinion.

BRISTOL CITY SURVEYOR.

At a special meeting of the Council, held on Tuesday, under the presidency of the Mayor, a lengthened report on the subject of the appointment of a city surveyor was presented. The committee recommended the appointment of Mr. Josiah Thomas on the following terms:—

That he shall not practise as an architect within the borough.

That he shall not be in business as a builder within the borough.

That he shall cease to prepare plans for laying out ground for building purposes within the borough.

That he shall not be concerned in any manner adversely to the interests of the Corporation, either within or outside the borough.

That his private business shall practically be restricted within the borough to surveys for the purpose of valuations, and valuations only.

That the whole of his work connected with the City surveyor's office shall be carried on in Prince-street, proper accommodation being afforded.

That he shall be paid a salary of 750l. per annum, to include the expense of a horse and carriage to be found by him.

That such clerks, draughtsmen, inspectors, and assistants as shall be deemed necessary shall be paid by the Council; but the power of appointment and dismissal of such clerks, draughtsmen, inspectors, and assistants shall be vested in the Streets Improvement Committee for the time being of the Sanitary authority, Mr. Thomas being empowered to suspend any of them.

That Mr. Thomas be allowed to collect and receive for his own use all the district surveyors' fees under the Bristol Improvement Acts; and that he shall pay over to the Corporation the net sum of 900l. per annum in respect thereof.

Mr. Alderman Green moved as an amendment, "That the city surveyor shall devote the whole of his time to his office, and not engage in private practice." The amendment was negatived by 19 votes to 14.

ROADS IN BRISTOL.

A NEW road from the centre of the city, in the direction of Cotham, Kingsdown, and Clifton, has just been completed. It is called Colston-street, and connects St. Augustine's-place, near the Drawbridge, with Perry-road. The new road is about 450 yards in length, 40 ft. wide, and the gradient one in sixteen. This is an improvement on Park-street, the gradient of which is one in eleven, and which has hitherto been the principal route to Clifton. The carriage-way in Colston-street is macadamised, and one of the city tramways will be laid down here when the price of iron justifies the authorities entering on such an undertaking. The new thoroughfare has been constructed under the superintendence of Mr. F. Ashmead, city engineer, assisted by Mr. T. H. Yallicom, and its construction has necessitated the demolition of several ancient buildings. Steep-street, too, has disappeared. This was a strange old street, very steep, with projecting dormicles, and used to be the route of the Welsh mail, over St. Michael's Hill, by way of Redland-lane and the Passage.

MECHANICS' INSTITUTE, COED-Y-GRIG, PONTYPOOL-ROAD.

The employees of the Great Western Railway propose building a mechanics' institute from plans by Messrs. Lawrence & Goodman, Newport, Monmouthshire. The building will comprise a reading-room, 28 ft. by 22 ft. by 20 ft. 6 in.; a library, 11 ft. by 22 ft. by 20 ft. 6 in.; separated by a movable wooden screen, and with gallery over: these can be thrown into one for a lecture-room.

There will be a curator's residence at the end, and the entrance to the building will be an arched lobby, 19 ft. by 6 ft. 6 in., with circular staircase at the side leading to the gallery. This staircase will form a turret with slated spirelet roof, and the end of lecture-room will be finished as an apse forming the platform. The cost will be about 600l.

"WORCESTER CATHEDRAL."

The *Builder* of September 21st informs us (p. 750) "that the year 1873 will probably witness the re-opening of the entire cathedral in its completely restored condition."

May I venture to suggest that the present mean appearance, caused by "the lead removed from the roofs, and slates substituted, 1791" (according to "Deighton's Guide to the Faithful City"), should be amended before the entire edifice can be deemed to merit that flattering description?

So much has been done, and is in progress, with no niggard hand, in the way of restoration and amendment, that I would fain think the replacing of the metal covering must form part of the contemplated operations, and that it is a question only of time, depending for its accomplishment on the essential one of finance?

N.

THE NEW SCHOOLS FOR STAPLEHURST.

A MEETING has been held at Staplehurst, to consider the amount of expenditure proposed by the School Board, in the erection of their contemplated school buildings. The tender of Messrs. Bridge & Cox, of Maidstone, which the Board had accepted, amounted to 3,307l., and this was, by many of the parishioners, thought to be quite an unnecessary outlay. It was ultimately resolved by the meeting to send the following letter:—

"To the Right Hon. Edward Forster, Vice-President of the Educational Department.—SIR,—We respectfully ask your assistance to prevent the School Board of this parish from incurring a heavy outlay in the building of their proposed schools. We have 1,800 persons in the parish, and the number of children likely to attend school is about 300. Our School Board have invited tenders for the erection of the buildings, and the lowest sent in amounts to 3,307l., which the parishioners consider to be a most excessive outlay. We therefore address you, as a majority of the inhabitants of this place, with a view to secure the prevention of so large an outlay, and asking you to withhold your consent."

Some seem willing to go to the length of a 2,000l. tender.

METROPOLITAN BOARD OF WORKS.

At the meeting last week a report was brought up from a committee of the whole Board to whom several tenders were referred for consideration, and they recommended that one by Mr. Good-year for the Hammersmith work for 796l. 10s. be accepted; for the second work, that of Messrs. Easton & Anderson, for 800l.; and for the third work, that of Mr. George Wall, for 54,600l.

Value of Land in the City.

Mr. Dresser Rogers, as chairman of the Finance Committee, announced that the National Safe Deposit Company had paid a cheque of 5,500l., being one year's rent of the triangular piece of ground near the Mansion House. This company hold a lease for this piece of ground for eighty years.

District Surveyors.

A letter was received from Mr. C. A. Long, district surveyor of Newington, stating that he was desirous of removing his office from the Walworth-road to No. 11, Clapham-road, and requesting the approval of the Board thereto.

Mr. S. Barker (representative for Newington) opposed the application, and said that Mr. Long had not been much more than twelve months at his former residence; that he was altogether opposed to the shifting about of district sur-

vveyors, as it led to great public inconvenience and mentioned the fact that Mr. Long had not waited for the permission of the Board to make the change, as he had already vacated his premises in the Walworth-road and gone to the place he then asked permission to go to. He moved that this application be referred to the Building Act Committee for consideration and report.

Mr. Runtz, in seconding the motion, said the builders and others were put to the greatest inconvenience by the district surveyors changing their residences.

The motion was then put and unanimously agreed to.

LEAD ROOF-COVERINGS.

SIR,—In a recent published statement I observed it said, that in covering the flats and sides of roofs with lead, the sheets "were laid between 'rolls' running up and down the roof, which were protected by 'roll caps,' also of lead, each sheet or 'cap' being only hung, as it lay inclined in its place, by its upper end, where alone it was fastened, if fastened at all, and not merely held by friction against the wood 'rolls' to the timber sheeting beneath, with which the roof framing was wholly covered." And it goes on to say,—"No better practice than this of the plumber's art of leading roofs has ever been devised" &c. Now I question this, because my locality we have for many years been in the habit of practising a different, and as it appeared to me a better, system of doing the work. In our style we neither require "wood rolls" nor "caps" when covering flats or sides of roofs with lead (although, when zinc is the material used, we employ both); but, owing to the manner of coupling the sheets together at their side, said coupling, if I may so speak, in itself forms "roll" and "cap" all in one. The writer very properly observes that lead gutters were, ought to be, laid in "drips;" but, as I understand, there is much difference in practice as to the depth of these drips. In many places they are only about 1½ in., or, as in some cases, even only 1 in. deep. Now, for various reasons, consider that far too little; and, in my opinion, for a good job, the depth of "drips" ought to be about 3 in., or as much more as you can afford, or choose to give.

ANOTHER PLUMBER.

ALBERT MEMORIAL: A SUGGESTION.

This costly monument, combining much that is graceful in architecture and sculpture, is not attracting crowds of visitors, who daily ascend the steps and linger in converse with the philosophers, poets, painters, and sages who are perfectly sculptured in life-size upon the massive frieze which surrounds its base. Altogether stands unique, and, to my mind, is unequalled by any other extant. Having said so much, may, however, be permitted to make a remark through the *Builder*, as to the pyramidal basement of granite steps, which would seem to have been heaped up after its erection; conceal what ought to be a pedestal or base, of character suitable to the superstructure. This pyramid granite rises to the height of 13 ft. from the pavement of the grand plateau (which occupies a square of 74 yards), having at the angles four pedestals, about 13 ft. high, supporting groups magnificently sculptured, representing Engineering, Commerce, Agriculture, and Manufacture.

The granite steps rise from an interior base of 144 ft. square, and mount to within 8 ft. the elevation of the massive pedestal, which is 36 ft. in width, exclusive of the four angular sculptured buttresses, thus giving a very proportionate elevation to the pedestal of structure so varied and so massive, a width of 36 ft. by a height of 8 ft. 1 in.

Now, were all this pyramid of steps cleared away down to the level of the plateau, the pedestal finished in suitable style, as also the four angular groups, this memorial would be a vastly improved effect; besides that the surrounding woodland scenery, which is now obscured by the graduated mound, would lend grace not enchantment, to the view.

Looking from the Long-walk towards Albert Hall, that building is five digits eclipsed as viewing it from the Park-drive side, a shallow mound of granite despoils the integrity of the monument, having the aspect of blocks temporarily heaped and deposited there, but hav-

affinity to the general design, which it fearfully mars.

Were this pyramid cleared away down to the plateau, and the pediment finished, as are our other lofty memorial columns, theulptered figures on the frieze might still be seen from a distance of only 12 ft., and being freed from constant manipulation, would in a rich finish to a clearly-defined pedestal, and at the same time leave an opening between the groups, showing rich and ornate plantations, which always contrast so favourably with works of art and architecture.

QUONDAM.

"* Our correspondent seems to have overlooked a suggestion to the same effect made on several pages some time ago by Mr. James Ferguson. In truth, however, the idea has occurred to many observers, and is spreading."

BUILDING IN BITUMEN.

SIR,—“A Builder” addresses some observations and inquiries to you, “before investing” in “Norton’s Patent Bituminous Building Connection Company, Limited.” The arrangements for granting patents must be curious if Attorney-General has sanctioned an application for a patent for building with bitumen. Sixteen years ago I was requested by a contractor to make him an estimate for some water-casks in Yorkshire (Halifax, to wit), and for that purpose he put into my hands the specification, a printed copy of which had been sent to me. The conduits, or some of them, were to be built with parpint wall stones, and the joints of which was to be poured melted asphalt, asphalt, tar, or bitumen,—for I forget the exact form in which the material was to be used; and although we do not commonly call a building a building, yet one would think that the Attorney-General, in the exercise of his public duty, when this patent was applied for, would consider the use of this material in the manner I have named to be sufficient to preclude the grant of any patent for its use in the manner named “A Builder.”

It is stated that this is the same Mr. Norton to some years ago invented a dangerous compound,—one, it was asserted, that would procure fire by being driven into the ground in almost any open space,—or, for the matter of that, in any place whatever, open or not, provided there was water in the ground at all. It was said, at the time of the Abyssinian war, that these compounds were found very useful to a marching army. That may be well understood to have been true, for they marched through an uninhabited country, comparatively with our own; and to introduce such a contrivance to the towns of England is a pestilent thing. I am glad to believe that the common sense of my countrymen has been sufficient to prevent any use of this stuff, so far as I have been able to ascertain; but I have known inquiries to be made by people living in towns whether they could not procure a supply of water for their household purposes from the porous ground of their back premises by driving down one of these pumps, the inducement being, of course, that the pumps were cheap, and the evil being that the men were ignorant, and believed in speciouses.

AN ENGINEER.

COLOURED GEMS.*

THE name of emerald is applied to three different minerals.—

The green variety of corundum known as the emerald of the East, is a variety of beryl, and is in Ceylon, Ava, Peru, &c. The coloring matter is derived from the presence of a metallic oxide, and it is only another name for a green sapphire or a sapphire of green colour. I have seen emerald, not exceeding half an inch square, valued at 500l.

A more common stone, but not less precious than the choicest character, is a variety of beryl, which is a crystallised anhydrous silicate of alumina with glucina. The gem is preferred of deep grass-green colour, arising from the presence of animal matter,—a hydro-carbonate, derived from fossilised organic remains belonging to the lower cretaceous formation. It is associated with black micaceous schists.

The pale varieties of green beryl are called aqua-marines,—pretty, but not costly. The emerald is met with in crystals of enormous size,

but of inferior quality, varying from leek-green to a waxy yellow.

3. Prismatic emerald is a name for the variety of mineral called *euclase*. It is a hydrated silicate of alumina and glucina. Examples may be found of various colours. A. HALL.

THE ANT NUISANCE.

SIR,—Your admitting the letters of “B.” and “W. B.,” on the subject of the ant nuisance in houses, induces me to hope that, now the question is raised, it may not be lost sight of until a satisfactory cure is mentioned.

“W. B.’s” suggestion of sulphur fumigation is out of the question in very many cases. Will any one tell us of something that ants *dislike*, and that will drive them back into the gravel under the house, whence they come? I am alluding to the little black ant. It infests ladders and basements, generally of perfectly new houses, in London, and because it does so it is a subject quite proper for treatment in the *Builder* as to how to get rid of the nuisance.

I hope you will not allow this matter to pass until it is thoroughly sifted, and oblige,

A LONDON HOUSEHOLDER.

SIR,—A correspondent has asked to be informed of a remedy for swarms of ants, by which his house is infested. A similar inquiry was made a year or two ago by a correspondent of the *Times*, and in reply numerous remedies were given by various persons, who had tried and found them all effectual. I subjoin some of them for your correspondents’ information:—

1. The wing or wings of a turkey or other similar animal, with the feathers left on, and laid in the places frequented by the ants. Swarms of the insects attach themselves, and they are then destroyed by dipping the wing in boiling water, and then again placing it to attract others.

2. Place saucers filled with weak rum and water, sweetened with brown sugar. The insects are attracted by myriads; and the liquor must be changed daily.

3. Sprinkle the embowders and other places infested with strong liquid ammonia,—the “*liquor ammoniac fortiss*,”—which will also destroy black beetles.

4. Washing the places infested with a solution of alum causes the insects to disappear.

5. Sprinkling the places infested with creosote. 6. Placing camphor in small muslin bags, and hanging these in the infested places, causes the insects to disappear.

7. Soft soap and water smeared in the various haunts of the insects expels them rapidly.

The various parties giving these remedies all state they have extirpated these pests by the means stated. C. H.

ACCIDENTS.

TEVOLI.—The thoroughfare in Middle-street has been stopped through the dangerous condition of the Temperance Hotel. The wheels of a trolley broke through the road, and discovered a rather alarming subsidence of the soil underneath the metal crust of the road. Late in the evening there was a more serious accident of the same kind immediately in front of the Temperance Hotel. The road soon caved in for half the width of the street, the doorstep of the house gave way, and then the foundation on the right-hand side of the doorway became exposed and quickly sank several inches. The house is a three-story building of brick, and the effect of the sinking foundation was at once visible in threatening cracks of the brickwork front, with breakage of window-glass and bulging of the window-frames. Two or three builders and a number of workmen were summoned to the scene, and the superintendence of the work was intrusted to Mr. F. Cox. Under his directions short pieces of balk timber were placed in the chasm as supports to the foundation, and the face of the house was shored up with long planks. The town surveyor and other officials visited the spot. The house still stood; but the tenant has removed his furniture. The house projects beyond the line of a recent improvement in the street; but we doubt whether the owner sees it in this light. The house was built on the edge of an old sewer, which was only partially filled up when the new sewer was put down. The excavations on that occasion, and again when the water mains were laid, disturbed the soil under

half the road; and probably for some time past the soil has been washing away by the action of water from the old drain, recently assisted by escapes from the water-pipes that burst when first charged. Anyhow, many cartloads of earth must have disappeared from this site before such a tunnelling could have been formed under the road as has now been discovered.

BARROW.—A number of men were engaged in the erection of a bridge at the terminus of a loop line from Marsh to Ormskill, and for the purpose of facilitating the work, a scaffold had been erected, upon which a crab was placed. At the time of the accident four men were on the scaffold, ready to lower, by means of the crab, a large piece of stone which had been swung, and four others were underneath prepared to place the stone in position on one of the piers. Without any warning, the structure fell with a crash. The men working underneath managed to escape uninjured, but the other four were very seriously hurt, and one of them now lies at the hospital in a very precarious state.

HANLEY.—A loop line of railway is to pass under the bottom part of Waterloo-road, just outside the borough of Hanley. The earth has been excavated for some distance under the road and props placed under the portion undermined. As a horse and cart were passing over this spot the road gave way, and the horse and part of the cart fell in. On their being extricated the horse was found to be much injured by its fall of from 17 ft. to 18 ft., and it died in about half an hour. The cart, which was empty at the time, was damaged. The insecure part of the road was at once fenced off. It is supposed that the supports did not extend far enough under the road, and that the portion which gave way was not sufficiently supported.

HOSPITAL PROVISION IN ROUEN.

SIR,—I have lately read a History, &c., of Rouen, translated (abridged, yet considerable) into English, perhaps rather a topographical curiosity, from foreign Press.

So much has been said of the history of this renowned city, that I will not enlarge on it. But its “hospital” charity seems noble, even by comparison with London and our principal cities and towns, and even to be further suggestive.

The number of beds in the Hôtel Dieu, for a city population, omitting vicinity of (I believe) within 123,664, is six hundred, nearly approaching the number in Bartholomew’s, 720.

But this is not all. There is a large subsidiary hospital for incurables also. Patients are kept in the first for six months, and then only, if incurable, transferred to the other. We have, sir, so little done yet for incurables, that I must humbly think this might be worth the notice and recollection of some of our best philanthropists.

Might I crave this opportunity, as not many more might be accorded me, of mentioning a medical anecdote (not hackneyed), highly honourable to, though I believe far from unusual with, that honorable profession, the more that I have had the pleasure of private confirmation of similar spirit in Abernethy, who, often rough eccentrically (intentionally) with the rich, was never so with the poor; always treating them with tenderness.

A cardinal prime minister, on sending for the most eminent surgeon of his day, said to him, “You must not expect to treat me as roughly as you do your poor wretches at the Hôtel Dieu.” “My lord,” answered the surgeon, with dignified consciousness, “every one of those ‘poor wretches,’ as your eminence is pleased to term them, is a prime minister in my eyes.” J. D. P.

SUBJECTS FOR PRIZE PAPERS.

AMONGST the subjects on which the Council of the Institution of Civil Engineers invite communications are the following:—

Account of the Progress of any Work in Civil Engineering, as far as absolutely executed (Smeaton’s Narrative of the Building of the Edfystone Lighthouse may be taken as an example).

On the Application of Graphic Methods in the Solution of Engineering Problems, and in the Reduction of Experimental Observations.

On the Elasticity, or Resistance to Deflection, of Masonry, Brickwork, and Concrete, with Observations on the Deflection of the Tops of Bridge Piers, by unequal loading on the Arches abutting on them.

On the Methods of Constructing the Foundations of some of the principal Bridges in Holland and in the United States.

On Bridges of large span, considered with reference to examples, now in progress or recently completed, in the United States, including an account of the loading, and of the effects produced by variations of temperature.

On the Theory and Practical Design of Retaining-walls for sustaining Earth or Water, and on Experimental Tests of the Accuracy of the various Theories.

On the Use of Concrete, or Béton, in large masses, for Harbour Works and for Monolithic Structures.

On the various Modes of Dealing with Sewage, either for its disposal or utilisation.

On the Separate System of Sewerage Towns, with a detailed description of the works in a town to which this system has been wholly or partially applied, and particularly as to the results.

On the Ventilation of Sewers, with a résumé of the experiments as to the motion, pressure, &c., of gas in the sewers.

On the Constant Service of Water Supply, with special

* See *Builder*, p. 739, ante.

reference to its introduction into the metropolis, in substitution for the intermittent system.

On Street Railways and Tramways through Cities and Towns, and on the best mode of working them.

On the Present State of Science in regard to the Manufacture of Gas for the Purposes of Illumination.

On the Practice and Results of Irrigation in Northern India.

On the Manufacture of Iron and Steel as now pursued; the effect on strength and tenacity of the admixture of substances with the ore.

IRRIGATION AND STREET CLEANSING.

Mr. Brown (of Messrs. Isaac Brown & Company, Edinburgh), to whom we alluded on p. 789 has, by desire of the Duke of Sutherland, exhibited, at Dunrobin, the capabilities of the system of irrigation which he recently patented. The *modus operandi* is as follows:—Lead pipes, having perforations about a yard apart, are sunk in the earth. The water, turned on at several taps, and, forced through the jets in the pipes, is thrown up like spray. On the pressure obtainable depends the distance to which the water may be thrown. On a piece of ground near the main avenue to the Castle, and also on the garden terrace, Mr. Brown introduced his plan. The water was procured from the main by which the Castle is supplied. The grass at the avenue before the application of the process had a dry, parched appearance, but since, it has become green and luxuriant. In addition to the water appliance, Mr. Brown uses a top dressing of manure of his own preparation. The change effected is best seen by contrasting the appearance of the grass operated on and that growing all round it; and it should be mentioned that all this has occurred within a fortnight. There are now feeding on the pasture twenty-five sheep to the acre. The same results are apparent on the terrace, and Mr. Brown has published a variety of statements showing the benefit of this system relative to the reclamation of straths, so that they might be made available not only for the breeding but for the fattening of sheep, and he contemplates its use for watering the public streets. The duke explained the system to the Queen, who saw it in operation, and expressed her admiration of its simplicity and utility.

The cleansing of the streets of Paris is an affair of greater importance than many people would imagine. It costs the municipality more than four millions of francs per annum. There are 11,000,000 square metres to be swept every day, of which 2,220,000 are at the cost of the municipality, 5,520,000 at the cost of such owners of property as do not subscribe, and 3,560,000 undertaken by the municipality for the subscribers. The average cost is 29½ centimes per annum. A bill is about to be submitted to the Assembly for compelling all proprietors to subscribe to the cleansing of the streets.

MASTERS AND MEN.

MR. FRANKLIN writes to the Society of Arts' Journal, suggesting that there should be such diversities of engagement between employer and employed as might secure us against desertion by all simultaneously.

"The following," he says, "seem to be practical diversities of the kind required, and we invite the suggestions of others:—

1. In the case of large contracts, often lost to English firms because they are afraid to rely upon a calculable scale of wages, let the hands be invited by the heads to engage for the term required by the enterprise, and at a normal rate of wages, either subject to adjustment by cost of living, as in the case of corn-rents, or otherwise, with recourse to arbitration in need, and in manner made binding in advance.

2. Modes of sub-contract, as in mining enterprise, in railway construction, &c., a mode found most successful by the Postmaster-General, *vide* his last report.

3. Spontaneous or other modes of supplementing wages, by contributions to sick or superannuation funds, to life insurance or mutual guarantee funds, to building or common supply unions, to savings-banks, or other provident associations, all more or less for advantage of workers, in concert with the same employers. Instances of such inducements to employes, plus salaries or wages, abound, both in the public service, in banks, and in other first-class establishments.

4. Reversal of relations between capital and

labour, so as to enable combinations of workmen to take lease of factories, hire management, and borrow capital, in security of the products of their labour, less 'subsistence money.'

5. Co-operation of heads and hands on the joint-stock principle, as it exists both at home and abroad, with improved methods of audit."

STRONG ROOM FOR THE NORTH-EASTERN BANKING COMPANY, NEWCASTLE.

At the premises now in course of fitting up for this company, under the superintendence of Mr. Matthew Thompson, architect, provision has been made in the course of the alterations for a strong room of rather large dimensions: 8 ft. by 7 ft. by 7 ft. high, is the size, and the construction is as under:—The outer casing is of half-inch plate-iron; then there is 1½ in. air-space, and inside a casing filled with fireproof material, 2½ in. thick. The top and the bottom are protected in a similar manner. At the back of the interior a space is divided off, and called the inner treasury; that is the full size of the safe, and 20 in. deep, and is designed for the deposit; and around the sides of the remainder are iron shelves, 20 in. wide for cash and deed boxes. The safe is enclosed by a pair of folding doors, 6 ft. 2 in. by 4 ft. 10 in., throwing twenty-three bolts of 3½ in. by ¾ in. all round the circumference, as well as at the meeting style. A peculiar arrangement has been made by which the striking bar being removed, or unscrewed, either door can be opened independently of the other. The outer plate of the doors is ½ in. wrought-iron, next comes ½ in. thickness of steel, then a plate of ½ in. and inside the fireproof composition. The safe is approached by a lobby, a complete case of ½ in. wrought plate-iron, bolted together and to the safe; the wall in which is the door is 20 in. thick; on the inner side are a pair of folding open grills, and on the outer side an external door, of the character commonly used for bankers' purposes. It will be seen that to get access to the inner treasury, four doors,—the external door, the grill, the door of the safe, and the door of the treasury proper,—have to be opened. The work is now completed, and the fixing will begin in a few days. The work has been carried out by Messrs. Chubb & Son, of St. Paul's Churchyard, and their patent locks are affixed to the doors throughout.

SCHOOL-BUILDING NEWS.

Rotherhithe.—The memorial stone of new schools, to be called the Gomm Schools, has been laid here by Field-Marshal Sir W. Gomm, K.C.B. The schools are in connexion with the new Church of St. Barnabas. The design, by Mr. G. Legg, is Gothic, and the building will accommodate about 400 children. The site is in Plough-road, and has been granted at a low sum by the Commercial Dock Company; and the total cost is estimated at 2,600*l.*, of which 2,000*l.* have already been subscribed. A piece of land was originally given by Sir W. Gomm, but the ground was acquired by the East London Railway at a cost of 800*l.* under the powers of their Act, and the present site was then obtained. Including the value of the original site and a donation of 200*l.*, Sir W. Gomm has presented 1,000*l.* in aid of the funds.

Bristol.—St. Gabriel's Schools, Easton, have been opened. The site was given by the Ecclesiastical Commissioners and the lease-owners, Messrs. Jones & Hamilton. Having ascertained that the ground was made ground, and bad for foundations, they inquired, and found that the foundations would not cost more than 50*l.* They entered into a contract with Messrs. Wilkins & Son, builders, of Surrey-street, for 1,260*l.* for building the school. This did not include the extra foundations; and, relying on the assurance of the architect that they would not cost more than 90*l.*, they applied for 1,560*l.*; the contract, 1,260*l.*; foundations, 100*l.*; architect's commission and law expenses, 100*l.* They had secured nearly the whole of the amount (1,560*l.*), and they were then astonished to hear that the extra foundation, instead of costing 90*l.*, would cost 350*l.*, making the total building and fitting up cost 1,810*l.*, instead of 1,560*l.*, leaving 250*l.* to be cleared off. This sum must be raised before they could get either the Government grant or that of the National

Society. The schools will accommodate 550 children.

Henstridge.—New schools have been opened here. The buildings are centrally situated on the turnpike road near Henstridge Ash, being about equally convenient for Henstridge and the hamlet of Xenston. There are two commodious schoolrooms, and a master's residence, built of the local forest marble stone, rock-faced, with Doubling dressings, and roofed with red and blue tiles in horizontal bands. Behind is a walled playground for the boys, and another for the girls, with the necessary offices; and there is also a garden for the master. Entrance to the building is given by two porches, which are covered by lean-to roofs, being, in fact, continuations of the main roof. The schoolrooms are lighted and ventilated by means of large windows, square-headed, stone mullioned, and fitted with movable casements; and there are also zinc ventilators in the ceilings. They are to be heated by open stoves, the flue-pipes of which are carried through recesses in the walls, covered by ornamental gratings. The dimensions of the principal schoolroom (intended for a mixed school under a master) are 60 ft. by 18 ft.; and the infants' schoolroom, which has the usual gallery at one end, is 36 ft. by 18 ft. The architect who designed and superintended the work was Mr. H. Hall, of London; and the builder, Mr. A. Reynolds, of Milborne Port. The total cost was about 1,300*l.*, including site, &c. The schools are calculated to accommodate 136 in the large room and 80 in the infant-room, being the full number for which accommodation is required by the Education Department, the population of the parish being about 1,300.

ROMAN CATHOLIC CHURCH BUILDING NEWS.

Manchester.—The new Roman Catholic Church of St. Francis of Assisi, situated in Gorton-lane, has been opened, Archbishop Manning, and other dignitaries of the Roman Catholic Church, taking part in the opening ceremony. The church has been in course of erection for the last six years, and it belongs to the members of the Franciscan community, who settled in Gorton in 1862. Mr. E. Welby Pugin is the architect, and the style adopted is the Geometrical, somewhat modernised. The building is 184 ft. in length, 72 ft. in width, and 98 ft. in height. Though the exterior is plain,—being built, for the most part, of red brick, with stone dressings,—the stonework and sculpture of the interior render it ornate. The whole of the carving, which symbolical, has been designed by Father Cuthbert, one of the resident fathers, and executed by Messrs. Williams & Milson, of Manchester. Above the altar is a stained-glass window from the works of Messrs. Edmundson & Son, Manchester. It represents historically the life of St. Francis, and is the gift of the Rev. G. Durand. The other two chancel windows are destined to contain a representation of the lives of St. Clare and of St. Louis of France, so that the three chancel windows will represent the three orders founded by St. Francis. The Lady Chapel, at the south of the chancel, will contain a stained-glass window, by Mr. Casalini, of St. Helier, the subject being the Immaculate Conception. This is the gift of Mr. G. F. Kighley. The chapel corresponding to this, on the north side of the chancel, is to be dedicated to St. Joseph. From it two doors lead to the sacristy and cloisters. These last are constructed in the ancient style, and are 100 ft. long. On the north side of the church six confessionals are provided, which are designed in the architecture of the building. The main columns of the interior are of Halifax stone; the carved and ornamental work of Bath stone; and the chancel columns of red Mansfield stone. The chancel will be lighted by a corona and lamp of ornate character, which is being manufactured in Birmingham. Mrs. Fossata, of Manchester, is the donor. Eight standards, each 13 ft. high, will light the nave. These have been made by Messrs. Hibbert & Co. Messrs. Sidebottom & Co. have supplied the benches. Brother Patri, one of the resident priests, has superintended the erection of the building.

Haverfordwest Congregational Chapel Competition.—The plans of Messrs. Lawrey & Goodman, Newport, Monmouthshire, have been selected.

Miscellaneous.

The Great Eastern Railway Extension.

The Society of Engineers paid a visit to the works of the Great Eastern Railway Extension to Broad-street, and the Locomotive of the North London Railway at Bow. Visitors assembled at Broad-street, and first reached the site of the intended new station, which will cover an area of 9 acres. The station has a frontage of nearly 300 ft., and is laid out with eight platforms, covered in iron and glass roof, in four spans. The portions of the side-walls have been built excavated trenches, and the 9 acres of soil next have to be cleared out to a depth about 15 ft. The platform-level will be below the level of Broad-street, and will approach from the roadway by an easy slope. The line will eventually be connected to the Metropolitan Railway. From Broad-street the line will be carried on the level for three-quarters of a mile, to Brick-lane, where it will pass under the existing viaduct of the Great Eastern main line. From Brick-lane there is a rising gradient of 1 in 70 to its junction with the main line, at Bethnal Green. Works at this end of the line are in a forward state, a station, between Commercial-street and Bishopsgate-street, for the relief of the present main-line station, being nearly ready for the construction of this extension line.

The construction of this extension line involved the diversion of the high-level sewer which intersected the route, but which has now carried direct from Norton Folgate, under Bishopsgate-street, to Gracechurch-street, where joins the original main sewer. Mr. Edward is the engineer, and Messrs. Lucas, Bros., the contractors for the line, which is expected to be opened about a year from the present date.

Case for Estate Agents.

At the Leeds City Court, before Mr. T. H. Marshall, the case of Mr. Joseph Lawton, of Wortley, estate agent, sued Mr. John Redshaw, of Armsley, for 10*l.* 10*s.*, for commission on sale of land in Tong-road, Armsley. Mr. Malcolm (Mr. Granger) appeared for the plaintiff; and Mr. W. Eansley for the defendant. The plaintiff stated that in May last he sold 2,600 yards of land for the defendant, and drew up a contract, which was signed by the purchasers, the conveyance having to be completed on the 1st of July. The defendant agreed to give him 10*l.* 10*s.* for commission, which was to be paid on the sale, but he had applied for the same several times, and the defendant refused to pay, as the conveyance had not been completed. Mr. Eansley, for defence, said his client denied that the commission was to be paid until the land was paid and, unfortunately, owing to the wording of the contract for sale, which had been drawn by the plaintiff, it was doubtful whether it could be recovered against the purchasers. The law was that an agent was not entitled to his commission until the purchase-money was paid. His client said that no doubt that was so, unless there was an agreement between the parties to the contrary, and in this case the plaintiff stated the commission was to be paid when he had the land; but the defendant's evidence was, no commission was to be paid until the purchase-money was received and the conveyance completed. Neither of the parties being corroborated, he should nonsuit the plaintiff, each party paying his own costs.

Work in Ereter Cathedral.

We are inclined to think that an entire clearstory window, probably similar in character to the beautiful flow still in its place (though sadly mutilated), opposite the Bishop's Throne, has been found in the Minstrels' Gallery. The old leading of the principal portions of the glass remain, so the window can be well restored by an ingenious glass-painter to its original state. This discovery affords convincing proof that the glass of the clearstory of the cathedral at least (if also in the aisle windows), was of light and clear *grisaille*, free from gauzy colour and opaque glass, and well calculated to display the architecture of the cathedral.

Railway Union.

An association has been formed between twenty-seven companies, representing 5,535 miles of railway, in Germany, for the purpose of establishing a common charge to pay all expenses and indemnities arising out of accidents of every description.—*Mechanics' Magazine.*

Proposed New Gaol and House of Correction for Bristol.

A letter has been received by the Mayor of Bristol from the Secretary of State, enclosing a report from Mr. Briscoe, the inspector of prisons, to the effect that nothing has yet been done to adapt the city gaol, or more than a portion of the house of correction, to the requirements of the Prisons Act, 1865, and that both prisons are unfit for the confinement of prisoners, and therefore that immediate steps may be taken by the authorities to build a new gaol and house of correction. On Wednesday a very large committee met at the Council House to take this communication into consideration. The committee included the gaol committee, who are members of the town council, and a good many magistrates who were associated with them; and, after a very long discussion, a sub-committee was appointed to wait upon the Secretary of State and point out to him the very heavy pecuniary burdens under which the city is now labouring, and that the gaol, although not fitted up under the requirements of the last Prisons Act, is healthy, and in all respects, in the opinion of the committee, adequate for its purposes; and to ask, under those circumstances, that the order, if not withdrawn, might be suspended until they are better able to bear the expense. The committee were requested, in the event of an unsatisfactory reply being given to this proposal, to ask if the Secretary of State would sanction the erection of a new gaol and house of correction on the site now occupied by the city gaol.

Japanese Progress.—The Japanese are an interesting and now, at least, a progressive people. They are decidedly clever: the bronzes especially which the Duke of Edinburgh exhibited at the Kensington Museum were remarkable. Sometimes, however, they are too clever by half, as an anecdote in the *Marquis de Beauvoir's "Voyage round the World,"* translated by A. & H. Stephenson, will show:—"The Japanese, who are as thoughtless as they are bold and enterprising, amiable, but as simple as children, and who believe they know anything when they have seen it once, threw themselves eagerly into steam navigation. They bought a number of vessels, and insisted on managing them themselves. They obtained one from the firm of Dent, a splendid ship,—the *Latouan*. It arrived one morning in the roads, and at midday they had turned out all the European sailors and engineers; and, sole masters of their vessel, off they went at full steam. So far so good; but when they wanted to stop her,—impossible: they did not know how. Then our imprudent friends put the helm aboard, and began to turn round constantly in a circle, calling out for help, to the great delight of all the crews in the roadstead, till one of our men-of-war, taking pity on them, sent them a boat with an engineer to stop the insane engines."

Setting a Drawing.—If a drawing is worth anything, it surely is worth setting, that is, fixing the lead or chalk with which it is drawn, so that, under ordinary treatment, it cannot injure by rubbing. For highly-finished drawings, or where the chalk or pencil has been very liberally applied, it will be better to proceed in this way:—Nearly fill a shallow dish or tray, somewhat larger than the drawing, with a weak solution of gum-water, or—which may sometimes be more convenient—a mixture of milk and water, half of each; pass the drawing carefully through the mixture (face uppermost) backwards and forwards; then fix it up on the wall by a corner to drip and dry; or the drawing may be pinned down to a board, held on an incline over a dish, and the milk and water poured over it with a spoon, beginning at the top; it is necessary to see that all parts of the drawing have been passed over. If the drawings are merely outlines, or having very little shading over them, then the fixing medium may be passed over the whole paper with a broad, flat camel-hair brush. With careful treatment, this method of preserving drawings will be found to be quite satisfactory.—*Cassell's Popular Educator.*

The Surveyor of Winchester.—At a meeting of the town council, held on the 3rd inst., Mr. John James Lanecefield was unanimously elected city surveyor. There were thirty-five applications for the appointment.

The Building Trade in Sheffield.—There has been a general advance of 5*s.* per 1000 in the price of bricks at Sheffield. The building trade is stagnant in this town in consequence of the advance in the price of materials.

The Holborn Valley Improvements.

A local statute of last session authorises additional works in connexion with the Holborn Valley and Farringdon Market improvements. There are two pieces of ground near St. Sepulchre's Church, the keeping of which open and unbuild upon is desirable and advantageous to the public. It is declared to be just and reasonable that the cost of such public improvements should be borne by the parish and the Corporation. By one section eight weeks' notice is to be given to the labouring classes of land required on which they live. By another, the Corporation may apply any funds belonging to them (not being trust-money) in erecting on any lands acquired by them for the Holborn Valley improvements, or for the purposes of this Act, improved dwelling-houses or lodging-houses for mechanics and other persons of the working classes who have been or may be displaced by improvements effected or to be effected by the Corporation. The City may make additions to the site of Farringdon Market and effect other improvements.

Employment of Children in Brickyards.

Joseph Taylor, the lessee of a brickyard at Round Hill, Tipton, was charged with employing Charles A. Taylor, aged eight years and a half, in his brickyard. Mr. Alfred Jones, the inspector of factories for the district, said the case was brought forward to check the universal practice in brickyards of setting children to work when they brought the workpeople's meals. He found the boy in the defendant's brickyard, when he had a large apron on, was without boots or shoes, and was bespattered with clay. The defendant's son (aged 25) stood by, and said the boy would not have been at work had his father been in the yard. Emma Summerfield, a girl employed at the brickyard, stated that the boy came on an errand to her, and wanted to help her; he put on a small apron, and carried a few lumps of clay, when the inspector came up. David Taylor, the father of the boy, said he did not wish the child to work there. The Bench said it was clear that the boy was at work, and the defendant should not have allowed it; and as an example they fined him 1*l.* and costs.

Approaches to the Courts of Law.

The new company, empowered by statute to widen Serle-street and Carey-street, and erect new buildings suitable for the legal profession, will soon hold its first meeting. There are several provisions as to the directors, and the mode of procedure under the statute. The capital is to be 300,000*l.*, in 2,000 shares at 150*l.*, and no shares to be issued until one-fifth part thereof be paid up. The company are empowered to take lands and houses, the compulsory powers of purchase to continue for two years. The widening of Serle-street, as described in the plans deposited with the clerk of the peace of Middlesex, is to be effected within five years, to the satisfaction of the Metropolitan Board of Works; and in the same period Carey-street is to be widened. Further widening of Carey-street and Serle-street is to be at the option of the authorities, and the consideration for such enlargement is to be paid by the Commissioner of Works to the company. There is to be a restriction as to the height of the buildings to be erected by the company fronting Carey-street.

The English Church at Spa.

At Spa, on the 24th ult., the Bishop of Ely, on his way from the Cologne Congress, laid the corner-stone of a new English church. The Belgian Government have always contributed liberally towards the stipend of the English chaplain, but the service has hitherto been performed in a large room at a building called Vauchall, which was formerly dedicated to the very different purposes of gambling. The want of an English church has been much felt, and a subscription was opened some years ago, which, with the generous aid of the Belgian Government and Town Council of Spa, has at length enabled the promoters to commence the erection. The site selected is beautiful as well as convenient. Messrs. Habershon & Pite are the architects, and Messrs. Blackmore & Morley the contractors. The amount of the contract is 3,560*l.*

The Manchester Concrete Company

have had awarded to them a silver medal by the Manchester and Liverpool Agricultural Society, a bronze medal by the Middleton Agricultural Society, and a silver medal by the Altrincham Agricultural Society, at their shows held during the past month of September, for "superior concrete flooring."

Islington.—An appeal was made to the guardians by the contractors for sinking the workhouse well. At the last meeting of the Board a report was received from the special committee appointed to inquire into the subject, recommending that a sum of 500l. be paid to Messrs. Baker, by way of compensation, for losses in carrying out their contract. Several members of the Board objected to this proposal: it was admitted that the well was a great success, and would be the means of effecting a large saving to the ratepayers; the Board, however, declined to adopt the committee's recommendation.

Workmen's Club.—A club for the working men of Clerkenwell and its neighbourhood has been opened in Cowcross-street, just opposite to the Farringdon-street Station of the Metropolitan Railway. The fee for admission is a penny daily, or twopence weekly; or if the working man prefers, he can compound for mob subscriptions by a lump sum of eightpence quarterly. On Monday evenings, and occasionally on other evenings too, lectures of a practical, instructive, and amusing kind are delivered, and concerts are given every Saturday.

Stopping Leaks in Iron Ships.—An ingenious method of stopping leaks in iron ships when at sea, has been patented by Mr. M'Cool. "Safety-plates" are "dished"—that is, made like a dish in shape;—and when the hollow side, lined with india-rubber, is pressed against the plates of a ship, the "safety-plate" fits close, and will keep water out when held firmly in place with screws. By a simple contrivance, when the leak is discovered, means can at once be taken for fitting on the new plate.

Stonehenge: a Suggestion.—The conduct of those who, during the late autumn manoeuvres, amused themselves by carving their own miserable names at Stonehenge, has met with severe reprehension. The *Pall Mall Gazette* suggests that the names thus inscribed should be publicly advertised, and that a dummy stone be erected for the express purpose of enabling such visitors to record their names, for public exhibition thereafter in Trafalgar-square, previous to deposit at South Kensington. This plan would, to a great extent, protect the sublime from being defaced by the ridiculous.

Laying the Foundation-stone of a New Church at Bexley-leath.—The foundation-stone of the new Christ Church has been laid by Mrs. Tait, the wife of the Archbishop of Canterbury who was also present. This church, which is to cost about 8,000l., of which, however, 2,000l. only have been obtained, is to be built in the Early English style of architecture, and the length of the interior will be 150ft. clear, by 61 ft. in width. The chancel will be 47 ft. by 21 ft., and the height to the spring of the roof 39 ft., and to the ridge 60 ft. The material used is Kentish rag, with Bath-stone dressings.

The Lacustrine Era in Europe.—Lacustrine dwellings have been found in several of the Polish lakes which are now being drained; urns containing ashes have been discovered in them, together with various skulls, declared to be Asiatic and African; all of which circumstances tend to prove an antiquity extending beyond the historical times; and go to corroborate one of the chief ideas entertained in recent leading articles in the *Builder*, that Africa aboriginally contributed, in an essential degree, along with Asia, to the peopling of Europe.

The Royal Academy, according to the *Art Journal*, has arranged for another exhibition of the works of ancient masters and of artists deceased in recent times, in the winter of this year; and we are informed they have resolved on following up the plan in 1874. It will probably be an annual exhibition for some years to come. The wealth of the country is almost inexhaustible.

The Fleet Sewer.—The Metropolitan Board of Works have decided to accept the tender of Mr. George Wall, of Kentish Town, to carry out, for the sum of 64,000l., the work of the sewer which it has been resolved to construct for the relief of the Fleet sewer.

Society of Engineers.—The first meeting of this society for the new session will be held in the society's hall, Westminster Palace Hotel, on Monday next, when a paper will be read on "Telegraphic Batteries," by Mr. E. G. Bartholomew.

Printing in Enamels on Porcelain.—A machine has recently been invented by a citizen of New Haven, Conn., for printing in coloured and gilt enamels on china and pottery, which, it is claimed, will greatly reduce the cost of the process.

The Escurial has been struck by lightning, and is in flames, as we go to press.

TENDERS

For the erection of a building in Willow-walk, Shore-ditch, E, for Messrs. Smith, of Queen-street. Mr. R. F. Notley, architect:—

McLachlan	£3,948 0 0
Macey	8,620 0 0
King & Son	8,570 0 0
Myers & Sons	8,419 0 0
Turner & Sons	8,374 0 0
Newman & Mann	8,326 0 0
Perry, Bros.	8,277 0 0
Browne & Robinson	8,166 0 0
Hart	7,885 0 0
Eaton & Chapman	7,600 0 0
Morter	7,637 0 0

For stabling for Mr. A. Hector, Worcester House, Cuddington, Surrey, Messrs. John Giles & Gough, architects. Quantities by Mr. Goods:—

Jocelyne (accepted)	£871 0 0
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For alterations and repairs to No. 1, Gloucester-street, Haggerston, for Mrs. Baker. Messrs. Ebbetts & Cobb, architects:—

Foulson	£218 0 0
Paine	169 0 0
Ferne (accepted)	145 0 0

For rebuilding Nos. 2 & 3, Gloucester-street, Haggerston, for Mrs. Baker. Messrs. Ebbetts & Cobb, architects:—

Paine	£702 0 0
Foulson	580 0 0
Ferne (accepted)	475 0 0

For new schools, Beazley-crescent, Old Ford, for the London School Board. Mr. Keith D. Young, architect. Quantities supplied by Mr. Sidney Young:—

Newman & Mann	£8,445 0 0
Roberts, Brothers	8,884 0 0
Perry, Brothers	8,804 0 0
Ennor	8,270 0 0
Williams & Son	8,574 0 0
Kilby	8,153 0 0
Hearing & Son	8,120 0 0
Dove, Brothers	7,995 0 0
Adamson & Sons	7,651 0 0
Hill & Sons (accepted)	7,548 0 0

For new library, &c., to Park House, St. John's Wood Park, for Mr. J. E. Gardner. Mr. C. Skerrett, architect. Quantities supplied by Mr. Sidney Young:—

Brass	£2,329 0 0
Conder	2,265 0 0
Dove, Bros.	2,135 0 0
Jackson & Shaw	2,100 0 0
Longmire & Burge	2,070 0 0
Macey	2,050 0 0

For new wharf at Rotherhithe, for Mr. J. Brandram Peete. Mr. G. A. Young, architect. Quantities supplied by Mr. Sidney Young:—

Smith & Co.	£9,695 0 0
Myers & Son	9,620 0 0
Dove, Bros.	9,475 0 0
Brass	9,440 0 0
Jackson & Shaw (accepted)	9,160 0 0

For Oval-road School, Croydon:—

Nightingale	£3,969 0 0
Taylor & Sons	3,658 0 0
Walkley	3,635 0 0
Allen	3,040 19 1
Heade	3,196 0 0
Wright, Bros.	3,157 0 0
Waterson & Co. (accepted)	3,045 0 0
Spearing*	2,969 0 0
Peskest & Taylor*	2,861 0 0
Coles*	2,840 0 0
Crooke & Wall*	2,678 16 0

For alterations to the King William the Fourth public-house, Streatham:—

Loat	£920 0 0
Parsons	875 0 0
Mason (accepted)	797 0 0

For alterations and additions to the Prince Regent Tavern, North-street, Walworth. Mr. F. Sparrow, architect:—

Kellaway (accepted)	£612 0 0
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For alterations, &c., to the Rutland Arms, Rutland-street, Hampstead-road, for Mr. R. Miles. Mr. C. Bradley, architect:—

Cairns	£179 0 0
Durrant	175 0 0
Berridge (accepted)	175 0 0

For additions to Elmstons Court, near Canterbury, Kent, for Mr. W. J. G. Barrett. Mr. Richard Martin, architect:—

Bridgman, Nuthall, & West	£2,478 0 0
Wilson & Son	2,290 0 0
Jarrett (accepted)	2,157 0 0

For additions and decorations to Ivy Lodge, Maidalale. Mr. H. M. Burton, architect. Quantities by Messrs. Corderoy & Sandall:—

Cracknell	£988 0 0
Elms & Son	776 0 0
Nightingale	720 0 0
Mitchell	720 0 0
Tinewell	687 0 0

For dwelling-house at Manners-road, Hainpale. Mr. W. W. G. Messrs. Spalding & Co., architects. Quantities supplied by Mr. Fleetwood:—

Hyde	£21,888 0 0
Simpson	1,822 0 0
Boys	1,688 0 0
Mann	1,639 0 0
Temple & Foster	1,610 0 0
Brass	1,570 0 0
Wicks & Bangs	1,522 0 0
Carter & Son	1,650 0 0
Scrivenor & White	1,628 0 0

For building the Bradley Memorial Hall, Marlborough College, Marlborough. Mr. Street, architect. Quantities by Mr. Poland:—

Dyer	£2,694 0 0
Williams	2,360 0 0
Nightingale	1,598 0 0
Dove, Bros.	1,875 0 0

For the erection of St. Peter's Church, Lordship Dulwich. Messrs. Banks & Barry, architects. Quantities by Mr. J. Strandwick:—

Crowland	£10,997 0 0
Jackson & Shaw	9,600 0 0
Holland & Hansman	9,237 0 0
Simpson & Co.	8,170 0 0
Ennor	9,162 0 0
Perry & Co.	8,898 0 0
Myers	8,721 0 0
Hart	8,450 0 0
Browne & Robinson	8,640 0 0
Asby & Son	8,465 0 0
Newman & Mann	8,348 0 0
Peto, Bros.	8,397 0 0
Dove	8,375 0 0
Henshaw	8,290 0 0
Wichell	7,968 0 0
Downs & Co. (accepted)	7,560 0 0

For building a church at Brighton for the Rev. W. Wagner. Mr. Somers Clark, architect. Quantities by Mr. Nunn:—

Fullet	£17,088 0 0
Scrivenor & White	16,215 0 0
Dove, Bros.	16,755 0 0
Baker	15,357 0 0
Cheeseman	15,050 0 0
Chapel	13,975 0 0
Nightingale	13,977 0 0
Buckley	13,460 0 0
Raynolds	11,100 0 0

For interior painting and repairs at St. Michael's Church, Bassishaw, Basinghall-street. Mr. G. architect:—

Mangin	£125 0 0
Pickering & Son	123 0 0
Oakley	100 0 0

For new schools and quarters for children, tea-master and matron, hospital, fever building, tram receiving wards, at the Royal Union Workhouse, Haddon, Brothers, architects. Quantities supplied:

Goodman & Burnore	£11,232 0 0
Pearson & Son	10,874 0 0
Jones & Allen	10,438 0 0
Bowers	9,100 0 0
King & Godwin	8,557 0 0
Welsh & Son	8,550 0 0
Clutterbuck	8,233 0 0
Everal (accepted)	7,819 0 0

For new Congregational chapel at Fign Brook, lord. Messrs. Haddon, Brothers, architects. Quantities supplied:

King & Godwin	£2,960 0 0
Niblett	2,954 0 0
Lewis	2,890 0 0
Bowers	2,850 0 0
Wood & Sons	2,750 0 0
Welsh & Son (accepted)	2,650 0 0

For alterations and partial rebuilding of premises St. James-street, formerly known as Crookford's house. Mr. C. J. Phipps, architect:—

Bracher & Son	£12,000 0 0
Newman & Mann	11,978 0 0
Simpson	11,697 0 0
Gannon & Sons*	11,621 0 0

Accepted tenders:—

For General Builder's Work.

Simpson (amended)	£11,300 0 0
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Ironwork and Zolled Joists.

Dawney	720 9 9
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Scagliola Marble.

Gaul	368 0 0
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Kitchen Apparatus, Lifts, &c.

Jeakes & Co.	330 0 0
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Sanitary Works, Lavatories, &c.

Jennings & Son	500 0 0
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Gas Work and Sunlights.

Strode & Co. (exclusive of fittings)	257 0 0
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* This tender was accepted by the architect, but afterwards the contract was declined by Messrs. Gannon on the ground of insufficiency of time allowed.

For the erection of a detached villa residence, Homelane. Mr. J. W. Reed, architect:—

Mould & Son	£1,935 0 0
Hunt	1,797 0 0
Nutt & Co.	1,512 0 0
Stains & Co.	1,346 0 0
Niblett & Son	1,400 0 0
Nightingale	1,414 0 0
Gridley	1,366 0 0
Jarvis & Co.	1,383 0 0
Hawkes	1,370 0 0
Boden	1,368 0 0
Wagner	1,352 0 0
Carter	1,235 0 0
Bowley	1,275 0 0
Blease	1,233 0 0
Cawdon & Co.	1,191 0 0
Sale	1,149 0 0
Warr	1,075 0 0

ditions to a house at Hillingdon, Middlesex.
Henson, architect.
4335 0 0
317 10 0
308 0 0
293 0 0
289 10 0
259 0 0

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The Builder.

VOL. XXX.—No. 1549.

Pollution of Rivers.

ET us speak a little further of the recent Report on the condition of the rivers of Scotland.* The North Esk rises in the Pentland Hills and flows into the sea at Musselburgh. On this river the paper manufacture (chiefly writing and printing paper) is carried on largely. Between Dalkeith, which is a few miles above Musselburgh, and Penicuik, which is situated about the centre of the river basin, the distance being about eight miles in a straight line and twelve by the river, there are eight paper-mills, employing 1,600 persons, and making 8,000 tons of paper in a year from 3,000 tons of rags and 8,000 tons of esparto grass. These mills use for power, besides that of the water of the

river, 50,000 tons of coal in a year (1870). The Commissioners say:—"The North Esk is one of the few rivers in Scotland on which attempts have been made by manufacturers to supply the natural want of water in the summer time by the provision of upland storage reservoirs." The North Esk reservoir, situated nearly at the river head, was constructed twenty-five years ago by the paper-makers on this river at a cost of 14,000*l.* Messrs. David & Thomas Stevenson, of Edinburgh, being the engineers. It holds 24,133,700 cubic feet of water, and is fed by a gathering ground of 1,700 acres. This, it is stated, is sufficient to give more than 200 cubic feet per minute to the mills during a period of three months,—a contribution which, when the minimum flow of the river without this aid falls to 80 cubic feet per minute, is of the greatest value.

The Water of Leith rises in the Pentland Hills, and is a smaller stream than the North Esk. Almost the only pollution it receives is the brown and frothy drainage from paper-mills, of which there are seven on the stream. Compared with the water of the North Esk at Dalkeith, it contains about six times as large a proportion of polluting matters. At five of these mills 386 hands are employed, 1,160 tons of rags are used in a year (1870), and 4,172 tons of esparto grass; the produce of paper being 4,070 tons, with a consumption of coal of 17,100 tons. Both here and on the North Esk, as well as in England, the rags and esparto grass are each boiled for several hours in a strong solution of caustic soda.

"During this operation the soda combines with silica and with resinous matters to form soap compounds, and the causticity of the alkaline ley is destroyed. The digestion is carried on in large wrought-iron boilers. Heat is

applied by means of free high-pressure steam, by which a temperature considerably above that of boiling water is obtained. The highly polluting liquid resulting from this process is technically termed 'bollings.' It is dark brown, approaching to a black colour, and is so soapy in its nature that one volume of it added to 2,000 volumes of pure water produces on agitation an extremely persistent lather or froth. After the bollings have been drained off, cold water is injected into the boilers for the purpose of cooling and partially washing the fibrous materials. This water becomes, of course, greatly polluted by the residue of the bollings, which remains soaked in the rag or esparto fibre even after the most effective drainage. This liquid, when drained off, constitutes what is known under the name of 'coolings.' The next process consists of washing and 'breaking in' or 'pulping' of the boiled rags or esparto. The quantity of water employed for every ton of esparto grass varies from 3,500 to 12,000 gallons. A very large volume of more or less polluting liquid known as 'washings' results from this treatment of the rags. As the greater part of the organic matter in suspension is useful fibre, the manufacturer suffers a great loss when he allows this polluting liquid to be charged into a river or stream without purification."

On the river Almond, the drainage area of which is similar in extent to that of the Esk, the great paraffine-oil works are situated. Young's Paraffine Light and Mineral Oil Company employ 1,200 hands; operate on 370,000 tons of shale annually; use 7,700 tons of sulphuric acid, 1,360 tons of caustic soda and other alkalies; produce 270,000 gallons of naphtha, 2,300 tons of crude paraffine, 422,000 gallons of lubricating oil, and 3,785,000 gallons of illuminating oil, besides 700 tons of sulphate of ammonia; and burn 113,000 tons of coal a year. Three other works together operate on about half as much shale, their chief produce being crude paraffine, of which they make about 600,000 gallons a year. Paraffine and petroleum oils, it is said, furnish a given amount of light as cheaply as it can be obtained from good candle gas, and much more cheaply than it can be got from coal gas. Except that which comes from the petroleum-wells of Canada and the United States, the source from which it is got is the cannel or bituminous shale, and

"The first process in the manufacture consists in heating this shale to dull redness in cast-iron retorts. The volatile products are condensed in appropriate refrigerators, and constitute crude paraffine oil, which, mixed with condensed water, runs into the tap-reservoir. From this the warm liquid is pumped into stills, where it is submitted to a current of steam, by which a very volatile spirit or naphtha is distilled off. The residual oil is then run into the water-separating apparatus, consisting of an iron tank, surrounded by a water-jacket, which is kept at a temperature of 60° C. for about ten hours. At the end of this time the water, which forms about one-third of the crude tar, becomes almost completely separated. The tar, thus freed from water, is now placed in immense stills of cast-iron, furnished with the necessary condensing apparatus. The distillation is carried out until nothing but a kind of coke remains in the still. The coke is of good quality, and is used as fuel. The distillation is transferred to wrought-iron tanks lined with lead, where it is vigorously agitated with sulphuric acid. This operation renders the oil very black, and at its conclusion the sulphuric acid subsides to the bottom of the vat, and can be run off through a cock provided for that purpose. After being washed with water, the oil is next thoroughly agitated with a strong solution of caustic soda. On being then allowed to stand at rest, the oil (now of a light yellow colour) floats above the solution of caustic soda, whilst a thin black layer of tarry matter takes up its position between the two. The purified oily layer is now submitted to distillation, when three products are successively condensed in the refrigerator, in the following order:—1. Illuminating oil; 2. Lubricating oil; 3. Crude paraffine. All these, with the naphtha already mentioned, are marketable products, the crude paraffine being sold to the paraffine-refiner or candle manufacturer."

The manufacture of textile fabrics from flax and jute has received very extensive development in Scotland. The Avon and the Almond, in the basin of the river Forth, are in the autumn months injuriously polluted by the water in which flax has been steeped. Several hundred acres of flax are grown within the area drained by these streams, most of the farms in the upper part of the valley having a field or two. "The process of steeping consists simply in placing the sheaves in a pit filled with water, loading them so that they shall sink beneath the surface long enough to cause the partial putrefaction of the stem, or of those softer portions of it which hold its fibre and its woody part together. When this process is completed, the sheaves of flax are taken out and spread abroad to dry, after which the stem is broken, and the fibre is then scouted free of it." About 250,000 sheaves are annually grown in these valleys.

"Some of the upland streams running into both the Avon and the Almond are entirely spoiled for several weeks every year by this extremely filthy waste, which, being much stronger in fertilising matter than average town sewage, and more than twice as strong in polluting ingredients, ought not to be allowed to escape from the farm on which it is produced. There is ample evidence of the agricultural value of this liquid manure thus wasted; and there is ample evidence of the power of soil and plants to cleanse and defecate such extremely offensive stuff."

As to the pollution of the rivers by town sewage the Commissioners still hold to the system of irrigation of land as being the best remedy where land can be had for the purpose, but they are confirmed, they think, in the opinion they formerly expressed, that where land cannot be had of sufficient extent for broad irrigation the system of intermittent filtration is to be recommended, based upon the experience that has since been had on twenty acres of land at Merthyr Tydfil. Every one loves his own production, and Dr. Frankland first suggested this method, after experiments in the laboratory, as those know who have read the *Builder*. Knowing something of the Merthyr drainage, there has often seemed to us a want of candour on the part of some of the advocates of this system (not, however, Mr. Denton) in keeping back the fact that the so-called sewage there dealt with is far from being equal to ordinary sewage in the quantity of polluting matter. Merthyr is often spoken of as being a town with a population of 50,000, the sewage of which is purified on twenty acres of ground; but it is not always at the same time said that not much more than one-third of the houses are connected with the sewers. This is recognised by the Commissioners, and they state that "it must not be forgotten, however, in taking the Merthyr Tydfil intermittent works as a model for other localities, that the sewage of this town is exceptionally weak as compared with that of other towns, the Local Board of Health being restrained by injunction from connecting the drainage of a large number of houses with the sewers." The objection we have to the system, so far as it goes, is that it wastes fertilising matter; and that, being a cheap process in the first instance, local Boards may for this reason be led to adopt it in places where, on a better consideration of the whole question, a more advantageous system might be adopted. There has been some return in crops at Merthyr from each of the small number of acres cultivated; but it is inherent in the system that, because the acres are so few, the manure cannot be applied to the best advantage.

ON SHADOW.

It must be due rather to the influence of Italian painters and Italian writers on art, than to any want of richness in the English language, that the word *chiaroscuro* has obtained a half-recognised naturalisation among us. It has, indeed, the great advantage of being one which a plain man is not unavoidably familiar, and thus one of which the judicious use, in order to produce an impression of the learning of the speaker, is a godsend to amateur critics. In M. Rigand's translation of Leonardo da Vinci's Treatise on Painting, the term is defined as the correct distribution of lights and shades; but the chapter which deals with the subject is headed, in good plain English, "Light and Shadow."

Shadow differs from shade in its greater individuality. Thus, we may have a lighter or a darker shadow, but it must be cast by a definite object. Shade, on the other hand, is sometimes used to denote tint, as in different shades of blue or of red, and sometimes to comprehend shadow, or a group of shadows. The leaves of a wood cast a shade beneath the trees; but each tree, or each leaf, if it stands directly in the sunlight, will cast a definite shadow. The arrest of a direct ray of light is necessary to this end

* See p. 773, ante.

When a mist covers the face of the sun, a shade is cast over the landscape. But a flying cloud casts its own fugitive shadow; and when the sun emerges from obscurity, the shadow of the observer is projected at once by the sunbeam.

The mastery of light and shadow forms one main section of the power of the artist. It has been, consequently, often dealt with, in lectures and works on art. But the point on which we now wish to dwell is this,—the painter has a special advantage, in being able to use different colours. The effect of simple light and shadow, or of what we call monochromatic work, is less powerful than is that of rich and harmonious colouring. But the work of the sculptor, regarded, not as it leaves his hand, but as it produces an effect on the eye, depends almost entirely on shadow.

It is true that this is not the ordinary distinction that is drawn between these two sister arts. We are accustomed to be told that sculpture regards form, and painting regards both colouring and shadow. But, in fact, the definition of form is the object of all art, whether graphic or plastic. The difference between the two is, first, in the way in which that definition is effected; and then, in the way in which it is accentuated or enriched. A fine, delicate outline, such as that which is employed by Moritz Retzsch, and with that most graceful draughtsman, forms the whole of his work, is the graphic form which most closely approaches to the outline of sculpture. Such drawing is appropriate either for a sculptor's sketch or for the copying of a statue. But to look at sculpture in outline only, is to lose almost all that gives it power and beauty. The simple black shadow of a face in profile, commonly called a *silhouette*, is that likeness of the person which Lavater considered to be the most characteristic, and thus, physiognomically, the most valuable, that it is possible to take. But a statue seen only in outline, like a face represented in *silhouette*, while possessing a truth of its own, has but a very simple and rudimentary character as a work of art.

The moment that we pass beyond the condition of outline sketch, of *silhouette*, or of sculptured form seen in dark relief, against a light background, it is obvious that the effect of sculpture depends on shadow. In this, it may be, lies the main secret of the grandeur of the art.

If we regard a relief in marble, or the surface of a statue, as distinguished from its linear contour, the effect which is produced on the eye is due to the variously distributed and modulated shadows. The form and depth of these shadows depend on two causes, namely, the modelling, or accentuation, of the surface, and the direction and intensity of the light that falls on it. Thus, in any given case, we may consider the modelling, or sculpture, and the illumination, as functions varied, a change is produced, such as would be effected by a variation of the latter, the light being unchanged. It is hardly necessary to attempt to prove a proposition which is so simple and obvious. The most simple experiment will show what is the effect of a change in illumination. Even in the living human figure this may be seen. Without reference to the magic effect of complexion, and the beauty which a delicate proportion of white and of red will throw over the most homely features, let us confine our attention strictly to such an effect as can be produced, either on a live person or on a statue, by a change in the incidence of light. Look, for instance, at any face, when daylight is absent, by a descending light. Then let the person stand before a bright fire, in a room not otherwise lighted. If there be a looking-glass on the chimney-piece, the entire change of expression produced by casting the shadows upwards, instead of downwards, will strike even the most unobservant. Traits of unsuspected power may at times be thus detected. But the usual result of the reversal of illumination is the destruction of any vestige of beauty. We recommend any fair reader who makes the experiment, to make it, in the first instance, alone.

Of the mode in which the Greek sculptors dealt with shadow we are unable to speak with all the precision that is desirable, from the fact that we have no knowledge of the effect of these works *in situ*. It is owing to the vandalism of a Venetian commander that we are unable to compare the illumination of the two companion groups, erected by Phidias on the eastern and the western pediment of the Parthenon. Over each of them was thrown a deep shade from the projection of the cornice, which must have varied with the position of the sun in the heavens. We

have ample proof that the subject received careful attention, though no canon or artistic utterance has been committed to writing. The Greek sculptors wrought; they did not write. It is more than probable that it would have been thought impious, or, at all events, an offence against art itself, to commit its secrets to the untrustworthy toll-tale of written speech. With regard to those extremely precise laws which have, within the last few months, been shown to regulate the proportions of statues, hardly a hint is to be found in writing; and what exists is in the pages not of a Greek artist, but of a Roman man of letters.

Among our proofs of the thoroughly truthful manner in which shadow was dealt with by the Greek artists, are the following. The modulation of the human figure, especially of the male figure, was detailed with the utmost minuteness. Such modulation is lost to the eye, unless duly illuminated. The light must fall in a given direction, to give full force and beauty. It may be said that hunger was the great artist that produced this modulation. It is true that at Sparta the young men had to appear periodically before the *ephori*, for personal examination, and that if they showed signs of fat, they were restricted in their allowance of food. But we are not told of such practice out of hard Sparta. The object there was the maintenance of robust health and well-nerved muscular strength. A beauty of their own attends on these qualities; and that beauty was appreciated and reproduced by the sculptor. In the female form, on the contrary, to which, in modern art, a modulation of any delicacy is almost exclusively confined, the Greek view of beauty differed widely from our own. Aristotle names size as the first virtue of woman. A colossal proportion was given to the queen of the gods. Thus, as we find to be the case, in a very exaggerated way, at the present moment in Italy, the women of the Greek artists appear to be better fed than the men. A full, round swell in every limb and every contour; a neck like a tower; powerful arms, that could grasp a weapon; stately legs, that the chase or the dance could not readily tire; a full rotundity of trunk, as well as a graceful swell of the bosom, characterise the female ideal of the Greeks; and the effect of the shadow, either of a form or of drapery, depended on the exact illumination that threw out these headful charms.

Again, we see, in Greek sculpture, the absence of that expedient, we may almost call it a trick, with the effective force of which we cannot doubt that such masters of the chisel were familiar. In a statue sculptured for no particular object, site, or illumination,—and such is most modern sculpture,—the artist will at times endeavour to compensate for his absence of the former to his architectural name and proper illumination to his work, by adding something by way of head-dress, that shall give a shadow under any ordinary light. Such, in real life, is the square piece of cloth worn by the Italian Contadina, as a protection from the sun. Its well-defined gloom gives a picturesque effect even to an ordinary face. The same expedient in sculpture, a shadowy hat, a hollow helmet, a mantle folded above the head, has often been introduced, and that with admirable effect. In the hall at Burlington House, which is an admirably-lighted *salon* for the display of sculpture, we have seen an ordinary plaster cast, with a shadowing head-dress, appear a finer piece of sculpture than any marble around it. By the absence of this provision, for producing good effect under casual illumination, the Greeks give us a mark of their care in selecting the light that would be proper for each individual statue.

Again, we have distinct proof that the Greek sculptors wrought their finest works to produce an effect on observers from a fixed and limited point of view. This shows a rigidity of rule more inflexible than the requirements of illumination itself. Shadow, truly regarded, depends on the relative position of the illuminating body and the illuminated surface, not on that of the spectator. If the latter see the figure at all, he sees it as it is actually illuminated. A hundred spectators would see the same shadow. With a perspective view, or where any obstacle to the visual rays intervenes, the case is quite different. There is an eclipse of the moon,—the actual shadow of the earth is thrown on the orb of her satellite. To every observer who can see the moon at all, the magnitude and progress of the eclipse is the same. But an eclipse of the sun is not a shadow thrown on the source of terrestrial light. It is the interposition of the dense body

of the moon, which throws, on the earth, a limited and fleeting shadow, the exact course of which is predicted, with the utmost accuracy, by the "Nautical Almanack." Our most enlightened astronomers are engaged in the study of tracing the course of these fleeting sun-paths back, to the very dawn of history. At no two places,—mathematically speaking, to no two observers,—does an eclipse of the sun appear, at the same moment, identical in its magnitude. For this reason, an observation of a solar eclipse is of so much more determinative value than an observation of a lunar eclipse. The case is more than analogous. If Phidias wrought his masterpieces to be regarded from a restricted point of view, he cannot have neglected the far easier task of working them for a distinct and prescribed illumination.

We will continue the subject in our next issue.

CONCRETE CONSTRUCTIONS AND THE METROPOLITAN BOARD OF WORKS.

The following paper, which has been forwarded by the Board of Works to the district surveyors, although in answer to a special application, will serve to show the views entertained by the Board and their professional advisers on the subject of concrete, and includes other information which may be useful.

It is right to mention that the Board have made a remarkable exemption in the case of one patentee, concerning which other patentees may excusably feel jealous:—

"Whereas, by the Metropolitan Building Act, 1855, it is provided that buildings to which the rules contained in the schedules in that Act, relative to the construction and materials of walls, are inapplicable, require the special sanction of the Metropolitan Board of Works.

And whereas it has been shown, to the satisfaction of the said Board, that buildings of certain moderate dimensions may be advantageously constructed of Portland cement, or sea-water lime, and similar concrete, combined with proper attention to the quality of the said cement or lime, and the proportion thereof to the concrete materials, and to the due application of a mould or machine for giving coherence to the work during its progress, together with proper consolidation by ramming and pressure.

And whereas Mr. Philip Brannon, of No. 8, Boulevard-street, in the City of London, on behalf of R. Bell, esq., of Bridlington, in Yorkshire, has applied to the said Board for their licence and approval for the use of the said concrete in the construction of certain blocks of sanitary dwellings and buildings at Balliol-square, adjoining Bishop Wilson's Memorial Hall, Islington.

Now, therefore, the Metropolitan Board of Works do hereby approve of and license the use of the aforesaid concrete in the construction of the houses and buildings aforesaid, subject to the conditions following, viz.:

1. The Portland cement shall be of the very best quality, ground extremely fine, and weighing not less than 12 lb. to the struck bushel, and capable of maintaining a breaking weight of 350 lb. per square inch seven days after being made in a mould, and immersed in water during the intervening days. Such test, when necessary, as ordered by the district surveyor, to be made at the works of the Metropolitan Board. When sea-water lime or other substitute for Portland cement is used, it shall be on the certificate of approval by the said surveyor.

2. The other materials of the concrete to consist of clean Thames ballast, or of gravel, crushed stone, or brick-burns, or small broken stones, or any hard and durable substance; and each to pass through a screen or mesh not exceeding 2 in. diameter, and to be washed. Such materials in the proportion of one to two. All such materials to be perfectly clean, and free from all greasy, loamy, or clayey matter, and, if necessary, to be washed in the evening frames, moulds, or clamps, so long as the district surveyor shall direct.

3. When it is desired to use, instead of Portland cement, sea-water lime, blue lias, or grey lime, then the gaugings shall not be more than one thereof, to five, four, and three of ballast respectively, and not less than each one part shall be ground with burnt clay. And all concrete materials so compounded shall be thoroughly consolidated by treading, ramming, or other pressure, and sustained by the evening frames, moulds, or clamps, so long as the district surveyor shall direct.

4. In making the concrete, a box, 2 ft. by 4 ft. by 2 ft., or other like proportions, is to be used for the materials, and a smaller box capable of holding one such or half a sack containing two bushels of the cement. The cement and materials are to be turned over at least three times, and thoroughly mixed together with water.

5. The concrete thus composed is to be laid into the walls of the buildings all round in equal layers, and to be firmly compacted by treading or ramming, and ground with cement in the proportion of one cement to two of clear washed, sharp sand, or ground ballast, after each layer, until the walls are completed in height. The ground to be made as mortar first, and then thinned with water to the necessary consistency.

6. The above materials and matters are to be well and thoroughly bound together, and fixed and applied by use of other of the processes now in use for concrete building, so that security shall be provided for the complete coherence of materials and work during its progress, and to guard against the delay, risks, and errors of the work being put up otherwise than by a well-arranged mould or machine.

7. If it be desired to use bricks or broken pavement stones, or other battens and like materials, suitable to be laid in horizontal beds alternately with the concrete layers (which are about 9 in. deep), any such material shall be firmly bedded, rammed, and grouted, so as to

become one body with and assist in consolidating the walls.

9. Flat roofs, constructed as herein directed, may be formed, provided they are fully protected on all sides by parapets not less than 9 in. thick and 3 ft. high; and in cases in which such roofs being continuous over any one terrace or block, they need not be subdivided by party-walls carried through the roofs. All such roofs to be properly waterproofed over the cement-work with asphalt or other effective means.

10. All such flat roofs shall be of a thickness proportioned to the area, and be constructed strictly according to the provisions of the patent specification submitted by the said Philip Brannon to this Board, with an embedded sustaining skeleton of iron and strained wire-work, and a sufficiency of wire and fibre tension seams, and wire mangled with the concrete and cement materials to give the utmost tension and transverse strength requisite. Every layer to be properly flushed with grout, and the concrete to be composed and treated as provided for walls.

11. For all such floors, stairs, partitions, or other internal constructions as are not within the provisions of the Building Act, and are made of concrete materials, or of the same combined with embedded iron skeletons, wire, and fibre, as in said patent provided, the builder and owner must be held responsible for the strength and sufficiency thereof, as in ordinary internal constructions.

12. The thicknesses of walls to be equal, at the least, to the thicknesses for brickwork prescribed in the Building Act.

13. Suitable cores to be provided for fireplaces and for connecting them with flues, and also for recesses and flues; or flues may be formed with tubes of earthenware.

14. Door and window frames, if any are employed, shall be built into the walls.

15. No timber will be allowed to be used in the walls of buildings under this licence; but otherwise the rules of the Building Act generally to be observed as in ordinary buildings.

16. Such concrete buildings to be carefully supervised by the district surveyor, and his fees in respect thereof to be one half more than the scheduled fees provided by the Building Act for new buildings or additions. The fees for supervision thereof, as in ordinary internal constructions.

17. A clerk of the works, or other foreman, shall be appointed by the architect or builder, subject to the approval of the district surveyor, and have constant inspection of the quality, mixing, and consolidation of the concrete during the progress of the works, to see that the foregoing conditions are faithfully fulfilled, in addition to the supervision by the district surveyor as aforesaid."

ON CONCRETE BUILDINGS.

NORTHERN ARCHITECTURAL ASSOCIATION.

At the quarterly meeting of this Association, held on the 3rd inst. in Newcastle-on-Tyne, the president, Mr. M. Thompson, introduced the subject of concrete buildings. He said he believed architects would have to turn their attention to the adaptability of some new material for buildings, the cost of stone and brick at the present time being so very high. It was the duty of all practising architects to look out for some other substance, the use of which would bring buildings down to a reasonable cost, while, at the same time, they were sufficiently substantial. He did not believe that architects were either educated or employed to spend money, but rather to save it, and therefore it behoved them to look forward and keep up with the times. He had tried concrete in two or three instances in Newcastle, and found it very much cheaper than either brick or stone. They also attained another object, and that was securing a wall, where space was limited, of great strength, with less thickness than would be necessary if it were built of brick or stone. It was a very admirable substitute where great heaps of gravel or slag were accumulated; for while such refuse was available for scarcely any other purpose, it afforded an excellent material for the formation of concrete buildings. Mr. Thompson here referred to a photograph of a large seed warehouse, which had stood the test of grain, an article that produced a greater strain upon the walls than almost any other class of goods that could be stored. He then gave details of various experiments which had been adopted to test the strength of concrete as compared with brick, the result being greatly in favour of the concrete, especially when built with brick and stone bondings. It was, therefore, very important to know that such rough materials as broken bricks and stones could be put together and run in with grouting, and produce a wall of such great strength and cheapness. In preparing foundations, he believed it was quite competent, instead of digging out the soft stuff and putting in concrete, to force down the soft substance and make it a perfectly solid mass, thus securing one of the best foundations. In laying down concrete floors, he thought there was an advantage in covering them with water, because they set better under such a condition, and became harder and stronger than if they were allowed to dry under the influence of the ordinary air. At Cullercoats a great deal of concrete building was going on. The walls were generally formed of iron slag and sandstone, with grouting; and when dry, if struck with a hammer, they sounded like the ring of a piece of

metal. The inner walls of a three-story building need not be more than 6 in. and the outer walls 9 in. thick. Concrete houses were, of course, exceedingly dry and comfortable. The inside required simply a finishing coat of plaster, and the saving in that department more than covered the cost of the outside stucco, which did not peel off the concrete as it did off stone and brick walls. Buildings, constructed with concrete walls, floors, and staircases were perfectly fire-proof, the windows and door-frames being alone capable of burning.

Mr. Ebdy, Sunderland, agreed with the president that the bricklayers and stonemasons were becoming so independent in the present day that it was absolutely necessary to become independent of them as soon as possible. He believed that where stone and brick were scarce, it was necessary to fly to some such substitute as the concrete method, and it was no doubt well adapted for the construction of workmen's houses or ordinary dwellings. They had not seen it used in superior buildings, however, and up to the present time they had had little experience of its durability. They knew it made a solid body, but the question was—would it last? Would the thin frail walls be there being put up endure, and be found as solid ten years hence as now? The effects of contraction and expansion in some property put up three years ago had been such as to rip up the building as though there had been a pit working beneath it. In all concrete floors provision had to be made for expansion and contraction, and it would no doubt be found that the same effects took place in concrete buildings.

Mr. Sbotton, Sunderland, gave an instance of a floor 41 ft. by 56 ft. where no such defect existed as either the expansion or the contraction of the material.

Mr. Oliver was doubtful as to the durability of the material. The question was, would atmospheric influence not affect it, as was the case with Portland stone. Another objection was, that in concrete buildings they would never be able to produce anything like architectural or aesthetic effect. Instead of brick and stone, they had a smooth surface, and would have to resort to stucco and painting.

LONDON LOCAL GOVERNMENT.

The Metropolitan Board of Works have just issued a series of returns furnished by the vestries and district Boards to the central Board, of the works and improvements effected by them since the passing of the Metropolitan Local Management Act, 1856. The returns have been prepared in accordance with a wish that the Home Secretary, who expressed a wish that the Metropolitan Board should assist the Government by presenting to them the result of their experience with regard to the local government of the metropolis since the Act of 1856 came into operation, with a view to enable them to consider how the present system has worked, and what improvements appear to be called for. It therefore occurred to the Metropolitan Board that it would be useful to show what the Board and the various vestries and district Boards have effected in the way of sanitary and street improvements during the period of their existence, up to the year 1870, and by this means rebut the allegations that have been freely made as to want of energy on the part of the local authorities, and indifference to the interests entrusted to them. For this purpose the following list of questions was sent to each local Board:—What extent of sewerage work have you executed since January 1st, 1856, and what has been the cost? What was the condition of the drainage of the district in 1856, and what is it now? What other sanitary improvements have you carried out since 1856, and at what cost? What quantity of paving have you executed since the same date, and what has been the cost? What amount have you expended in other works of improvement since the same date? Total amount expended in sewerage, paving, and other improvements since January 1st, 1856? Of this amount, what has been paid out of the rates, what by means of loans, and of the loan what has been repaid? What was the mileage of the streets and roadways under your jurisdiction on January 1st, 1856, and what is the present mileage? What part of this increase has been occasioned by the abolition of turnpike tolls? How many miles of streets are watered in your parish or district? What is the cost per mile for water and cartage separately? What regulations

existed with regard to the inspection and improvement of courts, alleys, and dwellings, and for lighting and paving in your parish or district in 1856, and what are the regulations now in force? How many additional street-lamps have been put up since 1856? What is the price charged for lighting, cleansing, and supply of all the public lamps in the parish or district? What is the sanitary and general condition of your parish or district now, as compared with its state previous to the Metropolitan Local Management Act coming into operation?"

From the replies to these questions, it appears that St. Marylebone has executed 12 miles of sewers and 7½ miles of drains since 1856, at a cost of 59,397l.; and that, whereas in 1856 the sewers were, in many cases, dilapidated and dangerous, and in several cases above the basements of the houses, they are now clean and well ventilated, and many have been repaired or reconstructed. A great number of sanitary improvements have also been effected, and paying to the amount of 343,726l. executed. The total amount expended in sewerage, paving, and other improvements, since January 1st, 1856, was 408,230l., of which 343,430l. were paid out of the rates, and 65,800l. by loans, of which 3,681l. have been repaid. The regulations for inspection and improvement of courts, alleys, and dwellings, and for lighting and paving, were, in 1856, carried out under the management of vestry committees; but since then there is a sanitary committee for the inspection of such work, aided by a large official staff. The result is great improvement in the health of the inhabitants. No house is without water-supply. The quality of water and gas is greatly improved.

St. Pancras has executed 15½ miles of sewers since 1856, and the condition of the drainage in the district was generally good; it has since improved. Among other sanitary improvements, public baths and wash-houses have been erected at a cost of 28,900l.; and 122,000 square yards of new paving have been laid down. The total amount expended in sewerage, paving, and other improvements has been 884,774l., of which 791,271l. have been paid out of rates, and 93,503l. by loans, of which 40,450l. have been repaid. In 1856 there were in many parts no regulations with regard to the inspection and improvement of courts and dwellings, whereas now there is a rigorous supervision; disinfection is enforced, and the Nuisances Removal Acts carried out. The local authorities of St. Pancras therefore report that the sanitary condition is improved, and the rate of mortality is below the average; but pauperism has increased.

In Lambeth 53 miles of sewers have been executed since 1856, so that the condition of the drainage, from being very shallow and inefficient, is now quite effective. 550,000 yards of paving have been executed, and the total amount expended in sewerage, paving, and other improvements has been 709,505l., of which 568,505l. have been paid out of the rates, and 141,000l. by means of loans, of which 55,938l. have been repaid. Under the system of local government the sanitary and general condition of the district has greatly improved.

In St. George's, Hanover-square, 21,427l. worth of sewerage works has been executed, a sanitary staff appointed, workshops, &c., inspected, impure water prohibited, many cess-pools abolished, and 189,000l. worth of paving executed. The total amount expended in sewerage, paving, and other improvements since 1856 has been 475,238l., of which 462,637l. have been paid out of the rates. The local authorities report that the sanitary condition has been much improved; the death-rate is 16·8 per 1,000; and water and gas are supplied to a monthly test.

In Islington 9·3 miles of sewerage works have been executed at the public expense, and 32·3 at private expense; the drainage has been much improved generally; and 2,707,611 square feet of paving have been laid down. The total amount expended in sewerage, paving, and other improvements has been 1,143,384l., of which 95,066l. have been paid out of the rates, and 3,435,000l. by means of loans, of which 3,500l. have been repaid. Whereas there were no known regulations for the inspection and improvement of the poorer parts of the district in 1856, the whole department is now conducted by four sanitary inspectors and a medical officer; and the general condition of the parish is reported to be much improved.

In Shoreditch 39,466 ft. of sewerage works, 146,767 ft. new granite cubes, 29½,621 ft. new foot-paving, and 64,100 ft. kerb have been executed; and the drainage, which in 1856 was in

many parts very defective, is now nearly perfect, and cesspools are abolished. The total amount expended in sewerage, paving, and other improvements has been 140,000*l.*, of which 42,000*l.* have been paid out of the rates, and 98,000*l.* by means of loans, of which 23,000*l.* have been repaid. Under the old régime, six separate rates were levied by three different authorities, but virtually no provision was made for the inspection and improvement of courts and alleys; whereas now the various Sanitary Acts are enforced by a full staff of officers, and the condition of the district has immensely improved.

In Paddington, the total amount expended in sewerage, paving, and other improvements has been 104,257*l.*, of which 64,900*l.* have been paid out of the rates. There is systematic inspection; cleansing and drainage are enforced. The result has been that disease is greatly diminished; there are no fever dens; and great sanitary improvements have been effected.

In Bothal Green, thirteen miles and a half of sewerage works have been constructed, and 309,000 yards of paving executed; and whereas in 1856 the greater part of the parish was almost without drainage, almost all the houses are now drained and improved. The total amount expended in sewerage, paving, and other improvements, is 95,324*l.*, of which 25,324*l.* have been paid out of the rates, and 70,000*l.* by means of loans, of which 18,700*l.* have been repaid. The district has very much improved generally; and there is a growing appreciation of the value of sanitary measures.

In Newington, the total amount expended in sewerage, paving, and other improvements (including precepts of Metropolitan Board), has been 399,624*l.*, of which 385,124*l.* have been paid out of the rates, and 14,500*l.* by means of loans, of which 3,875*l.* have been repaid. The district has been much improved; sickness has diminished; and there is a greater appreciation of sanitary knowledge.

In Camberwell, the total amount expended on sewerage, paving, and other improvements, has been 507,355*l.*, of which 427,355*l.* have been paid out of the rates, and 80,000*l.* by means of loans, of which 11,000*l.* have been repaid. In 1856, the district was almost wholly undrained, except into open sewers; but now the sewerage is complete as far as required. Formerly there was a large proportion of cesspools; they are now nearly all abolished; and the water supply is greatly improved; disinfecting apparatus and mortuary instituted; vigilant inspection from house to house by four officers; and special regulations for lodging-houses.

In St. James's, Westminster, the total cost of the sewerage, paving, and other improvements, has been 110,218*l.*, of which 104,000*l.* have been paid out of the rates, and 6,000*l.* by means of loans, of which 2,700*l.* have been repaid.

In Clerkenwell, the total amount expended in sewerage, paving, and other improvements, has been 80,740*l.*, of which 51,739*l.* 17s. have been paid out of the rates, and 29,000*l.* by means of loans, of which 8,533*l.* have been repaid. The sanitary condition of the district has very greatly improved, although the inhabitants are more crowded than formerly.

In Chelsea, the total amount expended in sewerage, paving, and other improvements, has been 95,466*l.*, of which 89,101*l.* have been paid out of the rates. The sanitary and general condition of the district is highly satisfactory as compared with its state before coming under the operation of the Metropolis Local Management Act.

In Kensington, the total amount expended in sewerage, paving, and other improvements, has been 206,469*l.*, of which 140,075*l.* have been paid out of the rates, and 16,464*l.* by means of loans, of which 1,000*l.* have been repaid. The condition of the parish has altogether changed since 1856; many acres of fields are now built upon, nevertheless the sanitary and general condition of the parish is very satisfactory.

In St. Luke's, the total amount expended in sewerage, paving, and other improvements, has been 71,625*l.*, of which 49,825*l.* have been paid out of the rates, and 21,800*l.* by means of loans, of which 790*l.* have been repaid. The sanitary condition has been greatly improved since 1856, and is now very good.

In St. George's, Southwark, the total amount expended in sewerage, paving, and other improvements, has been 145,305*l.*, of which 125,305*l.* have been paid out of the rates, and 20,000*l.* by means of loans, 3,000*l.* of this last having since been repaid. The result is that the sanitary con-

dition of the district has been greatly improved, especially in the worst localities.

In Bermondsey, the total amount expended on works has been 91,968*l.*, of which 74,219*l.* have been paid out of the rates, and 27,749*l.* by means of loans, 4,570*l.* of which have been repaid. In 1856 a considerable portion of the parish drained into open sewers and ditches; but the entire district now drains into the low-level sewer. The sanitary and general condition of the district is described as most satisfactory.

In St. George's-in-the-East, the total amount expended in sewerage, paving, and other improvements, has been 50,820*l.*, all of which has been met by the rates. In this district it is reported that the crowding is not abated; and pauperism has increased. But there is now a daily supply of good water, and the paving and scavenging have been much improved.

In St. Martin's-in-the-Fields, the total amount expended in sewerage, paving, and other improvements, has been 6,654*l.*, which have been paid out of the rates; and the result of the sanitary improvements is that there is greater cleanliness, and the death-rate has decreased.

In Mile-end Old Town, the total amount expended in sewerage, paving, and other improvements has been 68,624*l.*, and cesspools and old and defective sewers have been abolished, while as regards the sanitary and general condition of the hamlet, there has been a great improvement.

In Woolwich, 22,637*l.* have been expended on sewerage, paving, and other improvements, 11,137*l.* of which were paid out of the rates, and 11,500*l.* by means of loans, of which 1,974*l.* have been repaid. The local authorities state that the sanitary and general condition of the district has been much improved, and that sanitary regulations are better appreciated by the poorer classes.

In Rotherhithe, the total amount expended in works has been 46,660*l.*, of which 29,198*l.* have been paid out of the rates, and 17,462*l.* by means of loans, of which 4,146*l.* have been repaid. There were 15 miles of open sewers; these have been abolished, and the drainage greatly improved. Nuisances are suppressed, and slaughter-houses, &c., inspected; and there is a good water supply. The rate of mortality has been diminished, and the health of the population improved.

In Hampstead, 57,572*l.* have been expended in works, of which 16,472*l.* have been paid out of the rates, and 41,100*l.* by means of loans, 11,396*l.* of which have been repaid. Besides this, 70,589*l.* have been expended in sewerage, and paving works by private individuals, under direction of the local authorities. It is difficult to compare the rural parish of 1856 with the suburban parish of the present day; but there can be no doubt that great sanitary and general improvements have been effected.

In Whitechapel, the total amount expended in sewerage, paving, and other improvements has been 88,942*l.*, of which 69,942*l.* were paid out of the rates, and 28,000*l.* by means of loans, of which 10,367*l.* have been repaid. The district has much changed for the better; offensive business and other nuisances abolished; dustbins emptied daily, where required; and the water supply greatly improved.

In Westminster, the total amount expended in works was 119,807*l.*, the whole of which has been paid out of the rates. There is a careful supervision of slaughter-houses, &c., and a vigilant sanitary inspection; the result being that the district has greatly improved.

In Greenwich, 292,452*l.* have been expended in sewerage, paving, and other improvements. Scarcely one-fifth of the district was drained in 1856, whereas more than four-fifths are now. The result of sanitary improvements is seen in the reduction of the rate of mortality, and the decreased virulence of epidemics.

In Wandsworth, 906,609*l.* have been expended in works, 613,297*l.* of which have been paid out of the rates, and 228,000*l.* by means of loans, of which 26,492*l.* have been repaid. In 1856 this district was almost entirely unsewered, and was full of open ditches and cesspools; but 142 miles of sewers have been constructed, and the whole district is thoroughly drained into the main sewers. The sanitary and general condition of the district is described as good, and the public health much improved.

In Hackney, the expenditure on works has been 52,029*l.*, of which 12,029*l.* have been paid out of the rates, and 40,000*l.* by means of loans, of which 1,159*l.* have been repaid. In this district the sanitary and general condition has been very

much improved; 33,920 nuisances abated since 1856, and the drainage and ventilation attended to.

In St. Giles's, 108,303*l.* have been expended in sewerage, paving, and other improvements, all of which has been paid out of the rates. Under an efficient staff the district is in a much better sanitary condition, and there is a constant suppression of nuisances.

In Holborn, the total amount expended on sewerage, paving, and other improvements, has been 53,146*l.*, of which 47,146*l.* were paid out of the rates, and 6,000*l.* by means of loans, 4,000*l.* of which have been repaid. There is a marked improvement in the district as regards its sanitary and general condition, although it is in a state of transition, owing to the great disturbance caused by recent alterations.

In the Strand district, 76,728*l.* have been expended on works of sewerage, paving, and improvements, 64,728*l.* of which have been paid out of the rates. The sanitary and general condition of the district has materially improved.

In the Fulham district, the total amount expended in sewerage, paving, and other improvements has been 78,572*l.*, all of which has been paid by means of loans, of which 19,818*l.* have been repaid. In 1856 the sewerage system was very bad; it is now tolerably complete, and the district greatly improved in its sanitary and general condition.

In Limehouse district, the sum of 179,945*l.* has been expended, of which 162,145*l.* have been paid out of the rates, and 37,800*l.* by means of loans, of which 12,437*l.* have been repaid. The sanitary and general condition of this district has been greatly improved.

In the Poplar district, 136,443*l.* have been expended in sewerage, paving, and other improvements, 89,127*l.* of which have been paid out of the rates, and 47,316*l.* by means of loans, of which 8,792*l.* have been repaid. Very full and strict sanitary provisions are put in force in this district, and to meet special exigencies there is an inspector of factories.

In St. Saviour's, Southwark, the total amount expended on works has been 57,850*l.*, of which 50,350*l.* have been paid out of the rates, and 7,500*l.* by means of loans, 6,700*l.* of which have been repaid. The sanitary and general condition of this district has in many respects been materially improved.

In the Plumstead district the total amount expended on works has been 106,379*l.*, of which 39,329*l.* have been paid out of the rates, and 67,050*l.* by means of loans, 10,497*l.* of which have been repaid. The local authorities report that the district to have been always healthy; but it is now greatly improved, for whereas in 1856 there was no drainage beyond that afforded by open ditches and cesspools, there is now a proper sewerage system, the water supply is improved, and various nuisances have been abated.

In the Lewisham district the total amount expended in sewerage, paving, and other improvements, has been 49,796*l.*, of which 10,027*l.* have been paid out of the rates, and 39,769*l.* by means of loans, of which 14,558*l.* have been repaid. This district was also formerly undrained, but is now properly sewered, and the sanitary improvements cause it to be healthy.

In the St. Olave's, Southwark, district, 54,316*l.* have been expended in sewerage, paving, and other improvements, 50,616*l.* having been paid out of the rates, and 3,700*l.* by means of loans, of which 1,600*l.* have been repaid. Cesspools have been abolished, drainage system perfected, water supply improved, and there is strict sanitary supervision. The local authorities report that the sanitary and general condition of the district has in every sense infinitely improved.

It thus appears that the vestries and District Boards of Works of the metropolis, have exceeded since the period of their constitution under the Metropolis Local Management Act, 1856, works of sewerage, paving, and other improvements in their respective districts to the amount of 7,212,319*l.*

The "Father of Steam Ploughing."—Mr. J. A. Williams, of Baydon, farmer, known as "the father of steam cultivation," has been presented with a purse of 200 sovereigns and a valuable gold watch, in recognition of the services he has rendered to the cause of agriculture, and the sacrifices made by him in working out the principle of cultivating the soil by the aid of steam. The testimonial was subscribed for by a large number of agriculturists in Berks, Wills, and elsewhere.

PROGRESS IN THE '72 EXHIBITION.

RETROSPECT.

It seems an easy thing to define a word, and there are not a few who think they can do it readily and obviously; but it is in reality a most difficult thing to accomplish, and requires for each individual word a fund of knowledge, and not a little patience. Sometimes it is impossible to do it at all with any accuracy and comprehensiveness; and sometimes, what is more difficult still, it takes no little time and skill to convince those who fancy they understand some common word in its true significance, that they interpret the said word wrongly, and that things will grow clearer if but they amend their wrong interpretation, and look out for a true one. Is not this the present state of the common word *progress*? "Progress" is now in every man's mouth. We are all "progressing," and everything almost about us, from children's toys to palatial mansions, is also progressing in a way, and at a pace never before known. But what is *progress*? Lord Bacon defined *progress* to mean *advancement, notion forward*, and this is perhaps the general sense in which it is understood; but Shakespeare's definition, he not being quite so great a man of business as the philosophic Chancellor, was *course, procession, passage*; while Locke, it may just be noted by the curious, limited the definition to *intellectual improvement, proficiency in knowledge*. It will be seen, therefore, that this one simple and common word admits of a great variety of interpretations, and is applicable to very many different states of things. In the remarks we propose to offer on the '72 Exhibition, now about to close, it will be seen how usefully this changeable word may be brought to bear on some things in it.

We would impress this on the reader from the fact that each successive Exhibition is said to be a "progress" beyond that of its predecessor, and that each year in the civilised world of Europe is a progress beyond that of the last; and it becomes therefore not a little important to know what *progress* is, and whether it is indeed a reality. This present year's '72 Exhibition at South Kensington is, of course, a progress beyond the last, the '71 Exhibition; that is, as is supposed, the things exhibited in it are a progression beyond those exhibited in the last year's show. The world is a year older, and a year a year wiser, and more capable, and shall we say, it? a year "cheaper," for surely cheapness is a part of progress. But is it indeed so? and, if so, in what way? and shall we take Bacon or Shakespeare as our dictionary, or help us to come to a conclusion about it? In the first place, there is one thing that has not "progressed," at least in one sense,—the number of new machines for the superseding of human labour is not so great as in last year's show. There are some quite as ingenious truly, but they are fewer in number. There is the "Walter Printing Press," and, by the bye, we should like to see the name of the clever inventor and contriver of this wonderful machine in partnership with that of its far-seeing promoter and proprietor. It does all a machine can well do, as far as things have yet gone; it does ill but write, and that with a speed truly marvellous. A great rag-washing machine, too, is quite a marvel in its way. There is also, among peculiarly modern affairs, for time was, but a few years ago, when the envelope was not known, but here is a machine which does all but direct "the said envelopes. Machinery in these days is most surely triumphant. Thus we may truly say that, in Lord Bacon's sense, machinery "progressing" in every sense: increasing in quantity, going forward, and riding down all things. The great lawyer would surely have been himself satisfied with this progress had he lived to our day. So far, therefore, there is progress. But what will seem to so many to be the triumph of this, as of other "Exhibitions,"—as it will be doubtless of the great Vienna show of next year, with its Machinery Court, a resplendent mile in length,—has still its melancholy and solemn side; for no man can, with any of the feelings and aspirations of the artist in him, fail to see that this so fairly boasted "progress" and power of the dead machine is, in other words, *artist-work*, out of the world together. It is a curious but most significant circumstance that nearly all the best specimens of hand-work to be found in the building were here and there, would seem to have been put away into corners, and to be waiting for "pro-

gress and improvement" to come to their aid, and to fit them fairly with their manufactured and machine-made competitors. We do not think that this was done intentionally: it was evidently the result of the instinct of the place and time. It is in the very nature of things as they are now going on and progressing to cast everything into the *machine*,—the man having nothing to do but to look at the machine as it does its work, to feed it with fuel, and to oil the joints of it. We say that this is the very genius of the time, and the way in which the "form and pressure" of it is manifested. But where is the artistic faculty all this time, and where is it allowed to show itself? This is the question!

In this Exhibition, as in the last, the French Court, as was to have been expected, is not a little conspicuous for what it exhibits. There is truly a neatness, and finish, and inventive faculty shown in French work which can hardly be found anywhere else. It seems wonderful, however, that there was not in this year's show, it was so in the last, any example of work which can be called in strict language *modern French*. It is copied, or in some way or other borrowed work,—borrowed, too, from all sorts of things, and from all sorts of places and times. There are *mechanical* copies of objects from *Eastern art*, which the French in Algiers seem to take to, after a fashion, and we see in this show "Cufic" inscriptions to a large scale in metal admirably executed; but who can read Cufic characters? What does the inscription mean? It is probably a text from the Koran, and means something certainly to those who first wrote it on its proper object,—as a Mosque lamp; but what is it, and what does it convey to the common Frenchman, or to the Englishman, in this new show? Why, the French workman, with all his ingenuity and skill, might do not a little for the world of art if he would but, instead of copying Cufic, go to work and mould into some sculptural shape, the common Roman letters, with which he prints all his hooks, or writes his letters. This would indeed do something, and spread his fame far and wide, for it is surely a desideratum to be able to write over even a shop-door a name and a trade, even as the Chinese do, in an *artistic* way, and worth the looking at.

Again, all cannot but have noticed that there was nothing in this year's French show which could for a moment compare, as an artistic production, with the magnificent carved chimney-piece of last year, wherein the sculptured drapery in white marble, so light and full of folds, and so truthful to our minds, eclipsed everything of the sort in the building. In vain we asked the name of the artist, the working artist; it ought yet to be on record, for it showed in a way not a little consoling what strength there is yet in the artist's power of Europe and modernism.

We need not go into detail, for this has been done in many ways already, and our object is not so much to criticise the objects exhibited as to point out results, and to indicate a something, if possible, in the future. No one can have gone through this French part of the Exhibition without a feeling of regret that the idea of "art-manufacture" should dominate the French art, as it does the English, and for this very simple reason, that it fairly strands the Frenchman, and leaves him high and dry, and takes from him the use of his real art-power. He might as well be without it: it is a glorious faculty thrown away; and to show this, it is but necessary to look at and to examine, with some little care, the examples of hand-work exhibited in the French Court. We would specially instance the goodly show of painted dinner-plates, and other objects of the like sort. Some of these painted plates are admirably done, and it seems to be a pity indeed that the subjects on them were not a little better chosen, and from actual French life,—both town and country life. We were glad to see that our hope of last year has, to a certain extent, but not enough by a long way, been fulfilled; for a number,—a certain number,—of the objects have had the name of the *executive artist* written or attached to them. In one case, in a somewhat unlucky way, for the lady artist who painted some of these things so cleverly posted up her name in such a very conspicuous and staring way that all the world could not but suppose, as we did, that it was the name and advertisement of the exhibiting firm. This was a pity; for the lady's name ought to be known, not as mere exhibitor, but as *artist*. We have thus dwelt on the French part of the show, not because we have missed sight of the rest of it, but from the hope that the French artists will

come to see what it is they are made of, how much they can do, and what a world of fame and wealth there is in that power which they possess, if they but use it aright, and throw not away the great and precious gift which is theirs by birthright, and which cannot be taken from them by conquest, but can only be lost in the process of art-manufacture! wherein the observer cannot tell one man's work from his fellow's, and where all alike, the dull and the gifted, are as one man, or one machine,—all doing the work, but no one man's hand being visible in it. Let the reader ponder on this, and carefully compare the ideas of progress in the mind of the "play-writer" and in that of the lawyer with each other. There will be found more in it than he at first sight thinks for, and the deeper he looks into it the more he will find. Some things there are which do not need "to progress": they are good and perfect as they are: they need but to be added to, and for the world to find more of them, it may be. Stars, and flowers, and blue sky, and cloud-forms, and mountain-tops, and a thousand other things, do not progress, except still to live, day by day, and age after age,—a "procession of marvels! So of artistic work,—the Madonnas of Raffaele, the heads of Michelangelo, and Titian's picture-colours: they could hardly progress; but they live, and the world's work, its true artist-work, is to add to them,—each artist, mud and hand, as it has been given him to do it, individually.

We have exceeded our limits already, and could have wished to say something a little in detail on the English side of the great show. There is one special thing which ought not to be passed by in this record. It is English,—that is certain,—and fashionable, and big enough, in all conscience, and illustrates what "progress" really, in these modern days, does indeed mean. It is mechanical, too. We mean the ponderous gun of the latest scientific make and power, and with the shot or bolt by its side, beyond the power even of gunpowder to move, one would almost have thought. It did show and illustrate truly and vividly what "progress" is,—what the word means, and what it is to progress with an idea. Not only was the actual metal here shown in ponderous section; but close to it, and fixed to the wall, was the section, full size, of the biggest gun which, it seems, could well be imagined,—not in metal, be it observed, but in wood, painted iron-colour. Now, here was, indeed, "progress," in a sense in which neither Bacon nor poor Shakespeare, with all his imagination, could well have dreamed of. "Progress," from the possible and the actual, all on the move, and going on day by day, before the astonished world's eye, but progress even far beyond this, into the regions of the *impossible*. But we do not like to be heated even here. Why was not a piece of armour-plate shown so thick and so big, and so tough, and so impassable, as to defy even the gigantic imaginative war-tool! Such is modern progress!

PROGRESS OF CARDIFF.

THE onward expansion of the commercial and maritime emporium on the coast of South Wales bids fair, at no remote date, to be a formidable competitor with the great port on the south-western shore of Lancashire. At least, within the last half-century, Liverpool has been the main maritime outlet between this country and the Atlantic. The Thames has, indeed, contributed to a certain extent to this end, but the shores of the Mersey have for some years been the chief scene of Anglo-American intercourse. Indeed, from the establishment of the Cardiff line of mail steamships, now some thirty years ago, down to the present time, when no less than six distinct American fleets can be numbered as trading between Liverpool and New York, the port of Liverpool, practically having no rival, has been in undisturbed possession of the American passenger and merchandise trade.

This unruled monopoly is about to be invaded. Cardiff,—commercial and marine,—has for some years been making rapid strides, and she now appears to have attained a position which justifies her in bidding for a share of the trade between this country and America, and to-day practically illustrates the venture. A body called the West Atlantic Steamship Company are about to place on the station between Cardiff and New York, a fleet of steamers for passenger traffic similar to those which now sail between Liverpool and New York. The pioneer of this line of steamers sails

to-day for the West from the enterprising Welsh port. The vessel, which has appropriately been named the *Glamorgan*, is a large ship of 2,500 tons register, with a carrying capacity of 4,000 tons, and having compound engines of 450-horse power nominal, but which will work up to 1,800-horse power. The *Glamorgan*, in addition to the usual fittings and decorations, is supplied with one of Allen's gas-making apparatus, capable of supplying from 100 to 300 burners; and the large capacity of the *Glamorgan* will necessitate the adoption of the larger number. The intention of the promoters is to place a full complement of ships upon the line, and a sister ship to the *Glamorgan*, to be called the *Pembroke*, is now in course of construction on the Clyde. In connexion with this enterprise, it may be stated, that the Great Western Railway Company, in anticipation of an increased source of traffic, are about to expend 40,000, in the erection of a new station at Cardiff, and a new floating harbour is also in contemplation at the neighbouring district of Neath.

THE HOUSES AND POPULATION IN ST. GEORGE'S-IN-THE-EAST.

The annual report of the St. George's-in-the-East Vestry, which has just been issued, contains some interesting statistics as to the number of houses and the population in the area within the district. It appears that both as regards houses and inhabitants the census returns of 1871 show a decrease as compared with the returns of 1861. The number of occupied houses is less by 262 than in 1861, whilst there is a falling off in the population to the extent of 656. This decrease is in some measure accounted for by a considerable number of houses having been taken down to make way for the works of the East London Railway, and also by the guardians having demolished a number of tenements for the purpose of erecting the new workhouse infirmary on the site. Notwithstanding, however, that there is this numerical falling off in both houses and population, the latter is relatively more dense than it was in 1861, as at that period 48,891 persons were residing in 6,186 houses, being at the rate of 7.9 persons in each house; whereas, according to the late returns 48,239 persons are living in 5,924 houses, or 8 persons in each house. The Vestry contemplate the widening of Wapping, which they think is desirable in consequence of the erection of the new station of the Great Eastern Railway Company in Leman-street, shortly to be opened, but they consider that it ought to be carried out as a metropolitan rather than a local improvement, and they have resolved to apply to the Metropolitan Board of Works on the subject.

FROM OXFORD.

The Restoration of Christ Church Cathedral.—The restoration of this cathedral is still being proceeded with. The nave is being lengthened 20 ft. at the west end, and the new entrance to the office from the "Tom Quad," will shortly be completed. The cathedral has been rescaled throughout with Italian walnut-wood seats, richly carved. A new altar-table of cedar wood, with carved caps and bases, and four ivory crosses on the surface of the table, has been placed in the chancel. The total cost of the restoration will be upwards of 21,000*l.*, towards which 100*l.* have been given by the Queen, in her capacity as visitor, a like amount by the Prince of Wales; 1,000*l.* have been given from the corporation fund of Christ Church; a like amount from the chapter fund; 2,625*l.* by individual members of the governing body of Christ Church; and 6,925*l.* by its present and former members.

Restoration of Merton College Hall, Oxford.—The hall of Merton College has undergone a complete restoration at a cost of upwards of 4,000*l.* About the year 1790 some alterations were made in the Hall by Mr. Wyatt, architect, who destroyed the then existing roof, windows, and all the architectural features of the building, and substituted for the open-timber roof one in plaster-groining. He blocked up all the window-seats and openings, and concealed the walls behind the plaster partitions, thereby leaving none of the original features of the Hall open to view. In fact, those alterations were a mixture of classical and we may almost say debased Gothic work. A short time since Sir Gilbert Scott was engaged to restore the building, and the whole of the work that Mr. Wyatt executed has been cleared away. The

new work is in accordance with the original construction of the Hall, which is of fourteenth-century date. The whole of the interior has been restored, and the exterior renovated, and the walls are refaced with Tynnton stone.

McKEAN'S ROCK DRILL.

The production of a satisfactory rock-drill for tunnelling, mining, well-sinking, and other similar purposes is a matter of so much importance and difficulty that many minds have been employed upon it for some time past. Several such machines have been invented, and have done and are doing good work, still leaving, however, something to be desired. The last placed before the public is one of which a diagram appears in our advertising columns, McKean's Rock Drill. We went to look at it the other day, and feel bound to say that in respect of simplicity, strength in the right place, and applicability to varying situations, it seems to us to make a strong claim on the attention of those interested in such an invention. The machine we saw is of the size ordinarily used for quarry-work or open-cutting, weighing about 150 lb., with a single drill mounted on a frame. A smaller, and for many purposes a still more convenient form, is being manufactured, which can be handled by one man. With a steam-pressure of 75 lb. to the inch, it will drill, as a maximum, a 2½-in. hole to a depth of 12 in. per minute in Aberdeen granite, but the average duty is estimated at from 6 in. to 9 in. per minute, and the number of strokes from 500 to 1,000. It is driven by steam, but compressed air would be applied for tunnel-work. We advise such of our readers as may need a rock-drill to make a journey to the Borough-road, and look into the matter for themselves.

METROPOLITAN DISTRICT SURVEYORS.

The superintending architect of the Metropolitan Board of Works, Mr. Vulliamy, has issued his report for 1871, on the monthly returns of district surveyors, giving a general abstract of the returns of fees for the year 1871, along with a list showing the comparative revenues of the several districts into which the metropolis is divided.

The total of the gross fees received for the year is 29,099*l.* 10*s.* 6*d.*, in respect of 18,948 works, of which above two-thirds were done within the year. The gross fees received in thirty-seven districts vary from 60*l.* to 490*l.*, five being under 200*l.* each, six under 300*l.*, fourteen under 400*l.*, and twelve under 500*l.* In twenty-two districts the incomes vary from 598*l.* to 1,221*l.* The expenses of district offices are 7,459*l.* 3*s.* 7*d.* The fees remaining due for all arrears are 29,199*l.*, but probably mostly of little value. The sums asked or lost are 2,262*l.* 1*s.* 10*d.* Compared with the results of former years the present abstract shows still a decrease.

Year	Works	Fees received.
1862	15,707	£26,315 2 3
1863	17,954	29,440 9 9
1864	18,984	31,883 3 2
1865	19,251	32,972 7 9
1866	20,196	34,989 11 4
1867	21,303	36,674 6 0
1868	21,915	37,790 13 5
1869	19,947	33,248 19 6
1870	18,899	30,003 2 4
1871	18,948	29,099 0 6

A NEW THEATRE FOR DARLINGTON.

The present building in Northgate, now used as a theatre, is to be pulled down, and a new one to be built upon its site. The new theatre will be much larger and more commodious. The street façade,—not so extensive as at first proposed,—is in the Gothic style of architecture, adapted to modern times, and the front is broken up, in making a feature of the main entrance, which is the central object, and the superstructure, by recessing the other portions of the façade. The doorway is arched, finished with a hood-mould stopped on the foliated capitals of the pilasters: the tympanum of the arch is intended to have some dramatic scene carved in either wood or stone. The second story is formed of an arcade of windows, with circular shafts and foliated capitals. The upper portion is reserved for three niches. The whole is broken up with horizontal strings, and finished with a cornice. The principal entrance is by a corridor, on the left of which is a ticket-office, so planned as to supply tickets to the pit and gallery occupants,

and the occupants of the dress circle, without coming into contact with each other. The staircase to dress circle is intended to be of stone, at the top of which is a large landing, from which is the entrance to the dress circle and private boxes. The auditorium at this level is 46 ft. wide and 48 ft. deep. The stage is 47 ft. wide and 46 ft. deep, and so constructed that it may be removed if required, and be used for acrobatic and equestrian performances. Entrance to the pit is obtained through a door in the passage on the right of the main entrance, and a wide staircase leads to the gallery. Provision has been made in the shape of lavatories, &c. The ceiling is flat, with a cornice round, which is intended to be relieved with centre flowers and medallions, the latter formed for carrying off vitiated and heated air. Ventilation shafts in the walls with air-grates are let into each tier. On the top of the roof is a large louver, which supplements the other ventilators. The lighting of the theatre will be from a fan-light. The means of egress in case of fire have been considered. Besides a broad flight of steps from the gallery, in addition to the admittance entrances, there are two other doors opening into a spacious yard, which may be thrown open on an emergency. The doors also slide. The building is calculated to hold 1,300 persons sitting. In the large yard at the back there is room for dressing-rooms, &c., and also for stabling accommodation for circuses. Mr. W. Hodgson is the architect.

SALARIES OF ENGINEERS TO MUNICIPAL BOARDS.

The following list gives the amounts of salaries paid to some of the principal engineers and surveyors to municipal bodies and local Boards of Health:—

Name of Towns.	Amount of Salaries paid.	Population, Census of 1861.
Local Government Board—		
Chief Inspector	£1,000	—
Two other Inspectors	800 each	—
Metropolitan Board—		
Chief Engineer	2,000 and private practice	—
Assistant Surveyors	1,000 each	—
Liverpool	1,300 allowed pupils	443,639
Manchester	750 applying for 1,300 <i>l.</i>	367,979
Birmingham	600	236,075
Leeds	300	207,165
Sheffield	400 and private practice	155,670
Bristol	500 and 120 <i>l.</i> for horse and trap	151,093
Wolverhampton	550	147,670
Newcastle-on-Tyne	600	109,108
Salford	350	102,449
Hull	250 and private practice	97,660
Oldham	300	91,344
Brighton	400	87,000
Norwich	400	74,571
Nottingham	400	74,683
Leicester	500	68,636
Birkenhead	500	61,648
Portsmouth	400	49,779
Southampton	400	46,960
Derby	350 and private practice	43,991
Exeter	300 and private practice	41,747
Cheltenham	300 and private practice	39,693
Wigan	300 and private practice	37,688
Hullers	310	37,104
Ruddersfield	350 and private practice	34,577

THE ESCURIAL.

As briefly stated in the *Builder*, last week, the Escorial was struck by lightning and fired. The damage, fortunately, however, was localised. It spread by the angle of the Colegio and roof of the Library. The Seminary tower and the Lantern tower have fallen.

The damage done will cost about 40,000*l.* to repair, and this King Amadeus offers himself to defray. The Library, around and above which was the principal seat of the fire, is of world-wide renown. It contained fourteen to fifteen thousand of the rarest books and the oldest manuscripts. These were all saved, as were also the valuable paintings which hung on the walls.

The Escorial is situated about thirty miles north-west of Madrid. It was begun in 1567 by the moody monarch Philip II., whose amatory advances were so sternly refused by our own virgin Elizabeth, and was erected in commemoration of the battle of St. Quentin, which was won by the force of Spanish arms, on the day dedicated to San Lorenzo, in the Papal calendar. Hence, its name, "El Real Sitio de San Lorenzo, el Real de Escorial."

The first architect was Juan Baptista Mangro, of Toledo, and upon his death, in 1567, the work was continued by Juan Bustamante, one of his pupils.

The building is whimsically constructed in the

form of a gridiron, on which instrument of torture the saint to whom it is dedicated is said to have been broiled alive. Everything in the Escorial is commemorative of his martyrdom. The gridiron is seen upon the doors, windows, stairs, and even the rituals and sacerdotal habits display it. As to the edifice itself, the principal front faces the west, and behind it is a mountain: one opposite side looks towards Madrid, and the other the form of the shortened handle of the gridiron, while the bars are represented by the interior intersecting buildings, and the four towers are portrayed by the spires of four little square towers, which arise at the four angles. The western front shows a fine portal formed by large columns of the Doric order, half sunk in the wall, on each side of which are two huge doorways. The whole edifice is of a species of black granite, called heroqueano, and the brownish hue which it has assumed through time tends to rather than diminishes the natural verity of its aspect. The quarry whence it was dug is close by, and its vicinity is said to have been one reason for the choice of such a convenient and unattractive site. The same one is also seen in the little village of the same name, which nestles at the foot of the main building.

The central structure, around which all the rest aggregate of buildings spreads, is the magnificent temple built on the model of Peter's at Rome. It stands in the centre of a parallelogram which forms the gridiron, and is the shape of a Greek cross, with a splendid dome 330 ft. high in the centre, and lofty towers at the ends. All the wealth of Spain was vished on this church. It is 374 ft. long and 100 ft. broad; is divided into seven aisles, paved with black marble; and the walls are everywhere covered with porphyry, jasper, and other marbles of infinite variety, and with statues, portraits of the kings of Spain. This church forms one side of the central court of the building. On the other side is the grand central atrium and Ionic portal which opens twice for every Spanish monarch,—first, when he is crowned by his baptism; last, when he is borne to the grave, by three nobles and three monks. The *Capilla de los Reyes*, where the present confagration is said to have broken out, is so called because it is surrounded by six statues, 17 ft. high, of the kings of Judah, who were connected with the Temple of Jerusalem. They were all carved from one solid block, and enough remains of it to complete the dozen. The church itself contains forty chapels, each with its own altar. The ceiling is covered with the frescoes of Giordano, forming a pictorial history of Christianity; and of the forty-two pictures which adorn the sacristy, each one is said to be a masterpiece. The church is described by Ford

"The triumph of architecture. It takes away the breath of the beholder, from its majestic simplicity, its quiet, solemn, unadorned. No tinsel statues or tawdry paintings mar the perfect proportion of the chaste Christian temple. The religious sentiment pervades the whole of the House of God; everything mean or trivial is forgotten."

The royal tomb is under the high altar, in which that when the priest raises the Host he pray do so exactly above the dead. Descending to a flight of polished marble steps, between walls of yellow jasper, we come on an octagonal chamber, 36 ft. wide and 38 ft. high. In the centre is a black marble sarcophagus, between which, with a black marble sarcophagus in each. Of these sarcophagi sixteen are full, and the rest await their occupants. None but reigning monarchs are buried here, the monarch to the right of the altar and the consort to the left. The Queen Isabella remained on the throne until she would have been laid, at her death, under her father, and her husband would have been covered among the queens on the other side. Her royal personages are buried in a chapel called the Pantheon of the Infantas.

The great library is above the front of the hall called the Patio de los Reyes. It is an arched hall, 194 ft. long by some 32 ft. wide and 36 ft. high. The books had their edges, not their backs, turned on the shelves. They were originally arranged so, and the arrangement was never altered till now.

According to some accounts the length of all the rooms and apartments in the Escorial is above 11,000 English miles, and it contains 14,000 doors and 11,000 windows. These statements may be exaggerated. The fire broke out at half-past seven on Tuesday night (1st inst.). Only a single effective engine was at first brought to bear upon it; those from Madrid not arriving till

6 a.m., when the conflagration was already much reduced. The people of the village made such exertions as to remove some 14,600 books within an hour.

The *Correspondencia* believes that this is the fourth time that the Escorial has been set on fire by lightning. Ford does not mention any such occasions, but notes with surprise that an English translation, bearing date 1671, of Santos's "Description del Escorial," announced on its title-page that the Escorial had lately been consumed by fire. As it is, one has reason to be thankful that the great gridiron has been saved from the fire, in which, to carry out its symbolic idea, it ought to have been incombustible.

A fine painting of the Escorial, with its surroundings, by Rubens, will be remembered by visitors to the Royal Academy Exhibition of Old Masters.

THE WOLVERHAMPTON PILLAR.

I should like to see the pillar for myself; but I think the engraving in the *Builder* is quite enough to show that the column has more affinity to Roman than to Norman work, and in, as you say, *Saxon*. As for the term, "Danes Cross," it is only interesting in showing that the column is very old; and that people gave the name to cover their ignorance, as they ascribe everything they deem wonderful to the Devil. The Danes left a strong impress of their savage nature upon the land; and thus with Satan they divide the glory of the unknown, the desolate, and the remarkable. The field at Hartlip in which the Roman villa stood is called "Danes Field."

C. ROACH SMITH.

CASERTA MARBLES.

We have been interested by some specimens, now in Fenchurch-street, of marbles quarried in the Apennines, not far from Naples. Those quarries were opened by Vauviteilli in the last century, and were used exclusively for the royal palaces of Caserta and Naples, the noble halls and staircases of which will be remembered by many of our readers. The great cost of transport prevented these marbles coming into general use, but it seems they can now be obtained at no greater cost than ordinary fancy marbles, many of which they far surpass in beauty. The rich agathe, the large mottled jasper, the rose and grey drifts are certainly beautiful, and should be made use of.

THE LORD MAYOR AND ALEXANDRA PARK.

The newspapers announce that the skilled workmen, who are anxious that the working classes should possess the palace, with the unenclosed park of 500 acres, have presented to the Lord Mayor a unique work of fine art, executed by one of their number. It will bear an inscription expressive of their appreciation of the Lord Mayor's efforts to acquire and save the estate for their benefit. Surely it would be wise of the Lord Mayor to wait till he had really done something towards effecting the object. At present, the most unbusiness-like description.

We are very anxious to see the Park and Palace secured as a public recreation-place, but we are unable to persuade ourselves that this is at all likely to result from the present proposals.

MADELEY CHURCH.

The parish church at Madeley, near Newcastle-under-Lyne, which is one of the most ancient, and, from an archaeological point of view, one of the most interesting ecclesiastical edifices in North Staffordshire, has been reopened by the Bishop of Lichfield, after having undergone a renovation and having a new chancel built. The work has been done at a cost of about 5,000l. The new chancel has been built at the expense of Lord Crewe, who, in fact, has defrayed the entire cost of the alterations, with the exception of about 500l. contributed by parishioners and friends.

The chancel is about 35 ft. long by 20 ft. wide; and the body of the church about 60 ft. by 50 ft., and it measures about 72 ft. across the transepts. The church affords accommodation for about 400. The works now about complete principally consist of the rebuilding of the chancel, the erection

of an organ-chamber, the obliteration of many coats of whitewash from the walls, piers, and arches; the destruction of flat plaster ceilings, western gallery, and high and square pews in the church and chancel; the total renovation of the floors, glass of windows, lead roof coverings to north and south aisles; and a complete refitting of the interior.

The whole of the chancel has been rebuilt in fourteenth-century character. The walls are of coursed stone inside and outside. On the north side are two arches between the organ-chamber and the vestry; on the south a priests' door and windows,—one of two lights and the other of three. The east end has a five-light window, and the old chancel arch remains at the west end. The roof is entirely of oak, and has six bays with arched ribs, moulded timbers, open rafters, and plain boarded ceiling between rafters. The floor to stalls is of wood, all the other part being of tiles. There are five steps of stone from nave to altar. The eastern bay of the roof is decorated in gold and colour; the other bays are of simpler character, the oak in all cases forming the ground-work for decoration. The tiles of the floor are of varied patterns, mostly enriched by indented outlines, and some encaustic taken from old tiles found in the church during the restoration. The stained glass is by Messrs. Clayton & Bell. The east window represents in the main lights the following events in the life of our Lord: in the centre, the crucifixion; to the north, the bearing of the cross, the agony in the garden; to the south, the entombment and the resurrection. The tracery above contains emblems of the four Evangelists. The eastern window in the south wall has the adoration of the Magi; the western, the Last Supper. The sanctuary is fitted with sedilia, credence, altar of oak, reredos, altar-rail, bishop's chair, and two, seven-light standards. The super-altar is of polished Dorsetshire marble. The centre of the reredos has a red marble back, and on it a white statuary marble cross under an arched recess, the spandrels of which bear the monograms Alpha and Omega. The two side compartments contain medallions with initials *Jesur-De-Isis*. The principal members are of alabaster found in the church, the plainer surfaces being of Hoptowood stone. The arch mouldings, cornice, and impost are carved with the rye, wheat, and lily. On the north and south sides of the chancel are stalls for the clergy and choir, all of oak, slightly carved on the ends and fronts. There are standards for lighting at each end of the stalls. The present organ is a temporary one, a strike in the organ-building trade having delayed the erection of the permanent organ.

In the body of the church the ancient stone-work in the walls, piers, arches, and window dressings has been completely restored, the clerestory windows being entirely new. The variety of tint in the natural stone, the difference of workmanship of the several styles, and the multifarious plan give interest to the simple architecture of the interior. The timbers of the nave roof, as put in about 100 years ago, although very simple, are of oak and of large dimensions. They have been thrown open to view, and slightly decorated in colour. The roof timbers of the south aisle remain unaltered beyond necessary repairs. Those to the north aisle are old, but have been raised from a flat to a slight pitch. The trusses in the transepts have been thrown open and the rafters boarded beneath; the whole slightly decorated in colour. The windows generally are glazed with cathedral glass, in patterns and tints of varied design, executed by Messrs. Heaton, Butler, & Bayne. One two-light window on the north side is of stained glass by Hardman; it is the gift of Mr. E. H. Martin, in memory of his father, and represents the sower of good seed and of evil seed. The three-light west window of the south aisle is also of stained glass, the gift of the Rev. J. W. Dalry, the vicar, in memory of his daughter, and is the work of Messrs. Morris & Co, representing Noah, typical of the old church; St. Peter, of the new church; St. Philip, the work of the church; and the crucifixion as its crowning act. The floors under the benches are of wood, the passages of plain tiles, varied by sundry ancient brasses, coffin-lids, and monumental slabs of stone and alabaster found in the old walls and floor. The fittings consist of brass lectern by Messrs. Hardman & Co.; oak pulpit, Litany-desk, and benches; and stone font. The pulpit is hexagonal, of early seventeenth-century work, richly treated. The panels have been decorated in gold and colour, having in them the emblems

of the four Evangelists, representations of the five wounds, instruments of the passion of our Lord, &c. The pulpit has been illuminated at the cost of the architect. The benches made a few years ago have been refixed, the remainder being designed from ancient examples found under the modern pewing. The heltry floor, formerly hidden by the organ, is now disclosed, and is thrown open to the church, whence the ringers are visible while at their work. The quaint halustrade of this loft bears date 1634. The provision for lighting is by candle standards of wrought iron. The several doors are screened by bangings. The heating is by hot water.

In the exterior of the building every ancient stone and other material that could be preserved has been left in its place. The new works are the chancel, organ-chamber, parapets to aisles, east-ayle, and tower, lead on roof of aisles to the east chapel, and north porch.

The architect was Mr. Charles Lynn, of Stoke, under whose superintendence the whole of the work has been completed. The contractor for the general works was Mr. John Stringer, of Sandiach; the decorations have been done by Messrs. Heaton, Butler, & Bayne; the iron and other metal works by Messrs. Hardman & Co.; the general carving by Mr. O'Shee, of Manchester. The reredos was executed by Mr. J. C. Daniel, of Hanley.

The churchyard has been enlarged and improved by the lowering of the ground and tombstones and by the erection of new boundary walls.

THE DRINKING FOUNTAIN MOVEMENT.

The Lord Mayor of London has publicly opened a drinking-fountain at Bow, as a memorial of the successful opposition to the proposed match tax of 1871, and in honour of the firm of Bryant & May, who were mainly instrumental in averting what was considered a serious injury to many thousands of the very poorest class of workpeople in the metropolis. The site fronts the North London Railway Station. The fountain was designed by Mr. Rowland Plimbe, and executed by Mr. J. W. Seale. It has been made over to the Metropolitan Drinking Fountain Association, who have undertaken its care, and will supply it with water. It is handsome and appropriate.

At the last meeting of the Norwich town council, a letter was read from Mr. E. Freestone, offering to give half a dozen drinking-fountains to the city. The letter stated that he had seen in Scotland some very simple drinking-fountains, and feeling that they would be appreciated in Norwich in a sanitary point of view, be of great service to the working classes, and might be used for horses and other stock to drink at, he enclosed a drawing of one of them, and if the City would allow him to put up half a dozen, he would be happy to make a present of the fountains and fittings, so that the City would only have to supply the water. Mr. Freestone proposed the following places as sites for the fountains:—Stump Cross, St. Giles's (near the branch road to Bethel-street), St. Stephen's-plain, near Timberhill church, Trowse end of King-street, and Foundry-road (near the triangular plantation). The letter was referred to the Executive Committee, Mr. Youngs remarking that to Mr. Freestone's liberality many were indebted for the comfort of the iron seats upon the Castle-hill. The thanks of the council were unanimously accorded to Mr. Freestone.

SCHOOLS OF ART AND OF SCIENCE.

The Watford School of Science and Art.—Lord Ehury distributed the prizes gained by the pupils at the Science and Art Class at Watford. After referring to the origin of the classes in the establishment of a school of design in Spitalfields, his lordship said he was told that all the pupil-teachers in the elementary schools in the town were students in the Science and Art classes. They would carry, no doubt, the knowledge they there obtained to the elementary schools, and thus the standard of education would be raised by the exertions which had been made in the successful establishment of these Schools of Art and Science.

Bradford Art Society's Exhibition.—The third annual exhibition of the Bradford Art Society has been opened in the Freemasons' Hall, in Salem-street, Manor-row, Bradford, and the collection of pictures and drawings—about 150 in number—constitute an interesting and credit-

able exhibition of the original productions of the local artists, professional and amateur.

Proposed School of Art at Stafford.—This town has been visited by Mr. Chittenden, a Certificated Master of the Department of Science and Art in London, who has had interviews with some of the most influential inhabitants with a view of establishing a School of Art in the town. An important county town like Stafford should not have so long been without such an institution. The local *Advertiser* states that most of the gentlemen upon whom Mr. Chittenden called expressed themselves as being fully aware of the benefit that would accrue from his proposal, but doubted its success, as there was no particular branch of business in the town requiring art instruction. But this would appear to be a mistaken view of the object and effect of Schools of Art, as with few exceptions they are supported by artisans of every description—engineers, carpenters, joiners, paperhangers, decorators, &c., and by any person from twelve years of age to thirty who wishes to avail himself of the opportunity of improving the leisure time he has at his disposal. Mr. Chittenden instanced to our authority the fact that at Wol-verhampton School of Art, where he was head-master for five years, the janitors, for whose benefit the school was originally intended, never attended it in any number; but that the pupils consist of every description of mechanic and tradesmen's assistants in the evening class, and the sons and daughters of the principal inhabitants in the town in the morning and afternoon. As the Committee of Council on Education now make drawing so conspicuous a feature in the curriculum of school education, it is to be hoped that Stafford will no longer be unprovided with the means of acquiring so refining and useful an attainment.

Wedgwood Institute Schools of Science and Art. The annual public meeting of the friends of the Schools of Science and Art connected with the Wedgwood Institute, Burslem, has been held in the town-hall. There was a large attendance. Sir Edward Manningham Buller, bart., M.P., presided. The report of the committee stated that there is every reason to regard the progress and prospects of the school as eminently encouraging. Mr. Theaker, the head-master, in his report, said that, while there was room for further improvement, he was enabled to say the studies had been of a steady, progressive character, as evidenced by the number of works sent up to London for examination, and the increased value of the awards.

SLATE versus LEAD AS A ROOF COVERING.

WORCESTER CATHEDRAL.

Sir,—In the remarks of your correspondent, "N.," on Worcester Cathedral, in the current issue of the *Builder*, he seems to take exception to the restoration of this cathedral being considered complete while the roofs remain covered with slate instead of lead, the original covering; and thinks that the "replacing of the metal covering" is being delayed simply from a lack of the necessary funds.

It is somewhat surprising to find the superiority of lead, as a roof covering, insisted upon, so soon after the recent disaster at Canterbury Cathedral has shown that its use may be attended with much danger.

Experience teaches that stone-slate or slate practically answers all the purposes of lead, as an entire covering for roofs, without many of its disadvantages; while their capacity for architectural treatment is quite equal to that of their metallic rival.

Roofs covered with these materials, need not necessarily be "sloped" in appearance: their first cost is considerably less than that of lead, and they need but little attention and reparation afterwards.

Lead, on the contrary, is not only very costly, but is always a source of trouble and expense in reparation, and very liable to suffer from defective laying. Being fusible at a low temperature, it facilitates the action of a fire when it has once broken out in a building. Many other obvious disadvantages combine to make it an undesirable covering; and by many of our leading architects, its use is now judiciously restricted to flats, gutters, and the like, it being superseded by slate and other materials as an entire covering.

It is scarcely necessary, perhaps, to remind your correspondent, that "literal copyism" is

not "intelligent restoration." Let us, therefore, hope that his suggestion will fail to impress the authorities of Worcester Cathedral, and that they will refuse to recognise in it a justification of an extravagant and unwise expenditure. J. S.

MODERN ARCHITECTURE IN GERMANY. BOEDDEKEN MANOR HOUSE.

The Manor House of Boeddeken, about three miles from Paderborn, in Westphalia, the seat of Herr George von Mallinkrodt, was, until the commencement of this century, a convent of Canons Regular of the order of St. Augustine. The history of this religious house dates from the year 836, when it was founded by St. Meinolphus, archdeacon of Paderborn, as a convent for nuns. In 1409 it was refounded, and given to the Canons Regular. In 1803 the monastery was secularised, and a few years afterwards the ancient church was destroyed,—a work of considerable difficulty, owing to the great solidity of its construction. Nothing, however, was left of it but the base of the old Romanesque tower and the walls of the chancel, which latter date from the earlier part of the fifteenth century. The present possessor of the building, Herr George von Mallinkrodt, the brother of Prince Bismark's most talented and courageous opponent in the German Reichstag, is restoring the chancel and tower before mentioned as a domestic chapel. The drawings we reproduce, and which we should mention, are *fac-similes* of the architect's working drawings, represent the additions now being carried out in connexion with the partial rebuilding of one of the wings of what was originally a portion of the monastic buildings. This wing contains the drawing-room, principal staircase, and reception-rooms of the mansion; and our drawings represent especially the bow window of the drawing-room, front and side; and the folding-doors of the same apartment. The whole of the timber-work is executed in the finest oak, and the upper portions of the windows are filled with stained glass, in mosaic patterns. Considerable use will also be made of colour and gilding. This same wing also contains the grand staircase, which is now completed, and is a very noble work. The stairs are composed of solid logs of oak supported upon columns of the same material, which, being carried up to the ceiling, support the timbers of the roof. The whole is richly carved and moulded, and decorated with gilding and colour. The architect of these works is Mr. Gulpenpennig, of Paderborn, whose works have been frequently mentioned in this journal.

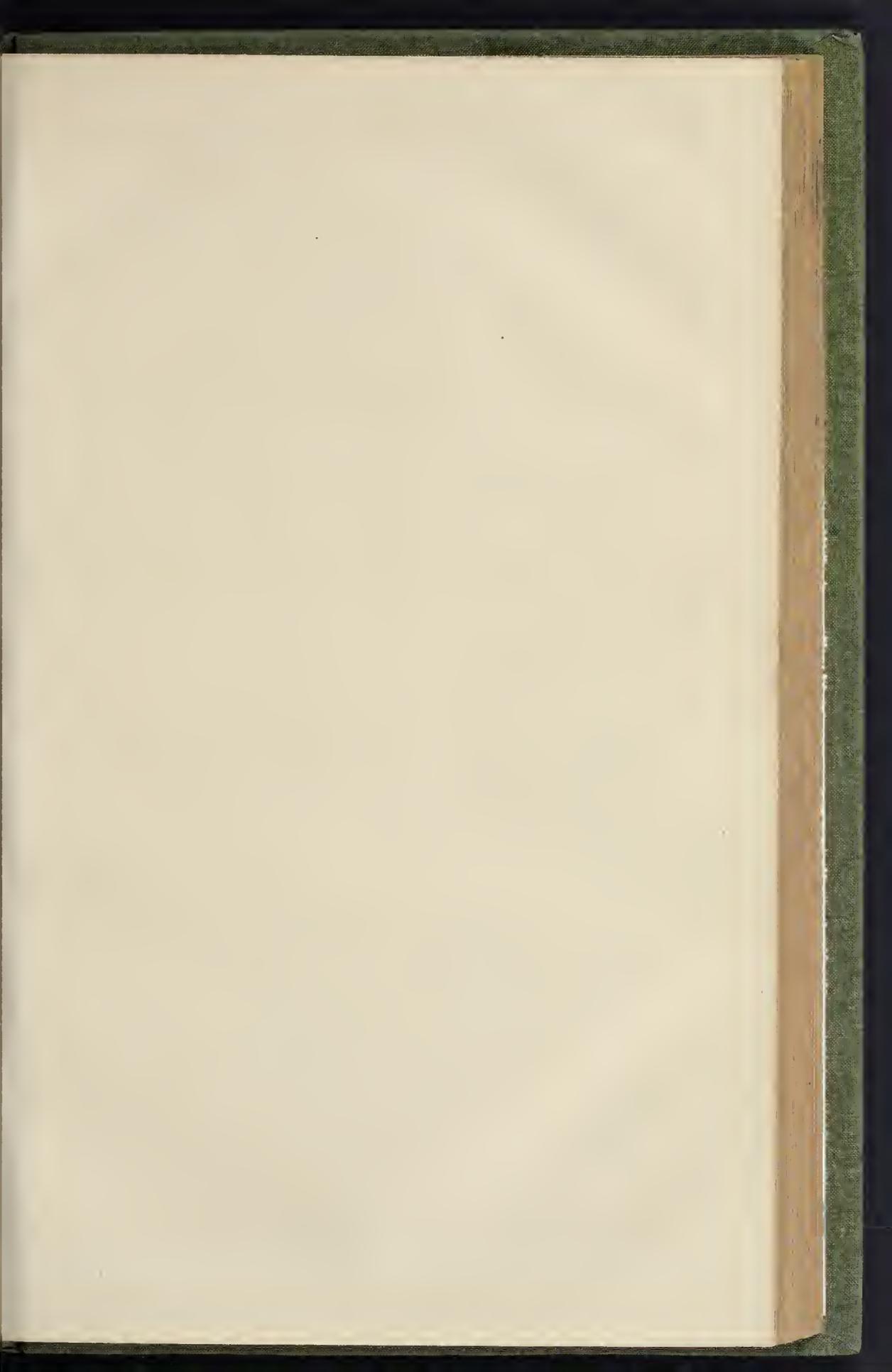
It will be seen from the drawings which we publish that the whole is being carried out in an elaborate style, and the designs show the originality and skill possessed by the architect. We would draw our readers' attention specially to two points in these designs which show how well a good architect can get over a difficulty. The first is the way in which the bow-window is corbelled out, and the second is the way in which the space between the folding-doors and the ceiling is filled up. It should be recollected that these folding-doors are not like our English ones, intended to be kept open, but are like the French doors, which are always kept shut, and their purpose is to provide a large and important means of ingress or egress when receptions, &c., are given, or by opening only one valve, to give sufficient room for one person to pass, when a large aperture is not requisite. We think that this kind of doorway might be advantageously introduced more often into this country than it is as it has many advantages over the ordinary room-door in use here. The whole opening is some 5 ft. wide; but by this arrangement only 2 ft. 6 in. need be open at one time, and when the whole space is open the doors, of course, only project into the room 2 ft. 6 in.

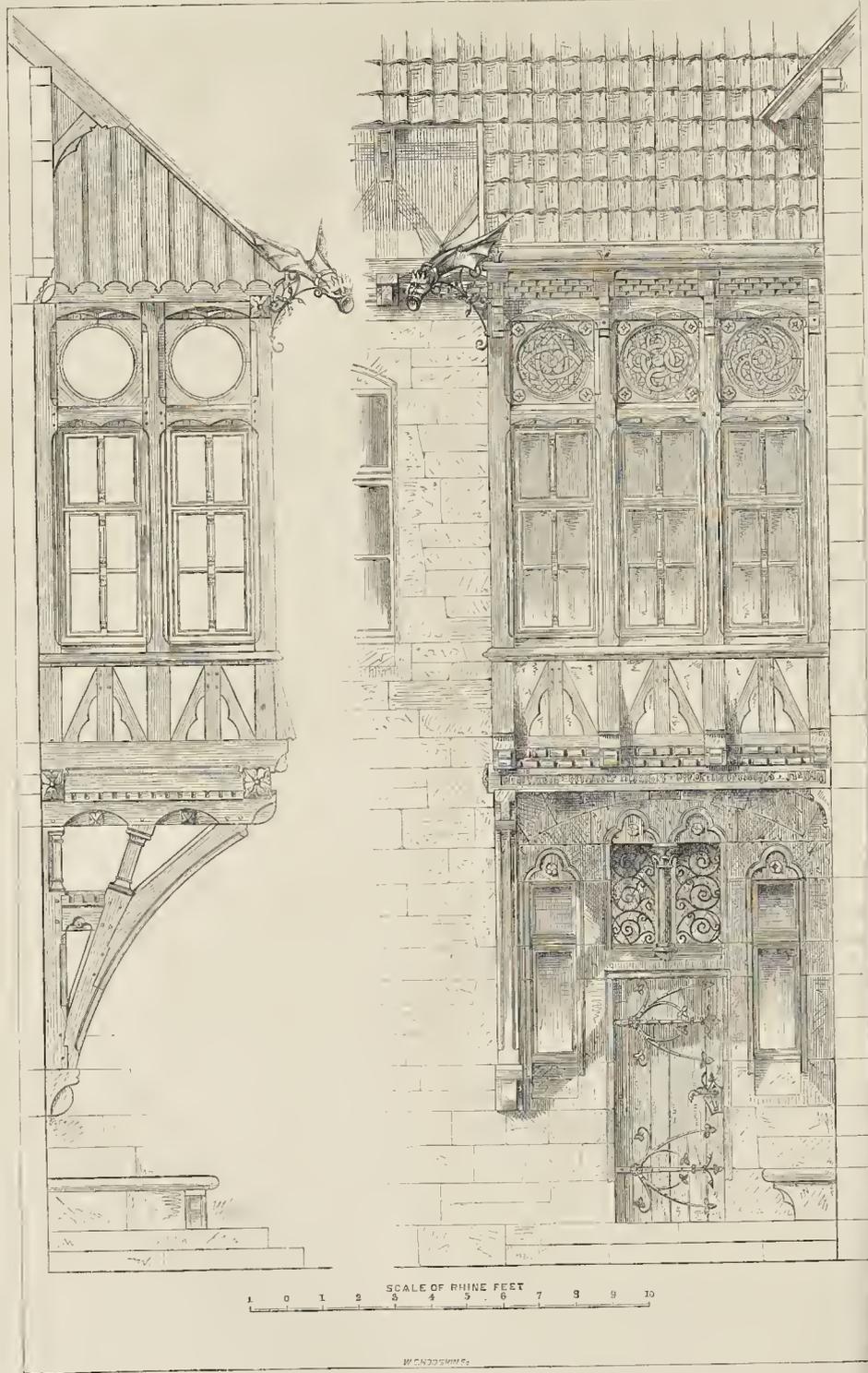
Great use seems to have been made of quaint German and Latin inscriptions in various part of this building; thus, over the folding-doors is the following legend:—

"Herscht heut der Teufel auch auf Erden
Morgen wird Gott meister werden. A. D. 1871."
"If the devil rules on earth to-day: God will be master to-morrow. A. D. 1871."

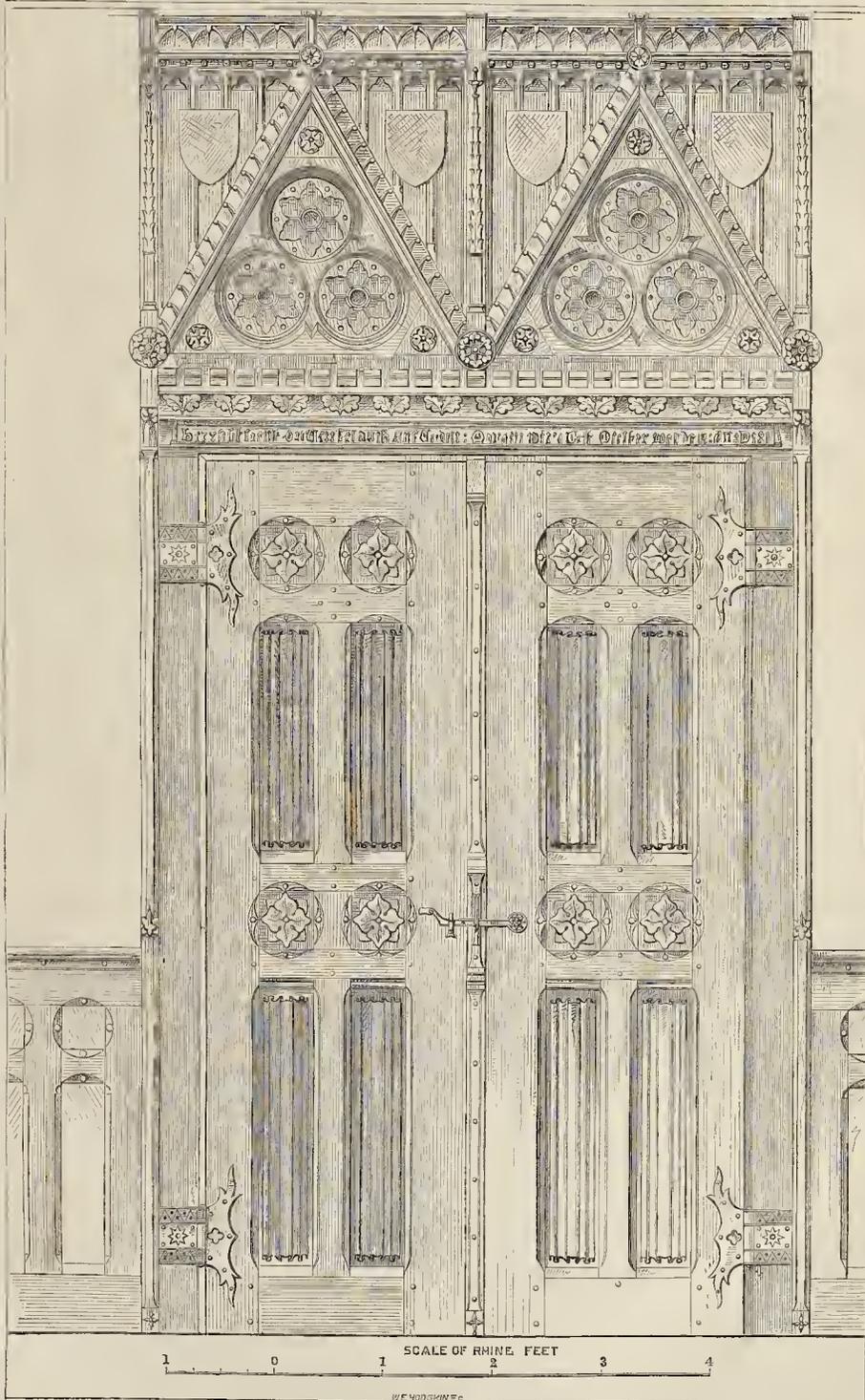
Over the chief door of the dining-room is the following inscription:—
"Quidamque agas prulenter ages et respice finem."

"Whatever you do, do it prudently, and look to the end!"—an excellent piece of advice before partaking of a German dinner, which often consists of eight or ten courses.





DOORWAY AND BOW WINDOW, BOEDDEKEN MANOR HOUSE, NEAR PADERBORN.
 HERR A. GULDENPFENNIG, ARCHITECT.



FOLDING-DOORS, DRAWING-ROOM, BOEDEKEN MANOR HOUSE, WESTPHALIA.



ARTIFICIAL STONE FOR HYDRAULIC WORK.

In the paper read by Mr. F. Ransome at the recent Brighton Congress, on "Some Recent Improvements in the Manufacture of Artificial Stone," the reader, after describing his new process, by means of which the field has been widely extended for the application of the stone produced, and which, for convenience, as distinguishing it from all others, has been termed "Apenite," said,—It is now no difficult task to produce blocks of this material of any form and of any size, the only limit being the means available for handling them upon the spot where they are employed. Moreover, the materials which form the bulk of apenite are, as a rule, generally to be found in abundance where hydraulic or other important works are being carried on, and for which purposes the new stone is eminently suited.

The want of such a material for such a purpose has long been felt, although that want, until recently, has only been partially supplied. In 1870, Mr. J. W. Butler applied for and obtained a patent for improvements in the application of concrete to structures and foundations, and also to cofferdams and similar constructions. Mr. Butler's obvious desire was, in the first place to provide a cheap and efficient substitute for stone for hydraulic operations, and in the second, to render unnecessary the construction of false works, &c., and thus to avoid the expense connected with the employment of iron cylinders, hitherto so extensively used. The idea was certainly an excellent one, but its realisation appeared to Mr. Butler very remote, until it occurred to him that the material then introduced under the name of "apenite" would answer the purposes of his proposed methods of construction. He accordingly communicated with the author upon the subject; and with the sanction of the engineer a set of hollow cylinders, 8 ft. in diameter and 9 in. thick, were made to form part of a retaining wall to protect the fore-shore of the Thames at Hermitage Wharf, where they were accordingly sunk, and the result was satisfactory.

The arrangement proposed for economically carrying out this class of work is as follows:—A timber staging is erected, upon which the materials may be mixed and moulded, the moulds consisting of an inner and outer framing, the space between the two forming the mould for each ring of a cylinder or hollow block, as the case may be. The courses are joined by means of a cement formed of similar materials to that of which the rings or blocks are composed. These are lifted from the staging on which they have been made, and lowered into position by an overhead traveller or crane, as may be most convenient. The lowest course is chamfered, as shown in the diagram, and when necessary from the nature of the soil, may be shed with iron. The operation of sinking is carried out generally in a precisely similar manner to that adopted with iron cylinders. The horizontal joints are made with alternate projections and depressions, and the several courses are connected vertically by dowel piles, which also serve as guides in sinking the work.

The application of this principle is capable of modification to suit almost every variety of construction, and it would be found especially applicable in structures requiring heavy foundations, particularly where the ground is uncertain. For forming a face-wall in building quays or docks, instead of cylinders, rectangular hollow blocks or caissons may be used. By employing hollow blocks of hexagonal form, no interstices are left, a thin layer of the cementing material rendering the structure practically homogeneous. Cylinders constructed upon this principle are also adapted for deep wells, apertures being formed in the sides for the admission of water.

Turning to works of greater magnitude, it will be seen that apenite forms a suitable substance for the construction of bridges, sea-walls, piers, and similar undertakings. The structure could be carried up to the underside of bridge girders, or built with ordinary masonry above high-water level. For sea-walls or piers, the arrangement given in the previous paragraph could be adopted. Here two rows of caissons are employed, separated from each other longitudinally, the intermediate space being filled in with dry rubble heaving, and the blocks themselves with a similar material, or, if necessary, with concrete.

In the case of an embankment for a reservoir, the heart of the bank, which is usually made with a puddle wall, is proposed to be substituted

by two rows of cylinders, the contained spaces being filled in with puddle, and the cylinders themselves with material similar to that of which the bank is made. In sinking the cylinders, they would be carried some distance below the natural surface, so as to obviate any chance of leakage below. Should a leak occur above, it could be held to a very small extent, as it would be prevented from extending by the proposed structural arrangement. It is obvious that this plan could, without much difficulty, be applied to embankments already constructed where there was reason to apprehend that any settlement had occurred. By sinking the cylinders from the top through the puddle-bank, but without removing any of the slope on either side, they would be carried down to sound ground, rendering the embankment safe, and removing all fear of danger in the future.

It would not be difficult to multiply the instances in which this material can be practically applied; but sufficient has been said on this point. An artificial stone, combining the advantages of apenite,—one, moreover, which can be so readily moulded into any form and size with but small expense and little or no delay,—is necessarily applicable to a great variety of uses. The author will therefore only briefly remark upon its applicability for ornamental and decorative purposes.

Besides possessing the several properties which have been described, the apenite, when prepared with suitable materials, is capable of receiving the most delicate impressions, and, by the incorporation of various metallic oxides, any variety of colour can be imparted to it.

By the use of the native red oxide of iron, manganese, and other mineral substances, artificial marble and granite of almost every description can be produced. These artificial stones, like their originals, are capable of taking an excellent polish, are extremely hard, and can be readily moulded into the most elaborate forms at a very small cost.

A LARGE CHIMNEY.

ON reading a paragraph in the *Builder*, a fortnight ago, under the above heading, I was astounded to find the statement that the shaft, containing over 1,000,000 bricks, 620 tons of stone, &c., cost but a little over 2,000l. As I have just prepared an estimate for a somewhat similar one (but circular), I cannot but think there is a mistake as to cost of "a large chimney," and write to ask you to insert this letter in your paper in the hope that the builder may read it, and take the trouble to set the matter straight, or it may tend to mislead as to the real cost of high shafts. T. L.

* * * The Cannah's Quay Chemical Company, for whom the chimney was erected, inform us, on inquiry, that the cost was but a little over the sum named, 2,000l.

A LESSON FOR ARTIZANS.

At a time like the present when there is a general movement on the part of artizans throughout the country to raise the prices of manufactured commodities or of emigrating to other places where wages are much higher than at home, the following facts, which are well authenticated, concerning the printing trade in the United States, whether many of our printers are now proceeding, may be usefully digested, not only by the class concerned, but by persons engaged in all other businesses. The employing book-printers of New York are all complaining of the want of remunerative work, and there is scarcely an office in the city that has not material enough to do thrice the work that is done; and the types and men are idle half the time. A reduction of wages has been partially acted on, but it is not enough to meet the views of publishers. They get the work done in interior and eastern cities and villages. But this competition is not so menacing as that of Europe. When the price of labour began to rise in the United States, buyers went abroad to seek advantages they could not get at home. They found that in England labour could be had at half the American rate; in Holland and Germany at nearly a third of the prices. The result was a transfer to foreign printers of a large proportion of the work. It now pays an American printer to have his books made in England, and one of the largest houses is negotiating for the establishment of a printing-office in London. Several

others are making preparations. The offices which have initiated this experiment of foreign manufacture deliberately decide to let a portion of their capital invested in printing machinery lie idle and to have their work done in offices abroad; and elect that it is the lesser evil to submit to the inconvenience of dependence on a manufactory three thousand miles distant. Even what is called "job" printing is not secure, and the cities of the United States are now canvassed by agents of foreign printers, chiefly French and English. One printing establishment in London has thirty machines in constant employment on American orders, and at the same time there are in America the skill, the men, and the materials lying idle that would do the work. At the present prices, however, they cannot be used. A large type-founding establishment in Edinburgh has just been bought by an American firm, and types can be manufactured there and sent over to the States with a saving of at least 30 per cent. on the home prices. These facts supply an admirable illustration of some of Mr. Lowe's remarks the other day at Glasgow.

STEPNEY JEWISH SCHOOLS.

THESE schools are curiously arranged. The approach is through a long, narrow playground and under an archway which has been formed beneath the upper part of an old house. By this contrivance, the accommodation contained in the seven rooms forming the upper part of the old house is retained as a master's residence, and a covered playground is formed where the ground-floor of the old house formerly stood. The new school building in the rear consists of a two-story building, each story 13 ft. clear in height. On the ground-floor is a girls' school, 34 ft. long and 21 ft. wide; and an infants' school, 23 ft. long and 21 ft. wide; and, on the first floor, a boys' school, 58 ft. long and 21 ft. wide. Attached to each floor are ranges of Macfarlane's sanitary latrines and lavatories, and the lobbies are fitted with the usual cloak-pegs. The buildings are so placed on the ground as to form a separate playground for girls and infants out of one portion of the site. The school buildings are lighted on three sides by ordinary lifting sashes, and the warming and ventilation are effected on Boyd's principle, by open grates placed in the usual fireplace openings, but with fresh-air external inlet gratings at back of stove, where the air, coming in contact with the stove, is warmed, and, rising, passes through an internal inlet grating along the top of the stove into the schoolrooms. The vitiated air is to be drawn out of the rooms by air-flues built in the brickwork close alongside the smoke-flues of the fireplaces, and separated from them by a thin iron fue division, which, becoming heated by contact with the smoke, causes an upward current in the air-flue of which it forms one side.

The new building will accommodate 280 children in all, and allowing 200l. out of the total amount of builder's contract for the work in altering the old house to form master's residence, the cost of the new school building will be about 1,260l., viz., 4l. 10s. per child, exclusive of desks and forms, and curtains or movable partitions, which may perhaps bring the cost up to 5l. per child. The roof is formed with strong wall-plates, so that at any time if required it may be raised bodily by a few screw-jacks under the plates, and a new story inserted under it. The architects are Messrs. Davis & Emanuel of London; and the builders Messrs. David King & Son, of Mitre-street, Aldgate.

LEAD v. ZINC.

A DISCUSSION took place last week at the Camberwell Vestry, respecting the roof of the new vestry-hall now in course of erection, and which will shortly be covered in. The point under consideration was the adoption or otherwise of an alternative estimate substituting lead for the roof of the new vestry-hall in lieu of zinc, involving an additional expenditure of 400l. The *Metropolitan* says,—The vestry-hall committee had recommended that the alternative estimate be not adopted. Several members contended that the expenditure of an additional 400l. in covering the roof with lead was altogether unnecessary, remarking that several of the large public buildings in the metropolis were covered with zinc, amongst others the Cannon-street and Charing-cross Hotels, and that what was good enough for those buildings

ought to be sufficient for their new building. On the other hand, it was urged that, as compared with lead, zinc was a perishable article, and that the wisest economy would be to cover the roof of the new building with lead, inasmuch as that zinc would have to be renewed, whereas lead would last for an indefinite period; and what was more, the lead would always be worth the money laid out upon it. The chairman said the committee had no feeling in the matter. The question was one entirely of expense, and, apart from that, there could be no question as to the superiority of lead over zinc. The vestry, by a large majority, ultimately decided that lead should be used for the roof instead of zinc; and it was also further decided, on a representation from the architect, that the figures and vases to be placed upon the balustrades and pediment of the hall should be carved in Portland stone instead of being executed in Portland cement. These two alterations will involve an additional expenditure of 450*l.*, and it was incidentally stated at the meeting that although the contract is for 8,000*l.*, the building will ultimately not cost less than 11,000*l.*

MONUMENTAL.

A NUMBER of gentlemen interested in the Liverpool Library have joined together to erect a monument in the Toxteth Park Cemetery, Smithdown-road, in memory of the late Mr. John Perris, who, for fifty-six years, was connected with the library. Mr. Hoffer, architect, of Castle-street, was commissioned to prepare a design for the proposed monument, which was executed in stone by Mr. A. Norbury, sculptor, and a few days ago it was removed to its place a few yards from the principal entrance to the Cemetery. The architect has adopted the form of an ancient Roman altar, which is embellished and finished in an artistic manner. The monument is more than 3 ft. broad at the base, and stands 6½ ft. high. It is of grey Yorkshire stone, with a slab of red polished granite on the front containing an inscription in gilt letters. The base is deeply moulded, and the body of the monument tapers slightly to the entablature. On the frieze, and running round the four sides of the structure are the words "John Perris, died Jan. 22, 1872, aged 67 years," in raised Roman letters very bold in character. The enrichments of the entablature consist of a representation of a book-back and some ornamental work, the whole being surmounted with a book with its leaves thrown open, forming an ogee pediment.

COMPETITIONS.

Surrey New Church.—The committee for the erection of this building (Rev. Newman Hall's) have approved the general design as prepared by their architects, Messrs. Paul & Bierkeide, of London. It is intended to provide a church capable of accommodating 2,000 appropriated sittings, and a lecture-hall for 800 adults, with numerous vestries and class-rooms, and other apartments attached. The style adopted is English Gothic of the Geometrical period, and the structure will be faced with stone throughout. At the point of junction of the Westminster and Kennington roads, a tower and spire will be erected about 200 ft. high.

WOOD PAVEMENT AND ASPHALTE.

It appears that the London Tramways Company refuse to lay down the Val de Travers asphalt opposite the British Home for Incubables in the Clapham-road, on the ground that it would be very dangerous both to the company's horses and the general driving public to lay down asphalt on so steep a gradient. It further appears that the Val de Travers Asphalt Company themselves object to lay their asphalt on a steeper gradient than 1 in. in 60, on account of its slippery nature, and that the London Omnibus Company, who provide horses for the Tramway Company, refuse to carry on their contract if asphalt is laid down, but that they are willing to lay down granite setts in the part of the road in question, if the Board will agree to it. After a discussion on the subject, the Board (Waudsworth) decided to lay down wood pavement along that portion of the roadway above named.

The fact is not to be blinked, that under certain conditions roads laid with asphalt be-

come unsable. To be precise, on Saturday morning (September 28th) the whole of the City traffic where asphalt prevailed was conducted at a walking pace; any attempt at more rapid locomotion would have resulted in a fall. This we saw and avouch. The effect of this sudden pull-up on all sides was most singular; the loss of time provoking.

ANTS, &c.

Sir,—I sympathise very much with those of your correspondents who are troubled with ants, beetles, and other vermin in their houses. Without doubt, such a state of things is a very great nuisance. I do not think, however, that they are to be got rid of by means of any of the remedies "C. H." copies from the *Times*. These appear to me to be only "sops to Cerberus." The evil is much too serious to be played with in that way. My plan would be to do that which vermin eminently dislike (to use the phrase of "A London Householder"), viz. *stop them out*. I should take up the whole of the floors, skirtings, &c., of the infested rooms, and take out the grates or ranges; then well pun or ram the earth below, and on this lay down a Portland cement concrete floor, 2 in. thick at least, which, if finished smooth on the top surface, would be a most excellent substitute for flagging, being without joints, and perfectly even. Carry the flooring into the chimney-breast, so as to form a good back hearth, and well render the fireplace opening throughout with cement and sand, 1½ to 4, up to the gathering over for flue. Run cement skirtings all round the rooms of a good depth, and reset the grates or ranges, and I venture to affirm, from much experience, that the remedy will be complete. Wooden floors may be laid over the concrete floors if desired, as the rooms will be perfectly dry.

E. G.

SCHOOL BOARDS.

Llanaelhaiarn.—The Llanaelhaiarn School Board has appointed Mr. Walter W. Thomas, architect, Liverpool, as their architect, and have accepted his design for a school and master's residence submitted in competition, which will be carried out under his superintendence without delay.

OPENING OF MACCLESFIELD INFIRMARY.

This new edifice, we are glad to observe, has at length been devoted to its intended purpose, as we strongly urged it ought, and was opened as an Infirmary on the 2nd instant, with appropriate ceremonial, by the Lord Lieutenant of the county.

The foundation-stone of the building was laid on the 8th of August, 1867, by Earl Grosvenor, now Lord Westminster. The entire building, exclusive of site, the laying out of grounds, &c., will cost about 18,061*l.*, the whole of which has been raised by donations and subscriptions. The endowment fund bequeathed by the late Mr. Tannicliff and the late Dr. Swanwick now amounts, with the accumulations, to a total of 33,000*l.*

The building stands pleasantly in close contiguity to the Public Park, over which there is a fine view from the western wing of the building; and the roads which have been opened up around it since the adaptation of the site make it convenient of access from all parts of the town.

The infirmary is built upon the Pavilion principle as our plan and view in last year's *Builder*, pp. 700 and 707, will show.

The style is Italian, but with limited pretensions to ornamentation. The prominent feature is the facade of the principal entrance, which is carried up in clustered columns and pillars. This entrance, which is approached by a grand flight of stone steps, in three tiers, is protected by a porch colonnade in keeping with the entire front. The centre block is surmounted by clock-tower and spire, rising to a height of upwards of 100 ft. from the basement, the towers being fringed with ornamental ironwork. The whole is built of stone from the Tegsnose Quarries, with finely-worked ashlar facings from the Windaway Quarries.

The grounds in front are to be ornamentally laid out, and encircled with wall and palisadings, in accordance with the design shown in the engraving.

The architect for the building is Mr. James

Stevens, of Macclesfield and Manchester, and the work throughout has been executed under his superintendence by Messrs. R. Neill & Sons, of Manchester, the principal contractors. The sub-contractors are Mr. Charles Frith, of Macclesfield; for the stonework; Mr. Robert Davies, Macclesfield; plumbing and glazing; Messrs. Kitchen & Brown, Manchester, for the inside iron work; and Mr. Best, of Manchester, for plastering and painting. The joiners' work throughout has been done by Messrs. R. Neill & Sons. The floors are of pitch-pine, to be polished with bees-wax. The internal hot and cold water apparatus, electric bells, gas-fittings, grates, and mantelpieces, fire-plugs, and hose, &c., have been supplied by Mr. William Wilson, of Manchester; all the above being under Messrs. Neill & Co.'s contract.

The institution starts with a total of thirty-nine beds, and to this extent the infirmary is furnished.

BUILDING WITH BITUMEN.

Sir,—My attention has just been called to the two letters in your impressions of 28th ult. and 5th inst. in relation to the above subject, to reply to the former by "A Builder," it is evident from his remarks that he has not even read the memoranda from which he quotes, or he would perceive that the walls therein compared are of 14 in. and 9 in. work respectively, which at once dispels of his argument respecting the "difference in the thickness of the joints." Next, as to "combustibility." "A Builder" quotes "Manspitt" to prove that because pure bitumen will melt at 284° Fahr., the composition which I use would be equally affected. And here again his logic and chemistry are equally at fault. Would he tell us, for example, that because hydrogen gas is highly inflammable, so is water?

Moreover, the furnace referred to is not built of fire-brick, as he assumes, and open to "A Builder's" inspection, I may further state that insurance companies in London are prepared to grant policies on all buildings constructed on my system.

Referring to the number of bricks which can be laid by one man per diem, I am prepared to supply "A Builder" with men, each of whom, paid as per rates quoted, will lay more than the number I have stated, and I am open to take contracts based on the figures referred to.

In conclusion, taking "A Builder's" figures for a basis, I find that the profits on "half a million of pounds" (which he quotes as "a large part of all that is done in this country") taken at 10 per cent, would be 50,000*l.*; and this sum, divided among the 1,500 builders in London alone, would give each the "magnificent sum" of 36*l.* per annum.

Need I comment further upon a "A Builder's" figures? In reference to "An Engineer's" remarks respecting my patents, I presume the Attorney-General is quite able to substantiate the views he took of them, which have since been fully corroborated by the highest professional authorities.

"An Engineer's" remarks on my "Tube Walls" are so clearly expressive of vindictive feeling, that I hope he may be induced to unmask, and if he will favour me with his name and address I shall be happy to furnish him with thousands of references both at home and abroad as to the effective working of what he is pleased to call my "dangerous pump," and the introduction of which to the townspeople of England he looks upon as a "pestilent thing."

I presume my friend never indulges in that universal beverage, *bitter ale*, or is unaware that Messrs. Allsop & Co., of Burton-on-Trent, use thirty-two of my tube-walls for the supply of water for their brewery J. L. NORTON.

THE NEW LICENSE ACT AND SANITARY REFORM.

A PROVISION in the new License Act, empowering magistrates and the police to suspend or refuse licences to public-houses that are out of repair or not in a good sanitary state, is now being put in force in the county of Durham, and the readers of the *Builder* will perceive from the following shocking statement that it was time some remedy was applied to alter a state of things which is a disgrace to civilisation.

At a recent Petty Session at Castle Eden, a district dotted all round with collieries and mines, Superintendent Scott handed the following to the magistrates:—

"To the Magistrates in Brewster Sessions, assembled. Gentlemen.—According to your request, I accompanied by Mr. Barker, your clerk, have made a careful inspection of alehouses licensed for the sale of intoxicating liquors within the Castle Eden Petty Sessional division. The houses undermentioned, in their present state, are so filthy and unfit for public-houses, that I would recommend the Bench to temporarily withdraw the licences until the owners met the requirements of the Bench.—I am, gentlemen,

PERCIVAL SCOTT, Superintendent of Police.
J. Cook, innkeeper, of Hutton Henry, bad stable, coach-house, and back premises in bad repair. James Hutton, innkeeper, house out of repair. William Wilson, innkeeper, of Sheraton, roof of house bad; no 'convenience' or coach-house. John Pattinson, innkeeper, of South Wingate, convenience and stable out of repair. Thomas Dixon, of Trimdon, six entrances to his house, Mark Hogg, of Trimdon Colliery, neither urinal nor convenience. James Hanson, of Trimdon Colliery, house in bad repair. Valentine Hamilton, innkeeper, Trimdon Colliery, convenience not satisfactory; no urinal; stable in bad repair. James Arrowsmith, of Thornley, back premises in bad repair. Isabella Walker, innkeeper, of Thornley, no convenience. George Greenfield, no convenience. Thomas Watson, innkeeper, Castle Eden Colliery, no convenience. William

Herricks, no convenience, and house out of repair. Thomas Humphrey, Wingate, house and back premises out of repair. James Scott, Wingate, no crinal or convenience. George Campbell, Shotton Colliery, no back convenience, and place to bad repair. Francis Smith, Shotton Colliery, no convenience. Mary Day, innkeeper of Haswell, stable and convenience out of repair. Thomas Webb, of Haswell, no convenience. William Richardson, South Hetton, no ash-pit or convenience, and place out of repair. William Lawson, innkeeper of South Hetton, no convenience. Benjamin Dobson, of Blue House, four rooms and passages out of repair. David Hutchinson, Wingate-lane, no convenience or ash-pit, back premises out of repair, and unfit to retain a spirit licence.

The landlords of the above disgraceful houses were called before the magistrates, the Rev. William Mayor and Mr. Stephen Robinson, and having promised to make their places decent, the hench allowed the owners and occupiers a certain amount of time, failing which, the licences would be refused. In several of the cases the houses were owned by wealthy brewers and distillers; and it appeared that scarcely a miner's cottage in the district had any sanitary accommodation, and those occupied by the agricultural labourers are in the like uncivilised and dangerous condition.

The action taken by the Castle Eden magistrates is being followed up in the other divisions, and, incredible as it may appear, even Castle Eden district proves to be better off than several other places in North and South Durham.

The writer, who has recently been in the north, and who is well acquainted with other counties, can state that so far as sanitary measures and decent dwellings are concerned, the north of England is as primitive and disgusting as Caffre land, and in no other part of England is such a fearful state of things to be found.

The want of water is universally complained of in Durham.

THE BUILDING TRADES MOVEMENT.

London.—Mr. McClymont, of the firm of Corbett & McClymont, last week took a deputation that his firm would pay each man such a price as they thought he was worth. Some of their best men were paid 8jd. per hour, and some less; but they declined to be compelled to pay 8jd. per hour to the men all round, when many of them might not be worth more than 6d. or 7d. per hour. He regretted to lose so many of his old workmen through the strike, but he had no offer to make to them, as he had the full number of men he required. The men on strike held a meeting, when they denied that they either claimed or expected the firm to pay 8jd. per hour to every mechanic on the works. They said they contended for was that the firm, like other master builders, should recognise 8jd. per hour as the standard rate of wages, and to be given to those men in the firm who were considered worth that sum by the foremen. A deputation was appointed to wait upon Mr. McClymont, and the interview took place on Friday, when Mr. McClymont consented to pay 8jd. per hour to all efficient skilled workmen. We understand, however, that the firm were able to take back very few of the old hands, having already as many as they needed.

On Saturday night a meeting of the Carpenters' and Joiners' Delegates, elected to secure uniformity of time and wages in the London district, on the basis of the agreement entered into with the Master Builders' Association, was held at the Brown Bear Tavern, Bloomsbury. The number present scarcely reached twenty-five. It was resolved to wind up the business, and terminate the movement. Mr. Mackin, the secretary, estimated that they had received and paid away during its progress £1,000; and now everything was paid for with the exception of printing the balance-sheet, which would be ready for issue in nine or ten days.—At a meeting of masons on Thursday, it was resolved to resist an application from the Master Builders' Association, asking the men to conform to the regulations made with other branches of the building trade, namely, to work till one o'clock on Saturday instead of twelve during the winter months, and accept 9d. per our for overtime instead of time and a half, i.e., 1s., as settled in the late agreement at the close of the strike.—A few days since 110 masons in the employ of Messrs. Jackson & Haw, of Earl-street, Westminster, turned out because the firm would not discharge a man, named Day, who was said to be a spy and an informer, and to have made mischief between the masons and the men. Messrs. Jackson & Haw deny that the man had ever given them

any information, but have discharged him, and, as this was all the men required, they resumed work.

Hull.—The joiners' strike at Hull, which has lasted thirteen weeks, has been brought to an amicable termination. The wages of skilled workmen are to be at the rate of 6jd. per hour. The working time is to be 53 hours for 40 weeks in the summer, and 47 hours for 12 weeks in the winter each year. The men resume work at once.

Paisley.—A difference has arisen between Mr. William Gillespie, of Paisley, and a number of men employed by him in the slating trade. Mr. Gillespie has had in his employment several men not connected with the union for a length of time, and he was informed one morning lately that unless he immediately dismissed one of them, who had rendered himself obnoxious to the society, all the members of it who were working for him would strike. Mr. Gillespie declined to dismiss a good and faithful workman at the dictation of the union, and those connected with it at once left his service. Some four years ago Mr. Gillespie successfully resisted a similar attempt to control his business.

THE LAND QUESTION.

Sir,—Mr. Stubbings fails to catch the spirit of my proposal when he compares it with the scheme of the M.P. (Fergus O'Connor, I presume) set forth twenty-four years ago, and which has been largely developed by various land and building societies since. These deal with freehold land, which they buy out and out, and on which they erect dwellings for their shareholders; most of whom are several degrees removed from the working-with-the-hands class, which I desire to benefit.

My proposal is to rent on long leases parcels of land of from three to ten acres each, according to the number in the occupying family, or the ability of the lessee to cultivate the same. The landlord to erect on each plot a decent dwelling, house and outhouses, with a good large barn, and keep the same in repair.

This land question has become so pressing that it will not matter much in what part of Great Britain the land is situated, provided it be accessible by a decent road, and of fair average quality; but poor land need not be neglected, as its poverty would be considered in the rent, and under spade cultivation its condition would soon be changed. "The wilderness would blossom as a garden."

The great superiority of a leasehold over a freehold holding lies in this, that a poor man may enter upon the land at once, with nothing but tools and seed, to which his labour and that of his family are to give value, and his yearly rental is only the interest of the money value of his holding; whereas in purchasing the freehold by a society he will not only have to wait a long weary time before he can get possession, but having to pay principal with his yearly interest will so cripple his resources, that in very many cases there will be a break-down in the attempt. E. G.

RISKS FROM FIRE IN CHURCHES.

WITH reference to the fire at Canterbury Cathedral, Mr. Richard Coveney, of Canterbury, who states that he has had many years' experience in the metropolis, principally in connexion with works executed for the Corporation of the City of London, suggests to those engaged in such work as the roofs of churches and other important public buildings that they may not only lessen but obviate the risk of fire by using coal instead of charcoal. It is an ascertained fact, he remarks, that in blowing the charcoal to make hot metal, the sparks in windy weather are uncontrollable, and consequently great risk is incurred by such a process. He would submit that a safer plan would be thus:—Use a coal fire; let the "devil" stand in a sheet-iron safe, large enough for the fire-basket, with about 3 in. depth of water at the bottom. By this plan the coal-embers must drop into the water, and be rendered innocuous. During many years' employment on the corporation works, he says, he practised this process without the slightest dangerous results. As to the risk to churches and large buildings from the liability of the warming apparatus to become overheated, and thus tend to the destruction of the entire fabric, he suggests an arrangement by which, he says, danger may be obviated. It con-

sists of a mechanical contrivance acted upon by electricity. Upon the apparatus becoming heated beyond a given point, a bell is instantly and loudly rung, and the precise spot where the overheating occurs is indicated. This alarm may be communicated not only within the building itself, but at any distance from it, and at any number of places at the same moment. Another great source of danger, he adds seems to be generally overlooked, in the modern practice of fixing gilded metal finials on roofs of buildings, without attaching any efficient means of conducting into the earth the electricity which they attract. These ornamentations might be rendered efficient lightning-conductors, and thus supersede the necessity of the ordinary appliances of that nature.

CHURCH-BUILDING NEWS.

Rochester.—The Church of Rochester, near Uttoxeter, the state of which had long been bad, has recently been almost completely rebuilt, and it has been reopened for divine worship. The services of Mr. Christian, of London, were secured as architect, and his designs have been carried out by Mr. Fern, of Leicester. Nothing now remains of the old church except the tower, and this has been capped by a spire, the battlements and hase being also renewed. The restored structure consists of tower, nave and south aisle, chantry, and vestry. The style is Early English. The chantry is divided from the vestry and the nave from the south aisle by four arches, the pillars of which are of Devonshire marble, with foliated capitals. The roof of the church is open-timbered. The pews are in the modern style, and will seat about 420 persons. The flooring is of encaustic tiles, supplied by Mr. R. M. Taylor. The east window represents scenes in the life of our Saviour. This is the gift of Mr. C. M. Campbell. It was from designs by Mr. de Morgan. The communion-table, of inlaid wood, is the gift of Mrs. Dawson, of Barrow-hill. It was designed by Mr. Christian, and made by Mr. Stuhls, of Denstone. Another of Mr. Campbell's gifts is the organ, built by Messrs. Foster & Andrews, of Hull. The font and pulpit are of Bath stone. The entire cost of the restoration is upwards of 4,000l. Mr. Campbell, besides 1,000l. to the church, has given a valuable piece of land as an addition to the graveyard, and had it laid out and fenced at his own expense.

Iltingworth.—The ancient church at Iltingworth has been reopened for divine service. In the spring of the present year the edifice was temporarily closed for restoration. The primary object of the present restoration was to remove the old-fashioned high-backed square pews. The modern style of seats now introduced are of pitch-pine, and fill the body of the church, consisting of two groups, with a partition running midway, the seats being entered from the nave, and the north and south aisles. In the gallery, the vacancy made by the removal of the orchestra has been filled in with seats, uniform with the rest, and the oak gallery-front considerably lowered, and the superfluous coating of paint and varnish removed. The painting and decorating were undertaken by Mr. Binns, of King's-cross. The eastern wall is decorated with a design of the fleur-de-lis as a ground-work. On each side of the cast window is a piece of scroll-work, bearing texts. The decoration of the ceiling consists of a design of fourteen circles, twelve of which enclose escutcheons bearing the badges or emblems of each of the twelve Apostles, and the two remaining circles, north and south of the centre, enclose a square circle bearing respectively the fleur-de-lis or the Lily and the rose. Each of these fourteen circles, forms the centre of a design, which extends the length and breadth of the ceiling, the whole having for its centre an oval-shaped artistic centre-piece. The reredos occupies one-third of the east end. It is divided into three parts, by coupled and carved capitals and marble columns, each side compartment formed into panels. The pulpit, the gift of Miss Moss, of Field Head, is (like the reredos) executed in Caen stone, by Mr. Charles Mawer, of Leeds. The organ has been removed to the south-east angle of the chancel. It has been recased in pitch-pine, with music-board and front of American walnut, and several improvements have been introduced. For these alterations it has been in the hands of Messrs. Ratcliffe & Sagar, Leeds. The pipes for the introduction of gas are now laid, in anticipation of gas being this winter

supplied to the village. The gasfitting has been done by Mr. J. Holdsworth, Halifax. An extensive heating apparatus, on the hot-water principle, has been supplied and fixed by Mr. Thornton, of Huddersfield. There yet remain to be erected three stained-glass windows (not yet complete), by the same friends who contributed to the adornment of the building, viz., the Holdsworth family, of Shaw Lodge, Halifax; and a fourth window (not yet completed) is presented by Mrs. T. Hartley, of Taunton. The recent improvements have cost over 1,000l.

Whitby.—All Saints' Church, at Uggelbarnby, near Whitby, has been re-opened. Before commencing the present new church, it was intended to restore the ancient church to something like its twelfth-century condition; but upon close examination it was found that nothing remained to show what the building had formerly been, and that the only traces of an old Norman church were the columns of the chancel-arch and a few disjointed stones, all of which have been preserved in the new building. The style of architecture adopted in rebuilding is thirteenth-century Gothic. The church was at first intended to be finished in a plain and similar manner; but, through the liberality of the Allan family, the interior has assumed an elaborate appearance, which will be more apparent when the whole is completed. The several works have been carried out from the designs of Mr. Chas. Noel Arnfield, York diocesan surveyor, and architect, Whitby, and under his superintendence by local tradesmen.

—The Bishop of Ripon has consecrated a piece of ground recently added to the churchyard, Aldborough, near Boroughbridge. The newly-added ground, provided by the burial board, is situate on the west of the church, and was formerly gardens and ground occupied by cottages. It has been cleared and trenched, and surrounded by a wall, with entrance-gate. The newly-consecrated piece will provide burial sites for 228 adults and 262 infants.

Trydalya.—A movement, with the restoration of the parish church here for its object, has been in contemplation for some time past, and with the view of initiating it, a vestry meeting was convened at the National School-room, and it was then resolved unanimously,—"That this meeting having fully considered the architect's report on this church, together with the sketch-suggestion of a new church, pledges itself to use every effort to carry out the proposed undertaking." A Church Building Committee was named, and a subscription list opened.

FROM SCOTLAND.

Partick (Glasgow).—The new town-hall and burgh buildings of Partick have been opened. The buildings are situated near to the public road, in Maxwell-street, to which they present a frontage of about 130 ft. There are two entrances from that street, the main one opening into a corridor which runs from the front to the back of the building, separating it into two wings. On the west side of the corridor is the Town-hall, with retiring-rooms for ladies and gentlemen. The hall is in extent 75 ft. long by 50 ft. in width, and the ceiling rises to a height of 45 ft., the roof being supported by open semi-circular iron-bound couples or joists. At one end of the hall is a platform, and at the other end, and also round the sides of the hall, is a gallery. Behind the platform an organ has been erected, built by Mr. Connacher, of Huddersfield. To the east of the corridor, on the ground floor, are the Commissioners' room and a committee-room, while to the back of the building, also on the ground-floor, are the ball kitchen, in which preparations can be made for entertainments in the hall, and the hall-keeper's house. On the second floor of the eastern wing is the lesser hall, which is 38 ft. long by 26 ft. in width. The architect of the buildings is Mr. Leiper, of Glasgow. The foundation-stone was laid on the 12th of March, 1871. At the front of the building are several sculptured figures done by Mr. J. Young, of Glasgow.

Books Received.

General Conference of Architects, 1872. Report of Proceedings. No. 9, Conduit-street. We need only mention that a report of proceedings at the last General Conference of Architects has been published by the Institute, and is now obtainable at their rooms. It gives the papers

and reports read, and the result of the discussions, but not the discussions themselves. We observe, with regret and wonder, on the cover and on the title-page this threatening intimation:—"N.B. The copyright of these papers is reserved." Under a wiser policy, we should read in its stead:—"N.B. Journals of all kinds, and in all countries, are earnestly requested to reprint such papers and statements herein as they may find worthy of additional publicity.

The Proportions of the Human Figure, as handed down to us by Vitruvius. With Outlines by JOSEPH BONONI. Roberson & Co., Long-acre, 1872.

In the third edition of this curious and interesting brochure Mr. Bononi gives Leonardo da Vinci's translation of the passage of Vitruvius in question, with an English version of it, and an additional plate, showing the difference in width between the male and female figures. Tried by the ancient standards, a truly fine female form is a rarity in England.

VARIORUM.

"A SUMMARY of the Principles of a Comprehensive Measure for the Improvement of the Sanitary Laws. By Henry W. Rumsey, M.D., &c. London: Ridgway." This paper, by Dr. Rumsey, late Crown member of the General Medical Council, and an honorary member of the Metropolitan Association of Medical Officers of Health, was intended for perusal at the Social Science Congress, but the author was unable to attend. It is brief and comprehensive, and is well worthy of consideration with a view to more complete legislation on the subject.

"The Public Health Act, 1872, with special reference to Plymouth, Stonehouse, and Devonport. By Christopher Buteel, F.R.C.S. London: Churchill." This paper was read at the Plymouth Congress of the Social Science Association, as already noted in the *Builder*. The author is surgeon to the Royal Albert Hospital at Devonport.—"Examples of Conics and Curves. By the Rev. W. H. Laverly, M.A. London: Rivingtons." The author of this pamphlet is a Fellow and Mathematical Lecturer of Queen's College and Public Examiner in the University of Oxford. The examples are of course illustrated with diagrams of curves and conics.

The *Garden* says, one of the most singular consequences of the late war has been the addition of a number of new plants to the Flora of the environs of Paris. The numbers of species found since the siege, which were before unknown there, amounts to 190. Of these, fifty-eight belong to the *leguminosae*, thirty-four to the *compositae*, thirty-two to the grasses, and sixty-six to other families. The seeds of these plants were for the most part conveyed in the forage of the French troops who were recalled from Algeria, Italy, and Sicily. Three kinds only appear to have been brought by the Germans, viz., *Vicia villosa*, *Stenactis annua*, and *Lepidium perforatum*. In other parts of France a similar result has been observed wherever there had been an encampment of troops. Should the Algerian and other plants thus introduced into so many parts of the country succeed in establishing themselves, it is obvious that in a few years the Flora of France will have to be rewritten.—The "Household Edition" of "David Copperfield," by Charles Dickens, just now issued by Chapman & Hall, is a marvel of cheapness. It is full of illustrations, some of them very good. The book itself we have always held to be the most charming of the author's creations.

Miscellanea.

The Polytechnic College.—The Polytechnic College (formerly the Polytechnic evening classes) has been formed for the purpose of giving a more permanent and influential character to the course of instruction long carried out at this Institution, under the management of the Rev. C. Mackenzie, M.A. At several meetings which have been held by the promoters, it has been resolved to give to the classes a corporate form, consisting of a president, vice-presidents, a council, members, and students. The college has for its object the interests of the middle classes, both ladies and gentlemen, during their evening leisure, and consequently has very great claims on the attention of those who desire to repair defects in their early education.

Artistic Training.—Professor Poynter, in his address as Slade Professor, University College, dwelt upon the higher position of foreign artists as regards technical excellence, and the amazing facility with which French or German artists combined unity of effect and even thoroughness of execution in carrying out large and small works alike. That was the result of the system of constantly working from nature, which, giving but a limited time for the completion of a study, obliged the student to work in the simplest and most straightforward manner. That system he had introduced into those schools with the object of obviating as far as possible the timid and unmethodical style of work which seemed to be the prevailing fault in our exhibitions. With a view to encourage a good style of work he wished to direct students where to look for examples for imitation. Although following pretty closely the French system, he did not consider that the result at which French artists arrive was by any means to be held up for imitation. They did not make that use of their technical facility which should be the aim of a true artist. The skill of French artists was almost entirely due to that thorough training and constant study of nature which all French students received, and it was their fault or misfortune if they could not derive a better result from their studies. To that system he should adhere, believing that the unmistakable English love of nature would lead English students, under the same system, to a much higher result. To that love of nature, however, there must be added an appreciative love which is capable of selecting what is worthy of imitation, and setting aside what is unimportant. Looking at the English pictures of the present day it would be found that this point was the one in which they were most deficient. The sort of execution which passed current popularly now was generally of the flimsiest kind, the latest fashion being to make a picture somewhat resemble the wrong side of a piece of worsted work.

Foundation for Carriage-ways.—The Liverpool Corporate authorities are trying an experiment in North John-street of laying the street with a concrete foundation, overlaid with sets, the joints of which are filled up with asphalt. The cost is considerably over that hitherto incurred in making street-foundations and laying the sets; but it is confidently expected that, where heavy traffic prevails, this will be amply repaid. The concrete consists of five parts of gravel to one of Portland cement. This concrete is laid upon a thin layer of broken stones, similar to macadam, a layer of these stones and a layer of concrete following each other in succession until the desired height, about 9 in. or 10 in., is reached. As each layer is put on, the workmen beat it in, and the result is a firm, homogeneous mass of concrete, the proportions of which are about eight or ten of gravel and stone to one of Portland cement. As soon as this portion of the work is completed the sets will be laid over the concrete. These will be about 6 in. deep, and from 3½ in. to 4 in. broad, and the joints will be firmly secured by asphalt being poured in between the interstices, into which there will previously have been brushed clean dry gravel. By this means it is hoped to make the surface impervious to water, and to confine the wear and tear of the street to the sets themselves, without at all interfering with the stability of the foundation underneath.

Removal of the Dead under the Union of City Benefices Act.—"A City Incumbent," writing to the editor of the *City Press* about the cost of working the above Act, instances the cases of St. Benet, Gracechurch-street, and St. Mary Somerset, and says,—"The removing of the dead from these two churches only (observe, not from the churchyards, but only from under the floor of the churches) has cost 4,949l. 6s. 7d. Surely an Act of Parliament which cannot prevent such extravagant charges as these needs to be amended or abrogated."

Encroachments on Greenwich Park.—A deputation has waited upon the Right Hon. G. J. Goschen at the Admiralty to protest against the letting for building purposes of certain land contiguous to Greenwich Park, and at one time forming part of the park. Mr. Goschen, after listening to the arguments of several members of the deputation, said the matter should have the best consideration of the Board of Admiralty, to see by what means they could comply with the wishes of the inhabitants.

Experiments with "Lithofracteur."—A series of experiments with an explosive material known by the name of Lithofracteur, have been made on the Minehead Railway, not far from the town of Watchet. There were present as spectators, Sir Alexander Acland Hood, bart, and Messrs. Mr. F. Fox, C.E. (engineer of the Bristol and Exeter Railway); Mr. W. Dennis, E. (engineer of the Minehead Railway); and Messrs. Knobbs, Brothers, & Co. of Cologne, represented on this occasion by Mr. Oliver Kirkman, assisted by Mr. G. H. Daw, London (inventor of the central-fire gun and cartridge), and Mr. F. Hawkins, of Timinhall Court, who conducted the proceedings. This material has for a considerable time, it is said, been used in foreign countries, and by the Germans during the late war. It is composed of 50 per cent. of nitro-cellulose absorbed in 25 per cent. of earth, and 25 per cent. of various chemicals, which it was made to render it safe in transport, stowage, and very-day use. It is made up in the shape of cartridges, and its explosion can only be effected by a long percussion-cap, filled with detonating composition, fixed on the end of a time fuse, and then inserted in the cartridge and secured to its paper envelope. If brought into contact with a flame, it does not explode it seems, but merely turns away like rosin. Its power is said to be twelve times greater than that of gunpowder. So far as could be judged, the experiments were considered very successful, and of the safety of the material there is said to have been no question.

The Rateable Value of the Metropolis.—From an official return just prepared by the direction of the Hackney District Board of Works, it appears that the rateable value of the various districts and parishes within the metropolitan area is as follows:—Marylebone, 173,316*l.*; St. Pancras, 1,105,836*l.*; Lambeth, 770,000*l.*; St. George, Hanover-square, 231,180*l.*; Islington, 981,156*l.*; Shoreditch, 46,420*l.*; Paddington, 920,544*l.*; Bethnal-green, 275,508*l.*; Newington, 280,000*l.*; Camberwell, 380,000*l.*; St. James, Westminster, 13,156*l.*; Clerkenwell, 264,744*l.*; Chelsea, 26,972*l.*; Kensington, 816,808*l.*; St. Luke, 43,812*l.*; St. George, Southwark, 175,000*l.*; Bermondsey, 234,000*l.*; St. George-in-the-East, 231,000*l.*; St. Martin-in-the-Fields, 20,564*l.*; Hamlet of Mile-end Old-town, 55,552*l.*; Woolwich, 69,400*l.*; Rotherhithe, 55,552*l.*; Hampstead, 236,680*l.*; Whitechapel, 25,808*l.*; Westminster, 457,964*l.*; Greenwich, 34,990*l.*; Wandsworth, 584,220*l.*; Hackney, 70,788*l.*; St. Giles, 318,200*l.*; Holborn, 24,407*l.*; Strand, 315,524*l.*; Fulham, 279,500*l.*; Limehouse, 273,424*l.*; Poplar, 481,410*l.*; St. Saviour, 194,000*l.*; Plumstead, 205,848*l.*; Epswicham, 310,000*l.*; St. Olave, 141,000*l.*

North Oxfordshire Archaeological Society.—This society had an excursion on Wednesday, the 25th ult., under the guidance of the Rev. Philip Hookins. At Cropredy Miss Loveday and several other ladies enhanced by their presence the pleasure of the day. The first place visited was Horley Church. The Rev. W. J. Flavel exhibited his collection of carved oak furniture, ancient china, Etruscan ware, Roman and mediæval relics, including part of a pax, string of beads, &c. The large church of Hanwell was next visited. It is greatly in need of restoration. The remains of Hanwell Castle, now a dwelling-house, were thrown open to the visitors, by the kindness of Mr. French. A short halt was made by the excursionists at Great Bourton. At the Church of Cropredy the visitors heard from Dr. Wood a résumé of the ecclesiastical history of the church and its appurtenant chapels; and at the historic scene of Cropredy ridge the same gentleman explained the position of the rival forces who met there on the 29th of June, 1644. Miss Loveday exhibited a gilded "histle," which was dug up on the site of the "leagard." A large yew-tree in the garden of the manor at Cropredy attracted attention. A dinner at eleven guests partook, at the White Lion Hotel, Banbury, was the immediate precursor of the breaking up of this friendly gathering.

Hindoo Temple in London.—Canon Trevor, writing in the *Record* on the controversy between the Archbishop of Canterbury and "the heathen," says:—"I learn from Professor Garin de Tassy's *Revue Annuelle de l'Indoustan Literature* for 1871 that there is actually a subscription on foot in Bombay to build a pagoda in London for the worship of Vishnu and Siva."

Inhabited Houses in London.—A statistical report from the Joint Parliamentary Committee of the Hackney District Board of Works has been issued, showing the progress made by the several parishes and districts under the jurisdiction of the Metropolitan Board of Works. By this it appears that the number of houses in the parish of Marylebone at the end of the last official year was 16,328; St. Pancras, 24,079; Lambeth, 29,123; St. George, Hanover-square, 10,425; Islington, 27,088; Shoreditch, 15,624; Paddington, 11,832; Bethnal-green, 15,981; Newington, 12,545; Camberwell, 17,755; St. James, Westminster, 3,381; Clerkenwell, 6,808; Chelsea, 8,989; Kensington, 15,492; St. Luke, 5,871; St. George, Southwark, 6,903; Bermondsey, 10,624; St. George-in-the-East, 5,924; St. Martin-in-the-Fields, 2,083; Hamlet of Mile-end Old Town, 13,037; Woolwich, 4,670; Rotherhithe, 3,934; Hampstead, 4,340; Whitechapel, 8,313; Westminster, 6,531; Greenwich, 16,170; Wandsworth, 19,091; Hackney, 19,355; St. Giles, 4,541; Holborn, 3,748; Strand, 3,271; Fulham, 10,177; Limehouse, 7,789; Poplar, 16,259; St. Saviour, 3,716; Plumstead, 7,960; Lewisbam, 8,271; St. Olave, 1,764.

Light from Air charged with Mineral Oil Vapour.—A renewed endeavour to bring this sort of light into use is being made. The air appears to be driven by bellows through the liquid "gasogen" and stored in a gasometer for use. It gives a brilliant light, but we should fear it is apt to become deteriorated by deposition of the liquid again, if allowed to stand. Air itself stored in the gasometer, and only charged with the vapour on its way to the burners would seem to be what is requisite to obviate this in the use of such a light. As for its liability to produce explosions, it is said to be admitted that it ranks with ordinary gas in this respect. The light has been exhibited in a new building in Chancery-lane, Cornhill. At a subsequent meeting, Major-General C. Scott, at the request of the chairman, Sir John Murray, explained the patentee's invention, according to particulars afforded him by Messrs. Harrison. Mr. H. Child, he said, had analysed the gas, which, we may add, is free from the offensive contaminations of coal gas, and smells a little like ether.

"Testing" a Gas-holder.—An accident has occurred to the new gas-holder at Hollinwood, belonging to the Oldham Gas and Water Works. The holder, which had been erected by Messrs. Mahon & Co., Ardwick Iron Works, Manchester, was considered complete, and the other day arrangements were made for "lifting" or testing it before it was formally handed over to the corporation. Mr. Mahon had promised to be present; but before either he or any one connected with the committee had arrived, the person connected with the building in course of erection took upon himself the task of testing the gas-holder. He accordingly set the engine to work; but instead of forcing air into the holder, he reversed the machinery, and, as a consequence, the air already inside began to become exhausted. In a short time the gas-holder gave way, under the force of the atmospheric pressure, and, in addition to a good deal of damage being done to the roof, a number of rods bolts, &c., were snapped and bent.

Railway Matters.—A contract has been recently entered into by the Crown agents for the Colonies on behalf of the Government of Natal, for the construction of 345 miles of railroad in that colony. The Colonial Government, when the requirements of the contract have been fulfilled, is to pay the company a subsidy of 40,000*l.* per annum for twenty years, and to make a grant of 2½ million acres of land. The latter is subject to the condition that the company introduce, within a certain time, 7,500 immigrants. It is stated that since the arrival of the Japanese embassy to England a contract has been made by Messrs. Brassey & Co. for the construction of a railway from Yokohama to some distance in the country, and that a good deal of the plant will be constructed at Manchester, and the Canada Works, Birkenhead.

Builders' Responsibilities.—A case has just been tried in the Clerkenwell County Court (Barford v. Bishop) in which 100*l.* damages for loss of services were sought to be recovered from a builder, on the ground that his servant threw a piece of lime into the eyes of the plaintiff's son, and injured his eyesight. The judge nonsuited the plaintiff, as there was no evidence against the defendant.

Mr. Emerson.—Mr. Edmund Waldo Emerson, son of the well-known American author, has written to the *Pall Mall Gazette* in the following terms:—"My attention has been recently called to a paragraph that appeared in your journal a short time since stating that subscriptions would be received from the English friends of Mr. Ralph Waldo Emerson for the purpose of rebuilding his house, by Mr. Hilliard, of Boston. Will you kindly allow me to state through your columns that I know that while my father would gratefully recognise the kind thought that prompted such a call, he would be extremely sorry to know that it had been made? Immediately after the partial destruction of his house by fire a number of his near friends in America kindly insisted upon taking upon themselves the cost of restoring it, and by the new year it will be finished and much improved. As my father knows nothing of the paragraph to which I have alluded, I feel called upon to make this statement for the benefit of his friends among your readers."

Good Advice.—At the opening meeting of the Working Men's College, Great Ormond-street, a word of good counsel was given by Mr. Cave Thomas, in a letter excusing his absence, which may be usefully repeated. Addressing Mr. Rawlins, the secretary, he begged that his congratulations might be given to Mr. Mark Carey, who has won high honours as an art student, and has rendered good service as an elementary teacher. Mr. Thomas said,—"Mr. Carey's work is a very remarkable exemplification of what may be accomplished in leisure hours. It exhibits not merely the mechanical results of industry, but great artistic feeling and power; that degree of ability, indeed, which might fairly tempt the possessor to make art a profession. Mr. Carey has decided, however, I think wisely—to make art a work of love, and the recreation of his leisure. This, too, is an example needed very much in the present day, when anybody who is able to scratch upon paper some resemblance to an object forthwith determines that art is his vocation."

St. Leonard's Tower, Bridgnorth.—At a meeting of the Building Committee last week it was decided that the architect's original design in regard to the tower should be carried out *in toto*, and that the spire should be erected. The extreme width of the tower is 41 ft. 6 in., and this additional feature will make the entire height 122 ft., as the spire will rise 23 ft. from its springing, and 14 ft. 6 in. above the top of the finials of the present pinnacles. The work is being proceeded with. Mr. Harry Hems, of Exeter, has modelled a half-sized figure of St. Leonard, as a model for the statue of the patron saint, which is designed to occupy a niche, 47 ft. from the ground, immediately over the large window on the south side. St. Leonard is represented in the simple garb of a religious recluse. His niche is to be carved. The rest of the carved work upon the outside and inner part of the tower, under Mr. Hems's supervision, is progressing.

Carlisle Gas Works.—The new gasholder erected at these works has been completed. It is a telescopic holder, and is erected in the same tank in which a single gasholder was erected in 1852, and which has now been replaced by the present one, in consequence of the increased consumption of gas. The new gasholder is 83 ft. in diameter by 46 ft. in height, its cubical capacity being about 250,000 ft.³, or double that of the former holder. Special means have been taken to secure the safety of the holder by the use of diagonal rods between the columns. The gasholder has been erected at the cost of about 3,000*l.*, by Mr. Daniel Howard (late B. Whitehouse & Co.), West Bromwich, near Birmingham, from specifications prepared by Mr. J. Hepworth, manager of the works.

Dante's House.—Dr. H. L. Barlow, writing to the *Athenæum*, says:—"By a letter just received from a devoted admirer of Dante, now in Florence, Colonel Gilliam, I learn that the poet's house in his native city is allowed to remain in the same disgraceful state to which it was reduced a few years ago, without anything having been done to restore it, or to effect those renovations which had once been proposed. 'The windows are still out, and the house has the appearance of having been gutted, and is looking utterly neglected.' These are the Colonel's own words, and they correctly describe the state in which I found it when last in Florence, in 1869. The only parts uninjured are the arch over the door and the inscription."

Settlement of the Coventry Sewage Question.—At a recent meeting of the Coventry City Council, it was unanimously resolved "that the draft lease to the General Sewage and Manure Company, Limited, of the sewage works, sewage message, and 28 acres of land at Whitley, agreed upon between the Sewage Committee and the Company, be approved." The mayor congratulated the council and the city generally upon the prospect of seeing this difficult question settled not only without incurring the enormous expense that was laid before them at previous meetings by Mr. Hawksley's plans, but, as Mr. Franklin had said, without any expense at all. He believed it was the determination of the company to make the system a success in Coventry, and a place that they might refer to in future.

The Sewage Question at Dover.—Alderman Finnis appears to have been successful in convincing the town council of the necessity of doing something in connexion with the sewage outfalls, of which serious complaints were made some time ago by the military authorities. At a recent meeting of the sewer outfall sub-committee of the council, Mr. Hanvey's plans for taking the sewage through a tunnel in Shakspeare's Cliff were examined and approved, and the co-operation of the War-Office authorities was invited. The minute was confirmed at the meeting of the managing committee, and the War Department will be asked to pay a share of the expenses of the works. The estimate is 10,000l.

Damage to Leeds Bridge.—A recent storm of wind and rain which swept over the country caused the river Aire to be very much swollen, and three coal-barges upon it broke for their moorings, and were carried down the current, coming in contact with Leeds Bridge. One of them was dashed against the new structure, and sank immediately; and another came so violently in contact with one of the piles supporting the temporary bridge that it was rendered unsafe, and all vehicle-traffic across it was stopped. Buildings in course of erection also suffered somewhat during the storm. A portion of a house which was being built by Mr. Dyson, of Carlton Mount, behind Cromer-terrace, was blown down.

Arrival in New Zealand of Brogden Workmen.—The *Marlborough Press*, a New Zealand newspaper, announces the arrival of the first batch of emigrants sent out by Messrs. John Brogden & Sons to work upon the New Zealand railways, as already spoken of in the *Builder* of the 28th of September. As to the attention to the wants and comforts of the immigrants on landing, the New Zealand paper says:—

"We cannot conclude without giving a word of praise to J. Brogden & Sons, for providing so well and amply for the housing and accommodation of the new arrivals. There was no hitch, no hurry, no disarrangement of plans; and everything worked so harmoniously that the men, women, and children were conveyed without delay from the steamer in which they arrived to the houses prepared for them, in which cheerful fires were burning, and provisions in quantity stored. The thoughtfulness of somebody in having lighted fires deserves mention, as the warm glow must have felt to many like an hospitable welcome to the land of their adoption."

Chelsea.—The Chelsea Vestry have under consideration a proposal to borrow about 8,000l. to cover the expenses of putting in brick sewers in the following streets, &c., at present served with pipe-sewerage more or less defective:—Limerston-street, 720l.; Victoria-grove, 600l. 10s.; Camera-square, 692l. 15s. 6d.; Radnor-street, 510l. 5s.; Shawfield-street, 540l. 6s.; Manor-street, 1,563l. 14s.; Godfrey-street, 621l. 7s.; Cadogan-place (north end), 720l. 4s.; Wellington-street, 520l. 6s.; Collingwood-street, 520l. 6s.; Arthur-street, 240l. 10s.; College-place, 350l. 16s.; Upper Manor-street, 529l. 9s.; being a total of 8,531l. 8s. 6d.

Ohan Church Competition.—The committee appointed to make a selection from the thirty-four plans that were received in connexion with the proposed new church, have decided upon the design of Mr. David Thomson, of Glasgow. The proposed edifice will cost about 3,000l., and is to be proceeded with at once.

A Local Museum for Newington.—At a vestry meeting in Newington, Mr. Malthouse has proposed that a portion of the waste space in the vestry-hall be turned to the uses of a local museum, where the antiquities of the parish may be exhibited for the inspection of ratepayers and others.

The Holborn Valley Improvements.—It is stated that the Improvement Committee of the Corporation are able to show that no expense has been incurred by the Holborn Valley Improvements—that they have been paid for (with 100,000l. to spare) by the improved value of the land which they caused to be vacant.—*City Press*. [We shall be glad to find this confirmed. At present we must be permitted to doubt.]

The Darlington Fever Hospital.—At a meeting of the Darlington Town Council, held on the 3rd inst., the report of the Hospital Committee was adopted, and it was resolved to erect the building forthwith, at a cost of 9,000l. The architect is Mr. G. G. Hoskins, of Darlington, to whom the first premium was awarded in March last.

"£22,000 for a Ceiling."—The paragraph thus headed, which has been circulated with reference to works in course of execution by Messrs. Cubitt & Co., for the Marquis of Westminster, under Mr. Henry Clutton, architect, is a fabrication. There is no mahogany nor ebony in the ceiling: it is of Jackson's composition, gilded. The doors and shutters are of mahogany.

Sale of Rosherville Gardens.—This property was submitted for sale by auction by Mr. Samuel Green, of the firm of Green & Son, on the 8th instant. The biddings commenced at 15,000l., and the hammer fell at 24,600l., at which sum the auctioneer declared the property to be sold. The hotel adjoining was sold separately.

Fire in the Theatre Royal, Cambridge.—A fire broke out the other evening at the Theatre Royal, Cambridge, soon after the performance commenced, whereby the "flies" were all destroyed. The fire, however, was discovered in time to prevent further damage. A similar fire occurred there last year.

TENDERS

For one pair of semi-detached villa residences on the Tramway Estate, Brixton-rise (No. 2 design), for Mr. W. Everett. Messrs. Gouly & Gibbins, architects.—Rowe & Verran (accepted).....£1,071 0 0

For boundary enclosures to St. Stephen's Church, North Bow. Messrs. Tolley & Dale, architects:—
Scriveners & White.....£458 0 0
Perry & Co.....447 0 0
W. & D. Brown.....438 0 0
Broome & Robinson (accepted).....373 0 0

For the erection of stables, cart-shed, &c., for the Corporation of the City of Lincoln. Messrs. Bellamy & Hardy, architects:—
Taylor.....£620 0 0
Young.....598 0 0
Cressley & Sons.....589 0 0
Hallam & Co.....573 0 0
Shingby.....563 0 0
Barnes & Wright.....551 0 0

For building the Public Elementary School, in New-road, Beckland, for the borough of Portsmouth School Board. Mr. Thos. Hellyer, architect:—
Evans, Brothers.....£3,850 0 0
Burbridge.....3,900 0 0
Light, Brothers.....3,439 0 0
Quick.....3,397 0 0
Ward.....3,397 0 0
Barnes & Moody.....3,290 0 0
Eades.....3,195 0 0
Moray, junr. (accepted).....3,165 0 0
Smith.....3,150 17 0

For additions and repairs to Stacie's Farm-house, Manningtree, Essex. Quantities by Mr. Ormes:—
Canham.....£188 0 0
Saunders & Son.....467 0 0
Capon.....463 10 0

For certain repairs to Bootmakers' Asylum, Mortlake. Quantities not supplied:—
Fish.....£225 0 0
Pathley.....209 10 0
Hart.....179 0 0
Fride.....152 0 0
Bowling.....135 0 0
Artes (accepted).....130 0 0

For taking up roads and laying pipe-sewers, for the Watford Local Board:—
Hubbard.....£989 0 0
Capper.....960 0 0
Pizzev.....939 0 0
Free.....899 18 0

For laying a pipe-sewer for the Acton Local Board:—
Stiggs.....£177 0 0
Nave.....141 0 0
Elliott.....138 0 0
Hubbard.....133 5 0
Godair.....123 12 0
Pizzev.....124 0 0

For farm-buildings at Shenley, Herts, for Mr. W. Edwards. Mr. A. King, architect:—
Cordell.....£490 0 0
Adams & Co.....470 0 0
Cooke & Groomer.....464 0 0
Boyce.....408 0 0

For lodge and farm-buildings, at the Ridgeway Oak, Enfield, for Mr. F. S. Foley. Mr. Thomas J. Hill, architect:—
Field & Sons.....£758 0 0
L. & W. D. Patman.....647 0 0
Rayes & Rammage.....590 0 0
Ward.....585 0 0
Childs.....531 0 0

For works in connexion with additions and alterations to Dorset Lodge, Kensington. Mr. T. Lawrie, architect. Quantities by Mr. H. P. Foster:—
Stimpson & Co.....£2,780 0 0
Macey.....2,162 0 0
Hibbins & Trester.....2,121 19 6

For Turnpike House public-house, at Stamford-hill. Mr. R. Botton, junr., architect. Quantities by Mr. W. H. Barber:—
Emery.....£2,250 0 0
Lewis.....1,931 0 0
Child.....1,890 0 0
Clayes.....1,837 0 0
Rist & Brown.....1,787 0 0
Marr.....1,752 0 0
Hiscock.....1,747 0 0
Jarvis.....1,687 0 0

For four shops at Brixton, for Mr. H. W. Nevill. Messrs. Habershon & Pite, architects:—
Adamson & Sons.....£3,100 0 0
Woodward.....3,150 0 0
High.....3,070 0 0
Rison.....3,025 0 0
Temple & Foster.....2,925 0 0
Chesum.....3,010 0 0
Morgan.....2,895 0 0
Hiscock.....2,845 0 0
Haynes.....2,738 0 0
Tonguo.....2,550 0 0

For five houses, Lowdon-road, Brixton, for Mr. H. W. Nevill. Messrs. Habershon & Pite, architects:—
Temple & Foster.....£2,374 0 0
Woodward.....2,350 0 0
Adamson & Sons.....2,348 0 0
High.....2,330 0 0
Rison.....2,267 0 0
Chesum.....2,245 0 0
Tonguo.....2,117 0 0
Hiscock.....2,115 0 0
Morgan.....2,100 0 0
Haynes.....1,739 0 0

For offices for the Phoenix Gas Company at their works at Greenwich. Messrs. Church & Rickwood, architects. Quantities supplied:—
Jerrard.....£979 0 0
Shuttleworth.....914 0 0
Colls & Sons.....897 0 0
Johnson.....880 0 0
Garland.....850 0 0
Tonguo.....830 0 0
Kirk (accepted).....734 0 0

Repairs and alterations to premises, Little Moorfields, for Mr. Ball, Mr. Hill, architect. Quantities not supplied:—
Turner & Son.....£267 0 0
Lark.....253 0 0
Bridgman, Nathal, & West.....248 0 0
Bevan & Lynn.....245 10 0
* Accepted.

For new storm relief line to Fleet sewer. Mr. J. W. Bazalgette, engineer:—
Anderson & Dunmore.....£81,300 0 0
Bloomfield.....81,000 0 0
Newe.....79,800 0 0
Mowlem & Co.....75,000 0 0
Pearson.....73,000 0 0
Rison.....72,900 0 0
Wheeler.....72,500 0 0
Groom.....69,900 0 0
Jennings.....66,900 0 0
Pickering.....65,200 0 0
Bridgman, Nathal, & West.....64,729 0 0
Williams & Co.....64,500 0 0
Newell & Robson.....62,977 0 0
Wall.....62,900 0 0

For alterations and additions to "The Brewers," St. Pancras-road. Mr. Ansell, architect. Quantities not supplied:—
Langmead & Way.....£356 0 0
Bridgman, Nathal, & West.....349 0 0

Oval-road Schools, for Croydon School Board.—Sir, In reference to the published list of tenders, we beg to state that we did not withdraw our tender, but were invited to send an amended tender with Messrs. Waterson & Co.—
Amended Tenders.
Peskett & Taylor.....£3,120 0 0
Waterson & Co.....3,010 0 0

Original Tenders.
Peskett & Taylor.....£2,961 0 0
Waterson & Co.....3,045 0 0
PESKETT & TAYLOR.

TO CORRESPONDENTS.

Erratum.—For 2s. per ton as the estimated value of town sewage (p. 778, and), read 3d. per ton.

E. L. (quite understood)—Builder (date of the lock-out was 1859).—Several readers who want to refer to articles in our volume must look for them themselves.—H. R.—A. K.—J. S.—J. & son.—Dr. G.—C. H.—E. H.—R. & V.—J. A.—M.—E. T.—M.—E. L. G.—E. C.—D.—Dr. H.—H. S.—F. J. W. H.—Dr. D.—R. C. F.—H. & P.—G. E. P.—H. W. B.—E. J. P.—J. O.—J. P.—L. L.—T. J. H.—N. S. O. G.

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

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The Builder.

VOL. XXX.—No. 1550.

The Exact Relation between the Food of Plants and the Refuse of Towns.



REQUENTLY and fully as the subject of the treatment and utilisation of sewage has been discovered, there is a mode of in-

vestigation that has not hitherto been applied with the accuracy that is both possible and desirable. We have analysis, indeed, pushed to the utmost minuteness of detail, both as regards the chemical composition of plants, and the chemical

elements that we send to poison our rivers. A certain balance is known to exist between what is taken from the soil for human and animal food, and what is returned to the soil, or to the atmosphere, by the result of the vital process. But what has been, in our opinion, overlooked, is the mode in which the question is affected by that the word *or*. Food is consumed in a tangible form. The results of the digestion of food are utterly tangible and partly invisible. The effect of the combustion that goes on in the living animal is a matter of primary importance. We wish, then, again to inquire into the subject of what is returned to the soil, and to investigate how far the actual chemical outcome, by balancing the consumption of the food of plants, allows of an economical utilisation of sewage.

The food of man is composed of certain elementary substances, known to chemistry, which exist abundantly around us, but which man's skill has not hitherto been able directly to combine, so as to produce the same result that is continually being effected in the laboratory of organic life.

Human food consists of two great groups, or categories; first, that which is the direct product of vegetation; and, secondly, that which is a secondary product; having been assimilated, the first instance, by herbivorous animals, and then presented to human consumption in the form of flesh, milk, eggs, or some edible of animal origin.

The attention of scientific chemists has been directed to the important quest of the means of directly combining the chemical elements of food. But the greater progress in this direction which we are acquainted consists in the chemical formation of certain flavours, indistinguishable from those of fruits.

In regarding the production of human food it will be convenient, in the first instance, to regard the case of wheat, which in this country forms the staff of life, and on which subsistence, though not luxurious, is possible.

It results from statistical inquiry that the consumption of wheat may be taken at one sack of flour, or 5.71 bushels of wheat, per head per annum. This allowance is equal to 3,483 lb. of wheat per head per annum, or 93 lb. per diem. The fair average return of our cultivated wheat-lands is stated by the most careful students of the farm statistics of the day at quantities which, reduced to the simplest expression, amount to a yield of 1,570 lb. of wheat per acre per annum. We take at present no notice of the straw, because, in one form or another, it is returned to the soil, if not exported.

In the discussions now raised as to the value

of sewage as manure, while very much information has been collected, the subject has never yet, so far as we are aware, been brought to that definite test for which analytical chemistry furnishes the means. In fact, from the form in which the ultimate analysis yet carried out has been left by the best writers on the subject, it is tolerably certain that the method we now propose to pursue has not hitherto been pursued.

We are not about to enter into that question of the relation of population to area which is suggested by the remark that the annual consumption, per head, of wheat is equal to the produce of nearly one-quarter ($\frac{1}{2.57}$ parts) of an acre. We have to see, first, what we take out of the land by a wheat crop, and what we therefore require, in some way, to return to it; and, secondly, how far the refuse of our towns is adapted to furnish that supply.

We take the average wheat crop at 25½ bushels, of 61 lb. per acre, which gives, in round numbers, 1,570 lb. of wheat.

This wheat, by analysis, consists of (1) 220 lb. of water, of which we take at present no further heed; (2) 25 lb. of mineral ingredients; (3) 230 lb. of flesh and force producing, nitrogenous matter; (4) 1,095 lb. of force-producing matter, which includes 523 lb. of pure carbon.

The elements of the food of plants, besides the small portion of mineral matter which they accumulate in growth, are these,—water, ammonia, and carbonic acid. From the ammonia that is fixed in the process of vegetable growth the nitrogen in the vegetable substance is derived. From carbonic acid the large quantity of carbon is extracted. Both carbonic acid and ammonia are evolved by the organic processes of animal life. They are so produced, to a large amount, in the form of imperceptible vapour. Much of this is dissolved in rain, and thus brought to the roots of plants.

We require, therefore, either by natural or by artificial means, to return to every acre of wheat-growing land 25 lb. of mineral matter in the year. This matter consists of lime, magnesia, silica, soda, potash, sulphur, phosphorus, oxide of iron, and chloride of sodium or common salt, in proportions into which it is not necessary here to enter. We arrange them according to their proportionate weights.

With regard to the more universal elements of vegetable tissue, it will be seen that the flesh and force producing, or nitrogenous, portion forms but the fifth part of the force-producing, or carbonaceous, matter. Each of these supplies is derived mainly, under ordinary circumstances, from the atmosphere. But if we seek to feed our plants as it were by hand, we must be careful as to the appropriate mixture of the food which we supply. To give in undue profusion a single element, or even all the proper elements with a single exception, is not to feed, but to starve. It is therefore necessary to learn first how much of the mineral matter necessary for the crop is already abundant in the soil and what is deficient and has to be returned; and, secondly, how far we can supply a store of the more subtle elements which, in a liquid or aerial state, are equally requisite for the luxuriance of the crop with the solid mineral matter.

We have now to consider the question of how far the ordinary contents of town sewage contain, in the proportion required by vegetation, the proper elements for its support.

The chemical composition of the *excreta* of human life, entirely undiluted, contains 92.88 per cent. of water, and 7.12 per cent. of suspended and dissolved matter. If we allow 25 gallons per individual for the water-supply, which is a smaller allowance than is considered desirable, we shall have a dilution of 100 gallons of *excreta* by 9,130 gallons of water, or 91 to 1. We may say in round numbers, therefore, the dilution is 100 to 1.

These suspended and dissolved matters may

be conveniently classed in three groups. Of the seven parts of which we first spoke, the mineral matter forms a tenth. Gaseous matter, including the non-mineral constituents of the sulphuric and phosphoric acids, forms a fourth; and the remaining 65 per cent. consists of organic matter.

In other words, we may take a unit of population as the equivalent of 9,000 gallons of undiluted sewage, and regard it as producing in the year 7 lb. of mineral water, 18 lb. of gaseous matter, and 46 lb. of organic matter. This result is closely accordant with analyses carried on for different purposes, and is at all events sufficiently accurate to form the basis of further inquiry.

The commercial value of the mineral matter it may be difficult precisely to fix. The most valuable portion is the phosphorus, which is found in small quantity. Phosphorus of lime is reckoned as worth 2s. 3d. for every 1 per cent. in a ton. The proportion of the mineral elements is that in which they are required for the crop, but the value of their return to the soil depends not only upon this fact, but upon the question of what mineral elements are naturally abundant in a given soil, and what are those in which it is deficient. The phosphorus is the only mineral for the collection of which it is absolutely necessary to have recourse to manure of animal origin.

The gaseous matter, whether present in the form of nitrates or other salts, or as ammonia dissolved in the water, may be taken with the mineral matter in forming an estimate of commercial value. If the 21 lb. of mineral and gaseous substance be priced at 1d. per pound, it will probably exceed the purchase-money likely to be obtained.

There remains the important question of the organic matter, which forms nearly two-thirds of the non-aqueous contents of sewage. In this, it is evident, lies the main knot of the subject. In the various methods proposed for the treatment and utilisation of sewage the most opposite views are entertained as to the value of the organic matter. In the various analyses it always appears in this comprehensive and uninvestigated condition. By some persons it is regarded as a fertilizer of high value; by others it is considered as merely the carrier and seed-bed of poison. It is desirable, therefore, to discuss this portion of the subject with some precision.

Before passing, however, from the consideration of the mineral elements, we must refer to a point which, although by no means novel, comes out unsought in our calculations. The mineral matter contained in the wheat consumed, at the above rate, by four persons in a year is a little over 22 lb. The sewage resulting from the same number of persons contains 28 lb. Ultimately, no doubt, that returned to the soil must equal that taken from it, with the exception due to our mode of sepulture. The difference in this case arises from comparing the crop containing the smallest proportion of mineral matter with results derived from a mixed diet. Oats, for example, contain 3.0 per cent., and barley and beans each 3.5 per cent., of mineral, against 1.6 per cent. in wheat.

But the balance is very suggestive as to the questionable economy of conveying to the soil, for the purpose of fertilisation, the sewage arising from a population at the rate of from 25 to 1,100 per acre; the first being that recommended as the most lucrative, and the second being that actually in use at Merthyr Tydfil.

The organic matter which forms 64 per cent. of the solid contents of undiluted sewage is not more minutely analysed in any of the works that we have consulted that discuss modes of treatment and of utilisation. The suspended, as distinguished from the dissolved, solid matter may be taken principally to consist of albumen.

At all events, if we take the analysis of that substance for our guide, any error of deduction will lie within limits that can be readily ascertained.

The albumen of the blood, according to MM. Dumas and Cahours, consists of 53.32 carbon, 15.70 nitrogen, 7.29 hydrogen, and 23.69 oxygen in 100 parts.

It is a remarkable and interesting fact, which seems to have escaped notice, that 100 parts of albumen, thus analysed, have required for their production exactly 250 parts of carbonic acid, ammonia, and water combined. The elimination of 150 parts of oxygen has converted that mixture into organic substance. At least, such is the exact result of the numeric value of the elements and their known combinations.

The combination of 150 volumes of oxygen, if we allow the degree of heat to be produced that is due to combination with carbon, is accompanied with the production of 200 units of heat. Omitting the addition due to the combination of the hydrogen with the nitrogen, we have thus the measure of the heat required for the liberation of the same weight of gas. In the vegetative process by which albumen is formed, the heat of the sun supplies this requisite. The leaves act as the organs for expiring the liberated oxygen. We thus obtain a view of the mode of formation of vegetable albumen, by weight and proportion.

The compound thus formed is one of the constituent parts of the vegetable structure, and is especially to be found in the seeds and fruit that form the main part of animal food. In the process stimulated by hunger, the albumen is taken, unchanged, into the animal system. We need not trace the entire circulation, but we find the substance finally either consumed by the respiration, giving out its proper *quotum* of heat, for the supply of the animal warmth, or passing in an undecomposed state into the localities in which we now have to deal with it.

Albumen, thus formed, is of course unfit for animal food. It is equally unfit for vegetable food. In order to allow of its assimilation by the plant, it is necessary to return to it that proportion of once and a half its weight of oxygen, of which it was deprived by the vegetative process that formed it. When this has not been done in the natural course, that is to say, in the animal body, it is only to be done either by extension of surface, so as to expose the greatest amount possible to an oxygenating process, or by raising the temperature, so as to turn a slow into an active combustion.

There is, indeed, one class of organism to which decaying organic matter furnishes an appropriate *pabulum*. The fungi are ordinarily regarded as vegetables; but they possess not a few of the peculiarities proper to the animal kingdom. Chief among these are the nitrogenous character of their tissues, and their habit of feeding upon decaying organised substances. Their appearance, under conditions favourable to pestilence, is invariable. Their growth and reproductive power are of fabulous rapidity. They are the scavengers of nature; but, like their superior brethren in the practice, are best kept at arm's length. Among them are to be found the cholera fungus, the potato fungus, and, if medical men are right in their suspicions, the countless and invisible spores that are the very means of communicating zymotic disease. In the albumen of the sewage this order of beings has a naturally provided home and vehicle. The assimilation, made by man, is out of the ordinary course of nature to remedy. Her sole organism, for the purpose, is the fungus; its activity is extreme, but the effect is at least as redoubtable as the mischief which has called for its commencement.

Each of the four elements which constitute albumen is necessary to the growth of plants. But they are only available, so far as we know, to support that growth, when they are present in due proportion, and in such combinations as are suitable for vegetable assimilation. The organic matter of sewage, therefore, as far as it is albuminous, is entirely valueless as manure, besides being liable to be regarded as the seat of an active poison. It is of primary importance to give prominence to this often neglected truth.

While the above analysis exhibits the value of town sewage as rather less than one half-penny per ton of effluent, undiluted liquid, or 1s. 9d. per unit of the population per annum, it is well to check the calculation by the results attained by the best cases of sewage farming.

For the economical treatment of sewage we are told that an acre should be allotted to

every 25 souls of the population. At Merthyr, on the other extremity of the scale, an acre appears efficiently to disinfect the sewage of 1,100 souls. Here is a wide margin.

The highest expenditure that we have yet seen recorded in high farming for manure has reached the price of 3l. per acre per annum. This, of course, is unusual. The crops on this farm have been worth 13l. 10s. per acre in wheat, and 14l. 16s. in clover and sainfoin. We refer to Mr. Prout's farm in Hertfordshire. Generally speaking, 40s. would be an outside price per acre for manure.

If we take the recommended allowance of 25 souls per acre, and what has been hitherto regarded at the low value of 5s. 8d. per head of inhabitants for the sewage, fertilising matter to the amount of 7l. 1s. 8d. is annually placed on every acre thus treated.

If we apply the same theoretic value to the proportion in force at Merthyr, of 1,100 souls to an acre of filtering ground, we shall find that fertilising elements, according to theory, to the value of 311l. are annually poured into that acre. The highest returns claimed from the use of sewage manure have been at the rate of from 32l. to 40l. per acre. We have not the exact details, but we find that a growth of Italian rye grass amounting to 7 tons per acre is stated to have been produced. If we took last year's price for hay,—this would give a higher value, but that may be considered as exceptional,—31l. 10s. would be the return for the hay at 3l. 10s. per ton.

In water-meadows without manure, or with an occasional top-dressing of bone-dust that will not amount to more than 1s. per acre per annum, crops of 5 tons per acre, including that which is eaten on the ground, are about the maximum. There is little doubt that these may be materially augmented by such a disposal of the irrigation as should avoid the present wasted area of innumerable water-carriers. But it is possible that this may cut both ways,—so that we take the difference of yield between the ordinary water-meadow and the sewage-farm at 2 tons of hay, say 9l. per annum. This is, therefore, the total produce of the application of a quantity of sewage averaging, in the value hitherto nominally attributed to it, at from 6l. 10s. to 312l. Thus it seems that the result of practice is in exact accordance with our analysis.

That the effluent water from sewage must go through the ground to be purified, we take to be an undoubted maxim in the present state of sanitary science.

But if we complicate this problem, in itself not a simple one, by attempts to derive from the sewage materials fitted for the food of plants which do not exist in it, in a state in which plants can assimilate it, and which we cannot convert into such a state, we go in the wrong direction. Chemistry and practice unite in one testimony. The organic contents of sewage are not manure. They are only poison. They must not be preserved, but destroyed.

THE EDUCATION OF THE ARCHITECT.

At the opening meeting of the new Architectural Association of Ireland, mentioned in another page, Mr. J. J. O'Callaghan, the first president, read the following instructive address:—

By learning to make truth the foundation of your education, you may hope in time to be able to design; truth is absolutely necessary to it, and no originality can assist a design without this one grand element; once depart from it, and you get into troubled waters. As written recently by an eminent architect, "It is truth only in every line and every detail which can ever make great architecture."

A more extensive course of study than is generally given is necessary for the architectural student. It is too much the habit now-a-days for a student to start too early in practice for himself; it often happens that he begins immediately on being out of his articles, as if the three or five years spent in the principal's office is all that are necessary. This is but a small portion of his education, even when supplemented by all the exertion of which he is capable. I know many pupils work very hard in this way, but I fear that with others it is only the mere routine of the office that constitutes their art-education.

The preparation for the profession is one of our weakest points, and in this respect France and other continental countries have the greatest

advantage over us. It is necessary that a good general and scientific education, and a fair knowledge of drawing, should be learned at school; this should include a general knowledge of perspective, its principles and practice, and good training in freehand drawing. When you have entered on your duties as pupils you will find you are in the right way to become artists not only in name, but also in reality; and you will the more readily work your way up in the office, and will the sooner be entrusted with responsibility. Then a knowledge of construction and the uses of materials should be your next care; this will give you a great confidence in your office work, because you shall then understand what you are doing, and there will be no hesitation in any constructional matter.

You should lose no opportunity of acquiring a thorough knowledge of all the trades; this is absolutely necessary for the making of your working drawings. When some new ideas are well and clearly laid before workmen, you find it difficult to get them to realise them, they find too much their habit to endeavour to do things their own way. How can you, then, possibly expect they should understand them if they are imperfectly sent from your office, much less hope they will follow you with confidence or respect? Without this knowledge your client will not have that confidence in you which is necessary; while the builder, who is really anxious to have the benefit of your assistance, and to follow your plans, so often finds that in matters under his own province you are at fault, that your influence is weakened. Were the educational defect removed, this state of things could not exist, and the aid of the architect would more generally be sought. The public would know their interests were safe in your hands; they would feel that technical knowledge and artistic taste were employed in their behalf, and they would unreservedly place them selves in your hands, and the cause of art and the public would be served in the end. The necessity for this is very apparent in our own country, where the position of the architect is very little understood, and good architecture, I fear, very little appreciated.

In immediate connexion with the attainment of this knowledge, the student should ever remember that a liberal education ought to be the ground-work of his profession, and that it will require his utmost exertion to fit him for that which ought to lead the sister arts. Architecture is the real foundation of the fine arts, and ought to be the guiding spirit to them. For this purpose the intellect must be educated and the imagination cultivated. This will be necessary, if we wish to imprint on our works,—which are so influenced by our modern requirements, as by the influences which science has opened up,—the spirit or life which is visible in those works which we would probably take as our model, from either the Classic or Gothic schools, or, may be, a combination of the two.

It is of the greatest consequence that a thorough knowledge of our history should be known, for the architecture of a country is intimately connected with its history, and the contemplation of the one brings forcibly before our minds the beauties and peculiarities of the other. And here I may mention the great fun of study which the ancient buildings of Europe afford the student. In our own country we have many examples of every period, although the are not so extensive or so elaborate as those in England or on the Continent. They afford most interesting studies to the student, and the details of a distinctive character that marks them as once as national. I would, therefore, suggest that you begin at home, and let your tastes be formed there. I know no more interesting study for the junior members than a day's, or a week's, or a month's, sketching at some of our fine old ruins, and I trust it may be my good fortune to join the members of the Association in the journeys through Ireland on the occasion of inspecting some of those splendid monuments of the piety and art-knowledge of our ancestor. We owe a deep debt of gratitude to those who like Petrie and others, drew our attention to those splendid monuments erected by our forefathers. I do not know a better way for a student to learn the rudiments of real architecture than by carefully sketching and measuring the spot those remains, particularly noting the mouldings and construction; and this is reckoned of such importance that I believe nearly all the art societies offer special prizes for this purpose. I am happy to see one included in the prize-list of this Association. Not only the

details should be sketched: the plan should be well studied; the purpose of the building, and how it has answered that purpose, should be carefully investigated. In this investigation I would suggest that no one style be adhered to, as beauty and good may be found in all. The remains of Athens and Rome have their admirers, and those of the Middle Ages are affectionately regarded by numbers. As for my part, I believe it is quite possible to cull from all without losing any of the feeling or beauty which either possesses,—not, indeed, to attempt to produce a mixed style of architecture, which I consider most undesirable. Ground your necessities of the age either on Gothic or Classic works, treat them with originality, and you will have a sufficiently new style, if you combine in your work those truths which they so beautifully express. I see no reason whatever why, though loving the pointed arch, should neglect the use of the round, and in our Gothic architecture we may well introduce that simplicity and repose which is to be seen in some Classic work. This has been very successfully achieved by the Italian architects, who introduce into their work some of the distinctive features of the Classic, and with unity and harmony. Even in the same windows they introduced the two kinds of arches, the inner arch being often semicircular, while the outer one was pointed. This gave a great appearance of strength, and the effect is exceedingly good. We must remember ever that literature has great influence on architecture, and is intimately associated with it.

I am very happy to believe that great strides are being made in the direction of educating the public mind, and that exhibitions of art are being more and more appreciated. I believe we may trace in the recent revival of Gothic architecture, that the very education for it was being prominently before the minds of the people the associations connected with those interesting remains; that the very way was opened for the actual results achieved by Pugin and others who laboured in the same field.

The pupil should early learn to sketch, and sketch well. Sketching is a power in the hands of an architect. It is impossible for you to be able readily to put together your ideas unless you sketch well: it gives you the greatest facility in grouping your buildings, and even planning them. You have the means of storing up in your mind every good idea, detail, and group. This power of sketching, combined with a thorough knowledge of perspective, is of the greatest benefit to yourself in your future practice; it enables you to take in constantly those works which may pass before you on all occasions. If you have this power, you will be able to get through a much greater amount of work than would be possible for you without it, no matter how well versed you may be in everything else that relates to your profession. When you have acquired this power of sketching well and freely, you can then take up some works, and measure and draw them carefully; by this means you will be doing more to understand their spirit, and feel those principles of truth and reason which they contain. It is only when you have carefully gone through this work, and understand thoroughly their plans, sections, and elevations, and their construction, that you can catch their ideas, which ideas once thoroughly impressed on your minds can never be completely effaced.

You can use them as copyists. These very ideas will arise in your minds, and will be to you of the greatest assistance when you most require them. Then from the power that sketching gives you in educating your eyes and your tastes, when you have the mind filled with the good things which you have already seen and sketched, it will not be possible for you to be satisfied yourselves, or to satisfy others, with what is unreal or bad. It will give you an easy path over many difficulties, and the fears that may perhaps arise when you have planned an original group will soon disappear, if your minds are stored with those ideas which have been formed long before in your sketching tours. You will then avoid starting with a sham. This is a very serious evil, and one against which you will have carefully to guard—this endeavour to appear what you are not. It is of the utmost dishonesty, and yet appears to be almost universally practised; the worst feature of it is, that it precludes us from the use of really good materials, and how disappointing in the end it is. These shams are practised almost everywhere and in almost every place, and yet every one appears to know it is so. How often do we see that plastering—very

good in itself, if properly applied—is utterly destroyed when made to imitate stone? This is so generally adopted that it is most difficult to get even the workmen to do this class of work without their putting the stone lines upon it. It would be annoying, if it were not such a serious subject, to hear the explanations given and the defence offered by them on this subject. Then we have metal and wood painted to imitate stone and marble, and how often are we allowed to have the simple colours applied to our work? No! we must have our wood painted to imitate oak, or maple, or such like, forgetting all the time how very beautiful the natural colour of the wood is, or how much better and more beautiful the simple colours would be. This we must never fail to oppose with all our powers, no matter from what quarter it proceeds; it is a combination of extravagance and vile taste. It removes us altogether from what we should have in view. Then in the matter of representing marble, do we not see it every day, or on every side of us? and this in a country where we have most beautiful specimens of the real material to select from. It is sad to find that all this occurs amongst us at the same time that real materials and rich colours are abhorred: we are very far behind in this respect. The public appears to be devoid of true feeling on this most important point; we should therefore do all in our power to awaken a love for truth, and beauty, and colour, in our architecture. We certainly have many opportunities of doing so in using the brick, granites, limestones, sandstones, and marbles, which may now be easily obtained in this country, and which in every respect are such admirable materials. By using our materials thus we shall tend to educate the eye and give strength and interest to our buildings; we may then hope to see love for the picturesque and beautiful become more general, and regularity and plainness shall not be considered the only beauty.

Sketching and measuring also lead on to the closer examination of those works you take up, and give you a power of thinking for yourselves otherwise very hard to attain; you will find out the points of them that please you most, and shall be enabled to mark carefully the treatment adopted for different works, and how the various difficulties were overcome; and, though last, not least, it will give you a thorough knowledge and power to use the materials in their best and most natural manner. You cannot love those buildings too much, nor is there any fear you may become copyists if you approach them in a proper spirit, determined to educate yourselves by them, not to select a piece of them for a particular work. It is impossible for a man who loves his art well not to cultivate it, and derive pleasure from its practice, which will be utterly impossible to a mere copyist. The study of those works will also tend to tone down that spirit which would perhaps sometimes tempt you to do queer things, in order to indulge in what is termed "originality." That which is natural will produce sufficient originality. In fact, to my mind, if you make use of your wants properly and naturally you shall always produce that originality which is desirable; truth in planning and in construction will always produce as much of it as is necessary to make our architecture picturesque and beautiful. It is the absence of truth in our architecture, coupled with the want of art-education, that produces the thoroughly uninteresting character of almost all our buildings. That which is actually bad and inconvenient is adopted, more particularly in our dwellings, because the public mind cannot realise the fact that truth would govern our architecture; the spirit of doing what has been already, though very badly done, appears yet to govern the masses, and they dread anything in the way of real art in architecture.

Then what must be avoided,—that spirit of singularity which is occasionally visible,—that restless, uneasy striving after effect which marks conceit or disregard of truth. This uneasy spirit generally arises from ignorance in treating the materials we have in hand, or the neglect of the study of those models we have been speaking of, but generally in the absence of that truth which is the real foundation of good design. You should approach each work in its true spirit, endeavouring to meet each case on its own special merits, making the design as natural and as suitable as possible.

You should above all avoid laziness in design; you must quit that spirit of mere imitation which your case would sometimes prompt. You should blush to copy or to make use of any of

the works you may see in your principal's office; you should imitate what you find there in order that you also may one day become original. The practice of copying and making up a design of another's works, and trying to deceive yourselves thereby that you have designed a building, is a most dishonourable practice, and it is utterly opposed to the true spirit of art. Once you rest satisfied with mere copying in this respect, you are lost to the spirit of the true artist, and you cannot take any pleasure in your profession. The true architect is always contriving, and never rests satisfied until he is convinced that he has realised the best effect possible. He goes on, ever improving on the past, till when old age comes on, he feels himself young still in the pursuit of art, and there will be no fear that his work will become uninteresting to him. The ever-changing, ever-grappling with the work will be to him a constant source of pleasure, and he has his own reward in contemplating the life-like creations of his fancy,—than which I know no greater pleasure. You have many opportunities for variety in your practice, for although sameness in general appearance is too generally sought for, yet in very few cases does one client wish to have that which has been already adopted by another. If you go into each work with spirit, it will prevent poverty in design, and produce that originality which we should all look for.

It is most essential that architecture should hold a prominent place in our public schools and universities, for is it not sad to find that, in many cases, the first idea a pupil gets of that which is to be his profession is in the office in which he is articled, and that he oftentimes takes a pencil in his hand for the first time when he enters the office as a pupil? I hope the day is not far distant when professorships of architecture will be established in all our colleges and universities, and thus architecture and the fine arts will form part of general education for all classes.

In England we find many opportunities for art-study open to the student, not only in the colleges and universities, but in the Royal Academy and the magnificent collections at South Kensington and elsewhere. I believe in only one university or college in Ireland does a chair of Architecture exist: this is a very great want, and one that should not be allowed to exist; but the architects of the country must agitate, when perhaps attention will be paid to their wants. In the face of those discouraging facts, it is the duty of the younger members of the profession to be diligent and industrious, and show thereby that, had they the means prescribed above, they would avail themselves of them. I believe, notwithstanding all the drawbacks, if a student is industrious, he has all the necessary means open to him for a good art-education, if he will only supplement the information he receives from his principal by his own exertions in the workshop, on the building or sketching tour; and pupils had better realise this fact as soon as possible,—that architecture is an art not to be learned easily or slightly, and the sooner they put their shoulder to the wheel the better. If pupils will not educate themselves, or at least receive the education afforded by their opportunities voluntarily, then the sooner we have examinations for admission to the ranks of the profession the better. Let the Institute establish an examination, the passing through which will be recognised as a necessary qualification for the profession. I am afraid in many cases the position of the profession must suffer, unless compulsory education be established; outsiders will come into the profession,—men without sufficient education. Even in this age, the position of an architect is not understood; the difference between an architect and a builder is not yet sufficiently defined. It will be said, and truly, that you cannot teach a man to design,—that it is a gift; but it is a power assisted very much by education and training, and it is only just to the profession at large that this education and training should be possessed by all those ambitious to join its ranks, and thereby put it on a level with other professions. If the want of any regular training for the artist in the higher walks of life is so apparent, what shall I say of the system adopted at our schools of art? I believe a considerable number of pupils have learned to draw in them, and I feel certain they deserve a large amount of credit for what they have done; but there is, I fear, a great absence of observation or investigation in the education provided: the effort appears to be more to realise an elaborate drawing. We

want spirit and life in drawing of the different forms, not a painfully over-studied drawing. Then I fear also the pupils do not sufficiently understand what they are copying, and a large amount of interest is removed from their work. Let us have vigorous and intelligent treatment rather than mere mechanical precision.

The study of painting, sculpture, and drawing forms a most important part of an architect's education, and it will be for the members of the Association to show by their co-operation and diligence their appreciation of this fact, when, I have no doubt, the Royal Hibernian Academy will be happy to afford all the assistance in its power to members who should seek admission to its halls.

You will perhaps say this is very hard work to go through, and you probably ask what is the reward for all this. I would say in reply that you are about to become members of a most honourable profession. It is an ancient profession, notwithstanding the efforts of those who try to prove that it did not exist in the Middle Ages, but that each workman designed his own part and depended on his devices. The examination of any of those buildings will at once convince you of the absurdity of such a statement, even if we had not actual evidence of the fact. It is an intellectual profession; for, though we know cases unfortunately that would prove the reverse, they are, I am happy to say, the exceptions, and the high standard of Vitruvius is that aimed at, I am sure, by those who approach it as they ought. It is also a profession that can confer the greatest honour on its members, for I believe no matter under what discouraging circumstances you begin, if you only work diligently you shall win your way, you shall gain the respect and esteem of others, and, even though you should fail, you shall have the reward of your own consciences that you traversed the right path.

ON SHADOW.

PURSuing the observations on the subject of shadow, commenced in our last issue,* it may be noted that with regard to the attention paid by the Greek artists to the point of view, there can be no doubt. The anecdote of the competition of Phidias and Alcamenes is well known. Two statues, by these two artists, were exposed to the public, *unpainted*, at the same time. The verdict was altogether in favour of Alcamenes. But on the next day, the statues were raised to their destined elevation above the observers. Then every voice was raised for Phidias. His rival was nowhere. We may observe this mode of treatment for ourselves, in the Elgin and Greco-Roman marbles at the British Museum. The thigh of one of the magnificent draped figures representing the Pates, who was seated in the pediment of the Parthenon, is altogether out of proportion as viewed by the spectator on the level. The head of an Apollo, which is dignity itself when viewed at a proper angle, recalls the account of the physiognomy of Titus Oates (whose mouth was said to occupy the centre of his face) as seen on the pillar where it is actually gibbeted in the gallery.

With regard to the art of Egypt, so much older, and so much more long-lived, than that of Greece, there is not the same reason for believing that the sculptors paid great regard to securing a fixed illumination. In their temples, indeed, the Egyptians knew how to take advantage of the effect of shadow, as they did also of the laws of perspective. They at times increased the apparent length of a vista, by the introduction of a false perspective, or an unnatural diminution of size, that gave the effect of increased distance. How far artificial illumination formed a part of their rites we are only partially aware. But in Egypt, shadow is so dense—mighty—palpable—that it cannot be played with as it can in Greece and in Italy, during the time when people can work in those countries. In the months when a vertical sun sheds a semi-tropical ray, no one *does* work there, or work, at least, in the heat of the day. The summer was the seed-time of Greek art. Then by shady stream, or dark cliff overhanging the blue sea and golden sand, as on the more public occasions of the great sacred games, the artist caught those glimpses of the unclothed form, in its natural grace of proportion and elegance of motion, which were reproduced in his finest works. Sculpture, in a country that has no summer, or has only what English people call a summer, must be a starved and stunted art.

But in Egypt, heat and shade are too decided either to allow of such instruction to the artist, or to teach him to deal with shadow as his great *organon*. Colossal magnitude was the grand means by which the Egyptian sculptors sought to affect the imagination. Shadow, indeed, there was, vast and pronounced, as that which the mighty figures of Memnon and his companion cast for furlongs over the sands. But it was a shadow like that of a rock; not like the dancing network of shade thrown by a forest. At the same time, in those magnificent portrait statues which, as portraits, vie even with the excellence of this branch of Roman art, while, as massive monuments, they are worthy of note even in the land of the Pyramids, we have the effect of the natural illumination under which men ordinarily live and move. The Egyptian artist has not enslaved shadow as his workman, but he has never, like modern workers, allowed it to distort and deface his work.

To the student of more recent art, the magical effects which Michelangelo knew how to produce by the disposal of shadow, will at once occur. It is the finest characteristic of his sculpture. It consists with the gloomy, grand, stormy, aspect of his mind. In the Medicean Chapel, the vast forms of day and night, of morning and evening twilight, seem almost spiritual and unsubstantial, from the well-directed shade. And to the central figure of the whole wonderful mausoleum, the seated form of Lorenzo de' Medici, the shadow of his helmet gives a ghastly life that seems to have stepped back from beyond the tomb.

In such a work as the Medicean Chapel, however, the sculptor disposed of the appliances of the architect. Thus in the brooding figure beneath the casque, we have more than sculptural shadow, we have pictorial shade. Something of the magic of aerial perspective is cast over the pensive face; and we seem not so much in the presence of a statue as of a ghost. Wonderfully powerful as is the effect, it is due to a combination of causes, in which, it is true, definite illumination holds the first rank. But the difference between those sharp shadows which define form, of which we have been speaking, and the diffused shade that obscures it, is marked. In the mouth of Mrs. Nightingale, in the monument by Roubiliac in Westminster Abbey, and again in that of the Newton, by the same sculptor, at Cambridge, the effect of a definite, contained, shadow is most remarkable. The study of these very different monuments brings into strong relief the difference between shadow and shade.

We have recently had occasion to remark how one of the main defects of a photographic portrait is the deep black stain, into which the shadow of the upper lip is converted, by the camera. It must be remarked that this is not the sculptor's shadow,—that cast within the parting of the lips,—which is, in itself, of extreme physiognomical importance, as defining that tell-tale trait, the outline of the lip itself. It is a shade thrown not by, but on, the lip, and tends not to intensify, but to obliterate expression. So marked is this unfortunate peculiarity of the portraiture effected by the camera (when reduction is employed) that in some of those shadowy half-defined figures, by which certain photographers, in this country and in America, have pretended to fonn the very features of the spirits of the departed, the black stain, which tells of light reflected from a solid body, and not of the nature of phosphorescent illumination, at once betrays the imposture.

In passing from shadow to shade, we pass from the province of sculpture to that of painting. We do not deny the command of either effect to the sculptor, any more than to the painter; but to each should he first assigned the mastery of his proper method. The shade, of which the sculptor avails himself, is that of nature. It is determined chiefly by locality; but the shadows by which he defines the sharpest and most delicate modulations of a relief or a statue, are the very characters of his art, and are due, in about equal proportions, to the true conditions of accentuation and illumination.

In shade, on the other hand, we approach the province of colour, and enter into a wide field of considerations that form an important chapter in the philosophy of art, but which are foreign to the art of the sculptor.

We referred to the shade cast by the cornices of the Parthenon, on the sculptured groups in the pediment. In dealing with shadow, as one of the main elements of the effect of architectural detail, the architect has to contend with the difficulty of the never-ceasing movement of

the sun. The Greek architect learned how to meet that difficulty. He so sunk and undercut the recessed members of his mouldings, that they caught a shadow at every angle of illumination, and brought out the delicate details of their workmanship, by deep lines of shade, ruled by the sun, from whichever direction his rays were incident. This is a very instructive and a very beautiful contrast to the mode in which shadow is dealt with by sculptors. In ever varying illumination, the architect gives deep hollows that must ever contain shade. The sculptor, for a fixed incidence of light, produces the most beautiful effects by delicate traits, that would escape the eye if the incidence were altered. Each artist deals with shadow as a most effective element of beauty; but each deals with it in the manner special and proper to his art.

"THE COMPLETION OF ST. PAUL'S."

THE October Number of *The Quarterly Review* contains an article under this head which will excite much anger. Written possibly by more than one hand, it includes truth and falsehood, justice and injustice. In abuse of modern English architects, it even outdoes a recent article in the same journal; and so, from the want of qualification and discrimination, overshoots its mark. In respect of the present system of art-manufacture and the destruction of individuality in the artist, the writer adopts the views we have set forth on several occasions. We may have occasion to return to the article, and in the meanwhile reprint its conclusion:—

"The Committee and the Dean and Chapter would be well advised to undertake first those works that would be most obvious and satisfactory to the greatest number, and at the same time most beneficial to the building; and if the exterior and interior are made properly approachable, and cleaned, and lighted, much will be gained for further operations. Then, secondly, the interior might be made suitable for the future work of the cathedral; and, thirdly, Wren's suggestions for the decoration of the dome and ceiling should respectfully be followed. The inlaid marble work is no affair of Wren's; it would be entirely inartistic, and worse than a waste of money. Were there no pilasters or 'Orders,' the plain walling might with propriety be decorated with a veneer of colour, a sort of large-patterned mosaic; but in St. Paul's the parti-coloured marble panels and pilasters would be a feeble imitation of the low-bred extravagance displayed by the more disreputable Papal families at Rome. At St. Peter's, the marble work and gilding impart a fuller idea of sumptuousness than Wren ever thought of for St. Paul's, and make the interior look like a splendid vestibule for a huge palace. It is not simple but imposing, and addresses itself to the low and worldly rather than to the more lofty and pure-minded portion of mankind. St. Paul's 'wants light' more than colour; and the effect of coloured marbles would be to damage rather than to glorify the church. Some slight panelling of colour might, perhaps, with great care be introduced; but the contrast between the piers and walling, and the rich but—emphatically—not heavy ceiling should be well maintained. The floor should be of marble; dark, to give solidity to the building, mixed with verd antique, that the cool colour may by contrast make the walls look warm, and highly polished to reflect the light. A building such as this requires different treatment from the choir at Chichester. The stained glass, home and foreign, at St. Paul's is of various qualities and styles, but all alike abominable, and should be promptly sold to any bidder. We would advise advertisements to speculating builders. This glass is another evidence of the absurdity of entrusting decorative work to distant manufacturers. The workmanship and material of Munich glass are excellent, but its principle is all erroneous, and its use entirely without appropriateness or artistic sense. We find stained glass used daily throughout England and the Continent, without the least regard for decency or fitness, till our churches have expressive rivals in the class of showily-dressed women, or disreputable-looking and bedizened scullery-maids. St. Paul's wants no stained glass; it has no 'storied windows.' The 'dim religious light' does very well as a poetic phrase, but it is nothing more. Windows were evidently *storied*, that in spite of all the 'richness' the light might not be dim. King's College Chapel is light enough, but, we apprehend, not therefore ireligious. Wren did not design St. Paul's for

* See p. 797, ante.

tained glass, and if Wren's intentions are to be regarded, then stained glass is out of the question. The building is entirely unsuited for it, and fit for the building. The present light is insufficient, and all that can be gained will not be more than enough. The walls are thick, and the piers large and obstructive, so that the windows are not obvious at a glance, but are only visible in small groups, or one by one. Thus there can be no general effect of colour from the windows in conjunction with ample light, as in a Gothic building like the Chapel at 'King's,' but only a very stupid observation, with no religion in it, and some isolated and entirely incongruous patches of colour. Great men are not always wise, and can afford to learn: let the Committee remember St. Michael's, Cornhill. The glass, then, should be white, as at St. Peter's, or very lightly flecked with colour, to neutralise the dirty tone of atmosphere and light; the glazing delicately fine, with narrow bars, but the panes of large, in order to avoid the drawing-room effect of modern churches of the Italian style. When all the childishness and fanciful profanity that assumes the name of 'Christian Art,' should be quite cleared away, and carefully excluded from the church. We need not spend our time upon 'Deum' puzzles, or make playthings of the emblems of the Passion, and then, like the Worcester's Chapel critic, become 'impressed' by them, or seriously play the fool with all the calendar. No man of any genius or power could degrade himself by taking any part in any 'eccelesiastical' imposture, or so deliberately ride with the childish public. That was not Giotto's way, nor Buonarroti's. Their art was certainly not 'eccelesiastical,' but manly, dignified, progressive, original, and true, and also appropriate to the 'Sistine' and 'Arena' chapels; there no stained glass obscures the necessary light, and there are no obtrusive 'Orders,' but the paintings are the decoration of the buildings. When we produce a Giotto or Massaccio, and have sufficient knowledge and artistic sense to lead him out, by all means let us seize him, shut him up in the cathedral, cut away all the 'Orders,' Wren notwithstanding, and let him glorify the building in a way not 'eccelesiastical,' but human and divine,—a way that Wren himself had no conception of. Such men may be, perhaps, found among us. They are really wanted, but not certainly until we have considerably got beyond the people who call tenth-rate 'architects' and decorators men of eminence, or who declare that the 'eccelesiastical element' is wanted at St. Paul's. It is remarkable that at its stage of architectural depravity we should be unable to supplement its weakness by any other art. The figure carvings at St. Paul's do not afford us hope; they are, in fact, a group of national 'ex-votos,' with all the hideous deformity and bad taste that are the special characteristics of such 'thankful' and 'memorial' displays; and of the paintings that were shown this year, the most attractive seemed to be those that exhibited the abject combination of man-millinery with knack and greed; but of the dignity and power of mind that indicate the artist, and would be worthy to adorn a Christian church, not the least evidence.

The duty of the Committee is certainly a difficult one. They have to satisfy the public, whose intense ignorance must be beguiled by some name with which they may have that familiarity which is a substitute for confidence, and they have unfortunately taken to voting, if course, there must be two parties, and those who are best informed will perhaps, when judgments differ, be most decided in their views and advocacy, so that the wavering balance of decision remains with the less instructed or determined men. We are stating now the rule without any reference to the actual fact in the present case. But we may ask the several members of the Committee whether they are each of them ready to undertake the responsibility of a decision; or, putting the question less *à bonhomie*, whether they are prepared to intrust to any other member? For, after this voting method, St. Paul's may at any time be at the mercy of some gentleman whose opinion on the subject in question may be entirely valueless. In such cases, the result is almost always a mixture; and then all handily admit that, though there is a public injury, it is done in the most excellent and equitable way, and that, after all, it is the principal thing. Trial by jury is the British nostrum, but the true specific is the judge, the learned and life-long practitioner of the law, and he directs the jury; he is not a mere copyist or transcriber of old forms, but has

personally practised long, a thorough working man, under the supervision of accomplished able men,—not *connoisseurs*, with anxious clients and astute attorneys, not a dull public or spasmodic clergy, looking on. So when the Dean tells us that 'we can judge' on Mr. Burges producing his designs, we must respectfully demur. There may be a decision, as is the manner of committees, anticipating or avoiding judgment; and this is headlong folly. But 'wisdom dwells with prudence to find out knowledge of skilful plans,' and the true method of such wisdom is not difficult to find. Let us listen to 'Socrates':— 'When the assembly meets to elect a physician or a shipwright, or any other craftsman (artist), will the rhetorician (cleric or *connoisseur*) be taken into counsel? Surely not. For at every election he ought to be chosen who has the greatest skill; and again when walls have to be built, for barbers or docks to be constructed, not the rhetorician, but the *master workman* will advise.* The Master of Balliol has not overlooked the value of the word *apricotisme*, 'master workman,'—not 'architects,' as we call our drawing-masters, who are not master workmen at all. So here we find that the Greeks, avoiding the rhetoricians (committee-men), went direct to the craftsmen whose work Mr. Burges has actually 'studied at Athens.' Let the St. Paul's Committee also go to the 'master workman,' and leave Mr. Burges to resume his studies at Athens.

Then, with reference to the qualifications of those entrusted with great public works, again let us hear 'Socrates':— 'Well, then, if you and I, Callicles, were engaged in the administration of political affairs, and were advising one another to undertake some public work, such as walls, docks, or temples of the largest size,—ought we not to examine ourselves, first, as to whether we know or do not know the art of building, and who taught us? Would not that be necessary, Callicles? Cal. (and the St. Paul's Committee). 'True.' Soc. 'In the second place, we should have to consider whether we have constructed any private house, either of our own or for our friends, and whether this building was a success or not. And if upon consideration we found that we had had good and eminent masters, and had been successful in building, not only with their assistance, but without them by our own unaided skill, in that case prudence would not dissuade us from proceeding to the construction of public works. But if we had no master to show, and no building, or many which were of no worth, then surely it would be ridiculous in us to attempt public works, or to advise one another to undertake them. Is not this true? Cal. (and the Committee of St. Paul's). 'Certainly.'†

One word more for ourselves: 'And now by the god of friendship, I must beg you, Callicles, not to jest, or to imagine that I am jesting, with you; for you will observe that we are arguing about the way of human life, and what can be more serious than this to a man that has any sense at all?'

DISTRICT SURVEYORS AND RUINOUS BUILDINGS.

At the meeting of the Metropolitan Board of Works held last week, a discussion ensued as to the fees allowed to district surveyors in respect of dangerous buildings.

Mr. Newton said, a widow in his parish called upon him and stated that she had been asked to pay 1l. 15s. in respect of two houses which were reported to be dangerous, and that by an expenditure of 12s. on each she had put those dangerous structures into a condition that was satisfactory to the officers of the Board. He gave this as her statement, without vouching for the correctness of it; but if this went on, the Board need not wonder that there were serious complaints of the extortionate claims for fees. He thought it should be referred to the Building Act or some other committee to see whether the matter should remain in the hands of the district surveyors.

Mr. Richardson is reported to have said he was not at all surprised at the remarks Mr. Newton had made, because there were many cases of the same kind, yet it was impossible to prevent them. When a surveyor examined premises to see whether they were dangerous, he charged 10s. 6d. for his visit, and if there were two houses together, he charged 10s. 6d.

for each house. There were instances of an examination being made of a coping where there were five houses together, and he had 10s. 6d. from each house, although there was only one visit. Then, if the parties did not immediately attend to the notice sent them that the structure was dangerous, fresh charges came upon them. The surveyor went to see whether the work was done, and there was another half-guinea. He had known cases in which, although the repair had not cost 5s., a man had been obliged to pay 35s. for fees, owing, in a great measure, to his own neglect. The smallest charge, he thought, was 15s. 6d., the charge of the surveyor, and 5s. for office expenses, although that 15s. 6d. might not cost the party 2s. 6d. in repairs. He did not know whether this arose from the Act of Parliament or from some bye-law of the Board.

The last speaker, if correctly reported, is in error in saying the district surveyor charges 10s. 6d. for a visit. He makes no charge at all in such cases,—has no control over the charge,—but simply accepts whatever fee the Metropolitan Board in each separate matter awards him. In most cases these prove far from remunerative. The district surveyors often spend much time in endeavours to induce owners to repair dangerous structures without invoking the interference of the Board, and nearly as often without effect. The widow's case mentioned by Mr. Newton by no means proves overcharge on the part of the Board. The amount of costs has no relation whatever to the extent of the work required to be done to protect the public. To obtain the removal of a dozen loose bricks, the fall of which would kill a man if he happened to be in the right place, might entail costs to the extent of say 30s. The fact that the bricks might be removed for 5s. would be no proof that the costs were excessive. The possible value of the man saved would have to be considered.

CHURCH ARCHITECTURE AT THE CHURCH CONGRESS.

DURING the recent Congress at Leeds an evening meeting in the Theatre of the Mechanics' Institution was devoted to the consideration of church architecture, when two papers were read. The first was by

Mr. G. G. Scott, jun., who dwelt chiefly on the desirability of building larger churches than are now generally erected:— 'The churches they built in their towns, he said, were founded too generally on the type of the Mediaeval village churches. They had the look of small designs done large, and there seemed to be a want of dignity even where the scale would admit of it. Several causes contributed to bring about this unsatisfactory state of things. The smallness of their ancient churches was due, no doubt, to the fact that in the large towns there was, if not a cathedral, some great monastic church, to which the small churches were practically chapels of ease. Thus the smallness of their churches was due to tradition. He could not but think, although it was almost heresy to say so, that subdivision of parishes had been carried too far. They had pushed the parochial system to extremes. Everywhere they saw little churches, little parsonages, and little schools, where, to meet the wants of the day, large churches and numerous clergy were required. He did not think that among the causes of the present poor character of our churches was niggardliness. There was plenty of generosity, but it should be borne in mind that a district possessing many thousand souls needed corresponding adjustment. If a church was viewed as God's house, and was erected for a high purpose, it never failed to meet with support. It was bad policy to content themselves with such small buildings as they were now in the habit of erecting. If the object was to provide private places, where respectable people might pay their Sunday tribute to propriety, well and good; but he maintained that such a building partook of the character of a semi-detached villa. If the poor and the artisans of our land were to be considered they would provide a totally different kind of building. Men and women of different classes of society would never meet in any church which lacked accommodation or plenty of elbow-room. In foreign churches the poor and rich worshipped together, simply because the buildings were large enough. It was only in large buildings that persons of all classes could be brought together with mutual satisfaction. Small churches would always be monopolised by the respectable classes. In

* Plato: 'Gorgias,' p. 455 B.

† Ibid., p. 514 A—D.

foreign churches this monopoly did not exist. The churches there were essentially public places of worship, and until this feeling extended to our own churches our national churches would never be the churches of the nation. He was not asking for the erection of grand and stately buildings of Medieval architecture, but that their churches should be on the scale of their factories, town-halls, and railway stations. He believed they would have no difficulty in erecting churches imposing from their size alone. A large parish, with a large church and a numerous staff of clergy, fed by mission chapels, would be far more efficient than the present system. It should specially be kept in view that the interior of a church was of more importance than the exterior. The exterior was sure to give a certain dignity from its dimensions. The Roman Catholic Cathedral at Birmingham was a building in point, harmonising and yet contrasting with the surrounding buildings. It was essential that they should economise in the erection of their churches. This could be done to a great extent by having little street frontage, a plan pursued very generally in erecting Italian churches. In other cases the tower of the church might stand to the street front, with the church behind; and by this plan funds otherwise spent in acquiring an available street frontage could be used for purposes of general dimensions. They should not, in the planning of their churches, blindly follow Medieval precedents, but consider their own requirements. The whole area of nave, transepts, aisles, and chantry chapels filled with pews, presented to his mind a most unsatisfactory effect. Their wants were not the same as their forefathers'. They must look less to the form and more to the principles, and not produce buildings which might have been built for the Middle Ages, but which the builders of the Middle Ages might have built for the present day. What they needed was large space, where all might see and hear when in the church. Whilst on the subject of plan, he might observe that the chancel arches might be dispensed with, and it would be better to fence off the choir with screens.

Mr. J. P. Seddon, in the course of a paper read by him, said:—The standpoint that we have attained is, a fair acquaintance with the spirit of Gothic, as well as a tolerable familiarity with its details; we have, in fact, learned to read and spell in it; and the question now is, how, as authors, we ought to say that which is to be said in each particular case. Hitherto, it must be owned, we have been too much of copyists after the Chinese fashion, imitating even flaws. Our models having become reduced to mere empty shells, shorn of furniture and decoration, we have taken their poverty for purity, and their bareness for purposed design. If we would sum up what has been effected, allowing for exceptions, we have built a multitude of churches, the vast majority of which would be best described in the language of passports, as having naves ordinary, aisles ordinary, chancels ordinary, towers and spires most ordinary, and so on. We reckon up the capitals carved after every plant in the hedge-rows, the windows dyed with all the tints both in and out of the rainbow, the marble shafts to pulpits and fonts, and the number of yards of encaustic pavement, as if a collection of things indifferent could make a satisfactory whole. Perhaps till we learn to measure art by merit, and not by superficies, it is as well that our church interiors have bare walls and some plain glazing left. But it is sad to reflect that these many years of church building and restoration have done so little towards raising up a school of decorative artists, that art-workmen generally are a myth, and that an expenditure of millions has not given us as many works of real high art in our churches as might be counted on one's fingers. Now that funds are forthcoming for the decoration of St. Paul's Cathedral, a difficulty arises in finding hands to execute it, since our many able painters have, from sheer want of encouragement, devoted all their energies to another branch of their art, which seems absolutely to snuff them for this. It would, in speaking thus, be unjust not to mention the isolated examples of artists of high eminence who have lent their great talents to this decorative work with more or less success,—such as Mr. L'Estrange and Mr. Gambier Parry for the roof of Ely Cathedral; Dante Gabriel Rossetti for the reredos of Llandaff Cathedral; and in connexion with E. Burne Jones and Ford Madox Brown, on the able glass paintings of the firm of Messrs. Morris, Marshall, & Co., Mr. Leighton at Lyndhurst Church, and Messrs.

Watts and Cave Thomas, &c., elsewhere. Turning now as I must to the few experiments my limited opportunities have afforded me to put principles into practice, with painful consciousness of their openness to criticism, I proceed to explain what those principles are. In the first place, much greater scale than usual seems needed for churches in large towns. It would be cheaper to build a few of noble size than many inferior ones, and the former would be far more impressive. If churches are to maintain dignity as compared with secular buildings, they want greater height, having to stand amid many-storied houses. As to area, too, they are now very much pinched, and the sight of a congregation issuing in rain, donning cloaks and unfurling umbrellas while hustled in a crowd, is ignominious. What it would be in case of fire may be conceived. Ample space in the approach, as common in German churches, would be both a useful and dignified addition. Within doors it would be well that there should be room, beyond what is occupied for seats and necessary for passages. Vestries for clergy and choir should not be mere closets; and if at the western end, instead of, as usual, at the east, a more direct and wider processional path would be obtained. A different arrangement of plan, consequent upon change of ritual, seems desirable in town and large churches, though, perhaps, for small country ones there is no such need. The division into nave and aisles has lost its original use and significance, and the columns it entails cause inconvenience to many in a large congregation. The desirability that as many as possible should see the single altar, and that all should hear both service and sermon, calls for altered treatment of the body of such churches. I assume that the entire accommodation is on the ground floor; for, although galleries could be treated, as in many German churches, with excellent architectural effect, they are quite inadmissible, as opposed to the proper ideal of Anglican worship. There are, however, limits to the size of the single unobstructed hall that would best meet the demand. Its width calls for corresponding height, for the sake of proportion. This is a desideratum to towns, but costly, and, as economy has usually to be studied, it would necessitate sacrifice of other features and in character of material. Brick, however, may well be used for stone and ornament eschewed to gain that effect which scale alone can achieve. One rule of the Incorporated Church Building Society, which restricts the width of naves to about 24 ft., would have to be honoured rather in the breach than in the observance. It has recently been waived at my application. Modern science and appliances may well be called upon to do what has been done before, and precedents, if needed, are not far to seek.

I can only touch further upon a few points connected with the treatment of such buildings as instances in which the last suggestion may be carried out. Instead of making nave and chancel separate, and each too short for effect, one continuous roof covering both is preferable, and the very considerable sum that the arch and wall of division would cost would be far more effectively spent upon an open screen, which might bear paintings, such as render many ancient ones in Norfolk rich treasures of art. Towers and spires,—weaknesses of the age, without which no committee would think the most ordinary class of church complete,—were better omitted, unless worthier far than scores or so of the numbers that have been erected, and to compass which most modern churches have been starved in other respects. Built usually as mere ornaments, irrespective of bells, a good peal of which would rock one-half into mists, they hardly rise above the adjoining roofs, and do not generally even clear the structure to which they are attached, so as, like old ones, to send forth, all around, the music of their bells. Let us have towers and spires, too, when they can be really fine ones, and well furnished with good bells; otherwise, let us be content with more modest turrets, the best of their respective kinds. Within the walls, in place of profusion of indifferent ornaments, let each church be the shrine of some one jewel of art, at least, that it might thus be worth the pilgrimage of those who now must seek such abroad,—not that churches should be turned into mere picture-galleries or museums. I wish that they were made less so than they are by the enterprising so-called art-manufacturers of the day; but they were once the Bibles of the poor, and their influence as such was great. It is a mistake to think that this office of theirs has

been superseded, although we have now the written Scriptures in every hand. The church should make use of all means of driving home to the hearts of men the great truths it is commissioned to preach, and in art it might still find a most able assistant. But the art I mean is not the architectural millinery which is now too often made to stand duty as for such. To be plain, the general conception of church decoration of the present day is an erroneous one; and we have often reason to be thankful for the prudery which makes it a sin to look at it when we are assembled for prayers, and for the heedlessness which prevents our doing so afterwards. Scant minutes only are fortunately allowed adventurous strangers, at the close of service, to peep through the chancel screen, if there be no distinction in design between the finery of tiles in the reredos and on the floor, and if it be but the gloss of mosaic that has been substituted for the former. The decoration of the church should be other than we usually find it. If its children ask for artistic bread, it is hard to give them fantastic diagrams of coloured stone instead. A better intellectual feast is needed than a bizarre medley of coloured bricks, or even a few panels of carving with figures of the size and with the expression of dolls, and smothered amid crocketed canopies, supported on twisted columns, and studded with agate balls. If our church-doors were not shut out of service time, what valuable aids to education might not their walls be made! We blame the poor for dulness of apprehension, but do little to enlighten them. Our own houses are closed to them, and the art provided for their cottages is but pet dogs and bad lithographs. Suppose, however, our churches were common withdrawing-rooms, stored with works of sacred art, leaving the secular to grace museums, such might be studied as pictures now are without the distraction caused by other objects competing with them for attention, and in peace and quietness. Surely here is an element of influence well worth cultivation. Donors would be more ready to give, and more careful as to what they gave, if they thought that their gifts would be looked at with other than sidelong repented glances. A higher style of art would be encouraged than the *tableaux d'genre* which artists are now doomed to paint since private houses alone receive their works. Art would be appreciated more than now when it can only be seen in monster collections, where the gilt frames jostle each other, and spectators are dazzled by the crowd of incongruous objects and people would find out that it had a tale to tell, and that that should be both worth telling and worthily told the church could and should ensure.

NEW SCHOOL BUILDINGS IN HOLBORN.

A SPACIOUS block of school buildings has just been erected close to Red Lion-square, Holborn, which are in connexion with the intended new church of St. John the Evangelist, about to be built in the immediate neighbourhood. The new schools, which will be completed and opened about a fortnight, are situated at the corner of Kingsgate-street and Fisher-street, close to Kingsgate-street Baptist Chapel, with entrances from each of the two streets named. The Kingsgate-street frontage is 72 ft. in length, and the depth into Fisher-street is about 40 ft. The height of the building from the street-level to the cornice is 48 ft., the roof being carried up to an additional height of 14 ft., and over the roof there is a belfry. The structure is built of yellow stock brick, with red brick and stone dressings. The brick bands being carried along the building at the bottom of the first and second story windows. The ground-floor and first story in Kingsgate-street have very lofty windows, three of those in each of the stories being double, whilst those at the south end are triplets. The windows in the Fisher-street frontage are similar in form. The second-story windows are also double and triplet, but oblong in form. The building contains three spacious school-rooms, with two class-rooms to each. They are 15 ft. in height, and including the class-rooms, 68 ft. in length, and about 36 ft. in width. The ground-floor is intended for an infants' school, and the first and second floors for girls and boys respectively. The estimated cost of the schools is a little more than 4,000l., which has in part been supplied through a Government grant, the remaining portion having been raised by subscription. Messrs. Young & Tasker, of Furnival's Inn, are the architects, and Messrs. Henning & Son, of Chiswick, the contractors.

THE DAVY MONUMENT.

A MEMORIAL of Sir Humphry Davy, erected in Penzance, opposite the Post and Telegraph offices, has been unveiled by the mayor. The pedestal rests on a base of unwrought granite, 10 ft. square, consisting of four blocks, each weighing over 8 tons. The pedestal itself is of blue Lamorna granite. The shaft consists of one block, 8 ft. square, 2 ft. 4 in. high, and weighs over 11 tons. The plinth is of one block, 5 ft. 4 in. square, 2 ft. 4 in. high, and weighs 5 tons. On it is placed the disc, one stone, 4 ft. square, 1 ft. high, in the centre of the front face of which the name of the great Cornishman, Davy, is cut in relief. This is surmounted by the cornice, formed of one stone, 5 ft. 6 in. square, 1 in. thick. The mouldings of the cornice are finely cut, and show the capabilities of the Cornish granite to receive delicate work. On the cornice rest six blocks to receive the figure. The weight of the base and pedestal is about 60 tons. The statue of Davy is well executed. One of his most useful works of his valuable life is embodied by a model of the safety-lamp, which he holds in his right hand. The figure is 8 ft. 6 in. high.

The erection of this monument is mainly due to the energy and perseverance of some working men of Penzance, conspicuous amongst whom is Mr. John May, who for many years has devoted himself to its accomplishment.

The sculptors are Messrs. W. & T. Davids, of London; the contractors, Messrs. Freeman & Co., of Penzance and Penryn; and the architects, Messrs. Tronson & Son, of Penzance.

THE CORNWALL MINERAL RAILWAY.

SIR SAMUEL MORTON PERO, the contractor for the Cornwall Mineral Railway, is giving employment to several hundreds of artisans, and last week he advertised for an additional number. It appears that there is now great activity on this and other mineral railway works now in progress in Cornwall, and that for the next eighteen months there will be constant employment for a large number of artisans on twenty-seven miles of new work, and twenty miles of building on the Cornwall Mineral Railways, the principal works on which are now in hand. The construction of the Lidford section of the Devon and Cornwall Railway works is one of the works in progress.

CAMBRIDGE HALL, SOUTHPORT.

The foundation-stone of the new building to be erected at Cambridge Hall has been laid by the Princess Mary of Cambridge, who was accompanied by her husband, the Prince of Teck. The new structure is in immediate continuity with the old town-hall, and will when completed, add materially to the convenience of the town and corporation. The design was submitted to public competition, and the prize of fifty guineas was ultimately awarded to Messrs. Maxwell & Clarke. In an architectural point of view the building, according to the design chosen, will be treated in the Free Italian style, but it is intended to subject the drawing which has been in circulation to considerable alteration. One-half of the ground-floor will be devoted to a new post-office. The remainder of the lower story will consist of two large dining-rooms and various retiring apartments. Upstairs will be the new assembly-room, designed to accommodate 1,500 people, and to supply a want which has long been felt in this fashionable place of resort. Externally the structure is to have a colonnaded front, and over that a balcony ranging along the entire extent of a carriage-porch beneath. The present assembly-room is only capable of accommodating from 500 to 600 people, and the advantages of the new hall, of more extensive proportions, combined with increased post-office accommodation, are recognised in Southport as matter of public congratulation. The estimated cost of the building is £40,000.

After the laying of the foundation stone, a banquet was given at the townhall.

In the mayor's address to the Princess and Princess, at the laying of the stone, he said, in reference to Southport,—"The pier they would see that day was open to the public, and was built at a cost of from 40,000l. to 50,000l. They were now extending the promenade, so that there

should be a carriage-way which could not be excelled in any other part of the kingdom. They had an asphalted drive reaching for nearly eight miles in the borough and in Birkdale. The improvements in the town had also been extended; they had new boulevards and other works which would enhance the beauty of the place, and they hoped would increase the number of people who came to enjoy the salubrious air of this healthy part of Lancashire. They had a park second to none in the country, extending over thirty acres, which was presented to them by their worthy rector. A system of tramways was about to be laid down at a cost of about 20,000l. The gas-works were about to be removed two miles from the town, so that they might have neither smoke, smell, nor anything which could annoy any one. In the midst of all this their town was prospering. Last, but not least, it was proposed to form a winter garden for the aged and invalid, at a cost of some 50,000l., and nothing smaller than the Crystal Palace would approach it. There was excellent accommodation for travellers, and excellent accommodation in the shape of churches and chapels. Southport is evidently moving.

OPENING ST. PAUL'S CHURCHYARD.

ACCORDING to the daily papers it is now arranged that the dwarf wall of stone which surrounds the cathedral facing Ludgate-hill, with the iron railings with which it is crowned, shall be removed as far as the north-west and south-west corners of the fabric itself, and that the entire area or courtyard, in the centre of which stands the statue of Queen Anne, shall be thrown open to the bottom of the steps which lead up to the great western door. These steps will be newly faced or cased, and nearly on the lowest step will be an iron railing, which will not be seen at all by day, but will be raised up at night, fall by machinery somewhat analogous to that now used for raising iron window-shutters from below. This change has been conclusively arranged in consideration of a money payment from the City to the Cathedral body. We hope this statement is correct. When the matter was discussed by the late Dean and a committee of advice from the Royal Institute of Architects, the boundary talked of was a little west of the statue. We have our fears about the winding-up machinery; but the arrangement is in perfectly good hands, and will doubtless come right.

EFFECT OF LIGHT ON GLASS.

THAT the colour of glass is affected by long exposure to light is well known: the violet tinge which the window-panes in some of the older houses in London have assumed has been often commented on.

At the last meeting of the British Association, Mr. Gaffield, an American, brought forward the results of a long course of experiments extending over a period of nine years, and embracing eighty different kinds of glass, of English, American, French, Belgian, and German manufacture, of rough and polished plate, crown, and sheet window-glass, of flint and crown optical glass, of coloured pot-metal, and of flashed and stained glass of various colours. The changes in the colourless glass were from white to yellow, from a greenish colour to a yellowish green, from brownish yellow to purple, from greenish white to bluish white, and from bluish white to a darker blue. By the colours of colourless glass was meant those faint tinges of colour that were seen by looking through the edges of the glass. In his first experiments of a few months, Mr. Gaffield found only a slight change in a specimen of purple pot-metal. A subsequent experiment, continued for five years with red, yellow, blue, and purple glass, produced no change in any pot-metal except purple. A change was observed in the colourless body of some of the flashed and stained specimens; a yellow or purple tint was produced when the colourless body was uppermost, and also when the coloured surface met the sun's rays, and transmitted them at different degrees to the colourless body beneath. Among the changes that took place, glass of an amber colour became of a rose tint. As glass of this latter kind was used in the painted glass windows of the past ages, this series of experiments may be considered as an important aid in solving the question of the alleged superiority of the old cathedral window glass, which it is not impro-

vable has been much modified in respect of tint by the sun acting on it for centuries. A curious fact was mentioned in connexion with this discoloration of glass, namely, that no matter how deeply it became stained or discoloured by light, it can be restored to its original colour by being exposed to the heat of the glass-stainer's kiln for a short time. The cause of the change is thought to be found in the peroxide of manganese, long used as an ingredient in glass-making.

RAMSGATE.

THE sewerage of this favourite watering-place is now being actively pushed forward, with the view of having the whole town sewered before the influx of visitors next year. The storm waters are being carried by a separate system into a tunnel, 5 ft. 9 in. diameter, the outfall of which is under the West Cliff. This separation has been adopted to prevent the recurrence of the inundation which took place last July, when the main streets of the town were 1 ft. deep in water. A new sea-wall, for the protection of the West Cliff promenade, is nearly completed. These works are being carried out by Mr. E. Ellice-Clark.

BELFAST ARCHITECTURAL ASSOCIATION.

ON the 14th inst., a meeting was held in Messrs. Young & Mackenzie's office, Calender-street, for the purpose of forming an architectural association for Belfast. Mr. John Lanyon, architect, occupied the chair. There was a large attendance of those connected with the profession.

Resolutions were unanimously passed approving of the formation of such a society, and a committee was appointed, with Mr. R. Young, jun., as secretary, for the purpose of framing a set of rules and arranging for future meetings.

Much interest was evinced by those present in the objects of the association.

SCHOOL BOARDS.

Ipswich.—The Wherstead-road School Committee reported as follows:—"The committee having conferred with Mr. Butterworth, the architect, recommended that the tender of Messrs. Gibbons be accepted for the erection of schools in the Wherstead-road; that the contract be prepared by Mr. Butterworth; and that six months from the date of the notification of the acceptance of the tender be allowed to the builders, subject to an extension of time if the architect certifies that the delay is caused by weather; and that the plans and specifications be returned to the department with form No. 7 filled up for their confirmation." Considerable conversation followed, from which it appeared that Messrs. Gibbons had originally asked nine months for the completion of the building, and on being told that the Board considered it too long, urged that possibly the frost might prevent their working, and being under a penalty of 10l. for every week over the time allowed, they could not reduce the time. To meet this objection Mr. Butterworth, the architect, had drawn out a weather clause to insert in the contract. It provided that the walls should be finished in three months, the roof on in four months, and the buildings ready for occupation in six months, and that in the event of the work being delayed by inclement weather or frost, an extension of time should be granted. At the suggestion of Mr. Westhorpe, a provision was added that the architect should be the judge of whether or not the inclemency of the weather was sufficient to delay the work. Mr. Christopher Gibbons attended, and expressed on behalf of his firm, his assent to the reduction of the time upon the insertion of the proposed weather clause; and also his assent to a similar provision with regard to the Argyle-street schools, as to which the committee reported as follows:—"The committee, having conferred with Mr. Eytton, the architect, recommended that the tender of Messrs. Gibbons & Co. for the erection of the Argyle schools, for the sum of 2,305l. he accepted, and that the contract be prepared by Mr. Eytton, and that six months from the date of the notification of the acceptance of the tender he allowed to the builders, subject to the same clause in regard to weather as in the Wherstead-road schools." The reports were each received and adopted.

The Chairman raised the question of the desirability of appointing a clerk of the works, as the Board would be building several schools, but at the suggestion of the Vice-Chairman the subject was deferred.

Nottingham.—A letter was read from the Education Department, by which the Department returned the plans for the alteration in the Bath-street schools. The Department considered that the arrangements in the boys' school were still unsatisfactory with regard to the desk and bench space. The document also stated that it would be desirable that the entrance to the school should be through the playground, and that the galleries and class-rooms should be placed at right angles with the windows. Messrs. Evans & Jelly, the architects, having been communicated with, wrote a letter to the effect that any further alterations would be injurious, and that an entrance to the playground would make it too much of a thoroughfare. The appearance of the building was improved by the present front.—Mr. Peret said the architects might have referred to the fact that it was not desirable to have an unnecessary expenditure of money.—Mr. Bentley said it was of very little use being careful over sixpence if you intended to spend 10,000. at last.

Gateshead.—The tenders for the erection of the Prior-street schools had been received, there being twelve contractors for the whole work, and twenty-one contractors for separate portions of the work, the amounts ranging from 7,000. to 8,900. The sub-committee had considered the whole of the tenders, and recommended that the tender of Mr. John Harrison for 7,000. be accepted. Mr. J. M. Redmayne moved that the committee's report be adopted, that the clerk apply to the Education Department to sanction it, and that steps be taken for the purpose of raising the money required.—The Chairman stated the entire cost would be 10,000., and in answer to Mr. Franco, said the last-mentioned sum would include the price of the land. The motion was unanimously carried.

Brierley Hill.—At an adjourned meeting of the Kingswinford School Board, the plans of Mr. Smith, of Stourbridge, architect, were chosen for the School Board school to be erected at Brierley Hill. Fifteen architects from various parts of the country submitted plans.

THE ANT NUISANCE.

Sir,—There is no remedy for the black ant, that I know of, at all comparable with powdered borax. I have often used this in America, where these insects are much more numerous and troublesome than in England, and they literally have always vanished. Once I have recommended it in England, and the result has been the same. ALFRED RIMMER.

TAKING UP my last week's *Builder*, I find your inquiry respecting the getting rid of that disagreeable pest, the black ant, and having succeeded myself, would advise you simply to shake down a dusting of "chloride of lime," near and about the runs of the insect. This you will find will obtain for you the desired result.

M. M.

THE "ANGEL" IMPROVEMENTS, CLERKENWELL.

THE scheme propounded by the Clerkenwell Vestry to enlarge the area at the "Angel" by removing the shops at the south corner of Goswell and City roads, which form a kind of neck to the City-road, and the whole cost to be paid out of the general rates, has virtually got the go-by from the Metropolitan Board of Works, who promise to take it along with a host of other mushroom schemes into consideration next July. The meaning of the resolution adopted by the Board is simply that the subject is shelved until Clerkenwell can undertake to pay half the cost, and then probably the superior Board will be prepared to treat with them, as the gain is wholly on one side. It would be a very desirable thing to widen the thoroughfare at that particular point, as both goods and passenger traffic are daily increasing, owing mainly to the rapid growth of Islington; but the difficulty is by no means insuperable, for if the tramway-cars and omnibuses be ordered to draw up beyond the narrow neck of road which does not extend more than 25 ft., no inconvenience will be felt, as the road suddenly widens, and is equal to all the traffic that passes during the day. The sewer-

committee of the Board of Works concurred in the opinion that a wider thoroughfare at that particular point was desirable; but it was so limited in extent, and the benefits to be derived from it being specially confined to one parish, they could not see their way to recommend it to be included in the list of metropolitan improvements. The vestry of Clerkenwell opposed the improvement, as being a metropolitan one, and refused to contribute towards it if adopted on payment of half the cost, on the ground that by the judicious arrangements of the two parishes the passenger traffic could be so diverted as to prevent delay in the transit of goods. Additional space will be given at that point by the removal of the Angel column clock in the course of next week, the vestry of Clerkenwell having ordered that it be taken away forthwith, so that every available inch of ground may be devoted to traffic. It may be urged, however, that the clock is a refuge in the midst of a crowded thoroughfare.

INCREASE OF HOUSES IN SOUTH LONDON.

AN official return which has just been issued, and already referred to by us, shows the immense expansion of the several metropolitan parishes, as indicated by the great increase of inhabited houses, during the last twenty years, or since the formation of the Metropolitan Board of Works in 1861. In no part of the metropolis has the increase of houses more strikingly manifested itself than in some of the districts south of the Thames. The increase in the number of dwellings in Wandsworth during the period in question amounts to no less than 130.55 per cent., the present number of houses in that parish, as shown by the return, being 19,091. According to the same return Camberwell had 17,755 houses at the end of the last official year in 1871, or an increase of 88.63 per cent.; Lambeth, 29,123 houses, or 42.43 per cent. increase; Bermondsey, 10,624 houses, or 51.61 per cent. increase; Rotherhithe, 3,934 houses, or 40.90 per cent.; and Newington, 12,545 houses, or 18.32 per cent. increase. It will thus be seen that during the two decades Wandsworth has more than doubled the number of its inhabited houses, and that the dwellings in Camberwell have increased in number almost to the same extent. It is not a little remarkable that within the same period the houses have decreased in some of the parishes in the district, notably in St. Olave's, in which the houses are reduced to 1,761 in number, showing a decrease of 33.79 per cent.; St. Saviour's also shows a decrease amounting to 23.75 per cent., the number of houses in the parish being 3,716 only; whilst in Southwark, which has now 6,903 houses, there has been a slight falling off, the decrease being 1.01 per cent. Amongst the causes which have contributed to this decrease in the three last-named parishes, the probability is that the absorption of dwellings by the railway companies may be regarded as one.

HORTON LANE CHAPEL, BRADFORD.

THIS building has been closed for three months, to allow of a thorough cleansing and decoration. The work is now finished. The walls have been painted in a quiet maize, the pilasters and finishings of the windows in stone colour, relieved by maroon bands. The columns supporting the arched ceiling are in green bronze, with gold introduced in the ornaments. The great cornice which runs round the building at the springing of the ceiling arch has been treated in cream colour, with ornamental panels between the carved trusses in gold colour, and the broad groundwork of the frieze in maroon. The arched ceiling is divided into panels, with centre decorations in each; the stiles or divisions between the panels in cream colour, and the panels themselves in French grey. At the intersections of the ribs of the ceilings are large pendants, which are brought out in maroon and gold. The gallery front is panelled, and filled with iron ornamental work, brought out and gilded. The windows all round the chapel, both on the ground and gallery floors, have margins in red coloured glass, with a white scroll pattern cut upon them. The general woodwork throughout preserves the natural colour of the wood, and is varnished. The organ is in the centre of the chapel, in a large recess behind the pulpit, with pilasters at the sides and angles. The pipes have been diapered in gold and maroon

upon a bronze-colour ground, and the woodwork relieved by maroon and gold. Considerable additions have been made in the heating power of the chapel, so as to bring it entirely under control, and preserve an equal temperature in all seasons.

The decoration has been carried out by Mr. Haley, under the direction of Messrs. Lockwood & Mawson, the architects of the building.

THE CHALLENGE. PRIZE OF THE NATIONAL MUSICAL UNION.

THE challenge-prize of the National Musical Union, value 1,000l., is now being manufactured by Messrs. Cox & Sons, of Southampton-street, Strand, who are making rapid progress with the work. The design was selected in open competition by Sir M. D. Wyatt and Professor E. J. Poynter, A.R.A., who acted as judges, and is by Mr. S. J. Nicholl, architect. It comprises a loving-cup, with a cover, resting on a platform and pedestal; the whole of silver-gilt, enriched with enamels, engravings, repoussé-work, pierced and flageooc work; a very important part of the decoration being shields suspended in an open arcade, and fixed in panels, to bear the devices and title of the successful societies, the society holding the cup having the place of honour in the crowning wreath. The pedestal has canopied niches, with statues of Guido Arefino, Palestrina, Handel, and Mozart; the base being 18 in. square; the whole rising to over 3 ft. in height. The design is of Medieval character. The following are the

INSCRIPTIONS:—

"Blest pair of sirens, pledges of heaven's joy,
Sphere-born, harmonious sisters,—Voice and Verse;
Wed your divine sounds, and mix'd powers employ;
Dead things, with unbreathed sense, able to pierce."
"Praise God in His holiness; praise Him in the firmament
of His power;
Praise Him in the sound of the trumpet;
Praise Him upon the lute and harp;
Praise Him in the symbols and dances; praise Him
upon the strings and pipes;
Let everything that hath breath praise the Lord."

HINDOO TEMPLE IN LONDON.

Sir,—I was much interested at observing amongst your miscellanea, at p. 813, a note to the effect that subscriptions are being taken up at Bombay, for the purpose of erecting a Hindoo temple in London. At first sight, this information will doubtless appear startling to many, yet upon second thoughts, when we remember that the natives of India are our fellow-subjects, and that in accordance with the spirit of toleration which allows Christian churches to be erected in Hindustan, it is only fair that Hindoo temples may be erected in Britain. I trust the intended temple will soon be a reality; and when such is the case, it is possible that the present popular ideas about the religion and worship of our Indian brethren will be considerably modified. W. P. BUCHANAN.

A CHIMNEY-PIECE.

IN designing the chimney-piece illustrated in the present number the desire of the architect was to harmonise the various coloured marbles used with the woodwork, so as to produce a rich effect. The chimney-piece is chiefly composed of Spanish Brocatello, with plinth and sunk panels of black and gold, the moulded bases being of green marble. The festoons, cartouches, and armorial bearings (the latter emblazoned) are white marble.

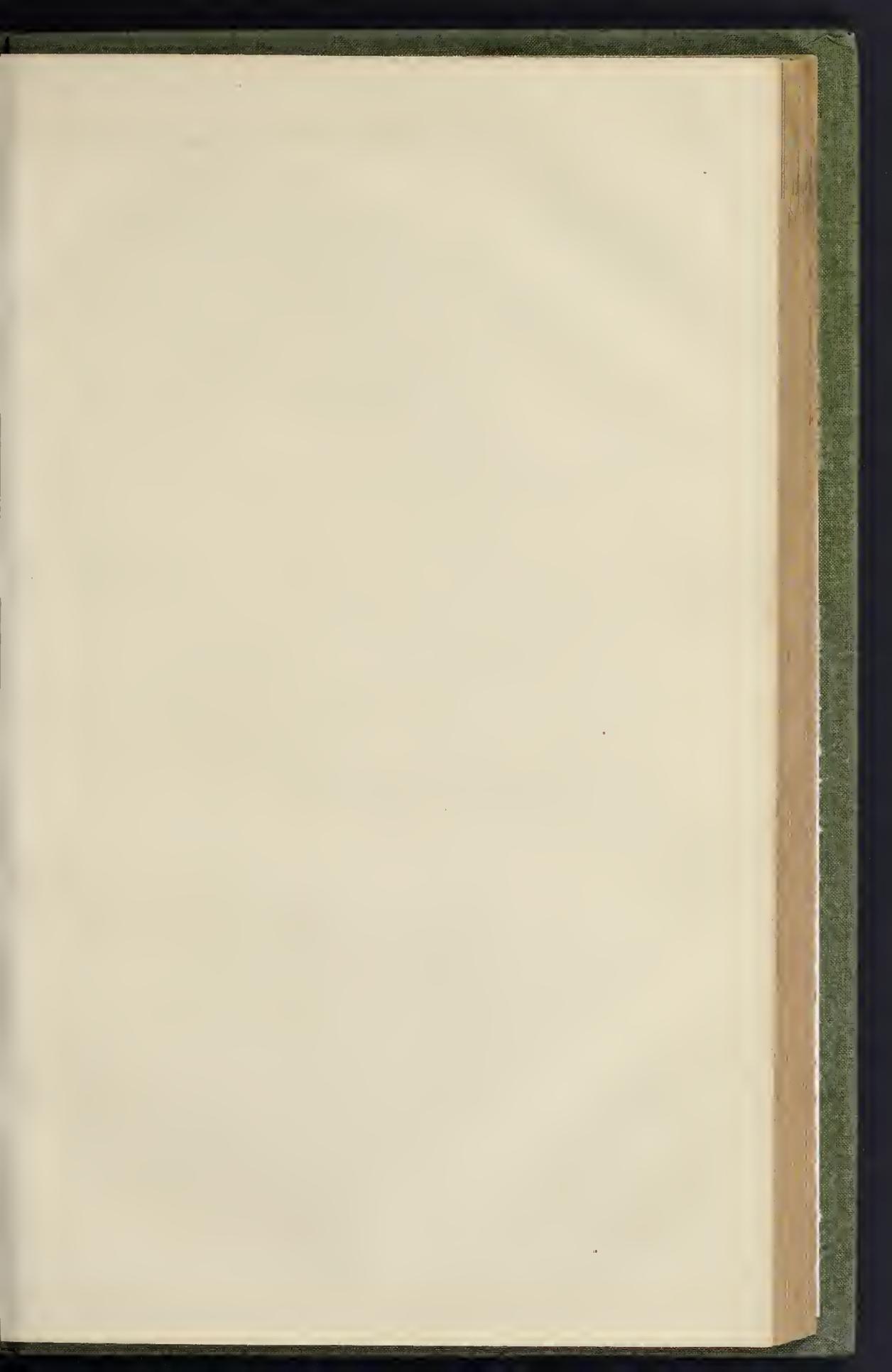
The fluted portions of the columns are griotte, the upper half being Sienna, and the astragal between of white marble. The capitals, of statuary, are in high relief, and support an entablature of diagonal projection. The latter, with the pediment, lunette, and frame at the back of the columns is mainly of camphor-wood, relieved by darker woods and marble bosses. The baserelief in lunette ("Summer") has a gilt background; other parts of the woodwork are gilded.

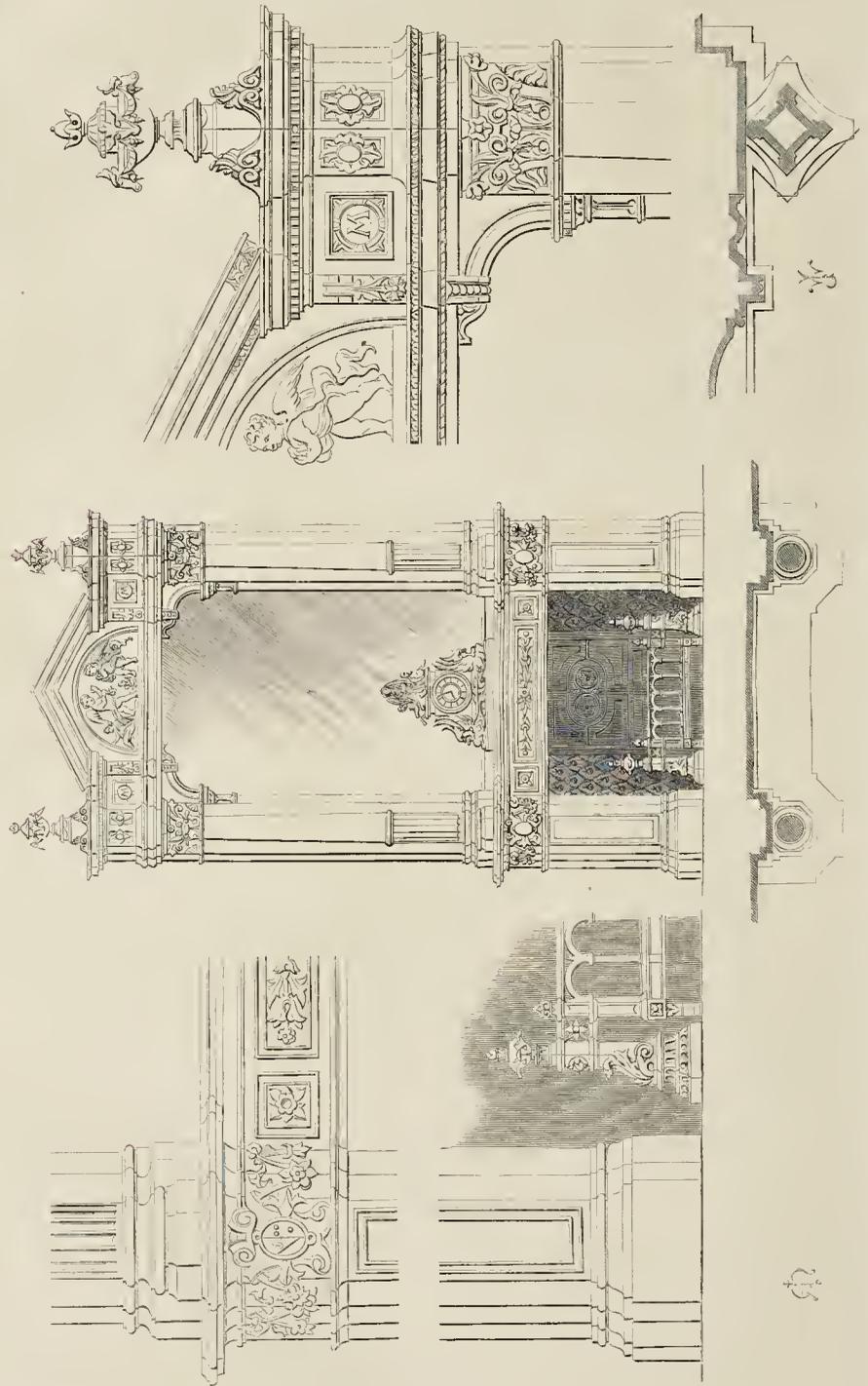
A black and gold marble fender, not shown in the engraving, encloses a heartily laid with encaustic tiles, which, like those on the splayed jambs, are from special designs. The hand-irons are electro-bronze enriched with ormolu.

The fire-basket, a combination of cast and wrought iron, is constructed to insure strength and durability. The cast-iron back has suitable fire-tiles below. The ash-pan, made to run on noiseless wheels and easily removed, forms a desirable feature.

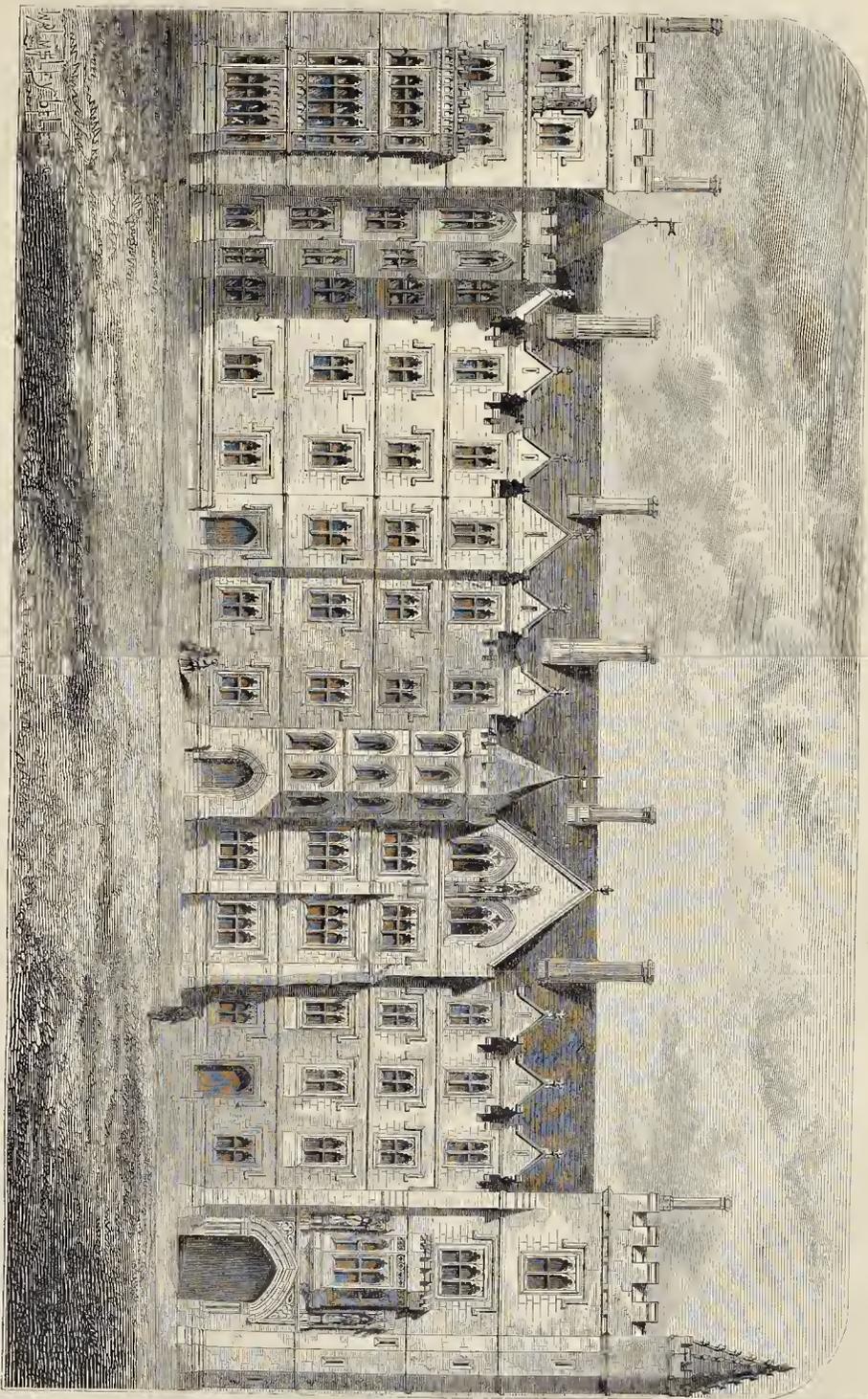
The elevation and plan are drawn to a scale of $\frac{1}{4}$ in. to the foot; details, 1 in. to the foot.

The whole is from designs prepared by Mr. Edward A. Heffer, of Liverpool, architect.



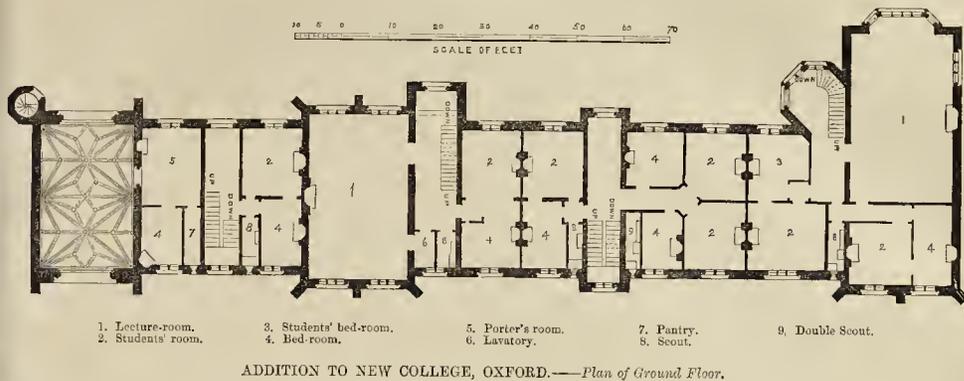


A CHIMNEY-PIECE.—MR. E. A. HEEFER, ARCHITECT.



ADDITION TO NEW COLLEGE, OXFORD.—SIR G. GILBERT SCOTT, R.A., ARCHITECT.





ENLARGEMENT OF NEW COLLEGE, OXFORD.

This college is being considerably enlarged, at a cost of upwards of 20,000. The architect is Sir George Gilbert Scott, and the builders are Messrs. Jackson & Shaw, of Westminster. We give a view and plan of the new building, which will be 177 ft. long, 33 ft. wide, and 62 ft. in height from the bottom of the plinth to the ridge of the roof, and is situated on the north side of the college, in Holywell-street. It will afford thirty-eight sets of rooms to the college,—two for fellows, and thirty-six for students, besides two lecture-rooms. There will be four sets of staircases to the building. The external dressings and ashlar work will be of Milton stone, carefully chopped, and the internal portion of the walls will be of brick. On the south side, at the west end of the building, a tower, about 26 ft. square and 70 ft. high, will be erected. It will project about 22 ft. beyond the main building, and in the angle there will be an octagonal staircase. There will essentially be a gateway tower erected at the eastern end, but it is not included in the present contract. The front of the building will be on the south side, facing the city-wall. The work is expected to be completed by Christmas, 1873. The buildings now in course of erection are only a third part of an intended extensive range of rooms, stretching the whole length of Holywell-street.

vigorous resistance to the railway-smoke and other obstacles, and still would present me with fruit by the bushel in a favourable year; but I now fear that even that is going the way of the apple-trees, and of all flesh, and succumbing to the general desiccation of the soil.

There is just one practical remark that this state of things suggests,—namely, that where a building operation in the neighbourhood of garden-ground involves a blind end to a new sewer, it should be the special business of somebody to see that the blind end is made impervious to water, and innocuous in draining the ground, when the gardener does not wish it drained.

NEMO.

MEMORIAL OF THE LATE SHERIFF YOUNG, M.P.

The foundation-stone of the above memorial has been laid by the daughter of the Mayor of Wisbech (Mr. F. Ford). The monument takes the shape of a column, standing in all 40 ft. high. At each corner of the base are antelopes, standing in all 4 ft. 7 in. high, the paws supporting a shield, each bearing arms carved in low relief, viz., the city of London and Middlesex, county of Cambridgeshire, Wisbech borough arms, and his family arms. On the sides of the base are engraved the following inscriptions:—

“A Memorial Tribute from many Friends to
ALDERMAN RICHARD YOUNG, J.P., D.L.
Born 1803. Died 1871.
Mayor of Wisbech, 1858—1863.
M.P. for Cambridgeshire 1863—1868.
Sheriff of London and Middlesex, 1871.”

On one side is also erected a drinking-fountain, of Portland stone and marble. The column is in red Kinstery granite, the base of column in grey Aberdeen, the cap of column being metal and Portland; the steps in Yorkshire stone; the whole of the other work, including the antelopes, is in Portland stone. Mr. J. Wallis Chapman, of the Harrow-road, London, is the architect; and the contractor for the whole of the works was Mr. John Whitehead, of London. The granite is from the quarries of Messrs. D. & A. Davidson, of Limerick; the Portland stone from Messrs. Thornton & Co.'s quarries, Portland; the Yorkshire stone from Mr. J. Haigh's quarries, Morley, near Leeds; and the metal-work, from Messrs. Richardson & Slades, of High Holborn. The foreman in charge was Mr. W. Doncaster.

OPENING MEETING OF THE NEW ARCHITECTURAL ASSOCIATION OF IRELAND.

The opening meeting of the above association was held on the 3rd inst., the president, Mr. J. O'Callaghan, in the chair. Mr. J. H. Longfield having read a report from the committee, the president delivered his inaugural address, which will be found on another page.

Mr. Owen, president of the Institute of Architects of Ireland, in proposing a vote of thanks to the president for his wise, earnest, and encouraging address, said it would afford him the greatest pleasure to assist the Association in any way in his power. He was certain every

member of the senior branch of the professional association of this country would feel satisfied at the prosperity of this new work, for to it they would look for the best recruits to the ranks of the profession.

Mr. Drew seconded the motion, which was adopted with acclamation.

Mr. Rawson Carroll proposed:—

“That the Association is deserving of the support of the profession at large.”

Mr. Charles Geobegan seconded the motion, which was adopted.

On the motion of Mr. Maguire, seconded by Professor M'Manus, it was also resolved:—

“That it is most desirable to enlist the sympathies of the other professions connected with architecture,—painting, sculpture, and engineering.”

SALARIES OF ENGINEERS TO BOARDS

Str.—In the list of salaries of engineers to municipal Boards, given at p. 802, *ante*, the amount, as regards Manchester, is not correctly stated. The salary of the city surveyor is 1,150*l.* per annum. I think it only right to make this correction, as public bodies are never too liberal in remunerating their officers; and the statements of a journal like the *Builder* are likely to be referred to when such appointments as those in question have to be made. J. CHOXPOND.

Sir,—With reference to Hull, in your list, the present population of Hull, from the Registrar-General's return, is 124,976*l.* The salary of the borough engineer is 450*l.* S.

WORCESTER CATHEDRAL.

“LITERAL copyism is not intelligent restoration.” Granted this dictum of “J. S.” in last week's *Builder*, some explanation seems desirable to justify the propriety of the rough internal masonry now seen in places in the walls and vaulting, and of patches of green colour introduced in certain parts of the latter in the nave of the cathedral.

It was a dark age in the history of this building when the roof-covering was stripped off, and ordinary slates, such as are used in *small* sizes for domestic purposes, substituted. Attenuation has been made in our day for acts of Vandalsim perpetrated about the same time at Salisbury and at Hereford. Much has been done at Worcester with the same praiseworthy purpose; but still I must maintain that alteration in the present covering, as suggested in my communication of the 8th inst., is essential to the satisfactory completion of the work of restoration.

If slate must be the material, we have examples of its use in large slabs,—producing the effect desired,—on the church at Camborwell, by Sir Gilbert Scott, and on the Reform Club, by the late Sir Charles Barry.

Still, hearing in mind the covering generally used on the other edifices of this monumental description, which adorn our country, and remembering instances of their restoration, which have come, in the course of years, under my own observation, I venture to repeat the suggestion made in my former communication. N.

INCIDENTAL CONSEQUENCES OF DRAINAGE OPERATIONS.

Str.—Your pages have heretofore contained forcible reflections on the injuries to which great buildings are liable when, as in the case of the Somerset House river front, the normal condition of their foundation, as regards moisture, is materially altered, by draining and pumping. I wish to point out that consequences, akin, so far as cause is concerned, to such injuries to great buildings, are probably at present developing themselves in multitudes of little buildings in the suburbs of London, in a manner rather unpleasant to the inhabitants than absolutely ruinous to the structures themselves.

Say that my neighbour's house or my own was formerly furnished with a cesspool, disused since the Metropolitan Drainage Act came into operation. Say that the soil was removed either very carelessly or not at all, the jobbing builder employed saying that the hungry clay thrown in would soon sop up all cause of offence. Years roll on: the earth becomes desiccated through the action of the drainage scheme; fissures open in all directions, and serve as ventilators to all the old cesspools in the neighbourhood, whose effluvia distill into the houses.

Meanwhile, suppose that my pride lies in a miniature Busby Park, consisting of a single horse-chestnut tree, formerly luxuriant in flower in the spring and in foliage in the summer and autumn. By the end of September it has now become nearly bare of leaves as in mid-winter, for want of water to the roots. My suburban orchard of apple-trees had for some seasons declined in produce, but my pear-tree made a

THE GLOBE BRIDGE, PECKHAM.

HAVING noticed, a short time since, some very un-authentic articles in the local papers relative to these works, which are very detrimental to the contractor, I am induced, in justice to the contractor, to trouble you with a few remarks.

An article has appeared in the *Peckham Times* upon the subject of the memorial-stone having been laid on Thursday last, the 10th inst., wherein it is stated that a Fenian flag floated over the stone. This was quite incorrect. No Fenian flag was there. The national flag of Ireland waved opposite the Union Jack, which floated over the head of Mr. E. Dresser Rogers whilst he successfully set the stone. The ceremony over the contractor, Mr. S. Stanley Peach, provided the men with a substantial dinner at the Surrey View.

As I believe it to be the object of your journal to circulate only that which is fair and true, to every one, under every circumstance, I shall esteem it a favour if you will give these remarks a place in your next issue.

FAIR PLAY.

THE AMENITIES OF COMPETITION.

SIR,—The unsuccessful ones in the late competition for the prizes offered by the Sunderland School Board will have small reason to regret contented with their want of success, if, as in my case, they have failed to receive that small modicum of courtesy which always soothes, viz., a word in acknowledgment of their efforts.

It would be injurious on my part to cast at the decision of the Board, as I am in ignorance of the process by which it has been arrived at, or even, perhaps, to quarrel with the scheme of appointing two committees, the one to decide upon the best plan, and the other upon the best elevations; yet I am strongly of opinion that such a course can result only in injustice, unless the two sets of judges are in accord as to both plans and elevations of the same author. If otherwise, as would be the case, to a certainty, I presume A has received half a premium for his plans, and B the other half for his elevations.

It is, after all, annoying (setting aside the wound to one's amour propre, in the event of a failure, which is always supposed to smart, whether it be the case or no), to be judged by a set of rules, which one's efforts were never meant to be subjected, and which are directly at variance with the true spirit of competitive endeavour.

JUSTITIA.

THE WINCHESTER SURVEYORSHIP.

SIR,—Finding that no notice has been taken of the above municipal hoax, I can only conclude that, unless they consider it beneath their contempt, none of the victims have had access to the local newspapers, and consequently are ignorant of what took place at the meeting of the Winchester Town Council, on Thursday, Oct. 3. Perhaps the following extract from the *Southampton Times* of Oct. 5th, may tend to throw some light on the subject:—

"TOWN COUNCIL MEETING.—The monthly meeting of this body was held at the Guildhall on Thursday; the Mayor (Allerman R. P. Ford) in the chair. The Finance Committee reported that in accordance with instructions from the Council they advertised for candidates willing to fill the office of surveyor, and that in reply thereto they received thirty-five applications, accompanied with testimonials; and having perused the same, arranged for a personal interview with three of the candidates, viz., Mr. Edward Dudley, of Kingston, Herefordshire; Mr. J. J. Lanceland, of Winchester; and Mr. J. B. E. Bruce, of Kingston-upon-Hull; and pursuant to the terms of the resolution, submitted their names for the Council to make the selection.

Mr. Alderman Budden proposed, and Mr. Councillor Gale seconded, the adoption of the report, which was agreed to *nem. dis.*

Mr. Alderman Fielder, in proposing Mr. Lanceland for the office of surveyor, said he had the greatest confidence in his knowledge of the work to be carried out; he had been accustomed to buildings from his boyhood, and from his excellent testimonials he would also be able to carry out the system of drainage, and give the greatest satisfaction.

Mr. Councillor Gale seconded the nomination.

Mr. Harris thought the qualifications as indicated by the testimonials were insufficient.

Mr. Morris thought that the advertising was useless, and the discussions of the committee a waste of time. They had previously pledged themselves to vote, and could have saved the twenty-four gentlemen the trouble of dealing with what was a foregone conclusion.

Mr. Godwin observed that it was a doubtful fare to bring down those two gentlemen.

Mr. Warren, as a member of the committee, said there had been nothing done to induce Mr. Newman to resign, and though he should vote, he had not pledged himself to do so for Mr. Lanceland.

Alderman Fielder replied by stating that it was the unanimous opinion of the council that the office should be put up for public competition, so as to select a good man, and no other candidate being proposed, Mr. Lanceland was declared duly elected."

The inference from this is, that bad the Winchester Town Council remembered what was due to their own honour, and been sufficiently candid to have added to their advertisement for a surveyor a note to the effect that the appointment was then virtually filled, they would not only have saved thirty-four gentlemen the trouble and expense involved in preparing their testimonials, to say nothing of the trouble given to their friends and supporters, but have merited the esteem of all right-thinking men. However, it is somewhat refreshing to find that even the Town Council of Winchester contains one or two men not wholly lost to a sense of justice.

It is not stated whether those two rival candidates who unwittingly took part in the "doubtful farce" of coming all the way from Kingston-

upon-Hull, and Kingston, respectively, had their travelling-expenses paid; but even if they had, it is still a matter of question whether the Corporation of Winchester is not liable to thirty-four actions for damages from the several victims of this dishonourable hoax.

JUSTITIA.

BAPTIST COLLEGE FOR MANCHESTER.

LAST week the foundation-stone of the new Baptist College, to be erected in Brighton-grove, Rusholme, was laid. The new building will be a spacious structure. The total frontage is to be 115 ft., and the total depth 77 ft., faced externally on every side with white fire-bricks, and relieved with terra-cotta moulded strings, label-moulds, bands, and friezes, with sunk and moulded devices on the face of the bands, and an elaborately moulded terra-cotta cornice. The principal feature in the front elevation will be a tower, with a slated high-pitched roof, surmounted with iron cresting, the total height being 70 ft. The bay-windows are also carried up above the roofs, breaking the line, and forming minor towers, having high-pitched slated roofs, terminating with ornamental ironwork. The principal entrance to the college is under the tower, leading to a spacious hall; from thence to the students' rooms, provision being made for the accommodation of about twenty-five students, each having a separate room, also a residence for the president. The ground-floor contains dining-hall, 40 ft. by 24 ft.; lecture-hall, 33 ft. by 24 ft. (by removing a sliding division, the dining and lecture halls may be converted into one room); class-rooms, study, president's rooms, and servants' department. The first and second floors contain the students' rooms, bath-rooms, lavatories, and president's bed-rooms. The works will be carried out under the direction and supervision of Mr. Henry Pinchbeck, of Norfolk-street, Manchester. Mr. James Herd, of Clarence-street, Cheetham, Manchester, is the contractor.

BUENOS AYRES.

A SUPPLEMENT to the *Packet*, a Buenos Ayres paper, of the 14th of September, contains a report by Mr. Revy, who was chief assistant there to Mr. Bateman, C.E., who proposed a scheme for a port at Buenos Ayres. Mr. Revy reports to the Provincial Government against Mr. Bateman's scheme, and in favour of one of his own for the construction of a port at Boca, and the cleansing and canalisation of the Riachuelo for the sanitary improvement of the district. A port for Buenos Ayres, according to Mr. Bateman, can be made: according to Mr. Revy it cannot. The construction of a port at the Boca, in Mr. Revy's opinion, offers every facility, at a comparatively trifling expense. There would be no breakwater, no embankments, no dry-dock excavations; nothing but simply to dredge the bed of the Riachuelo, and on one or two short canals, and build wharfs, quays, and warehouses along the banks, for which a solid foundation of loam is obtained at 20 ft. to 30 ft. deep. The plans of the Boca Port present three large docks, together, 100 acres, with 4,000 yards of quays for loading or discharging merchandise. Several other docks could be afterwards constructed, as found necessary. The work would cost, in all, 144,000*l.*, without including wharfs, quays, and warehouses. Mr. Revy only undertakes the canalisation, and to provide a port of 16 ft. deep, suitable for hundreds of vessels which are at present obliged to anchor in an open roadstead, and which could discharge and take in cargo at the Boca in as many hours as at present days are necessary. The project is not an original one of Mr. Revy, for the late Don Manuel Lynch agitated an identical one in the columns of the *Packet* ten years ago.

The Louvre.—A new sculpture-gallery is about to be opened in the museum of the Louvre. This gallery is to be devoted to the sculpture from the national palaces, and to some of the finest productions already in the Louvre. At the end of the gallery is to be placed the statue of Michelangelo, which for a long series of years formed one of the glories of the famous Chateau de Chenonceaux, the art collections of which were dispersed five or six years ago; and the gallery will take its name from the great master. The decorations are now being completed, and the catalogue is being prepared.

CHURCH-BUILDING NEWS.

Dunstable Abbots.—The ancient church of St. Peter, Dunstable Abbots, has been reopened for divine service, after having undergone a restoration. The village is picturesquely situated five miles north-east from Cirencester, and about half a mile south-westward from the high road from Cirencester to Gloucester, the "Irmin-street" of the Roman occupation. The church is a small stone building in the Early English style, and consists of a tower with three bays, nave, chancel, and porch. Having become dilapidated, the rector (who is also the patron of the living), the Rev. Thomas Hanor, and other land-owners and inhabitants of the parish, called in Messrs. Waller & Sons, of Gloucester, architects, under whose superintendence a restoration has been carried out. The south wall has been taken down, and a new aisle and organ chamber erected. The east wall of the nave has also been taken down, and there has been erected a new chancel arch, supported on Aberdeen granite columns with carved stone caps. The whole of the interior fittings have been taken out, and new floors laid, with benches of varnished pitch-pine. The chancel fittings are of oak, and consist partly of the old seats. The chancel and altar floor is laid with Godwin's tiles. There are a new stone pulpit and a pitch-pine reading-desk. The organ-chamber is parted from the south-aisle by an open screen of pitch-pine. The porch has been rebuilt. The timbers in the new roof are of pitch-pine, stained. The old roofs of the nave and north aisle and chancel have been generally restored, and strengthened with new timbers. The tower and the walls of the north aisle have also been restored and pointed. The total cost has been about 1,000*l.* The whole of the works have been executed by Mr. A. Estcourt, of Gloucester.

Honor Oak.—The foundation-stone of St. Augustin's Church, Honor Oak, has been laid by Mr. J. G. Talbot, M.P. The new building is situated on a hill near Honor Oak-road, and will be in the Early English style. At present it is intended to contain only one aisle, but a second will be added, together with a tower, whenever the requisite funds are forthcoming. It will accommodate 350 persons, and the estimated cost is 3,200*l.*, of which the greater part has been subscribed. The architect is Mr. Oakley, of London; and the builders are Messrs. Roberts, of Islington.

Cowley.—The church here has been re-opened by the Bishop of Gloucester, after restoration. The restoration consists of a new roof to the chancel, with trussed rafters and principals resting upon moulded oak plates, and a stone dog-tooth cornice, with corbelled shafts under the principal timbers, provision being made for a roof-screen (the remains of which were discovered) at the junction of the nave and chancel. The curved timbers and braces of the nave roof have been opened out, and the woodwork repaired. The nave has been filled with oak open seats, copied from the existing old late fourteenth-century seats, some of which have been retained in their original positions. The remains of the stairs to the roof-loft that were discovered during the progress of the works have been opened out, the font restored, and the Jacobean pulpit replaced by the old fifteenth-century stone, one that was used as a base to the more modern work. In the chancel the new work further consists of oak seats, prayer-desk, lectern, and sedilia; new steps of red Mansfield stone; and a new communion-table. The remains of early decorative colouring have been retained as far as was possible. The whole of the stonework has been cleansed from the many coats of whitewash with which it was covered. The spaces within the steps in the chancel have been paved with Minton's encaustic tiles, and the rest of the chancel with the old monumental slabs. In the nave the passages are paved with small black and red tiles. On the outside the walls have been under-pinned and strengthened with buttresses. The windows have been glazed throughout with pale lilac and white glass in patterns. In the chancel three of the windows have been filled with painted glass by Messrs. Powell, viz., in the east the Crucifixion, and in two side-lights figures of the Virgin Mary and St. John. The north-east doorway has been opened out, and, with the south and west doorways, fitted with oak doors, framed in small panels, and hung with wrought-iron ornamental hinges, lock-straps, &c. The work was under the superintendence of Mr. Albert Hartshorne, and

has been executed by Messrs. Wall & Hook, of Brinscombe. The cost of the restoration of the nave has been in great part defrayed by the squiro of the parish, Mr. J. Hutchinson, Cowley Manor, and his relatives and friends; that of the chancel by the rector and some of his family.

Welford.—The ancient Church of St. Mary the Virgin, Welford, has been reopened for divine worship, after restoration. The chancel of the church was restored about four years ago, and its internal ornamentation was carried out by the rector, the Rev. G. A. Poole. At that time the nave and aisles were in such a condition as to require immediate restoration. In the early part of the present year this difficulty was fairly grappled with, and the result was that the whole fabric, with the exception of the tower, has been restored. The architect employed was Mr. E. F. Law, of Northampton. The total cost of the restoration is about 2,300*l.*, the work done to represent that sum being somewhat as follows:—In the first place, the north aisle has been rebuilt. Previously to the restoration, this part of the church was blocked up with enormous square piers and semicircular arches, the arcade apparently at some time or other having been removed. A new arcade, of the Decorated period, has been inserted, having carved capitals, with natural characteristic foliage of the period. The north aisle at the west end is also carried beyond its original position, and the extension is converted into a small sacristy. Its entrance arch is supported by two decorated columns, of the same character as those just noticed, and it is lighted in the west wall by a small Early English window, which has been filled with coloured glass. The south arcade was considerably out of plumb, and it was Early English, and in order to preserve its character, it was deemed expedient to take it down stone by stone, which were either marked or numbered, so that, when rebuilding, each might be fitted into its original position. The tracery in the windows of the south aisle had been destroyed, but their ridges have been reinstated in original form, and are filled in with lead-lights. On the exterior of these windows a number of old carved heads have been inserted. The west gallery has been removed, and the tower-arch having been opened and restored, its proportions are no longer hidden, the effect being considerably heightened by the Perpendicular west window which comes into view. The nave-walls have been restored. The roofs to the nave and aisles are new, and are made of pitch-pine, moulded. The church has been re-seated in oak throughout. The seats are of modern construction, without doors. The four windows in the north aisle are filled in with coloured glass. A coloured window has also been placed with the east window of the south chapel by members of the Ferraby family, and the subjects represent the "Annunciation," "Espousal," "Wise Men," and the "Presentation at Jerusalem." Towards the total cost, that for the north aisle, including windows, has been about 800*l.* Mr. Phillips, of Northampton, executed the carving work.

Elstead.—St. James's Church, Elstead, has been reopened after alterations and repairs. The original structure, dating back probably to the thirteenth century, had not only become dilapidated in some parts, through age and exposure, but was manifestly insufficient to afford the accommodation required for an increasing congregation. It was, therefore, determined to erect an additional aisle, and to effect other improvements, so that the interior might be rid of its characteristic mustiness, and the general arrangement of the edifice suited to the present period. The expense attending the alteration amounts to 1,000*l.* A south aisle has been built, and a vestry added to the east end of the church, while the sittings have been altered, and the character of the building so changed, as to allow a better distribution of light, ventilation, and sound. The antiquated fabric to which these desirable additions have been made, consisted only of a nave and chancel, with a low wooden steeple at the west end, the gallery, to quote the expression of the bishop of the diocese, being of "a most villainous description," the pews "horrible," and the ceiling "low." Additional accommodation is now afforded to about 100 hundred persons, the total number of sittings being about 300. The plans were prepared by Mr. H. B. Goring, architect, of Southborough Hall, near Tunbridge Wells, and carried out under the personal superintendence of his manager, Mr. Johnson, by Mr. Pink, builder, of Milford, near Godalming. The new aisle is

lighted by eight windows, some of the heads of which are formed of stonework of the former windows, belonging apparently to the thirteenth and fifteenth centuries. A new three-light window has been inserted beneath the tower at the west end, the stained glass in which was contributed by Mrs. Cornwall, and the tracery carved by Miss Cornwall, her daughter. The building is composed of Bargate stone with Bath stone quoins and dressings, red and black tiles being used in the pavement, excepting the chancel, where Maw's encaustic tiles are laid down. The new portion of the roof rests upon four columns with five arches. The shafts of these are composed of Forest of Dean stone, with capitals and dressings of Bath stone.

Buxted.—The church at Highhurst Wood, erected mainly through the liberality of Colonel and Lady Catherine Harcourt (and consecrated some time ago by the Bishop of Chichester), has been publicly reopened for divine worship. Highhurst Wood is a hamlet of Buxted; it is distant some three miles or so from the parish church. In the early part of last year the building was commenced by Mr. Charles Lulham, of Uckfield, from designs furnished by Mr. Christian, of London. The principal materials used in its construction were obtained from the immediate neighbourhood; the stone, of which the church is exclusively composed, being excavated from a quarry about 500 yards from the spot, and the sand used in the composition of the mortar being equally well to hand. The church, which consists merely of a nave terminating in a semi-circular apse with a side aisle on the north for children, is built in the old English style, and is of a simple character. The roof of the nave is supported by stained wood rafters, that of the apse being domed, and the spaces decorated. The chancel is approached by several flights of steps, and is backed by the altar. The floor is laid with pitch pine, the aisle being paved with Staffordshire tiles; Minton tiles forming the floor and steps of the chancel. The church is lighted by six windows, and the apse by five. The principal window, which faces due west, is glazed with coloured glass. This is the special contribution of Lady Catherine Harcourt, who has painted the window with her own hand. It is not yet finished. The building provides accommodation for 260 adults and children; the seats, which are movable, being hacked, and fitted with book-shelves. Arrangements have been made for heating the church with hot air in the winter time. Surrounding the nave is a small bell-turret, in which are hung a couple of bells. The structure is surrounded with a wall of stone; and in the rear half an acre of ground has been appropriated for the purpose of interment. The total cost of the erection is about 6,000*l.*, nearly the whole of which has been borne by Colonel Harcourt. A parsonage is in course of erection about 300 yards from the church, and a school for upwards of 100 children will shortly be commenced, not far from the spot.

Stoke.—The chancel of the parish church has been re-opened. It has been restored by the liberality of Mr. W. F. Pridmore, Wyken House, at a cost of 300*l.* It is lined throughout with encaustic tiles, and the altar-railing was designed by Mr. F. Skidmore.

STAINED GLASS.

Market Weighton Church, Yorkshire.—A stained-glass window of one light by Mr. J. W. Knowles, of York, has recently been placed in this church, near the font. The subject is our Lord Blessing little Children. The cost of the glass has been defrayed by subscription from the ladies of the parish. The drawings for the stonework were a present from Messrs. Atkinson, of York, under whose care the church was restored last year.

St. Martin's, Brighouse.—A stained-glass window has been placed in the north side of this church, to the memory of the late Mr. Brooke, of the Rhydings. The subjects represented are the Birth of our Lord, and the Presentation in the Temple. The window is from the works of Messrs. Morris & Co., of London.

St. Andrew's, Gravesend.—Three stained-glass windows have been presented by Lady Franklin to the St. Andrew's Waterside Mission Church, in memory of the petty officers, seamen, and marines of the *Erabis* and *Terror*. Beneath the windows brasses, with the names of each of the crews will be placed. These ships sailed from Gravesend.

St. Peter's and St. James's, Belgrave-cum-

Birstall.—The east windows of the two churches of Belgrave-cum-Birstall, Leicestershire, have lately been filled with stained glass by Messrs. Ward & Hughes, in memory of the Rev. Richard Stephens, B.D., late vicar of Belgrave-cum-Birstall. The window in St. Peter's, Belgrave, consists of five main lights, which are occupied by ten representations of events in our Lord's life, two in each, under characteristic canopies—viz., the Adoration of the Shepherds, our Lord's Baptism, His Accusation before Pilate, Bearing His Cross, the Crucifixion, the Entombment, the Angel and Women at the Sepulchre, the Appearance of the Twelve with Thomas, and the Ascension. The large circle in the apex contains a seated figure of our Lord in glory, orb and sceptre in hand, surrounded by the Heavenly Hosts, and below this are two groups of censing angels. The architecture is of the latest geometrical, and the glass accords with it. The colours are deep-toned. St. James's, Birstall, was restored by Sir G. G. Scott, R.A., only two years before the death of the late vicar, and the simple east window, of the Early English period, consists of three main lights, which are occupied with representations of the Adoration of the Shepherds, our Lord's Crucifixion, and the Angel and Women at the Tomb after the Resurrection; above are emblems of the Trinity, with the Lamb and Dove, and between these an angel choir in two groups. The canopies and ornamental work are in character. This window is raised by his widow and his unmarried daughter. A reredos in each church is about to be erected under the direction of Sir G. Scott, by the parishioners and a few friends, in memory of their late pastor.

St. Thomas's, Halifax.—A stained-glass window has been placed at the east end of this church, in memory of Alderman Midgley and his wife. The window, erected at the expense of the various members of the family, is done in the style of the German school of glass painting, and is from the studio of Mr. Wailes, of Newcastle. The window is a five-light one, and the subject chosen is the Good Samaritan, three pictures from which are portrayed. On the dexter side the window, at the lower portion, the traveller is represented as falling among thieves; occupying the whole centre of the window is the scene where the good Samaritan relieves him, whilst the priest and Levite pass by "on the other side;" and in a corresponding portion on the sinister side of the window, the departure from the inn is pictured.

Cromer Church.—The west window in the tower of this church has just been completely restored, and fitted with stained glass, at the expense of Mrs. Charles Buxton, as a memorial of her husband, the late Mr. Charles Buxton, M.P. It is a Perpendicular window, 35 ft. high and 13 ft. wide. Fortunately, there was sufficient evidence remaining on the jambs and fragments of the tracery upon the old churchyard wall to enable the original design to be followed. The battlemented tracery is of a similar character to the aisle windows, which were restored ten years back. The tracery of the head and transoms is filled with stained glass, of a foliated pattern, in bright colours, and the upper panes are glazed with Powell's embossed quarry glass, having coloured borders. Five painted figures, representing St. Thaddeus, St. Mark, St. Paul, St. Simon, and St. Philip, are introduced in the lower panes. They came, we understand, from a church in Posen, Prussia, and are very old. The stonework has been executed by Mr. Stanley, of Norwich, from the design of Mr. J. H. Brown, architect, Norwich.

Miscellaneous.

Accidents.—In Derby, at a bakehouse in Upper Brook-street, a pateut oven was being erected, with divided compartments in order to facilitate the dispatch of baking. Whilst a workman was engaged in finishing one of the archways, the roof fell in, and he was instantly buried. The removal of the *débris* took upwards of half an hour, and the poor fellow was quite dead before his body could be recovered.—A bricklayer at Uddington has been killed by a fall from a chimney-stalk. He had been, at the dinner-hour, coming down the inside of the stalk, at present being erected at one of the new pits near Uddington Railway Station, when the rope which was attached to a nesdie at the top of the chimney gave way, and he fell to the bottom, a distance of 64 ft., and was killed instantly.

Constant Metropolitan Water Supply.—Alderman Sir Sidney H. Waterlow (the Lord Mayor elect) has published in the *Times* a statement as to the supply of water in a district crowded with the working population, and in which the Improved Industrial Dwellings Company, over which he presides, have recently erected, at a cost of nearly 17,000*l.*, 112 three, four, and five-roomed tenements for the working classes; namely, upon a large plot of land leased from the Baroness Burdett-Coutts, in Crah-tree-row, Bethnal-green, nearly opposite Columbia Market. An improved system of constant water, he said, has been adopted during the last two years in buildings erected by his company in Pimlico, George-street Grosvenor-square, and Goswell-road. In all these dwellings the system has been found to work admirably. The water is supplied by meter at a fixed price per 1,000 gallons, and at the end of each year the total cost has been less than under the ordinary system of rating each tenement. When the buildings in Crah-tree-row, however, were opened, it was found the East London Water Company were unable to deliver a drop of water into three out of five tanks, the three being 9 ft. above the others, and at an elevation of only 55 ft. above the level of the pavement. The Water Company said that, under a private Act of Parliament obtained about twenty years ago, the highest point to which they are bound to raise water is 40 ft. At the Gladstone Buildings, containing 168 dwellings, and situate within a few hundred yards of Crah-tree-row, the New River Company give a daily supply at 59 ft. Yet the East London Company charge as much 1,000 gallons as those who serve the other districts. What, he adds, would the wealthy inhabitants and legislators who dwell in the lofty houses at the West End say if the water companies refused to supply water on the third floors of their houses, or at a height greater than 40 ft.? He is afraid the public can have no redress in this matter until the Legislature interferes.

The New Chelsea Embankment.—Since August last, the works have been progressing in the hands of Mr. Welster, the contractor. The length of the wall of the new Embankment is 4,430 ft. The segment of reclaimed land at its widest point, opposite the angle of Cheyne-walk, is about 140 ft. in width; and the area to be laid out in ornamental gardens is about 9½ acres. The thickness of the wall at the bottom is 12 ft.; it is being built with Portland cement concrete, the cement being supplied by the Burham Company, and regularly submitted to engineering tests before use. At the top of the wall, which is to the level of the road, the thickness is diminished to 5 ft.; it is faced throughout with granite, only roughly axed. The use of cement concrete for the wall in lieu of brickwork reduced the expense of the undertaking by about 21,000*l.* The granite is being supplied partly by Mr. Fyfe, of Aberdeen, and other portions by Messrs. Freeman, from Cornwall, and the Dulbeattie Granite Company. There will not be an open balustrade, but a solid pannelled parapet, with hold moulded coping and square pedestals at intervals. There are 3,173 ft. of the lowest portion of the wall completed, and 1,220 ft. of the parapet. The filling-in of the area behind will require about 200,000 yards of earth, of which a large quantity has been already provided. The low-level intercepting sewer, corresponding in length with the Embankment, will be constructed of Gault bricks from the Burham Company, the lower third of the inner ring lined with blue Staffordshire bricks from Messrs. Donlton & Co., of Lambeth. Some portion of the sewer at the lower end has already been put in. The ultimate destination of the low-level sewer is the western pumping station. Mr. Welster has also obtained the contract for erecting buildings connected with the western pumping station, and for the extension of the low-level sewer westward to the Chelsea Embankment. The tender amounted to 126,950*l.* The same contractor has got the work of providing engines, pumps, and machinery at the station: amount of tender, 56,789*l.*

Tax on English Locomotives.—At the last meeting of the Great Luxemburg Railway Company, the chairman stated that the Belgian Government had imposed a duty of 200*l.* upon all railway engines imported from England. He added that English engines were much better than those made in Belgium, and more economical, although the first cost was greater.

Utilisation of Water Power.—Of the use that might and ought to be made of now wasted water power in many districts we have often spoken. A step in the right direction has been taken at Bellegarde, where the Rhone, after issuing from the Lake of Geneva, falls into a deep chasm. After passing for some distance between these walls of stone, the river falls suddenly into a huge fathomless gulf. An American conceived the idea of turning the force of this mass of water to account, and creating a power for a number of industrial operations. England and Switzerland found the necessary capital, seven millions of francs, and the work is approaching completion. About 100 yards above the fall, is a dam and a basin, by means of which the water is diverted into a tunnel, 600 metres long, 10 metres wide, and 20 metres high, and which opens into the ravine of the Valserine. At this point a large building is erected to receive turbines, which are calculated to give a force equal to 3,000 (steam) horse-power. The subterraneous aqueduct is continued 700 metres beyond this first point of operation, and conveys the water to another set of turbines, of 5,000 nominal horse-power. The total force of the water diverted is said to be equal to 12,000 horse-power, so that 4,000 remain for future application. The motive power is obtained and brought into subjection, and will soon be applied to various industrial purposes.

The New Church of St. Silas, Bristol.—In the spring, St. Silas Church, St. Philip's, was found to have subsided 20 in., owing to the bad foundations, and as it was in a dangerous condition, it was resolved to take the church down and rebuild it on piles. Mr. J. P. Stephens was the contractor for the taking down and rebuilding, and Mr. W. Merewether, of Bedminster, undertook the piling. Mr. Davis was clerk of the works. About 300 piles of 28 ft. in length and 10 in. in diameter, of English larch, have been driven in, and it is intended to build the church of the old materials, and on nearly the same plan as before. The cost of the building was estimated at 2,100*l.*, exclusive of the boundary-wall, not in the estimate. According to the altered plan the height is reduced, and wooden arches constructed to support some of the weight of the roof. The piling having been finished, the ceremony of relaying the foundation stone has now been performed by the Rev. Flavel S. Cook, who, in the course of an address, said he had appealed to the public for 1,500*l.*, and they had given him 1,700*l.*; but, as usual, the cost was more than was estimated, and about 200*l.* were required to complete the undertaking, exclusive of the boundary wall.

Distribution of Forests in India.—An important and able paper, signed "D. Braudis," appears in the October number of *Ocean Highways*, "On the Distribution of Forests in India." The author is of opinion that in India forest conservancy, in Government hands, has become necessary, in order to meet the growing demands for timber, wood, bamboos, and other forest produce, all the more especially as the peasantry and others begin to desire substantial houses, and there seems no prospect of finding coal in sufficient quantity in North-western India; but he is not hopeful of the possibility of increasing the rainfall to any considerable extent by preserving and extending the forests, or of thereby in any way altering the climate; and, indeed, he considers that there is not yet sufficient evidence to prove that any material deterioration of climate has been the result of denudation in any part of the country. The seasons in India are regulated by the two half-yearly winds, dry and wet, which are cosmical. But a great deal can be done by improving and extending the wooded tracts along the borders of the dry country, and these and other like extensions may be beneficial to the sanitary conditions of districts.

The Annual Trade-Union Congress.—The Trades' Union Parliamentary Committee, of which Mr. Alexander M'Donald is president, and Mr. George Howell secretary, in exercise of the powers conferred upon it by the last Trade Congress at Nottingham, has just issued a circular to the various trade councils and trade societies throughout the United Kingdom convening the fifth annual Trade-Union Congress, to be held in Leeds in the first week of January next. The Congress is to last six days, and the details connected with its sittings will be under the superintendence of Messrs. Denton and Plockett, the president and secretary of the Leeds Trades' Council.

The Preservation of Alexandra Park and Palace.—A meeting was held on Thursday in last week at the Mansion House, for the purpose of enabling the Lord Mayor to report to the committee the result of an interview which he had had with the proprietors of the Alexandra Palace and Park. After doing so, it was resolved that,

"as the owners of the property are unwilling to sell unless a deposit of 100,000*l.* can be paid or guaranteed to be paid at a certain date to be named in the contract; and believing that if time be given to the skilled artisans and working men to subscribe money for the purchase of the property the whole of it will be forthcoming; believing also that the 100,000*l.* required to be paid as a deposit will be forthcoming by a certain day to be named in the contract of purchase, provided the Lord Mayor and sub-committee be able to purchase the property on such fair terms and conditions as they may consider to be fair and reasonable; that as soon as the terms of the contract shall have been agreed on, the Lord Mayor's suggestion be adopted of holding an evening meeting at the Mansion House."

A form of guarantee with regard to the 100,000*l.* was agreed upon, by which any deficiency which the guarantors might have to make good should be paid out of the first money forthcoming from the shareholders. An executive committee was formed for the purpose of collecting subscriptions for shares.

The Sand Process of Engraving on Glass.—A new step of progress in this very curious process has been made. It consists in the substitution of the force of mere gravitation for that of steam or blast power. A box, or hopper, of suitable dimensions, is placed near the ceiling of the room, and from it depends a small tube of about 8 ft. long. No machinery whatever is used. The sand or emery-powder to be used for engraving is placed in the hopper, and regulated by a slide at the top; it falls down through the tube, under the end of which is held the glass, watch-case, cup, or other object to be engraved. In a few minutes the designs are cut with a great degree of exactness and beauty. Sufficient protection is afforded by designs of paper being pasted upon the surface to be engraved, or by writing or drawing the design on the glass with gelatinous or india-rubber ink. The cutting-powder is used over and over again, being transferred from the tray in which the work is placed to the hopper.

New Music Hall in Southampton.—This place of amusement has been erected at the rear of the Royal York Hotel Above-bar. The large hall is nearly completed. The walls are divided by piers finishing above the main cornice, with circular tops, having a shell ornament on the face of same; from the cornice springs a cove, having circular-ended panels, fitted with enriched ventilating gratings. The ceiling is divided into three compartments. In the centre of each compartment or panel a large circular ventilating flower is introduced. Twelve smaller flowers are placed at regular distances, and from these the chandeliers will descend. Private boxes are provided at the east end. There is a gallery the length of the hall on the south side, arranged outside the main walls and over the entrance passage to the stalls. The stage is at the west end. The building was designed by, and is being erected under the superintendence of, Mr. Bedborough, architect. Mr. Gambling is the builder.

Fall of a Suspension Bridge, Paris.—The suspension-bridge known as the Pont de Constantin, erected in 1838, to connect the island of St. Louis with the Quai St. Bernard, has just fallen into the Seine. It was suspended to two cables of iron wire, to which were attached long rods supporting the planks. These had been gradually worn away by the continual oscillations caused by the tread of passengers, and the iron had become rusty, so that it had been undergoing repairs for nearly a month past. At about five o'clock on Tuesday afternoon, owing to the rupture of the cable on the side of the Jardin des Plantes, it gave way. About fifteen workmen were precipitated into the water, but were all rescued.

Proposed New Pier and Harbour for Newlyn.—A meeting of the promoters of the new harbour at Newlyn has been held at the offices of Messrs. Borslase & Milton, solicitors to the proposed company, under the designation of the Newlyn Harbour and Pier Company (Limited). The plans of Messrs. Trauson & Son were submitted and approved of by the meeting, and who are to be the working engineers, under the direction of Mr. N. Douglas, C.E., who will be the consulting engineer of the company.

The Albert Memorial Chapel, Windsor Castle.—A number of wooden cases, containing portions of the sarcophagus which is to adorn the interior of the Albert Memorial Chapel have arrived. The marble sculptures composing the sarcophagus were forwarded by Baron Triqueti at Paris, and immediately upon their arrival were deposited in the Albert Memorial Chapel, when the sarcophagus will be erected upon the floor of the interior, at the east end. An effigy of the Prince Consort will surmount the sarcophagus.

Extension of the Meat Market at Smithfield.—A meeting of the members of the Markets Improvement Committee has been held at Guildhall, to further consider the plans and specifications of the intended extension of the Metropolitan Meat and Poultry Market, Smithfield, and also to give directions for taking out quantities and nominating builders to be written to for tenders for the execution of the works.

Unveiling of Two Statues at the Wickliffe Congregational Church, Leicester.—The ceremony of unveiling the statues of Wickliffe and Latimer, which are placed in niches in front of the Wickliffe Congregational Chapel, London-road, Leicester, has been performed by Mr. J. Stafford (mayor). The attendance was not numerous. The statues are the work of Mr. John Finn, of the Midland-street Marble Works, Leicester, and are cut in white stone.

Mortuary for Warrington.—The Town Council of Warrington has determined to erect a public mortuary in their borough, and has fixed upon a portion of the borough cemetery, about a mile from the centre of the town, as a site for the building. In style the building will be Gothic, and it will be constructed chiefly of bricks, and with an open timber roof. Mr. R. Vawser, of Warrington, is the architect.

A Great Bridge over the Nile.—A bridge has just been completed spanning the Nile at Cairo. Its total length is 1,353 ft. and its width 38 ft. It is composed of girders resting upon stone piers, and the centre span swivels to allow vessels to pass through.

A Find near Rome.—We hear of the discovery of an antique statue near Aspra, not far from Rome. It is of white marble, life-size, and is described as representing a Venus naked to the waist, and of the best school of Greek art. It has been sent to Rocca-Antica.

Builders' Benevolent Institution.—We mention, with desire to assist, that the anniversary dinner in aid of this institution will take place on Thursday, November 7th. Mr. Edwin Lawrence will preside.

The Architectural Association.—The first trumpet to announce the opening of the Society season in London is blown as usual by the Architectural Association, who will lead off with a conversation next Friday evening, the 25th inst.

Hyds Park.—The Commissioners of Works have caused to be erected in Hyde Park a granite pedestal and iron standard surmounted by a board, to mark the spot where alone it shall be lawful to hold public meetings.

Fleet Sewer.—The Metropolitan Board of Works have entered into a contract with Messrs. Novell & Robson to carry out this work for the sum of £2,997l., Mr. G. Wall having withdrawn his tender for 54,000l.

Holloway Workhouse.—The roof of Holloway Workhouse being in a dangerous condition, the City guardians, to whom it belongs, have given order for its reparation.

The Crown Lands.—The net income from the Crown lands in the year ending the 31st of March last was 375,000l.

TENDERS

For alterations at the Lord Hill, Westbourne Park. Mr. Cotton, architect. Quantities not supplied.—
Brown £2,075 0 0
Capps & Co. 1,836 0 0
Kelly, Bros. 1,877 0 0
Beach 1,649 0 0

For the erection of nineteen cottages at Camberwell. Mr. H. Connew, architect:—
Allen (accepted) £2,800 0 0

For new house and warehouse, in Commercial-road, Whitechapel, for Messrs. J. Nixon & Sons. Quantities supplied:—
Thorpe £1,590 0 0
Shedfield 1,473 0 0
Wicks & Langley 1,387 0 0
Moyle 1,360 0 0
Ennor 1,820 0 0
Brown 1,313 0 0

For the erection of seven dwelling-houses, with shops and other premises, St. Andrews-road, Hastings, for Mr. John Woodcock. Messrs. Cross & Wells, architects. Quantities supplied:—
Bridgland £7,372 0 0
Jones 6,390 0 0
Parks 6,313 0 0
Yidler 6,223 0 0
Longhurst 6,157 15 0
Avard 5,872 0 0
Stentford 5,100 0 0

For offices and stalls on the Hastings and St. Leonard's Promenade Pier, Messrs. Cross & Wells, architects. Quantities supplied:—
Partly Roofed with Lead,
Howard £3,350 £3,475
Yidler 3,270 3,000
Tupper & Carr 2,980 3,066
Brown 2,971 3,030
Avard 2,971 2,978
Jukes, Coulson, Stokes, & Co. 2,935 3,013
Fatman & Fotheringham 2,829 2,978
Stentford 2,793 2,830

For warming the Pavilion on the Hastings and St. Leonard's Promenade Pier with hot-water apparatus, Messrs. Cross & Wells, architects:—
Truss £368 0 0
Bacon & Co. 850 0 0
Jukes, Coulson, Stokes, & Co. 730 0 0
Cheale 725 0 0
Smeaton & Co. 710 0 0
Huggatt 690 0 0
Jennings 676 0 0
Barrow & Wilson 670 0 0
Fraser, Bros. 615 0 0
May 598 0 0
Jones & Son 578 10 0
Alderton & Shrewsbury 570 0 0
Wootner & Smith 535 0 0
Cunning & Edmonds 500 0 0

For building new schools, &c., in Church-court, Kensington. Mr. Gordon Hills, architect. Quantities by Mr. William Smith:—
Chapple £6,135 0 0
Patman & Fotheringham 5,975 0 0
Myers 5,921 0 0
Hockey 5,709 0 0
Higgs 5,693 0 0
Sawyer 5,693 0 0
Hills & Sons 5,155 0 0
Dove, Bros. 5,135 0 0
Stimpson & Co. 5,275 0 0
Manley & Rogers 5,087 0 0
Cullum 4,894 0 0

Reinstating Mount Ash-road, Upper Sydenham. Messrs. Cortis & Parier, architects:—
Lawrence £100 0 0
Clark 165 0 0
Cole 130 0 0
Wood 123 0 0

For alterations and repairs to seven houses, Quaker-street, Spitalfields, London. Messrs. F. & W. Stone, architects:—
Petigrew & Moyes £472 0 0
Anley 439 0 0
Langmead 435 0 0

For alterations and additions to factory, No. 65, Mansell-street, Whitechapel, for Messrs. J. Jacobs & Co. Mr. John Hudson, architect:—
Wall £290 0 0
Little 753 0 0
Read & Son 716 0 0
Jacobs 694 0 0

For Stanningfield new Parsonage-house and stables, &c., near Bury St. Edmunds, Suffolk. Mr. E. Christian, architect. Quantities not supplied:—
Allowed for old House Materials.
Rednal £2,450
Pearson 2,550 £10
Sanders & Bolls 1,836
Vickers (accepted) 1,522 50

For new school at Stanstead, Suffolk. Mr. Fowler, architect. Quantities not supplied:—
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Cadge 251 13 6
Pearson 237 0 0
Theobald 219 10 0
Smith (accepted) 291 13 0

For the erection of vineries, melon-house, and sundry works at Shooter's-hill, for Mr. N. Carter, Mr. G. Judge, jun., architect:—
Blake & Lamplen (accepted) £300 0 0

For new Wesleyan Chapel, Nunston, Warwickshire. Mr. W. S. Burton, architect. Quantities supplied:—
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Linnells 1,570 0 0
Towers 1,436 15 2
Neal 1,350 0 0
Sackree 1,350 0 0
Hardy 1,290 0 0
T. & G. Harford 1,247 15 0
Spencer 1,133 13 8
Fox & Hood (accepted) 1,160 0 0

For wool-spinning mill and offices, Newark-street, Leicester, for Messrs. Drierley & Sons. Mr. W. S. Burton, architect. Quantities supplied:—

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Ratcliffe 3,754 0 0
Monte 3,687 0 0
Dexbury 3,663 5 0
Osborne, Bros. 3,460 0 0
Neal & Sons 3,457 0 0
Scott 3,420 0 0
Hatchinson 3,409 0 0
Eagle (accepted) 3,378 0 0

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Richards £1,121 0 0
Pegg 1,068 11 0
Cort & Paul 1,033 0 0
Gimson & Co. (accepted) 1,033 0 0

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Credit.
Old Materials.
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Lucas 8,050
Monte 8,052 162
Hayward 8,095 210
Myers & Son 7,849 300
Axford & Co. 7,827 189
Allen & Son 7,697 159
Axford 7,502 119

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The Builder.

VOL. XXX.—No. 1551.

The Materials of the Architect.



ELECTION of materials for architectural use is a subject that so continually demands the attention of the architect, the engineer, and the builder, either directly or implicitly, that it is desirable from time to time to review our knowledge of the subject, and to see how far new discoveries, or local or even temporary causes, may tend to modify our practice.

The chief considerations which should regulate the selection of material for any structure are, on the one hand, hygienic qualities, durability, and beauty; and, on the other hand, economy. We place these qualities in two distinct categories, because it is thus, for the most part, that they are regarded; whether properly or im-

properly remains to be seen. Under the head of economy rank the questions of local convenience and supply; and these again are often closely connected with the sanitary qualities of a material, whether as a conductor or non-conductor of heat, an absorbent or non-absorbent of moisture, or with reference to qualities yet more subtle, as to which scientific investigation is yet in its infancy. But there seems to be good reason to hold that, apart from the physical properties to which we have referred, there are others the nature of which we have as yet been unable to grasp, but the effect of which is more direct on human health than may be at first imagined. We see this very clearly marked in the selection of site. Apart from any question of drainage, there is a difference, which we will not for the sake of expressing what we mean, speak of as of something resembling a magnetic or electric character, directly due to the chemical nature of the soil, which is most sensibly perceived by delicate or unhealthy persons, and which we may thus be justified in regarding as of some importance to us all. Such, for instance, is the difference experienced by many persons between residing on a clay, a sand, or a limestone soil. This cannot be attributed altogether to hygrometric causes. For we may instance the "rab" of Pembrokeshire, which is a species of stratified clay, so indurated that it breaks into small fragments that may be used as gravel for paths and footways. The soil above is dry from the innumerable fissures of this geological rock, and yet the peculiar effect of clay soil on delicate health is experienced by those who reside on the soil, and who give attention to such subjects. Again, those who have resided on a volcanic soil, such as the Italian *tufa*, are well aware of the extreme fatigue which attends walking on the surface. This is not a question of latitude and solar heat; for on limestone soils, in the immediate vicinity, this special fatigue is absent. We have here a direct illustration of the relation between soil, site, and structural materials. When in our own country, the natural asphaltes which are imported are used for pavements or roadway,

something of the fatigue experienced on the *tufa* soil may be detected by the pedestrian. On the other hand, a marble floor, or a marble staircase, in a *tufa* country, gives a freshness and vivacity to those who command such a domestic luxury which is well known to persons of experience; and which is not at all dependent on causes to be detected by the thermometer.

There are many things which lead us to suppose that there is something specially akin to human health in the earth, whether we regard the mass of the planet or the mixture of various elements that forms good agricultural soil. The marvellous powers of earth as a disinfectant, though long known, have been only recently brought into prominent notice. Lime and clay each has its special value; and the experiments that are in progress as to the deodorisation of sewage by the admixture of these simple materials deserve attention. Again, the benefit to health that is often obtained by sending a sickly child to follow the track of the newly-turned furrow, is not a mere result of air and exercise. The warmth and substantial comfort of a turf bed, such as those which rise, like mushroom cities, along the course of great public works, cannot be spoken of as they deserve, except by those who, like ourselves, have made experience of them. They have, no doubt, like thatched roofs, their special disadvantages. We are not about to advocate a return to the aboriginal wigwam; but we say that there is so much that is good in this rudest form of dwelling, that it is well worth the attention of the builder how far earth that is thoroughly dry and protected from moisture may be rendered more available than is our present custom for increasing the comfort and sanitary excellence of our dwellings.

Earth, it may be replied, is what we do use, in the greater part of England, in the form of brick. The reply is not exactly correct, as the use of clay for the material of bricks is the selection of the species of natural soil which is least favourable to human health for the staple of our building materials. Yet, even so, there are special advantages proper to brick. When well burnt, it is by far the most durable of materials. Neither metal nor stone can compare with it in this respect; and not only is this true with reference to durability, under ordinary circumstances, but it is especially true with regard to the terrible casualty of fire. It is on evidence, from the results of the operations of the Fire Brigade, that neither stone nor iron can be relied on when exposed to great heat. The stone flies, the cast iron cracks, the wrought iron bends and yields. In transmitted heat alone,—that is to say, great elevation of temperature without actual exposure to flame,—a wooden staircase has been found safer than a stone one. Solid beams of wood are considered, by the experience of the Fire Brigade, far more reliable than iron standards. Again, the superiority of a tile roof, for the maintenance of a mean temperature in a house, over one of slate, is very great. In this case, indeed, it is rather owing to the relative thickness of the roofing stratum than to any other quality, as clay passes into slate by imperceptible degrees; but the difference in the action, as regards the sensible comfort of the inmates of a dwelling-house, of a tile roof and of a tile floor, is very deserving of attention. If the influence which is either transmitted or arrested by the clay be of a nature akin to terrestrial magnetism or electricity, we may form some idea why a tile roof should be a comfort and a tile floor a discomfort.

Recent improvements of various kinds, and the knowledge which the International Exhibitions have served to spread, have turned the attention of the architect to the use of terracotta in building, of which we have not infrequently spoken. But it is matter of very serious regret that nothing seems to arrest the increasing

deterioration of ordinary building bricks. Their extreme roughness is such as to demand a quantity of cement altogether disproportionate to that used by the old bricklayers. We use the word in its general, and not in its special, sense. With the increase in the quantity of cement employed comes an increased temptation to mix it with inferior materials. Thus the main good quality of our brick buildings, their durability and defiance of weather, is becoming seriously impaired by the struggles of the brickmaker to use every sort of earth obtainable.

The main architectural novelty of the last twenty years has been, as most of our readers are aware, the increased use of iron as a building material. This has reacted on structure, and on pictorial design. In some instances the action has been most desirable. Thus we have attained a power of covering large apertures, whether with heavy rolling weights, as in our estuary and intra-mural railway-bridges, or in the way of mere shelter, as in railway stations and slip-roofs. We find a legitimate and admirable use of iron in such structures as the Albert Hall. We regret the power of bigness which has been placed at the command of the builder in such places as the Charing-cross and Cannon-street roofs. But there are so many and so great objections to the use of iron as a building material that it is well to review them.

To a certain extent, we may speak of these objections as, in the main, economical. But economy is not all,—or, at least, the word must be taken to include the economy of life. It is only the other day that the traffic on the St. John's Wood branch of the Metropolitan Railway was arrested by some threatening symptoms in the bridge over the Regent's Canal. The company are to be congratulated on their vigilance, as one of the main evils of iron as a structural material is the entire absence of warning before fracture.

Then we have to bear in mind the constant invitation which any unprotected surface of iron continually offers to the subtle and destructive power of rust. Careful and constantly-renewed painting is of vital importance to the durability of iron. In large exposed spaces where the metal is thin and outspread this source of danger becomes disproportionately large. Thus, on the one hand, all those fittings and ties which are exposed to atmospheric influence (as to which the fact of being under cover is not of so much importance as might be imagined), but removed from ready inspection and access, and, on the other hand, those plates and sheets which cover large areas with comparatively small weights of metal, are sources of danger which the architect who builds for posterity will carefully avoid.

Added to its structural fickleness, especially when exposed to fire, and to its liability to stealthy erosion by rust, is another peculiarity of iron that will render the provident designer very chary of its use, except in those circumstances for which no substitute can be readily procured,—that is, the great fluctuations of price to which it is subject. These amount, as we have recently seen, to 300 per cent. Fluctuations in the price of labour, and thus of materials, are among the difficulties with which the architect has always to reckon. But nothing that has yet occurred among carpenters, masons, or bricklayers, either as regards the materials on which they work or the wages they may demand, is at all comparable to the violent fluctuations that take place in the price of iron.

A further caution to be observed in the architectural employment of iron depends on the excessive variability of its tensile and compressive strength. In bar iron there is a difference in tenacity, between the best Yorkshire bar and the ordinary merchants' bar, of 40 per cent. In elasticity, the difference is yet larger, amounting to 75 per cent. over the minimum, or average of from 14,000 to 8,000. In toughness, the work

done in breaking a 1 in. bar, 1 ft. long, differs from 730 to 3,700, the best Yorkshire iron having eight times the tenacity of the common bar, and the disproportion in plates being even greater. Even in specific gravity differences occur to the amount of 22 per cent. It is therefore evident that, when we speak of iron, we speak of a group of metallurgical products differing, as much as if they were known as distinct metals, in all the qualities which are of value to the architect; although they may very closely agree in one of the properties with which he has to contend, viz., liability to corrosion. Absolute test, in the case of any important ironwork, is a *sine qua non* for the engineer. And the tests, to be worth anything, must be applied either to the whole supply, or to samples selected at will by the purchaser, without any communication with the provider. We could give striking examples of the manner in which iron is got up for special testing; and we believe that Mr. Kirkaldy, the inventor and proprietor of the best mechanism employed for the purpose of testing iron of any kind, could tell much more.

But even this is not all. It is now seventy-one years since the first successful application of cast-iron beams to the purposes of building, which took place, according to Mr. William Fairbairn, in 1801, in a cotton-mill at Manchester, after designs by Messrs. Boulton & Watt. Tredgold's work was published in 1822. Mr. Hodgkinson commenced his well-known inquiry into the strength of iron beams in 1827; and we have a Parliamentary Blue Book, the report of the commissioners appointed to inquire into the application of iron to railway structures, which dates in 1819. Yet on a subject which certainly ought, by this time, to have been reduced to scientific certitude, we have recently seen published a new treatise, in which the author establishes at all events a *prima facie* case, to the effect that in all the wrought-iron beams that are constructed according to the *formule* now generally accepted, fully one-sixth part of the iron employed is wasted; while in cast-iron beams, repeated applications of the recognised working loads will subject the upper flange to a repetition of the proof stress, and are thus likely ultimately to cause failures. Thus, in a word, iron, as an architectural material, is not perfectly understood in its scientific theory; is subject to extreme variation in quality; to a variation in price of from one to three; and to the never-failing action (unless carefully counteracted) of the corrosive elements of the atmosphere.

Our recent experience with regard to stone has been enlarged in both an upward and a downward direction. How far stone, which has not been carefully selected from a known bed, is from being a durable material, or even from equalling the durability of wood, may be estimated by any architect who will take the trouble to examine the condition of the New Palace of the Legislature at Westminster, and any of his own buildings. The most striking instance within the range of our own personal experience is the case of St. David's Cathedral. Beds of red and purple sandstone, of colours most charming to the eye, are to be obtained in Pembrokeshire, which are almost indistinguishable on inspection, when first quarried; but which differ in their durability as much as Portland and chalk differ. Nash, the architect, restored St. David's in his time. He used some of the perishable stone, and much of the restored work is more decayed than that which it replaced. Some of this stone was used in the station buildings of the South Wales Railway, to the great satisfaction of Mr. Brunel's staff in the first instance. Symptoms of decay, however, soon made their appearance; but were arrested by the application of a silicate.

On the other hand, we have recently had the opportunity of comparing the condition of massive stonework that may be definitively assigned to known dates, differing from each other by periods of 540 and 570 years respectively, the most recent of which is 1,900 years old. We refer to the results of the exploration of Jerusalem by Capt. Warren, which are such as to enable us to identify with certitude, in certain points, the work of Herod, of Nehemiah, and of Solomon. Of the former, which was constructed without cement, but with the joints strengthened by mortises and tenons in the solid stone, there are stones now *in situ*, with the quarry marks, in red paint nobilitated, in perfect preservation. There are others of the same or later date, much decayed. The result of the observation is, that in 2,800 years the difference in durability between stone from different beds in the same

quarry has been such, that we have reached the limit of that of the inferior quality. It may be said that this is a long life for masonry. We may contrast it with the cathedral work to which we have before referred. The result is, that or a stone building on the durability of which the architect desires to rest his fame, the selection of bed is a matter of as much importance as the selection of quarry. No beauty of appearance, or behaviour under the pick or the chisel, is a proof of durability. Actual experience of the power of any particular stratum of stone to resist atmospheric influence, can alone assure the builder that he is working securely for the future.

It ought to be hardly necessary, in the present day, to call the attention of the architect to the extreme danger of an intermixture of iron and stone, or, indeed, of iron and brick. When brought into direct contact with mortar, nothing will prevent the slow erosion of iron. It is not necessary for the atmosphere to have access. The materials requisite to allow of destructive chemical change are to be found in the iron and in the mortar. And it is not merely the gradual disintegration of the former that is to be feared. That would be a source of positive danger, so far as the tenacity of the iron had been depended on by the builder. But the evil is active and unceasing. Beds of rust, of three or four times the thickness of an ordinary iron plate, grow within the structure, with an energy as destructive as that which is exercised by the roots of plants. The marble sarcophagus of King Henry VII., is an instance of which we can speak from personal observation. Most of the metal work of the beautiful structure was either copper or brass. But there were iron plates introduced as washers between the horizontal slab and the walls, which behaved exactly as we have described. They coated themselves with beds of rust, of three times their thickness, and were, when removed, slowly shattering the tomb.

Hoop iron laid in as bond to brickwork is a not unmechanical method of increasing cohesion to a very considerable amount. But it requires care that it should not become an engine of destruction from its chemical action. Such is invariably the case when it is laid in mortar. In cement, however, the destructive action does not occur. The iron lies chemically dormant, and does its mechanical duty. But in all cases where the use of metal is absolutely necessary for the support of masonry,—as, for instance, where a delicate pinnacle, or the acute quoins of a skew arch, are pierced with a bolt,—we most strenuously urge the use of copper.

We do not wish to introduce moral reflections into an architectural inquiry. But it is impossible to investigate the question of durability of building material without being struck with the immense difference in the treatment of their work by ancient and by modern builders. Men build now for a livelihood. We do not speak of this as discreditable,—far from it. Yet it has the invariable accompaniment of the temptation to build cheaply, and therefore not durably. The old builders wrought for durability. The Great Pyramid, or the Great Temple Enclosure, or the mysterious Stonehenge, might have been executed at the tenth part of their actual cost, and so as to have presented, when spick and span new, as brilliant an appearance as could ever have been their pride. But where would they have been now? Where will any of our public buildings be, we will not say 3,000, but 300 years hence?

THE ANTIQUE, AND MODERN STUDY.

So many differences there are between the way of bringing into existence an art work in these modern times, and that of doing the same thing in times gone by, that one hardly knows what special difference to select that shall most interest those students of art who care to go into such matters. We will know that it is too theoretical and abstract, and unpractical for many; but to the few who can see into it, it is a matter of no small interest, for before *practice*, or a change in practice, there must be *theory*, and thought, more or less. What very remarkable difference, therefore, is there between the old art action and the new, which shall take in, so to phrase it, the greatest possible sum of difference between the two systems? We think we shall be safe in saying that in no one respect is there a greater distinction between the old or past method of artistic procedure and the new, than in the fact, so seldom if ever noticed, that the old art, as the

Greek sculpture, came direct from nature, while modern sculpture for the most part, and always in the Royal Academy Schools, comes from "precedent," i.e., sculpture produced in past days by almost extinct races of men. It is almost impossible to imagine in these times what the position of a Greek sculptor was. With his block of marble before him, as yet unshewn, his mallet and chisel in hand, and with every mental and bodily capacity to do the work, what did he go by without precedent, or "ancient examples," to adopt a favourite phrase? Let any one who thinks this commonplace, fancy, if he can, what our Royal Academy would be were the "antique" away from it. What would be said, what done? No man can imagine. But yet this was the precise position of the old Greek, and we may fairly add the Roman, and most surely the still older Etruscan. Yet did the Greek with all this lack of our artistic helps, do his work right well, as the Greek fragments and remains in the British Museum alone will evidence to any one who will give but a little thought to it. "Imaginative power" of the highest order, say some, did the work: it all lay in the mind,—what need of precedent? Then there is the "anthropomorphic" theory, as adopted by Mr. Gladstone; and then again the notion that the "haphazarding" of Homer, and his inspiration, wrought such wonders out of the dull and formless marble. All or any of these, for we need not go into the controversy just now, may or may not be true, or may or may not account for what the Greek did; but of one thing we may be quite certain, that the great sculptors of Greece could not but see the fine and noble forms about them, and seeing them, could not but admire and be impressed by them, and influenced by the magic of their constant presence. To see was to profit practically by the seeing. The impression once made could not be effaced, and the power of mind and hand could not but be helped, nay, almost created, by the perpetual presence of such well nigh perfect models: not still and lifeless, and void of expressional power, as our academy models are, but ever living and moving in the common and every-day Greek life. What need of "precedent," indeed, could there well be for those who have created precedent for us? What precedent could there be for the production of the perfect Theseus, or, according to Canova, the yet more perfect Iliuss?

If all this be not a little curious, and significant of the difference between the old and the new,—between the antique mode of doing things and our modern and, as some will, perhaps, say, improved method of work,—there is yet a more singular evidence of the vast change that has taken place in principle between the old-world ways and the new and modern. It is, and we ask attention to it especially, that of the little use made in such a place as the Crystal Palace of a collection of antique examples. Let us explain. In the Royal Academy, as is so universally known, the "antique" is everything. It is the life, and soul, and body, of the place, as an art-school. The antique in it lives again,—a sort of galvanic life only, it is true, but still there it is all and everything, the only true foundation and guide to art-action. But at the Crystal Palace all this living antique is no longer the all-animating inspiration, but is found to be nothing more than a collection of interesting fossil bones,—mere antiquities,—neither more nor less,—interesting to the student of history and the instructed sight-seer, but no longer the guide to actual action of any kind. The Crystal Palace action, as all know, is made up, to a great extent, of what may be termed amusement,—artistic amusement, if you will. Quoit-throwing, running, dancing,—dancing, prohibited almost everywhere else,—gymnastics of very various, if not actually classic, kind: all these things are done instinctively, and because people naturally like them, and like to look at them; but who ever saw any one human being, whether art-student or not, attempt to imitate the antique in any way whatever? Whoever, for instance, ever thought of casting even so much as a glance at the "Discobolus," for the purpose of classically handling the *discus*, or throwing it well? Who has ever thought of looking to his own "muscular development" by the side of the "Fighting Gladiator," to find out, it may be, what progress, if any, has been made in the vast interval between the days of old Homer, or Phidias, or Miron, and our own in the facts of muscular development, of increased strength of arm-power, or of hand-grasp, or of flexibility of foot, or indeed of anything which could or may have

been added to the *power* of living humanity? No one, of course, has ever thought of this for a moment, and still less has any one ever dreamed of acting upon it. Yet why not? If to multiply "sculpture," to make new statues, to study how to draw the "figure" or how to become a great sculptor, it is necessary to go to the antique, and to copy it, and almost religiously to imitate it why should not the modern gymnast, and lover of muscular action and the exercise of the bodily powers, go direct to the glorious antique, and learn of it, and, if not directly to imitate it, as they do at the Academy, in learning to draw it, to, at least, be guided by it, and to have it ever and always in view, and within call, so as to be able to refer to it, and test power by comparison? We say, why should not this be? For if the insensible marble be necessarily lifeless without perpetual reference to the old Greek antique, why should not the living athlete be alike mortal of it?

These things cannot but strike the thoughtful student of art with a little astonishment, for the impression made by the antique being so powerful, it seems a wonder that it has not a greater practical and common influence,—influence that is on every-day life; and we cannot but think that there is, and must be, a germ at least of a right good idea in it. The Greeks and Romans! What would all our schools and colleges be without them, and their memories, and writings, and wonderful ways? We yet live on them, and dream about them, and in "sculpture" certainly, if not in architecture, and in decoration, imitate them as closely as we can. A wonderful race of artist men! We are all led to these thoughts on old Classic times every now and then, for the modern cultivated man could not live without the "Classics" in some form or other. Even a Latin play, acted out by college students, in Westminster, is a something, and in spite of all sorts of hindrances and odd mistakes, and an almost unpronounceable language, school-boy Latin, it seems somehow or other to carry one right into the great times when the plays were written. Could not this idea of seeing into the old Classic ways be extended, if only a little? Mr. Thomas Carlyle in his last lesson to the modern student, and on a very special occasion, emphatically recommended the study of the Greek and Roman writings and ways; and it is quite certain that, whatever their failures and shortcomings, there was very much in them well worth the looking at, and very careful study, if not imitating; and it seems strange that more has not been done to give it expression, and to place the semblance of it before the mental and bodily eye of the art-loving public.

We have noted the action of the Crystal Palace as one of some singularity if carefully looked at, and that of the Royal Academy as one equally so in another direction, and the thought has struck us more than once, could not these ideas be extended, and, may be, combined somewhere,—say,—for there would seem to be some small difficulty in spite of every effort to utilise it,—in the Alexandra Palace. That building is now a blank space, and no one seems to know well what to do with it, or in it. Could it not be made effective for real, and *bona fide* artistic purposes? There is ample room for it, we should think; for the general public, truth to say, see but little or nothing of art in action. Let us, by way of example, and to make our meaning as clear as may be,—a little difficult, for the thought is somewhat new,—cite *horse-racing*. That there should be a *racecourse* in such a place, and in connexion with such a building, may seem somewhat strange, but the *fact* is quite certain, there is a *racecourse*, and it has been on more than one occasion brought into practical use. Horse-racing in this country is pretty much the same everywhere. Horses, men, mode of riding, dress, and all the surroundings are the same, and no one can deny that it is "popular," and meets the wants of a large bulk of the British public. It fills the pulpit eye, and everybody is satisfied; and the whole show is to the British man an artistic display, quite as much so as the famous Olympic Games were to the ancient Greek, or the great Gladiatorial shows to the Roman.

Of all this no one can or will doubt, though the facts are somewhat of the strangest, but not more so than the conclusions that may be drawn from them or the lessons that are to be learnt from them. No one who will with some patience go into the subject will dispute the fact of how much the Greek got out of his great Games artistically. They were, indeed, his "pre-occupant." In them he found his models, and his life and action, and could make out of them the

pictures,—the status-pictures, if we may use the term,—which we see and go by, and try to copy, but only in despair, and call the "antique." Of the magnificent power displayed in those wonderful fragments no one needs to be told, or that they are truly representative of the antique classic life. But turn to the modern horse-race, and look at it as an artistic show and as the precedent out of which to create an artistic work, capable of being placed side by side of the Greek work, even supposing the art-power of the *executive* artists to be the same. What must be the art result? It is surely needless to say, or even to hint at it. It must fail, the conditions being so different. How much, therefore, must there be to learn, and what a really useful purpose might the now empty Alexandra Palace be put to if filled with instructive evidences of the highest artistic power, and a "school" in combination with it, for the purpose of making it all practically useful. Much might be added in detail to show how all this that we have thus hastily glanced at, might be best worked out; but we must be content to simply indicate the way.

VARIETIES IN RAILWAY GAUGE.

THE Government of New Zealand has wisely determined that the railways they are about to lay down in the colony are to be on the comparatively narrow-gauge of 3 ft. 6 in. The "huddle of the gauges" has been a long and obstinate conflict, and has extended to very remote regions,—to India and Australia,—but there is no reason for any contest in New Zealand, where the question of working junctions with existing lines can scarcely be said to present itself for the embarrassment of the question, the lines now or about to be commenced being practically the beginning of a system of railways for the entire colony; with this notable exception of an existing line in the province of Canterbury, which includes a work of the same nature, and nearly equal extent, as the once celebrated Box tunnel in this country.

The history of the gauge question is interesting, and presents some curious features. The prevailing impression probably, amongst those who are not called upon to interest themselves specially in railway matters, is that there are two gauges only,—the prevailing 4 ft. 8½ in. gauge, adopted by George Stephenson, and the 7 ft. gauge laid down by Brunel on the Great Western system. The fractional ½ in. in the ordinary narrow-gauge may appear whimsical, but it is accounted for very easily. Railways, as they are, are a growth rather than a creation. They were preceded first by wooden tramways, then by plateways, next by flanged rails, and finally by flanged wheels running on iron rails. The ordinary gauge of carts and wagons that were used upon the primitive tram, plate, and flanged railways, was 4 ft. 8 in. This width was found to answer very well practically, and when the flanges were changed from the rails to the wheels, it was retained, no reason presenting itself probably for an alteration, which if made would have caused considerable disturbance and cost in the adaptation of rolling stock: 4 ft. 8 in. was really the gauge; the odd ½ in. was added to afford play without side friction. The gauge served its purpose on the Stockton and Darlington line. Stephenson looked to a future when, as he said on an occasion to his son Robert and John Dixon, "Railways will come to supersede all other modes of conveyance in this country,—mail-coaches will go by railway, and railways will become the great highway for the King and all his subjects. The time is coming when it will be cheaper for a working man to travel upon a railway than to walk on foot. What I say will come to pass, as sure as you live. I only wish I may live to see the day, though that I can scarcely hope for, as I know how slow all human progress is, and with what difficulty I have been able to get the locomotive adopted, notwithstanding my more than ten years' successful experiment at Killingworth." The result, we need scarcely say, has even exceeded Stephenson's most sanguine anticipations. Having such views, it was natural that the same gauge should be adopted for the Liverpool and Manchester line as that upon which the Stockton and Darlington line had been laid. Very early in the history of railways, a curious accident led to an unintentional diversity of gauge. At the same time as George Stephenson was giving evidence in favour of the Stockton and Darlington line in one of the dingy committee-

rooms of the old House of Commons, the Llynvi Valley line was being promoted in another. The principal promoter of the South Wales line, inspired probably by Stephenson, and sharing his belief in the ultimate reticulation of the country by railways, prepared for the future junction of the Llynvi line with the Stockton and Darlington by adopting the same gauge,—a junction, however, which was never to take place, from the inadvertent mistake of placing the flange on the *outer*, instead of the inner, side of the wheel, and making the gauge so much less, by the thickness of the two rails, than 4 ft. 8½ in. The old Llynvi road was so laid, and for many years served usefully as a mineral line. Portions of this old railway still remain, although not now used, and others have been incorporated with the amalgamated Llynvi and Ogmore system, by which the original Llynvi has been absorbed. The communication with the North has only recently been completed; and it is a curious fact that the first "foreign" wagon that came upon the Llynvi and Ogmore, a few months since, was from the Stockton and Darlington line, forty-five years after the Llynvi Valley Act was obtained, 6th Geo. IV.

The question of increasing the width of gauge arose with Isambard Kingdom Brunel, engineer-in-chief of the Great Western Railway, an imaginative, self-reliant, and daring genius, who was thoroughly averse to follow any man's lead in the gauge of a railway, the design of a bridge, the construction of an engine, or ought also coming within the *role* of the engineer. He aspired to make the best possible road, irrespective of cost; the Stephensons, father and son, were content to make good and safe roads that would *pay*. Brunel's adoption of the 7 ft. gauge for the Great Western, opened the question, and led to the long and keen contention not yet settled. Engineers sought for perfection in a *via media*, between the 7 ft. and the 4 ft. 8½ in. gauges; but no one at first proposed a gauge narrower than that last named. The arguments in favour of the broad gauge were, that greater steadiness would be secured, and higher speeds attained with safety than were possible with the narrow gauge. To give better space for the machinery of the locomotive, to secure greater steadiness and higher speed, it was thought that the 4 ft. 8½ in. gauge might be widened with advantage, and without material increase to the cost of the line or of the rolling-stock. For the Eastern Counties a gauge of 5 ft. was adopted. In Scotland some short lines were made with a gauge of 6 ft. Ireland could not, of course, be affected by the question of junctions with British lines; but the promoters of Irish railways might have been expected to be influenced by the consideration of junctions between lines in their own island. Thus they do not seem to have been, seeing that the Ulster company adopted a gauge of 6 ft. 2 in., and the Drogheda company a gauge of 5 ft. 2 in. The Irish Board of Works had much more contracted notions, feebler faith, and shorter sight, than George Stephenson, as to the ultimate extension of the railway system. When he was consulted as to the gauge of the Carbury and Whitstable and the Leicester and Swannington railways, he said,—*"make them both alike; they are a long way apart now, but they will be joined together some day."* When complaint was made to the Irish Board of Works as to the discrepancy of gauge, their reply was that "the two ends were complete; there was little chance of the intervening space ever being filled up by a railway, and that, therefore, there was no harm done." General Pasley, to whom the matter was referred, fixed the gauge for Irish railways at 5 ft. 3 in., which was different from three other gauges then in operation.

The question of gauge of railways is now presented in a totally different light from that in which it appeared fifteen or twenty years since, and the contention is not now between the 7 ft. and the 4 ft. 8½ in. gauge, but to how much less than 4 ft. 8½ in. can it be reduced? On the Great Eastern line the gauge was long since reduced to 4 ft. 8½ in. On many portions of the Great Western itself the 7 ft. gauge is abandoned, and the 4 ft. 8½ in. gauge substituted. Numerous important improvements have been effected in the construction of the locomotive, and much has been done to demonstrate the capabilities of narrow-gauge railways. Mr. Robert Fairlie has conclusively demonstrated with his "Little Wonder" on the Festiniog line, that heavy loads can be conveyed, with perfect safety, at fair speed, on a line with stiff gradients, and some curves of two and three chains radius, that has a gauge of not more than 1 ft. 11½ in. We have

travelled upon this "toy line," as it has been called, and were certainly startled by the quickness of the curves, and the daring nature of its sinuosities, as it ascends and descends the mountains between Portmadoc and Festiniog; but we could not fail, in the face of its immunity from accidents, and of its wonderful performances, to conclude that if a 2 ft. gauge line can do so much, and do it so well, a 3 ft. 6 in. gauge should be capable of doing anything that can reasonably be expected from railways or the locomotive.

Some of those most directly interested in the development of the material resources of India are urging that future extensions should be on a gauge of 3 ft. 3 in. instead of the 5 ft. 6 in., laid down by Lord Dalhousie's administration. The fractional $\frac{1}{2}$ in., like the $\frac{1}{4}$ in. in the English gauge, is probably an allowance for play. In Victoria there is an agitation for the reduction of the gauge for extensions from 5 ft. 3 in. to 3 ft. 6 in. In India the proposed narrow gauge for extensions is opposed by Colonel Kennedy, on the ground, chiefly, that the loosely-packed cotton brought from the interior cannot be carried upon narrow-gauge trucks. That is rather an argument for an improved mode of packing, than for the construction of hopelessly unremunerative broad-gauge railways. In the International Exhibition, just closed, a bale of Indian cotton, pressed by West's hydraulic press, was shown compressed to the density of timber, and hard enough to hold a nail driven through the hoop-iron lashing into the cotton as firmly as it could be held by a deal plank. Every separate cotton plantation might not have its own press, or full work for one, but packing stations would surely be practicable, and narrow-gauge branch railways that would give a reasonable prospect of a return upon the capital expended upon them, would be an immense improvement upon the bullock drays by which the cotton is now dragged tediously to the stations on the trunk lines. If a given weight of cotton as packed cannot be carried upon one wagon on the narrow gauge, it may be carried on two. The narrow, as compared with the broad gauge, effects a large saving in the road-bed, in cuttings, tunnels, and embankments, in rolling stock, in dead weight, in working expenses, and in other respects. In many localities at home, abroad, and in the colonies, where railways are greatly needed, comparatively inexpensive narrow-gauge lines furnish the only possible or satisfactory solution of the important problem of "railway or no railway."

In New Zealand, free from the embarrassing element of physical junctions, and where the principal commodities carried will be mineral and agricultural produce, including wool, the 3 ft. 6 in. gauge may be confidently expected to answer satisfactorily all requirements.

THE LATE MR. ALLOM, ARCHITECT.

On Monday, the 21st inst., Mr. Thomas Allom, architect and artist, died at his residence, Barnes, Surrey, of disease of the heart, after several weeks of severe suffering, which he endured with an exemplary patience. Mr. Allom was born in London, March 13th, 1804. Showing early signs of artistic talent, he was articled to the late Francis Goodwin, architect, in whose office he spent nearly eight years, engaged upon many important public and private architectural works. Proposing to travel to improve his knowledge and taste, his artistic powers soon led to offers from Messrs. Fisher, Son, & Co., Messrs. Virtue & Co., and Messrs. Heath & Co., the well-known publishers, which were accepted, and resulted in beautiful illustrated works from Mr. Allom's pencil, being published in periodicals, extending over a course of twenty years. These were eagerly sought after, not only in this country but in many Continental cities.

The following are some of the works in question:—"Cumberland and Westmoreland;" "Devonshire and Cornwall;" "Yorkshire, Derbyshire, and the Midland Counties;" "Surrey;" "Scotland;" "Belgium;" "France;" "Constantinople;" "Asia Minor," including the "Seven Churches of Asia;" and "China."

Mr. Allom (who was at an early age a student of the Royal Academy) exhibited at the Royal Academy and other exhibitions for many years, where his charming pencil usually gained a place of honour. He was frequently called upon to assist his professional brethren, and there are few artists who forget the vigour and beauty of the drawings, made for the late Sir Charles Barry, of the new Houses of Parliament, and presented

by him to the late Emperor Nicholas. We may also recall the designs made for the embellishment of the Thames in 1846, which had great merits.

Mr. Allom was one of the founders of the Royal Institute of British Architects, and of late years devoted his attention to his original profession (that of an architect), but continued to produce from time to time many beautiful pictures in water and oil colours.

Among his chief works as an architect are the following:—During his partnership with Mr. Lockwood were executed—the Kirkdale Industrial Schools, for 1,200 inmates; the Liverpool Workhouse; the Wesleyan Chapel at Hull; the Holy Trinity Church, Hull, &c. Subsequently, Mr. Allom designed and carried out the following works:—Kensington and Colne Union Workhouses; Christ Church, Highbury (now being enlarged in accordance with the original designs); the Loudon and Lancashire Insurance Office, at the corner of Leadenhall-street and Bishopsgate-street; the Cambridge Asylum for Soldiers' Widows; the Harwich Hotel; Hanwell Cemetery; the Islington Vestry-hall; and the covering the Kensington Park Estate with mansions, for the late Mr. C. H. Blake, at a cost of nearly 200,000*l.*; besides numerous other buildings for private individuals. Several of the above works were obtained in public competition, in which Mr. Allom was successful; but he was, however, doomed to a great disappointment in the year 1856, when, in the competition for the Free Public Library at Liverpool, his designs having been awarded the first premium, were handed over to the town surveyor. In the Manchester Assize Courts, Mr. Allom's designs, as his friends state, so far as the plan is concerned, carried out.

It is painful to reflect on the number of artists, architects, and men of letters, friends and fellow-workers with the late Mr. Allom, who have passed away, most of them within the last ten years. David Roberts and Turner, two of England's greatest painters; Rorn, Smith, Leech, Kenny Meadows, Samuel Lover, Mark Lemon, Charles Barry, Douglas Jerrold, Stirling Coyne, Professor Cockerell;—these and many others were his early companions and valued friends.

A widow, a married daughter, and two sons,—one following ably the profession of his father in London,—are left to mourn their loss.

There remains with the family a collection of many hundred original drawings and sketches of interesting places visited by Mr. Allom in his travels through Europe and the East. It is not many years since his "Seven Churches of Asia," works in oil, painted for Mr. George Virtue, were engraved in the *Art Journal*. These are now being exhibited, with Mr. Virtue's collection, at the Crystal Palace.

FROM FLORENCE.

THE floods and inundations in the north of Italy have been dreadful. The canal made here in 1668, parallel to the Arno, has since saved Florence from its ravages, but great fears were entertained on Sunday night and Monday morning that the river would break all the barriers, and guards with torches were parading the quays the whole night to watch for any breach. The waters rose 5 ft. ! Such torrents of rain, such sudden inundation, had not been known since 1814. The damage around Florence has been very great and very distressing. Houses were washed down. At Ligma, the water reached to the first floor of the houses. The railroad from Pistoia to Lesto was utterly disabled for two days.

Notwithstanding the great damage done at Pisa by the inundations of last year and in 1869, the prevention had only this year been taken; but after an expenditure of five millions of francs the engineering has proved to have been this week of no avail, or rather has been so badly executed that 50 metres of the work have been carried away, and the Arno there is having its own way as of old. The inhabitants, more alarmed than before, have shut up their shops all the length of the quays. The people, terrified, are rushing from their homes, and strangers escaping as fast as can be, after settling down for the winter.

I can never forget the rain of the early morning of the 14th. The heavens, indeed, seemed to have opened, and no hope of their shutting seemed to present itself. The thunder and light-

ning were most awful. The frightful devastations and, unfortunately, loss of life—either by the floods or the falling of houses—are not yet known. Florence is looking forward to a very abundant influx of foreigners. It can no longer be recommended as an economical residence, so exorbitantly is everything increasing in price. Meat, on account of the immense exportation of cattle to France, is dearer than in England. Its attractions, however, are increasing; it promises more advantages than ever for education and improvement.

You have doubtless heard that the first architectural society in Italy was established this year. Its first meetings were in Milan; but Peruzzi, the Sindaco of Florence, has induced the society to make the ex-capital the seat of its operations, meetings, &c. It is a curious fact, that a country possessing so many architectural riches should have never, until this year, established a society for the study and consideration of the kindred art to painting and sculpture, of which it can boast that it possesses the most perfect specimens. Italy is progressing on all sides, thanks to the peace it is now enjoying. F. C.

THE "BULLETIN MONUMENTAL" AND M. DE CAUMONT.

WITH a recently published number, the last of the thirty-eighth volume, the *Bulletin Monumental* is announced as discontinued. When, thirty-eight years ago, M. de Caumont commenced this review, nothing of the kind was published in France. The *Revue Archéologique* of M. Didron commenced in 1844, ten years after the *Bulletin Monumental*. The *Revue de l'Art Chrétien*, at Amiens, and the *Revue Archéologique*, of Paris, are of a yet less early origin.

The "Société Française d'Archéologie," established also by M. de Caumont, had also preceded the *Comités Archéologiques*, of the Minister of Public Instruction. It may date its foundation so far back as 1831, and it was formally inaugurated in July, 1834. From that year it has never ceased to hold Congresses in all the chief cities and towns of France; and these meetings have widely advanced the science of archaeology. As director, M. de Caumont, by his earnestness, his perseverance, and capacity for organisation, with intelligence and liberality spread, has succeeded triumphantly in disseminating a vast amount of archaeological knowledge, as the *Mémoires* of the society testify; but they cannot be spoken of independently of his other works, among which stands pre-eminently the *Cours d'Antiquités*, of which no less than 20,000 copies have been sold. The *Bulletin Monumental* is, however, the work which has been mainly instrumental in giving the most extended impulse to archaeology as a science throughout France, Belgium, Germany, and England: it is, indeed, indispensable, to every true antiquary.

Of course a life so spent demands an enormous amount of physical as well as intellectual powers; and thus, through this long series of years, we find M. de Caumont ever active in the field as well as in the closet, directing and encouraging researches with zeal and good nature; while, at the same time, his private purse has ever revealed that he has not only had the means but also the heart to give freely. Indeed, everything connected with M. de Caumont is replete with liberality and unselfishness; and he stands a bright example to societies as well as to individuals, who would be archaeologists in deed as well as in name.

C. ROACH SMITH.

THE EXTENSIVE NEW DRAPERY BUILDINGS IN HOLBORN.

THE palatial block of new stone buildings, at the west end of the Viaduct, which have for some time been in course of erection for Messrs. Meeking & Co., are now fast advancing towards completion, so far as regard the central portion, and the east end, the boundary of which will form a part of Holborn Circus. When the eastern portion now in progress is completed, the west side, uniform with it, and extending to Fetter-lane, will be proceeded with, and on the entire block being finished from Fetter-lane to Holborn-circus, the Holborn elevation will be no less than 200 ft. in length, the height of the central portion, exclusive of the cornice and balustrade, being 60 ft., and that of the east and west por-

ions, 50 ft. The building throughout contains a very lofty ground-floor, with plate-glass windows, running the entire length of the Holborn, Fetter-lane, and Holborn-circus frontages, as well as the frontage southwards in continuation from the circus. The central portion of the building contains five stories above the ground-floor, the fifth story having eleven circular-headed clustered windows, with ornamental dormers between the balustrades. The east and west sides of the central portion of the elevation contain four stories, surmounted by a cornice and balustrades uniform with the central portion of the block. The first and third floors along the entire elevation have pediment-headed windows, and the magnitude and capacity of the building may be imagined, when it is stated that the number of windows in the Holborn elevation alone, exclusive of the ground-floor, is 112. Whether as regards their colossal extent or general appearance, these buildings form one of the most prominent architectural features in Holborn, and are perhaps unequalled by any other drapery establishment in the metropolis. Indeed, with the exception of Compton House, in Liverpool, which is a distinct square block, having four elevations, immediately surrounded by an equal number of thoroughfares, it is stated that the new buildings in Holborn surpass any similar place of business in the country.

ASTLEY'S AMPHITHEATRE.

The well-known establishment in the Westminster Bridge-road, which within a few years has undergone several alterations, has within the last week again been placed in the hands of the builder, with the view of the interior being entirely reconstructed. Messrs. Sanger, who last Christmas had their equestrian company there, have just purchased from Mrs. Barry the lease of "Astley's," thirty years of which are yet unexpired. The new lessees have determined to reconstruct the interior upon an entirely different principle; and with the view of carrying out this object workmen have been engaged in gutting the building during the last few days, and nothing whatever now remains beyond the main walls. We understand that the interior is to be so reconstructed as to serve both as an equestrian establishment and a theatre proper, with an entirely new stage and machinery, so as to adapt it to dramatic performances as well as those of the ring; and the auditorium is to be so arranged that the full extent of the ring, and the equestrian performances in it, will be seen from every part of the house with the same ease as the seat of the house with the same ease as the seat of the house. The designs for the new interior have been furnished by Mr. J. T. Robinson, architect, who has recently reconstructed some other metropolitan theatres, and the contractor is Mr. Snowden. The works will give employment to one hundred of carpenters, plasterers, painters, and decorators, and as Mr. Snowden is said to be under very heavy sureties to have the building ready for opening on "Boxing-day," relays of hands are to be employed on the works both day and night. The cost will be about 5,000l.

THE COST AND SEQUEL OF STRIKES.

The principal building trades who took a prominent part in the recent and former strikes and lock-outs have been furnishing their members and the public for some weeks back with their balance-sheets. Each has preceded the financial statements by an explanatory preface on the course of the respective struggles, the masons leading off first, in consequence of their earlier settlement with their employers. The carpenters and joiners, more ambitious than the others, have accompanied their balance-sheet with an introductory preface, containing a brief history, or rather outline, of former strikes and lock-outs during the last forty years. This last account published by the carpenters and joiners is not worthy, for more than one reason. As an expression of operative opinion, it proves that workmen in the building line have learned much, not forgotten little. At last they have candidly acknowledged the evil of strikes and lock-outs, and desire that they may soon be superseded; yet they proclaim their determination to still resort to the former on an opportune occasion, for the full terms of their late memorial—"nine hours and 9d. for fifty-one hours per week all the year round."

After an agitation, extending over eight

months, and an exhaustive financial struggle of upwards of four, counting the subsequent partial strikes against particular firms, the carpenters and joiners wind up their warfare at a cost of 7,251l. 13s. 11d. There is every reason for believing that the cost even exceeded the above by a pretty large sum, in disbursements for "dispute pay" to members of the General Union and the Amalgamated Societies of Carpenters and Joiners.

It will be instructive to those outside the trade, as well as within, to scan the following figures, showing the sources of income in support of the recent strike. Under the list of "subscriptions" from workmen in firms, there were realised 342l. 5s. 6d.; local Joiners' Societies, 280l. 13s.; the London branches of the Amalgamated Society of Carpenters and Joiners contributed 914l. 6s. 9d., and the Amalgamated country branches, 108l. 7s. 2d. The eight lodges of the General Union of Carpenters and Joiners in London gave 88l. 2s. 8d. and the various General Union provincial branches, 110l. 5s. 5d. The Associated Carpenters and Joiners of Scotland sent 18l. 9s. 6d. The Ship Joiners altogether gave 120l. 12s. 11d. The Cabinet-makers, 170l. 2s. 8d.; Plane and Tool makers, 15l. 19s. 6d.; Pianoforte makers, 8l. 1s. 6d.; Tailors, 81l. 1s.; Bookbinders, Printers, Compositors, &c., 47l. 5s. 8d.; Goldsmiths and Jewellers, 9l. 0s. 7d.; Bricklayers, 6l. 4s. 7d.; Engineers and Metalworkers, 37l. 2s. 11d.; Painters, 7l. 8s. 3d.; Plasterers, 1l. 18s.; Masons, 26l. 7s. 4d.; Patternmakers' Society, 8l. 2s.; Zinc Workers' Society, 5l.; Rope Makers' Society, 11s.; Basketmakers' Society, 5l.; Gilders' Society, 3l.; Polishers (Carter's), 11s.

From public and coffee houses there was an income derived of 93l. 14s. This account is explained perhaps from the fact, that there are either societies or meetings held in all of these places, or they are otherwise "lonesome cells" for the members of the trade. Country friends, from various parts of the kingdom, contributed 669l. 11s. 8d.; and "Friends of the Movement," 540l. 18s. 7d.; levies at several local districts, 452l. 19s. 10d.

Between the 3rd of February and the 19th of October the total of the above sums, with the exception of a balance of 1l. 9s. 2d. was expended in "strike pay" dividends to men locked out, and in the collection and administration of the funds, including stationery, printing, postage, committee, and officers' expenses, "pickets," &c. A few of the principal disbursements may be stated. The two firms—Messrs. Jackson & Shaw's and Brass's—cost the carpenters and joiners alone, for fourteen weeks' payment to 293 men withdrawn on the 1st of June, upwards of 1,800l. Add to this the dividends paid in ten districts to men locked out during eleven weeks, with the sum of 117l. 12s. 4d. in support of the partial strikes at Messrs. Corbett & McClymont's, Adamson's, Morant & Boyd's, and "half-wages" (25l. 15s. 4d.) paid to men for refusing to work overtime, and we have an outlay, according to the carpenters' and joiners' own statement, of 6,375l. 7s. 2d.

During the early part of the struggle there sat as many as from twelve to fifteen committees, who received 2s. per night for their labours; but in the months of June, July, and August the committee-men sat during the day as well as in the evening. Here is one item. From June 24th to July 24th, there were twelve committees, the majority of whom sat during the day, for which they received their 6s. 8d. and 2s. for their evening sitting.

Some sat upwards of twenty-six days during the month, with night and day pay, also travelling expenses, averaging from 5s. to 8s. per day. One month of this form of administration cost the carpenters' and joiners' funds, according to their own entries, 56l. 12s. 11d.

Clubbing the general committees, the district committees, the chairman, secretary, treasurer, two auditors, and adding the expenses allowed for deputations, district meetings, and some other matters appertaining, there were nearly 600l. expended. The printing, postage, telegrams, stationery, newspapers, and small sundries in connexion, approach to nearly 160l. The cost of the strike stands thus:—Total receipts, 7,251l. 13s. 11d.; total expenditure, 7,251l. 13s. 11d.; balance, 1l. 13s. 2d. As the cost of printing the present balance-sheet is not included in the above expenditure, it will necessitate the sale of nearly 2,600 copies at 3d. per copy to relieve the trade from an actual liability. This would be a small item indeed if the carpenters and joiners could point to material advantages

gained by their late struggle. The working hours are now 52l, and the wages they receive less. The shortening of the hours of labour is, doubtless, or ought to be, an advantage, but one of the objects sought is still unattained. Surplus labour will still exist in the market, and were even the nine hours, yea even the eight hours obtained, the absorption of the surplus labour in the London building trade would scarcely be appreciable. The increase of wages and the diminution of the hours of labour cannot, under the present condition of society and trade, take place at the same time save to a very small extent. It is perfectly visionary to suppose that, if strikes were determined upon every other or alternate year the principle that admits of wages being increased admits also of reduction in the hours of labour. The cost of production depends on the rate of remuneration; and in the cost of materials used, as well as in the workmanship, there is an amount of labour embraced. There is scarcely aught of the building operative uses in house-construction or in the practice of his art but has passed through several hands previously to reaching his own. The stone from the quarry, the lime from the kiln, the brick from the earth, the timber from the forest, ore, colour, and pigment, all have to be torn from the soil, and pass through various manipulations ere they are finally utilised. Supposing for a moment these materials, in their various forms of production, were subjected to a like tax upon the labour that supplies them as that which utilises them in a building, what would be the result? All workmen are at liberty to strike at one time, and, whether striking or not, each is equally free to demand an increase of wages. Were this concurrence of events to take place, the building operatives, not being the first producers, would fare badly indeed. Too many houses may be built for the population, and of these there may be a great number unsuited for the incomes of their would-be tenants. As there cannot be a uniformity in the rent of all classes of houses it is scarcely possible that there can be a continued uniformity in the time and wages of all classes of workmen. No person will pay 50l. rental for a cottage worth only 25l., nor will he pay 150l. for a dwelling worth at the outside 90l. The position of a house of course often enhances the value of a building; but, on the other hand, property will be found depreciating in one locality, while it is rising in another. So with trade: a scarcity of labour in any particular place will have the effect of either absorbing the surplus hands elsewhere or of adding to the rate of pay. Wages have for years gradually increased in the building line, while they have decreased in other branches of trade; but this is no criterion that the increase will continue. The workmen in the building line in London always exceed the demand.

In the late struggle the non-society men were the weak point. The carpenters and joiners had to support several hundreds of them during the lock-out, and this constant drain upon their resources told in the end, and hastened their agreement. Non-society carpenters and joiners who are competent workmen, and thousands of them are, receive equal wages to society hands; but outside the society there are numerous hands who are only receiving still from 6d. to 7d. per hour for their labour; and there is a large class of young men called "improvers," who receive less. The absorption of all the competent non-society hands into the Union would undoubtedly strengthen the societies, and render strikes more prevalent; but it would eventually fall in the object sought,—the constant increase of wages. There is no way of estimating the number of incompetent workmen. They are to be found in numbers, within the union as well as without it. The fact of their joining the society does not insure them continuous employment, though it has the effect of having them looked on with more favour by their fellow workmen.

The carpenters and joiners say, in winding up their late struggle: "The late agreement concluded between the carpenters and joiners and the master builders can only be accepted as a temporary arrangement, instead of a permanent settlement, or a compact binding for any length of time;" and they give their employers to understand that the struggle will be renewed for the full terms of their demand. The injury that will be done by this threat, through the doubts and fears thus raised with reference to future building arrangements, will be enormous, and will be felt by themselves as well as others.

The wisest words they have given utterance to are the following, which, we trust, they may every day more and more realise the truth of:—"The carpenters and joiners believe that strikes and lock-outs are evils, and, after all, but clumsy weapons of offence and defence; and they trust that the day may soon arrive when they will no longer be necessary, and that Courts of Conciliation may supersede them. Technical knowledge and skill will at no distant period assert their legitimate sway, and with that knowledge will grow the power that will enable the workman to ennoble himself and elevate his trade to its proper position."

Had the "clumsy weapons of offence and defence" been flung aside, and conciliation and arbitration been resorted to last May; had the compromise we early proposed been accepted; the carpenters and joiners might have saved the members of their trade and others nearly 8,000*l.*, much privation and suffering, and a good deal of business for this city. Masons, bricklayers, plasterers, painters, smiths, and labourers, have probably, in one form or another, collected and expended nearly 3,000*l.* during the late strike and lock-out. The income of the great strike and lock-out of 1859-60, in which all the building trades were affected, was 23,065*l.* 6*s.* 6*d.*, and the total expenditure 22,717*l.* 2*s.* 11*d.* There was a balance of 318*l.* 3*s.* 8*d.* The partial strikes and lock-outs in 1861-2, in opposition to the "hour system" and in support of the masons, cost the carpenters and joiners nearly 1,000*l.* About the same period the "bour strike" cost the masons' body, according to their recent balance-sheet, upwards of 6,000*l.* The masters, in their turn, have lost thousands.

The financial loss is small, after all, when compared with the magnitude of the aggregate evil that strikes have always produced, and will always produce, when resorted to by workmen under a mistaken notion of their utility. It is not because strikes are lawful, and in some cases even unavoidable, that they are the less pernicious; and the resort to them cannot be justified except under the most exceptional circumstances and necessity—when all other obvious and honourable modes of adjustment have been exhausted.

SCHOOL BOARDS.

London.—Mr. C. Reed brought up reports of the Works Committee. The committee had received the following tenders from builders for the school for 1,010 children to be erected on the site in St. Paul's-road, Bow Common:—

Longmire & Burge	£9,980
Nixon & Son	9,977
W. Brass	9,949
W. Webster	9,925
W. Higgs	9,876
G. S. Fritchard	9,777
Perry & Co.	9,438
Cooke & Green	8,992
B. E. Nightingale	8,990

On receiving these tenders, the committee felt it necessary to reduce the cost of the school, and the architect was instructed to revise his plans accordingly. The reduction thus effected amounted to 1,029*l.* 16*s.* 9*d.*, and the committee now recommended that Mr. Nightingale's reduced tender, amounting to 7,969*l.* 3*s.* 9*d.*, be accepted. The committee thought it desirable, for the sake of economy, to obtain a general tender for the supply of wire-guards for windows; they accordingly recommended that the tender of Messrs. J. J. Thomas & Co., of Edgware-road, for strong wire-guards, in all cases where necessary, at the sum of 7*d.* per square foot (exclusive of fixing), be accepted, and that in each case the architect be instructed to include provision for the same in his specification, the amount being deducted at prime cost, and paid direct by the Board. For the same reason, the committee recommended that the tender of Mr. W. Wright, of Westminster, for the general supply of tar paving, at 2*s.* 3*d.* per yard superficial (exclusive of preparing ground), be accepted, and that in each case the architect be instructed to include provision for the same in his specification, the amount being deducted at prime cost, and paid direct by the Board. The committee's reports were received by the Board.

Notwich.—The Board have resolved,—“That the tender of Messrs. Downing & Wegg, for the erection of the Heigham-street School, at the sum of 4,163*l.* 17*s.*, subject to a deduction of 293*l.* 10*s.*, according to the amended specifications, be accepted.” Canon Howell was the only member of the Board who voted against the motion. It was also resolved,—“That the clerk

be instructed to apply in the name of the Board to the Public Works Loan Commissioners for a loan of 4,842*l.* 4*s.* 4*d.*, as sanctioned by the Education Department, for the Heigham-street Schools, and as to the terms upon which they will grant such loan.” It was also agreed,—“That the question of the appointment of a clerk of the works for the Heigham-street School be left to the Building Committee, with power to appoint such clerk.” In course of a discussion as to the estimates, which preceded these resolutions, and in which Canon Howell called upon Mr. Browne, the Board's architect, for explanations, the chairman quoted instances from the *Builder*, showing that in large places, such as Bradford and Southampton, discrepancies between architects' first estimates and the tenders received, had been common in consequence of the state of the labour market and the increased cost of materials. In justice to their architect, Mr. Browne, he desired that their statement should go forth. In answer to Mr. Hinds Howell, the architect said that he supplied all the builders who contracted with the quantities. It was usual to supply the builders with quantities in such cases. He showed this from the *Builder*, and also said that he was authorised by the committee to supply them. Mr. Hinds Howell said it was a bad plan for the payer to give the quantities. Mr. Browne contended that it was the only way to secure a correct estimate, and stated that the Institute of British Architects approved of its being done in the provinces, though not in London. In all the schools Mr. Hinds Howell had cited, he had no doubt the architects supplied the quantities. Mr. Pinder said that no fault could be found with Mr. Browne for giving out the quantities, as it was done with the sanction of the committee.

PNEUMATIC WELLS ON DONNET'S SYSTEM.

THE *Technologist* for August gives the annexed details of a method adopted by a French engineer, M. Donnet, of Lyons, for increasing the yield of water in ordinary pump-wells.

When a pump, no matter what may be its principle, is employed in raising water from a well, the quantity of water so raised must be proportioned to the draught of the well; in other words, the volume of water thrown out by the pump in a given time should be less, or at any rate not greater, than the volume of water which finds its way into the well in the same time. Now, the draught of the well is determined by the depression, i.e., by the difference in level, at the end of a stroke, or at some other given moment, between the water within the well and the source whence the water is supplied.

To increase the draught of the well, and, consequently, the volume of water yielded by it within a given time, we must increase the depression of the well, by deepening it, more or less. Where this cannot conveniently be done, recourse may be had to Donnet's system, of which we have now to speak.

Donnet's wells differ from those in ordinary use in that the water within them is shut off from all contact with the outer air: the steining is made air-tight, and the mouth of the well is hermetically closed. This may be effected in three ways:—

1. By steining with headers set in cement, with a backing of puddle, the whole inside of the shaft being faced with cement; and the mouth of the well being closed with a metal plate luted down on the steining, so as to be air-tight.

2. By forming the shaft with the aid of a bell-shaped metal case, sunk in the ground, so that the mouth of the bell may be lower than the minimum level of the water in the well. The space between the sides of the excavation and the bell should be filled in with concrete. The suction-pipe of the pump passes through the upper portion of the bell, with an air-tight packing. A small pipe, furnished with suitable valves, connects the space above the surface of the water in the well with the suction-pipe, so as to prevent the air given off from the water accumulating within the bell.

3. When the piston of the pump is cased, the well may be rendered air-tight without removing the machinery. It will be sufficient to chisel holes in the steining, a little above the maximum level of the water in the well, to receive the ends of wooden or metal rods forming a grating, upon which is laid a flooring of planks: the whole is then cemented over, so as to be air-tight. This

method is cheapest, and may readily be adopted in country places.

As already stated, the inventor's object has been to increase the supply of water in ordinary pump-wells without deepening them, and thus incurring increased outlay in the process of construction and on the pumping-machinery required; and this object is said to have been fully attained by the removal of the atmospheric pressure from the surface of the water within the wells. For example, at Lyons, where the wells are fed by water filtering through a succession of sandy and gravelly beds from the Saône and Rhone, it has been found that to insure a constant supply of 2,000 litres of water per minute in uncovered wells of not less than 2-50 m. diameter, it is necessary to have a depression of 3 m. or 3-50 m., i.e. the level of the water in the wells must be kept constantly 10 ft. to 12 ft. below the mean level of the rivers, to give the requisite head of water. Now, if we remove the pressure of the atmosphere from the surface of the water within the well, it is evident that the draught of the latter will be increased by the atmospheric pressure without. As a practical illustration of the increased power thus obtained, it is stated that a well at M. Millard's establishment at St. Etienne, supplied by three springs of water rising in rocky while in an uncovered state yielded, on an average, 65 litres of water per minute. Three years ago it was hermetically closed, on M. Donnet's principle, and has since given an uninterrupted supply of 400 litres per minute from the same sources.

HYDE PARK AND KNIGHTSBRIDGE BARRACKS.

IMPROVED of late years from the aspect which it wore in memory of this generation, our park, an enclosure of 360 acres, in the richest centre of aristocratic London, has become an indispensable resource to the whole population. Nearly encircled by an open iron railing, planted around by the Woods and Forests officers, adorned with flower borders and marginal shade walks, encircled with drives and rides, it becomes every year more valuable to the pent-in denizens of the metropolis. On one side only it is margined and degraded by the old Cavalry Barracks, which are as comfortable to the troops as they are unsuited to the age we live in; and this antiquated pile, extending one quarter of a mile along its border, not only spoils the unity and beauty of the *enclave*, but degrades and depreciates the most valuable quarter of our choicest suburb from Albert Gate to Rutland Gate, a distance of about half a mile.

Public opinion, expressed through the press, and frequent remonstrances by the *Builder*, had induced hopes that this hideous bane on London's fairest park would soon be removed. It had been surveyed, and found inadequate to afford proper accommodation to her Majesty's Guards, save only the officers' quarters and mess-room, which opens out to the park: suggestions were made, and hopes induced that suitable Cavalry Barracks should be erected at Chelsea; but on passing the sentinels to-day, we observed painters at work, giving a white coat to the windows, sashes, back and front.

This seems not to portend an early evacuation, but rather fixity of tenure. Is there no authority to weigh expediency in such a case? Have the Woods and Forests, or the Horse Guards, or the Board of Works, any authority or discretion in such a matter, where great public interests are at stake?

The barracks were, in fact, first erected on public park—the people's property; they occupy a length of 450 yards; they advance upon the fair mile drive 30 feet, and they curvet outwards 40 ft. upon the most important of our metropolitan boulevards, the Kensington-road, which in this open and elevated position ought to be the choicest site for aristocratic mansions, but which, owing to the profusion of night houses of entertainment and grog-shops, has long been degraded and depreciated.

Surely it is worth a little sacrifice to accomplish a great public benefit,—to give integrity to London's grandest feature—Hyde Park; more especially when by such a change the condition of the soldier and of the citizen would be equally improved.

If barracks are needed in this quarter, there is a plot of waste ground between the entrance to the palace and Kensington Garden-road, amply sufficient, too, to accommodate the whole

ment of Horse Guards; and it needs but a small comparative outlay for the completion, in the year of a permanent structure, which would secure solace to the regiment, and a satisfaction to all residents or wayfarers.

There is also another public benefit that might at the same time be assured,—the removal of the misshapen and misplaced guard-house, and other *non-adjuncts* from the centre, which should be most sequestered portion of Hyde Park, as also the withdrawal of the powder-magazine, which ought to be removed to a safe distance from the most important ranges of aristocratic mansions.

Lastly, some allusion may be made to a fenced enclosure of about 10 acres, in the central wood and dell, where a crowded village is yearly on the increase,—a goodly-sized country manse, with meadow, gardens, stables, and numerous offices, representing a ranger's house, where no ranger has ever resided; at least, during the present century. Four other buildings have been erected on the outer bounds, all tenanted. In the New Forest, or at Epping (even reduced to the extent as it now is), there may be some duties or a woodreeve, if not a ranger, but for Hyde Park, with 300 acres of parker, there can be no possible occasion, unless to qualify him for a stipend.

As to the receiving-house, at one end, and the new police-station at the other,—these establishments are indispensable; but to keep up other refuges for desolate pensioners seems to be a wasteful intrusion upon the most valuable of our public liberties. This dell is the most picturesque portion of the whole expanse, which, in the present swollen state of our city, ought to be dedicated to the health and freedom of range for so still-growing population.

QUONDAM.

THE SOUTHAMPTON DOCK COMPANY'S NEW OFFICES.

LARGE and extensive new office buildings have just been completed for the Southampton Dock Company. In the erection of these buildings the company have looked beyond their present requirements, and taken into consideration what the necessities of the port may eventually demand. Acting upon this view, the building just finished not only provides accommodation for the company's existing purposes, but it has been designed to meet the future, and an anticipated increase in the business of the port. On the ground-floor there is a large public office for the transaction of the general business, with offices for the export and import warehouse keepers and other officers of the company. Also book and strong rooms. On the upper floor are the board and directors' rooms, and the offices of the superintendent and accountant. The building, which is of stone, was designed by Mr. A. Gibbs, the dock company's engineer, and has been erected under the superintendence of Mr. John Howell, as clerk of works, over the company's own workmen.

THE NEW CHAPEL AT RUGBY SCHOOL.

The chapel of Rugby School, which has been consecrated by the Bishop of Worcester, completes the list of new buildings which have been erected at Rugby during the last thirteen years. The chapel has been nearly rebuilt. The entire length of the building has been extended from 2 ft. to 133 ft., and double aisles have been brown out on each side. The tower is 105 ft. high and 22 ft. 6 in. square, finished by an octagonal lantern, with a timber spire. An organ-chamber upon the north side of the tower has been built from subscriptions raised as a testimonial to Dr. Temple amongst his old pupils. On entering by the west door, we still see facing the well-remembered east window by Albert Oliver, of the Wise Men's Offerings, which Mr. Butterfield has specially adapted his new work to receive. The four remaining windows, two on each side of this in the apse, are filled with stained glass, presented by his friends in memory of Dr. Cotton, Bishop of Calcutta, and formerly assisted-master in the school. The various stained-glass windows, with the mural and other monuments, have been preserved and incorporated in the new building. The decoration of the east end in panels with mosaic on a gold ground has been by private subscription. Seven panels have already been filled with six figures and a centre cross. The gymnasium, 100 ft. by 45 ft., with dressing-rooms, &c., raised

upon a basement, hereafter to be used as work-shops, although not absolutely completed, has just been opened to the school. The old bath and the building known to most old Rugbyans as "Sam's Farm" have been swept away. It is on the site of the latter that the gymnasium stands. It is, perhaps, the most complete building of the kind which has yet been erected in England. This with the pavilion, the racquet-court, and two Eton five-courts, stands on the edge of the new Big-side, which, formerly known as the head-master's field, was added to the school-close by the then head master, Dr. Goulburn. The levelling of this field, a great and costly work, has been carried out by the Old Rugbyans.

SLOANE-SQUARE AND THE DISTRICT RAILWAY COMPANY.

About a fortnight ago the Chelsea Vestry resolved to take proceedings against the Metropolitan District Railway Company for the non-fulfilment of their contract in reference to restoring the houses in Sloane-square. It now appears, however, that in consequence of a purchase by the Earl of Cadogan the railway company are powerless in the matter. At the last meeting of the vestry a letter was read stating that the Earl of Cadogan had purchased the surplus land from the railway company, and that the company, though legally liable, were unable to fulfil the contract they had entered into with the vestry. But it was stated that his lordship was most anxious to do away, as soon as possible, with the unsightly appearance of the severed and broken-up buildings in Sloane-square, and hoped soon to be able to restore the uniformity of the street.

THE PROPOSED FIRE-ENGINE STATION IN PIMLICO.

At the last meeting of the St. George's (Hanover-square) Vestry, the question of erecting a new fire-engine station in Pimlico again came up for discussion, when Mr. Walker moved a resolution to the effect that the Metropolitan Board of Works be asked to place a fire-engine station in Ebury-street, Pimlico, ground having been offered as a site by the Marquis of Westminster, and the immediate neighbourhood not being protected from fire. He stated that there was a distance of two miles between the fire-engine stations in the district, and that the site in Ebury-street was as good as could be procured. After some discussion on the subject, in the course of which it was denied that the inhabitants of Ebury-street were unfavourable to having a fire-engine station there, the motion was carried unanimously.

THE NORTH CAMBRIDGESHIRE HOSPITAL.

MISS M. E. THAPFORD SOUTHWELL has given the poor of Wisbech and its neighbourhood a cottage hospital, and has just now laid the chief stone. On the suggestion being first made, plans for the building were obtained from Messrs. Adams & Son, and after some alterations suggested by Miss Southwell had been made in them, she approved of them, and the work was placed in the hands of her own builders, Messrs. J. & M. Challans, of Grantham. The contract sum is 3,260*l.*, and the entire cost will be borne by Miss Southwell, who, we understand, intends to furnish the hospital with every surgical appliance. A piece of land has also been given by Miss Southwell, which will be made into a carriage-drive, from Ruby-street to the hospital. But, besides the gift of the site, and bearing all the cost of erecting the building, Miss Southwell has generously endowed it with 3,000*l.*, to provide for its future maintenance. Further sums have been given by others.

The building will be Gothic in style, and there will be a tower on the north side, 50 ft. in height. It will be built of white brick, with red banding, and relieved by stone ornamentation. The height of the main building will be 36 ft. The following are the interior arrangements. There will be sixteen beds provided, six of which will be fitted up in each of the large wards, which are 37 ft. by 18 ft., and 13 ft. in height, 1,500 cubic feet of air being allowed to each patient, or double the average allowance in hospitals. There will also be two occasional wards, 15 ft. 2 in. square, for isolated cases, and two special wards,

in which persons who are able to pay for their maintenance will be nursed. A commodious convalescent-room, 20 ft. square, was one of the rooms added to the plans by Miss Southwell's desire. On the ground-floor are the nurses' operating, and committee rooms, store and bath rooms, dispensary, kitchen (20 ft. square), pantry, and the customary domestic offices. On the basement are large cellars, which will be fitted up as larders, wine-cellars, and store-rooms. The chamber floor, which will be approached by a stone staircase, will contain, besides the wards, store-rooms and other conveniences. The ventilation of the lower ward will be by hollow air-chambers, built in the walls, which will pass round the back of the fireplace, and admit the warm, fresh air, the vitiated air passing off by regulating ventilators in the ceiling, communicating with the external air. The same arrangement applies to the upper ward, the air passing off through ventilators in the roof. The building will be warmed by open fireplaces. The drainage will, at present, be carried into a cesspool, until the new drainage works are carried out. To prevent any escape of gases from the pipes, charcoal ventilators will be placed at the junctions, and other precautions will be taken.

THE OLD BILLS OF EXETER CATHEDRAL.

At the invitation of the Dean and Chapter, the mayor and the civic authorities of the city attended recently at the cathedral for the purpose of witnessing the progress that has been made in the work of restoration. The inspection was of an official character, and the procession from the Guildhall was headed by the sword and mace bearers in their quaint costumes, and the mayor also wore his robes of office.

Archdeacon Freeman pointed out what had already been done in the way of restoration, and at the same time brought before them such matters of interest as had been brought to light in the progress of the work. In reference to the Lady Chapel, he said they knew for certain the painting they would now see there, and which had been lately restored, had been there ever since 1301. They had found a bill for painting in that year forty-nine bosses, and otherwise colouring the vaulting. It did not say what building, but if they took the trouble to count the bosses, they would find that there were thirty-one in the Lady Chapel, and eighteen in the two side chapels. Therefore they knew that in the first year of the fourteenth century the Lady Chapel was completed, for it could not have been painted and coloured until the wall part was finished. The windows presented very early specimens of that period, and the bosses were carved in a great variety of foliage, all the leaves being gilded, and the branches painted in different colours. In the bill he had mentioned, they found exactly the colours to be seen there. The roofs of the two side chapels were painted in imitation of the sky, with the gold stars and silver moons, and the colours mentioned in the account. They would perceive that the restoration was really the bringing back to its original condition the colours found on the bosses of the roof, as mentioned in the account.

The Archdeacon then spoke of the part of the building in which the party was assembled,—the choir, which was now in all main particulars to be restored to its original condition. To the eight windows, four on each side, which form the presbytery, or eastern part of the choir, he paid particular attention. The Chapter, he said, possessed a bill taken from the accounts of 1301, showing that one Master Walter, the glazier of those days, received 4*l.* 10*s.* each for glazing the whole of those eight windows. The quantity of glass in each window was exactly named. The two side ones contained 1,271 ft. of glass, according to the bill. Each of them was 25 ft. high, by 10 ft. broad, and contained 275 square feet of glass. Each cost 6*l.* 10*s.* The smaller clearstory windows, 19 ft. by 10 ft., cost 4*l.* 10*s.* The whole of them were filled with stained glass.

The Episcopal Throne was placed where it stood in 1317. It used to be referred to the date of 1470, but Sir Gilbert Scott pronounced it on first sight to be of the earlier date, and since then the bill had been found for it, supporting his judgment. It was built by Bishop Stapleton in 1317. It was entirely of wood, was 57 ft. high, and contained a number of figures that were now lost. It was of carved oak, and was originally coloured. It was now being taken to

pieces; point by point the paint would be removed, so that the natural wood, with a slight admixture of colouring, would be brought to view. The oak for it cost 4l. 10s., and the carving 6l. 10s. Its restoration would be effected in the most careful manner.

As they had found the bill for the colouring of the bosses in the Lady Chapel, so also they had found a bill for the carving of thirty large bosses of the vaulting in Bishop Bytton's time, in 1305. They were carved for 5s. apiece, the work being done on the ground, and then the bosses were lifted to their positions. Every fourth boss was the key of an arch, so that if it were removed the whole arch would fall. There were very happy devices used in the carving of the figures, and the style adopted was a favourite mode of ornamentation. It would detain them too long to point out the various figures.

HINGHAM CHURCH, NORFOLK.

This church, which is dedicated to St. Andrew, and is one of the largest churches in the county of Norfolk, has recently been restored, and the nave and aisles reslated. The whole church, with the exception of a few minor portions, is of fourteenth-century work, and is said to have been rebuilt by Remigius de Hethersete, A.D. 1316 to 1359. It consists of a nave nearly 100 ft. long by 28 ft. wide; north and south aisles, each 14 ft. 6 in. wide; a chancel, about 60 ft. long, by 28 ft. wide; a western tower, 22 ft. square inside; a south porch, and a vestry (now in ruins). From the floor to the apex of the new nave roof is about 60 ft.

The nave piers and arches are of lofty and elegant proportions, with well-moulded caps and bases; the aisle windows are of two lights each, filled with very good Decorated tracery. The east window of the south aisle, which is of three lights, is a very elaborate specimen of the tracery of this period. In the chancel is a handsome and lofty monument to a Lord de Morley, erected in the fifteenth century.

The restoration, as far as it has gone at present, has consisted chiefly in removing the low pitched, decayed nave roof, and replacing it with a hammer-beam roof of oak, in the position and of the pitch indicated by the original dripstone on the east wall of the tower. The new roof is of simple character: moulded and curved ribs, springing from carved stone corbels, support the moulded and crenellated hammer-beams, from which spring the lofty main-moulded and curved ribs. The spandrels between the lower ribs and the wall are filled with foliage of varied design, and the spaces of hammer-beams with tracery.

The aisle roofs, which are also formed with hammer-beams, are not entirely new, but have been carefully restored. The roofs of the nave and aisles have been covered with Whitland Abbey green slates, which harmonise well with the old work.

The stonework and walls throughout, with the exception of the south porch, vestry, and tower, have been restored both outside and inside. New eaves cornices have been put to the nave and aisles, new copings to the gables, and a cross to the east gable of the chancel. The internal stonework of the nave and chancel bore evidence of having been much damaged by an extensive fire, which apparently extended from the west end of the nave to the east end of the chancel. Several of the nave-shafts were scaled from top to bottom. The defective parts had at some time been patched and covered up with plaster, and then the whole stonework and plaster alike had been coloured with a yellow wash. Upon the removal of the plaster much of the stone was found to be still in a very loose and unsound condition. These portions were cut out and replaced with solid stonework, making every part perfect and substantial. The remains of a piscina and three sedilia were discovered in the south wall of the chancel, which appear to have been inserted in the fifteenth century. They were so much injured and scaled by the action of the fire, and mutilated by projecting parts being chopped off when the walls were plastered, that it was not considered advisable to restore them. Parts have, however, been left exposed to view, which give a good idea of what they have been originally.

After some opposition, usual in such cases, it was decided to clear away the whole of the old boxed seating with which the church-floor was covered, and which was in a dirty and dilapidated

condition, and to reset the nave and aisles with open benches, of oak, resting upon deal flooring, with oak curbs, for the bench-ends, the rest of the floor being paved with red and black Staffordshire tiles. All the seats have sloping backs, and the solid oak bench-ends, as well as the front and back framing, are ornamented with carving, consisting of a great variety of foliage, with which beads and other animal and insect forms have been introduced. It has been all designed and arranged conventionally from nature by the architect, and executed, with a few exceptions, by Mr. James Forsyth, of London, from full-size drawings.

The church has been fitted up and lighted by gas; this has been effected in the nave and aisles by simple jets above the capitals of the piers: the chancel is lighted by a handsome brass corona. The gaswork has been done by Mr. Pank, of Norwich.

The whole of the works of the restoration, with the exception of the oak seating, have been carried out in a very satisfactory manner, by Mr. Robinson Cornish, builder, of North Walsham, for the woodwork, and by Mr. J. Lacey, builder, of Norwich, for the stonework.

The oak seating was made and fixed by Mr. William Hubbard, builder, of East Dereham. The architect was Mr. James K. Colling, of London. The cost of the restoration and re-seating has been about 3,250l., and it is estimated that about 500l. more are required to rebuild the vestry, now in ruins, and restore the south porch and tower.

CRYSTAL PALACE COMPANY'S PRACTICAL ENGINEERING CLASSES.

THE Crystal Palace directors have established these classes for the purpose of affording to students of civil and mechanical engineering the advantage of thorough practical instruction in the rudiments of either profession and in the manipulation of materials. The classes are also available for gentlemen anxious to become engineering draughtsmen or to compete for the Whitworth scholarships, or to enter the Steam Mercantile Marine. We need scarcely say such a preparatory course will render pupils on entering an engineer's office at once useful to their employers, and enable them to take advantage of the opportunities offered to them during the time they are articled. One term will be spent in the drawing-office, one in the pattern-shop and foundry, and one in the smiths' fitting and erecting shops. The students will be engaged in mechanical drawing, estimating and calculating, pattern-making, and constructing machinery for the market. Lectures will be delivered from time to time by the principal or by some eminent professor, on subjects connected with theoretical and practical engineering, and the students will be required to pass an examination upon such lectures at the expiration of each term. Mr. J. W. Wilson is the principal. The code of regulations which has been drawn up shows that work is intended, not sham; and we cordially wish success to the undertaking. The foundry, smithy, pattern-makers', fitting, and other shops that are being fitted for the purposes of the engineering class will be finished and the tuition commenced before the end of the year.

Classes for the study of drawing and of modelling in clay are in operation, under the direction of Mr. W. K. Shenton.

FROM AUSTRALASIA.

VICTORIA.

Melbourne.—The Prince of Wales Opera House has been built according to designs furnished by, and under the superintendence of, Mr. Geo. R. Johnson, architect. The site is that where the Varieties once held sway, opposite the Theatre Royal. The piece of ground extends from Bourke-street to Little Collins-street, being a depth of 315 ft., and possesses a frontage of 66 ft., being the same area as that of the Theatre Royal. The theatre will be approached by three entrances from Bourke-street to the auditorium, and two entrances from Little Collins-street for the use of the stage and for means of escape in case of any sudden panic. The western entrance from Bourke-street will be for the grand tier or dress-circle alone. A polished blue-stone staircase leads to the level of the grand tier. In this entrance there is a flower-stall formed in a recess

in the wall. There are also fruit-stalls on each tier. Adjoining the grand tier are a large crush-room, *cafés*, ladies' cloak-room, and lavatories. There are only three rows of seats in the dress circle, but ample provision is made for extension. The seats are of polished cedar on iron framework, filled in with cane, with movable cushions for the winter season. The seats in the stalls will be of similar construction. At the back of the dress-circle is a spacious promenade, fitted up with marble tables and couches. Under the stage there is a depth of 20 ft., in order to sink large set scenes; the height above the stage is 48 ft. The ceiling is in the form of a large dome, with a sunlit in the centre 15 ft. in diameter. There is a large ring of silvered glass, and from this shoot rays of gold on a blue ground-work, filled in with gold stars. This sunlit supplies light to the whole of the auditorium, so that chandeliers attached to the front of the tiers are unnecessary. The decorations throughout have been executed by Messrs. Schemmell & England, under the direction of the architect. White and gold are the chief ornamentation. There is accommodation for seating 2,500 persons, and this can be increased to 3,000, exclusive of private boxes. The seating to the dress-circle and stalls has been manufactured by Messrs. Cohen, Brothers. The ironwork has been executed by Messrs. Joseph Laughton & Co., and Mr. T. Laughton. The plasterer's work is by Mr. Parry. The general scenery has been painted by Messrs. Fry, Holmes, Clint, and assistants. The act-drop has been painted by Mr. A. C. Habbe, the artist who painted the scenery and ceiling of the Princess Theatre, and of late has been engaged in Sydney. He has also left his mark in San Francisco and on the Continent of Europe. The gasittings have been carried out by Messrs. Hague & Colley, of Emerald Hill. Messrs. Roche & Co. have done the upholsterer's work. The whole of the works were contracted for by Mr. G. Cornwell, the contractor who also built the late Haymarket theatre and the Olympic. He has completed the whole within three months from the date of commencement. Mr. Cornwell has been assisted by his head foreman, Mr. James Johnson. There is an entire absence of paper and canvas on the walls and ceilings. The total cost will be about 15,000l.

Williamstown.—Trinity Church of England, which will be a prominent feature in Williamstown, is built in the Early Decorated style, of blue-stone with free-stone dressings. It has nave, aisles, chancel, organ-chamber, vestry, and lofty tower and spire. The lower slope of the tower forms a porch, and the roof is of open timber-work. The clearstory and nave roof are supported by ten arches, with Malmesbury stone pillars. The length of the nave and aisles is 81 ft., width 50 ft.; the length of chancel 28 ft., width 22 ft. 6 in.; organ-chamber, 17 ft. by 16 ft. 1 in.; tower, inside 14 ft. square; height to top of spire, 168 ft.; height of nave-walls from floor, 34 ft., to ridge, 55 ft.; height of aisle-walls, 16 ft. The doorways are deeply recessed, having three pillars in the depth, and the arches have bold mouldings. The window near the central entrance of the nave has four lights with geometrical tracery; the chief window of the chancel has three lights, and the aisle and clearstory windows have two lights each. Considerable cost was incurred in obtaining a proper foundation for the walls and pillars of the church, the site being covered with large boulders and other unsafely placed stones, which have been removed and the space filled with concrete. The building will accommodate upwards of 600. Mr. Leonard Terry is the architect. Our authority is the *Australian News*, which gives a view of the edifice, and the following.

Mount Gambier.—A new Presbyterian church has been recently opened at Mount Gambier. It is constructed of the salmon-colored stone locally called dolomite, with white coral limestone string-courses and facings. The style is Early English, with enrichments in bands, mouldings, labels, and buttresses of a later period. The windows are lanciform, with mullions and tracery, and the main entrance is in the western gable, beneath a large four-light tracery window. A tower, with belfry and spire, occupies the north-western corner of the edifice, designed to contain a gallery, entrance and stairs. The church is on a gentle eminence, a very short distance north-west from the centre of the town. The interior dimensions are 65 ft. by 38 ft., and it is calculated to seat over 400 persons. The lofty ceiling is open, with stained roof-timbers and lining, with tracery enrichments. Just within the western door is a stone vestibule, and

gives access to two aisles, which divide the fittings into the usual sections. The floor has an incline of 2 ft. from the western door to the preacher's rostrum, to which access is obtained from a vestry. The total cost of the building is estimated to be about 2,000.

Sandhurst.—The *Bendigo Advertiser* reports the opening of the new Sandhurst Mining Exchange. The *Advertiser* says:—

"That the interior of the new exchange presented a truly magnificent appearance. The elaborate ornamentation of the building was much admired, and its convenience and suitability for the purposes for which it is assigned was admitted on all hands, while its great extent seemed to take every one by surprise. Ranged on each side are cedar desks, tables, chairs; in fact, every convenience possible for the transaction of business. The lower floor of this hall would amply and comfortably accommodate some 2,000 persons."

A new Wesleyan Church, in Golden-squares, Sandhurst, which is now in course of erection, is from designs by Messrs. Creuch & Wilson, of Melbourne. It is to be built wholly of brick, on stone foundations, in the Early Decorated style. The exterior is relieved with dressings of white bricks and pressed cement. The turret has a slated spire rising to the height of 110 ft., and will be furnished with a large bell. The side walls are 24 ft. high, the length and width of the church being respectively 90 ft. and 45 ft. in the clear. At the rear of the church there are three vestries or class-rooms and a deep organ-loft, in which it is intended to place an instrument to cost 350*l.*, having modern improvements. The height of the church to the ridge is 46 ft. Galleries are planned all round the church capable of accommodating nearly 600 persons. The estimated accommodation of the whole edifice is 1,500. Attention has been given to means of ventilation, and the requirements of the Central Board of Health as to external doors have been complied with. There are six doors to the body of the church, and four to the galleries. The total cost will be about 2,000*l.* A portion of the design was erected about two years since; and the remainder now in hand is to be completed early next year.

Abbotsford.—The (R.C.) Church of the Immaculate Conception, erected in the Convent of the Good Shepherd at Abbotsford, is a building of blue stone, with freestone dressings, and will, when the whole of the design is carried out, cost upwards of 8,000*l.* At the present time only a portion of the building has been completed, but this is sufficient to hold 800 persons, and has cost 2,000*l.* The plan of the church is cruciform.

A square transept is intended for the accommodation of penitents, and has been completed. Of the western transept, intended for the use of the public, only a small portion has been built. The nave is unfinished, though intended exclusively for the use of nuns. Internally, the extreme length of the church will be 110 ft., by a width of 25 ft. across the nave, and 82 ft. across the transepts. Only the northern end of the church has at present been built. It will eventually extend to a further length of 75 ft., divided about 18 ft. from the extreme end by a partition, open at the top. This end will also be octagonal in form, and will be divided, like the transepts, into two floors, the upper one to be used as a choir, and the lower devoted to conventual requirements. Two-light traceried windows will light the nave, the designs of which will vary throughout. Internally, the roofs are shewed so as to form a six-sided barrel, divided into panels by the ribs. The entire of the woodwork has been stained and varnished. Bluestone has been selected for the superstructure, Mahabury stone for the springs, bases, and copings, and Spring Bay freestones for the dressings to the doors and windows. The works have been carried up under the immediate personal superintendance of the architect, Mr. T. A. Kelley, Mr. Thompson acting as his clerk of works; while Messrs. Reid & Stewart, of West Melbourne, were the contractors for the undertaking.

Artisans' School of Design, Melbourne.—The third annual meeting for the distribution of prizes to the pupils of this school was held on July 19th, in the Trades Hall. Judge Bindon occupied the chair, and the hall was filled by young people. On the walls were exhibited a number of admirable drawings by the pupils. The report stated, that during the past twelve months the school had continued to be prosperous. There were now 194 pupils on the roll.

East Collingwood School of Design.—The first annual meeting and distribution of prizes to the pupils at this school took place on July 26th, in the local council-chamber. The mayor of the

borough (Mr. Rushall) occupied the chair. The secretary read the report, from which it appeared that in the first quarter of the year 55 pupils joined, the average attendance being 45. In the second quarter there were 62 pupils,—average attendance, 40; third quarter, 41 pupils,—average, 23; last quarter, 50 pupils,—average, 36; making a total for the year of 129 pupils, with an average attendance of 44.

The Census of Victoria, 1871.—Returns of the census of the colony, taken on the 2nd of April, 1871, have been laid before the colonial Parliament. From these it appears that, of the total population of 731,528 in the colony on that date, 401,050 were males, and 330,478 were females; the Chinese numbered 17,935, of whom 17,899 were males, and 36 were females; and the aborigines 1,330, of whom 784 were males, and 546 were females. There were 150,618 occupied and 6,997 unoccupied [Colonial] habitations in the colony, and 866 in course of erection. Since 1861, the males increased by 22 per cent., and the females by 56.13 per cent. The population in the cities, towns, and boroughs was 374,150, the males exceeding the females by 6,700. The increase of population in the mining districts since 1861 is 42,247. There were 38,588 occupiers of land, who held 36,928,104 acres. Nearly 20,000,000 acres were still unoccupied. There were under cultivation 804,508 acres. There were in the colony,—209,025 horses, 212,193 milch cows, 561,534 other cattle, 10,477,976 sheep, 188,109 pigs, and 122,164 goats. The live stock numbered 6,641,023 in 1861, and 11,643,837 in 1871. Between the two periods the number of sheep was almost doubled, having been 5,780,806 in 1871. The table showing the religious of the people gives 257,835 Episcopalians (including 5,997 Protestants not otherwise defined), 112,983 Presbyterians, 94,220 Wesleyan Methodists, 18,191 Independents or Congregationalists, 16,311 Baptists, 170,620 Roman Catholics, and smaller numbers of various other sects, besides 17,650 Pagans. From the table showing the birthplaces of the people it appears that 329,697 were born in Victoria, 28,669 in other Australian colonies and New Zealand, 164,287 in England, 6,614 in Wales, 56,210 in Scotland, 100,468 in Ireland, 3,870 in other British possessions, and 16,637 in Continental Europe and the French colonies (of whom 8,995 are from Germany).

NEW ZEALAND.

Queenstown.—An Atheneum and Town-hall has been erected by a joint stock company (limited), with a capital of 1,500*l.* in shares of 5*l.* each. The materials employed are stone and brick, finished outside in Portland cement and inside in plaster. The accommodation provided is as follows:—On the ground floor: entrance-hall and staircase, coffee-room and council-chamber, and concert-hall, the latter 55 ft. long by about 30 ft. wide and 19 ft. in height, lighted by ornamental lantern lights, and having a gallery in the end, the front of which is finished with ornamental open woodwork. On the first floor there are library and reading-room, lodge-room, and ante-room. The design of the building is in the Italian style of architecture. The principal part is of an ornate character, with a balcony, to be used by public speakers. The architect was Mr. F. W. Burrell, of Queens-town. The contractors were Messrs. Smyth & Arnal.

HOSPITAL FOR SICK CHILDREN, PENDLEBURY, MANCHESTER.

The Children's Hospital, which has been for the last eighteen months in course of erection on an elevated site at Pendlebury, four miles to the west of the city of Manchester, under the superintendance of Messrs. Pennington & Bridgen, architects, of that city, whose designs were selected in a limited competition, is fast approaching completion.

The building is intended to accommodate the establishment now located in Bridge-street, and which has, for some years past, owing to its situation and the small extent of its premises, been found totally inadequate to the wants of the city and to the successful working of an institution of this kind.

In many respects this hospital may be considered an advance on the arrangement of similar buildings on the pavilion system, inasmuch as, with the exception of the administrative block, it is one story only in height, an arrangement which, while it completely embodies the idea of each pavilion containing within itself a complete

hospital, and counteracting the serious evils which are always experienced by the hospital atmosphere ascending through the staircases when the wards are placed one over another, diminishes both the labour and cost of administration. The distance, also, between the pavilions (100 ft.) and a very large air-space afforded to each patient, upwards of 1,600 cubic feet, and the abundance of light throughout the building, are also noteworthy.

The hospital will accommodate 170 patients when completed, but at present only three of the pavilions on the north side of the corridor have been erected; the administrative portions, however, for the entire hospital are, in all respects, finished and fitted up.

The land falls very considerably from the north to the south, which, though it has added somewhat to the cost of the building, has enabled the architects to place all the kitchens, stores, and offices in the necessarily formed third story (the corridors being level) under the administrative block, and to devote the whole of the ground-floor to purely hospital purposes and to the accommodation required for the resident surgeon, matron, and other officials of the establishment.

On the first floor are the sleeping-apartments for the nurses and servants in the north and south wings respectively, to which separate staircases give access and effect the necessary separation.

Each pavilion is arranged for twenty-six patients, with a window between each bed 3 ft. 100 ft. long, 23 ft. wide, and 16 ft. high to the flat ceiling; and is heated by four open tiled fire-places in the centre of the wards, built back to back. At the entrance to each pavilion is a special ward for two beds, a nurses' kitchen, and a linen, brush, and water closet. At the other extremity are baths, lavatories, and water-closets, on a scale adapted to the age of the patients, and a verandah, accessible from the pavilions.

The extreme easterly pavilion being devoted to fever patients, a separate entrance and reception-room are provided.

The pavilions are connected by a spacious corridor, 12 ft. wide, ventilated and lighted on both sides, with an open boarded ceiling, and octagonal lanterns at the intersections of the main with the connecting corridors. The operating-room, with the ward for one bed attached, the gymnasium or play-room, reception-room for general patients, together with the dispensary service (with lifts from the basement), linen and house-keeper's rooms, are placed conveniently on the main corridor.

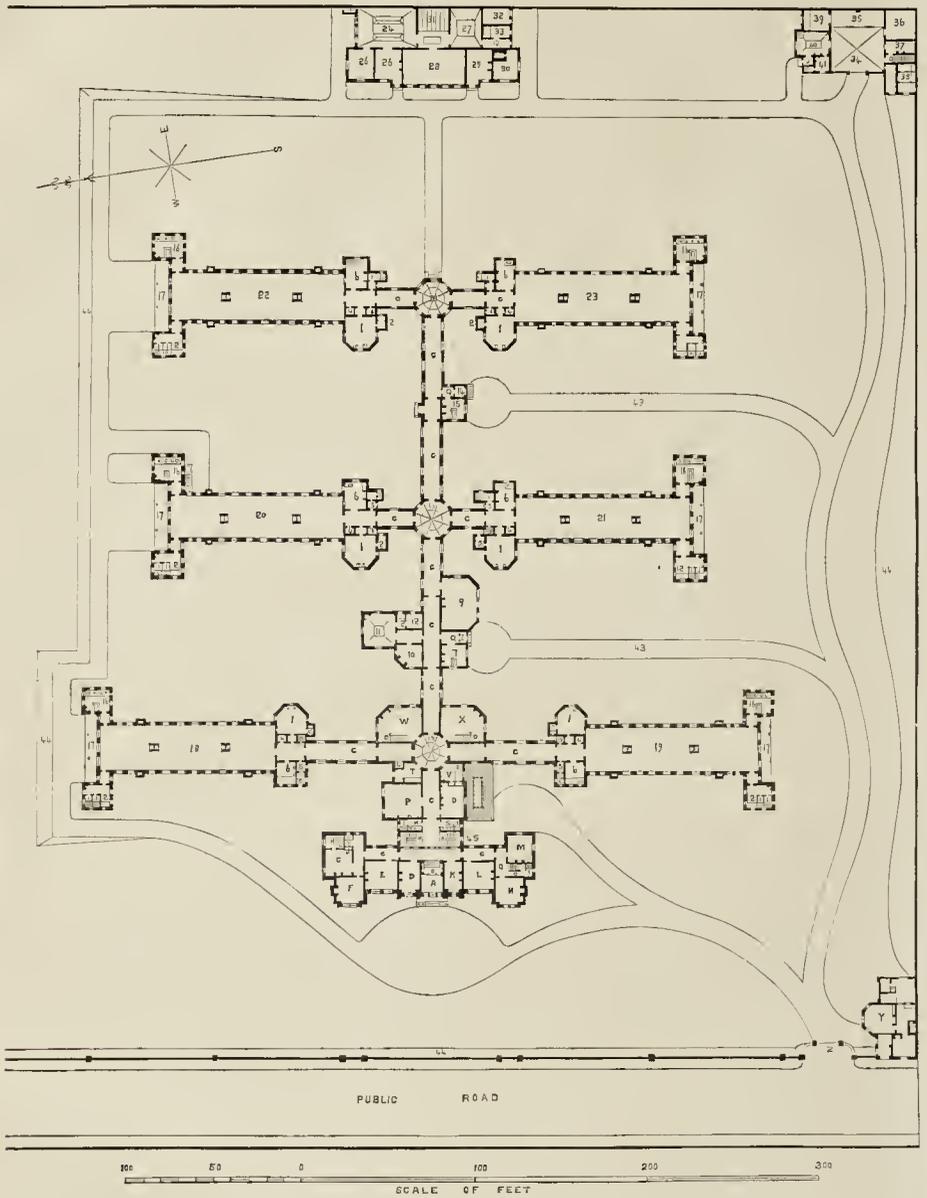
The remainder of the building consists of the laundry and block of buildings containing the stables, coach-house, post-mortem-room, dead-house, &c. The lodge-entrance is on the road approaching from Manchester. The administrative block is surmounted by a clock-tower, rising to a height of 100 ft.

All the buildings are of plain but substantial character. The front pavilion, administrative block, and lodge are faced with yellow Raabon bricks; all the cornices and chimney-tops have been executed in similar materials, interspersed with a few bands of chocolate glazed bricks. The stone, of which a sparing use has been made, has been quarried in the locality. The other buildings are of common brick, with arches in stocks, an earthenware or damp-proof courses being carried round all the walls. The floors of the pavilions are of oak. The internal walls are finished in Parian cement, and the windows glazed with plate-glass. The walls of the kitchen, and of all lavatories, water-closets, and bath-rooms are to be lined to the height of 5 ft. with glazed wall-tiles; and the whole of the woodwork is of red pine, stained and varnished.

The floor of the main corridor is paved with patent concrete, with a border of Staffordshire tiles on each side. The corridors of the administrative block are fire-proof, and, together with the vestibule and entrance-hall, are laid with Minton's tiles. The carriages, landings, and rias of the nurses' and servants' stairs are of iron, with treads of teak.

Mr. W. Southern, of Manchester and Salford, is the contractor for the entire building, including the boundary walls and fences. Messrs. Willson supplied the cooking and heating apparatus, gas and water mains, engine, boiler, &c., for the washhouse, which is fitted with Messrs. Bradford's washing-machines. Mr. George Gilbert executed the earthworks, formation of roads, and the drainage.

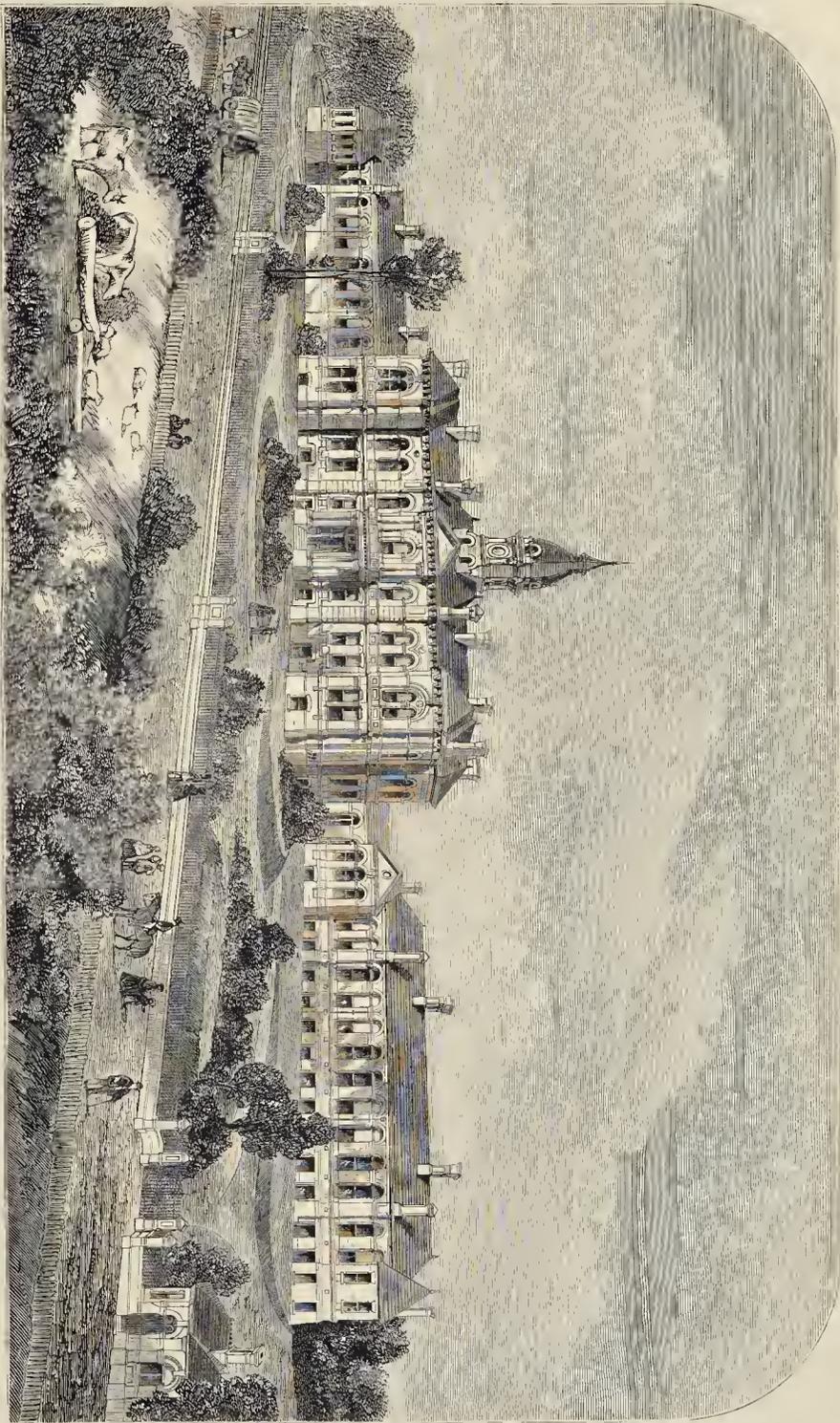
The total amount of the various contracts is 15,500*l.*



REFERENCES.

- | | | | | | |
|--|--|--|---|--|---|
| <p>A. Vestibule.
B. Hall.
C. Corridor, 12 ft. wide.
D. Surgeon's room.
E. Consultation-room.
F. Resident Surgeon.
G. Surgeon's bed-room.
H. Surgeon's bath and drilling room.
I. Water-closets.
J. Cupboard.
K. Visiting Physician.
L. Committee-room.
M. Visitors' or waiting room.</p> | <p>N. Matron's room.
O. Staircase.
P. Nurses' dining-room.
Q. Passage.
R. Nurses' lavatory.
S. Officials' lavatory.
T. Service-room.
U. Dinner and coal lift.
V. Housemaid's pantry.
W. Dispensary.
X. Linen-room.
Y. Gate-keeper's lodge.
Z. Entrance-gates.
1. Special wards, two beds each.</p> | <p>2. Sink-room.
3. Brushes.
4. Linen.
5. Lobby.
6. Nurse.
7. Reception and bath room.
8. Porch.
9. Gymnasium.
10. Ophthalmic ward.
11. Operation-room.
12. Instrument-room.
13. Lantern.
14. Entrance for fever patients.</p> | <p>15. Fever reception and bath room.
16. Lavatory and bath room.
17. Verandah.
18. Pavilion ward for 26 beds.
19. Ditto, ditto.
20. Ditto, ditto.
21. Ditto, ditto.
22. Pavilion fever ward, 26 beds.
23. J 26 beds.</p> | <p><i>Wash-house and Stable Offices.</i>
24. General wash-house.
25. Officials' wash-house.
26. Sorting-room.
27. Fever wash-house.
28. Laundry.
29. Packing-room.
30. Foul linen and disinfecting room.
31. Drying-room.
32. Patients' clothes.
33. Engine-room.
34. Stable-yard.</p> | <p>35. Shed for horse.
36. Coach-house.
37. Harness-room.
38. Stable.
39. Dead-house.
40. Post-mortem room.
41. Ante.
42. Entrance to kitchen offices on basement floor.
43. Carriage drive.
44. Terrace.</p> |
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HOSPITAL FOR SICK CHILDREN, PENDLEBURY, MANCHESTER.—Plan.



HOSPITAL FOR SICK CHILDREN, PENDLEBURY, MANCHESTER.—Messrs. PENNINGTON & BARDEN, ARCHITECTS.



THE COST OF PAVING.

The following tenders, received for paving Chipping Barnet, Herts, under the direction of Mr. John Laddis, architect, afford information. The quantities were supplied by Mr. T. Laddis:—

	High-street.	Wood-street.	Union-street.	New-road.	Moxon-street.	Total.
New York Stone.	Old York Stone.	Brick.	Brick.	Brick.	Brick.	
J. Asplund & Sons	£2,053 6 0	£469 13 0	£252 8 0	£328 13 0	£306 14 0	£3,740 19 0
P. G. Alderson	1,998 10 0	636 0 0	368 0 0	230 0 0	185 10 0	3,481 10 0
P. Barton	1,810 0 0	394 0 0	440 0 0	258 10 0	182 10 0	3,093 0 0
Lloyd	1,915 7 7	383 14 4	369 16 0	245 7 0	184 15 0	3,093 1 3
Ewens	1,649 1 4	235 2 0	389 3 0	222 7 0	165 18 0	2,661 5 4
T. Knight & Sons	1,465 0 0	339 0 0	368 0 0	210 0 0	153 0 0	2,565 0 0

Alternative Tender for Paving the Streets with Patent Victoria Stone, 2 in. thick.

	New Victoria Stone.	Old York Stone.	New Victoria Stone Paving.
Patent Victoria Stone			
Paving Company	£1,427 0 0	£383 0 0	£45 0 0
Ewens	1,308 7 7	235 2 0	211 5 0
			£2,725 0 0

For Asphalted alone, exclusive of Curbs and Ground-work connected with same.

	The Val De Travers	Asphalte Company	General Asphalte Co.
Asphalte Company	£819 0 0	—	£290 0 0
General Asphalte Co.	1,032 10 0	—	363 2 0
			£1,400 0 0

Mr. Ewens's tender has been accepted, subject to approval of surties, &c.

THE LABOURING POPULATION.

In a South of England newspaper, a few weeks ago, I saw the statement of an agricultural labourer, living under forty miles from London. He says, "My wages are 12s. a week. I have a wife and five children to support. I spend my 12s. thus:—Rent of cottage and garden, 2s. 2d. per week; eight loaves of bread, at 8d.—5s. 6d.; 1½ lb. of bacon, at 10d. per lb., 1s. 8d.; butter, 1d. per day—7d. per week; leaving for tea, butter, sugar, soap, cheese, and candles, 2s. 6d. per week." Much has been recently said upon the deterioration of the agricultural labourer, and it has been ingeniously explained that the cause is to be ascribed to inter-marrying.

I am convinced there are many causes in operation rapidly deteriorating the race of agricultural labourers in England. 1st, as the above statement will show, they are miserably underfed, and we all know the animal frame cannot be developed unless it receives the requisite support. For instance, look at the sheep and cattle, and ponies, reared on bleak moorlands. 2nd, The habitations of the labouring classes of England are small, overcrowded, and generally situated in the most unhealthy spots; often beside some brook, or elsewhere, on some out-of-the-way spot of little value. Anywhere will do for the site of a row of cottages, as long as they are far enough from a gentleman's grounds; therefore, if it is desirable the gentleman should secure the healthiest spot in the locality, the cottagers must accept the worst. Beggars must not be choosers. I have seen cottages in country districts that are a positive disgrace to a civilised country, these same cottages belonging to persons of great influence, which of course secured them immunity from the visits or inquiries of the sanitary inspector.

In addition to the violation of the merest rules of sanitary science in the cottages of labourers in the country, a large proportion of the strongest and most energetic leave the locality either for manufacturing or mining districts; emigrate, or go for soldiers, policemen, or sailors, and a very small portion of those that once leave an agricultural district ever return to settle there. It is the worst that stop quietly at home, hand the best, as far as regards energy, that leave the locality or the country.

The populations of the industrial centres of England have a deeply impressed conviction that the country is done up for the working class. I have seen them in possession of passage tickets for the United States, even when their trade has been in a prosperous state; and when questioned, they would remark, there was no telling how soon there might be a slack time come, as there was no dependence to be placed in work, and directly there were symptoms of there being a slackness they should be off to America. If a man has high wages in England, in comparison with the working man of France and Germany, his cost of living is very much greater. Some thirty-five years ago, several thousand weavers migrated from England to Saxony, to the great detriment of their English employers; they got 6s. per week in Saxony, but then they could purchase more for that 6s. there than they could for 20s. or 24s. a week in England.

I anticipate an exodus of the working classes from England to the United States, especially as the resources of that country are being developed daily. The iron ore of the shores of Lake Superior, the coal-fields of Indiana and Nova Scotia, may be destined to become vast centres of industry at present unthought of. For the

Nova Scotia coal-pits machinery is being made in this locality; and in the course of a few years, instead of the cry being, "Ireland for the Irish!" it may be, "America for the English!" but in a different sense.

Any man willing and able to work ought never to be in want of remunerative employment. But the feeling of employers or the buyers of labour has been that they ought to buy labour at whatever price they choose to offer; and when a man did not feel disposed to work for their terms, they were highly indignant that their offer was not gratefully accepted, however inadequate. That such a state of things should be customary sufficiently shows the degraded, servile position of the labourer of England.

Just shift the scales, and what indignation would be expressed if a buyer of merchandise were to tell the seller to deliver a certain quantity of goods, and after the buyer had received them he paid the seller what price he thought fit, and if the seller grumbled, the buyer told him he would prevent him selling to any one else.

That the upper classes might do more for the welfare of the lower can scarcely admit of a doubt. But there seems to be a steadily-increasing antipathy between them, which the occasional indiscretions of the great unpaid do not tend to smooth down. The enclosure of commons, the game laws, the throwing of small or moderately-sized into overgrown farms, that are half-cultivated only, all tend to operate against the interests of the agricultural labourer. The game-preserves tend to keep large areas from being cultivated, to say nothing of the injury done to the crops of the farmer by the system. It is also had in principle. It is hopeless for a working man to think of acquiring even a small freehold in England. A small freehold allotment, at an exorbitant price, he might, by great denials, acquire. I have had cottage allotments pointed out to me, in the adjoining county of Yorkshire, that a working man bought, one for 12s. 6d. per square yard, or at the rate of 3,025l. per acre; and I was told that it was worth 20s. per square yard at the present time, or 4,810l. per acre. I admit this is an extreme case; still, there is very little chance of the lower classes acquiring any freehold land in England, as there is nothing that is bought or sold in England that there is so much difference between the wholesale and retail prices as there is in land. I have known land worth about 40l. or 45l. per acre, in a country district about half a mile from a small town, and when cut up in quarter-of-an-acre pieces, eligible for gardens, 3l. per perch, or even more, asked for it. This is purchasing garden-land with a vengeance, and shows the little prospect an English workman has of acquiring a cottage and garden of his own.

A tenant farmer is sadly under the caprice and whim of his landlord, who, if he cannot at once turn him out, can make matters very awkward for him; for instance, in many cases preserve so much game as to nearly destroy his crops, to say nothing of having the tenant farmer and his men systematically annoyed by the gamekeepers. In too many instances a tenant farmer is deterred from improving the land he rents, lest he should by such improvements have his rent raised next term.

Nearly every other branch of industry, excepting agriculture, may be overdone. It is not a great calamity to have more bullocks, cows, and sheep than the population can eat, as in Australia; neither is it a very great misfortune to have good wheat in such abundance as

to be worth only 1s. 6d. per bushel, as I have seen was the case in some of the Western States of America,—Illinois, I think.

The proportion of waste lands in England is enormous, when the length of time the country has been a leading European Power, and the denseness and requirements of the population, are taken into consideration. In these particular respects it compares most unfavourably with Belgium, where almost every blade of grass is utilised. I wonder what some of the small Belgian agriculturists would think if they were located upon some of the farms that have hedge-rows all round the fields, one to two perches in width, with here and there a coppice plentifully stocked with strictly-preserved game. I maintain, as well try and mix oil with water as think of a game preserve or hunting-ground in a well-cultivated district. The one is an imitation of a primitive state of nature, and the other a refined state of civilisation, and each in its most prosperous days is hundreds of years apart from the other. I have seen somewhere in print that 500 acres of hunting-ground only yield as much support to a population as one acre of cultivated land, and I am under the impression this comparison was made in North-West America, where large game was abundant; but it is now becoming a thing of the past, owing to the influx and increase of population; and if the preserving of game is not compatible with the requirements of an increasing population in such a vast area as North America, where freehold land is worth less than a year's rental of the same area in England, how injudicious it must be in England, with a large population requiring land to cultivate, and largely dependent upon foreign countries for agricultural produce for her population, in fact, to live upon. Were we to read in ancient history of an isolated nation keeping land out of cultivation for amusement, and sending vessels across the seas for food their land could partly produce, what should we think of such a people? And that is not all: we have an agricultural population ready and willing to till these same waste lands.

A VOICE FROM THE NORTH.

THE NEW WORKS AND BUILDINGS ON THE GREAT NORTHERN RAILWAY.

The vast expansion of the Great Northern and Midland Railways in new works and buildings connected with their respective undertakings has, within the last few years, been something marvellous; and an analysis of the expenditure of the first-named company upon works in progress during the past half-year, as shown by the accounts, as well as the prospective expenditure on other new works which are about to be commenced, is a proof of the great resources of the company. It appears that during the half-year the completion of sundry land-purchases and works about London, and the widening of the lines between London and Peterborough, amounted to 47,457l.; the extension of the telegraph-block system absorbed 4,464l.; and a new goods station at Leeds, 16,040l. The lines in course of construction wholly owned by the company include the Bradford, Ecclehill, and Idle, and Idle and Shipley Railways, and the Batley and Dewsbury extension, on which the sum of 64,379l. has been spent during the past half-year. The contributions to other new lines now in progress, in which the company is jointly interested with the Midland and Manchester and Sheffield Companies, and which include what are known as the "Cheshire Lines," were 88,237l. The subscriptions to these lines, with the new line from Manchester to Liverpool, and the Liverpool new central station, now in course of erection, have already absorbed no less than 1,288,850l. of Great Northern contributions; and the sum which the company will yet have to contribute towards the completion of these particular works is estimated at 425,424l. The magnitude of the works in connexion with the Liverpool extension and the very large new central station there, is proved by the fact that the amount contributed by the Great Northern Company only represents about one-third of the entire cost of the undertaking, inasmuch as the Midland and Manchester and Sheffield Companies contribute in equal proportions. The aggregate cost of these works alone, when completed, may therefore be set down at between 5,000,000l. and 6,000,000l.; but the expenditure, large as it is, is expected to be remunerative, as it will, amongst other things, give the three associated companies

direct access from Manchester to Liverpool, for which they are now paying the London and North Western Company upwards of 60,000*l.* a year in consideration of running over twenty-four miles of the last-named company's line; and the associated companies will also—in addition to having direct and independent communication between London and Liverpool,—secure the advantage of being competitors for the enormous local traffic between Liverpool and Manchester. The new railway between the two great Lancashire towns is now about completed, and it is intended to open it for goods traffic immediately, and for passenger traffic in spring; but the works on the central station at Liverpool are so heavy that it is not expected to be ready for opening before July or August next. The future expenditure of capital on the Great Northern line on works in progress was estimated last year at 1,440,356*l.*, but to this there is now to be added the extensive outlay to which the company is committed by the passing of the Acts of last Session of Parliament. These Acts involve the construction of the lines from Nottingham to Derby and Burton, to the collieries in the Erewash Valley, the new line from Bradford to Thornton, and the important junction by which the Great Northern will gain access to the North London line at Highbury, and also by this route to the City. The cost of these various new undertakings is estimated at not less than 2,861,700*l.*, bringing up the total future expenditure of the company in new works to the sum of 4,302,056*l.* With the exception of the Midland, which has very extensive works on hand in different parts of the country, this is the largest amount required in new works by any of our great railway companies.

SCHOOLS OF ART AND OF SCIENCE.

Hanley School of Art.—The annual meeting of the friends and supporters of this school has been held in the town-hall. The hall was crowded, and the proceedings, the successes of the school at the recent national competition having been of a striking character, were animated and enthusiastic. A large number of meritorious models and drawings were exhibited, and remained on view on the following day. Mr. George Melly, M.P., presided. The report of the committee said:—In presenting their annual report your committee express more than ordinary satisfaction with the continued and increasing success of the institution. In the last report the committee ventured to express a hope that the remaining room at their disposal would soon be occupied, and they are gratified to say that not only has this hope been realised, but during the year so many new students have sought the advantages of the institution as to make it necessary that the committee should provide additional teaching accommodation. Since your last meeting the committee have appointed Mr. Joseph Ellis an additional master. The actual working of the school under Mr. Bradbury has more than justified the high character with which they received him. The results of his efforts, combined with those of the assistant masters, Mr. Lees and Mr. Ellis, have been a marked advancement of the pupils, a larger number of works for national competition, and a higher acknowledgment of merit by the department than any hitherto attained by the school.

Liverpool Operatives' Science Classes.—The distribution of the prizes gained by the students attending these classes took place at the Trades hall, Duke-street. Owing to the inclemency of the weather, the attendance of members was but limited. The chair was occupied by Professor Henry F. Roscoe, F.R.S., who distributed the prizes. Mr. M. Fitzpatrick, the hon. secretary, made a brief statement, as to the progress of the classes during the past session. The session, he said, had been a very satisfactory one. Fifteen students had passed in chemistry, and eight in mathematics,—a result with which the committee are perfectly satisfied. With regard to the arrangements for the next session, they had taken up one or two additional subjects,—free-hand drawing, acoustics, light and heat, magnetism, and electricity. Professor Roscoe delivered an address on the subject of the scientific education of the working man. He divided the labouring men of all nations into two classes,—those who worked with the brain and those who laboured with the hand. The man who worked with his brain by an expenditure of nervous energy was as much a working man as he who

laboured solely by the force of his muscles. Indeed, they had only recently a sad instance of the complete destruction of such nervous energy in the case of the lamented judge who had just lately died. He died a martyr to hard work as much as did the slave who fell under the lash of his master. The great object of education was to enable men to ascend in the scale of intellectual development; it enabled men to use their nervous instead of their muscular energy. There was in the nation a certain amount of nervous energy, just as there was in a pound of coal a certain amount of latent force; and the object of education, he took it, was to get out of the nation more of its latent energy than was previously developed, to gradually raise the whole mass of the people from the exertion of their power as merely mechanical up to an exertion of their intellectual activity, which, when educated, they were able to use.

Leeds School of Art.—Speaking at this school, Sir John Pakington mentioned a touching incident which is worth columns of specifying as an encouragement to perseverance under difficulties. Holding in his hand a drawing which had been done by a former pupil of that school, he said,—Here was a boy in this Leeds school so poor, so humble, that he worked at that drawing two days without food, in the hope of getting something on which to live. It was an honourable fact, and he hoped it would be widely circulated; it ought to be most encouraging to other students that this young man, evidently a person of talent and an artist, had now obtained complete success, and, after undaunted effort and continual striving, was earning an honourable income, and he had sent from Manchester to Leeds to beg as an especial favour that he might be allowed to re-purchase this picture which he had sold in his moments of distress.

CORPORATE HONOURS TO A SURVEYOR.

ON the 11th of this month, the Durham Borough Surveyor, Mr. John Henry Collinson, died of consumption, at the early age of twenty-eight, leaving a young wife to deplore his loss. Mr. Collinson had filled the post of borough surveyor for the city of Durham for about two years only, and had been unable to fulfil his duties for some time past. He came to the city of Durham from Oldham, at which borough, and also Bradford, he had held a similar position.

The corporation of the city, as a mark of esteem, attended his funeral to St. Giles's churchyard, on Monday, the 14th inst., the Mayor, Alderman White, the Town Clerk, and several members and officials of the city being mourners. The Freemasons of the district also attended in regalia, the Granby and Norman Freemason Lodges assembling in great numbers, the deceased being one of the stewards of the Granby Lodge. A great number of working men left their jobs to add their respect to a worthy man's memory, and his professional brethren were present in strong numbers.

SLATES AS A COVERING.

SIR,—Your last week's impression contains a letter on "Worcester Cathedral," objecting to the roof covering, because the slates are similar to those used for ordinary buildings, and suggesting that large slabs should be used instead. Now, without going into the question as to whether the roof-covering of a Gothic cathedral should be copied from an Italian club-house or not, it seems that if the theory of rejecting the use of suitable materials in an ecclesiastical fabric because they are used in buildings erected for domestic purposes were carried out, there would be an end to church building.

With respect to the use of large slabs, the writer some thirty-two years ago superintended the rebuilding of a village church. The roofs had a flatish pitch, with principals at moderate distances, and strong purlins, eaves, plates, and apex-pieces all framed flush on the upper side, covered with two rows of 1-in. planed slate slabs, lapped on the purlins, with fillets over the vertical joints, bedded in oil cement and screwed to the woodwork, making a neat, light, and rain-proof covering, with a panelled appearance to the interior; but it was a failure: the atmospheric vapour, condensed upon the lower surface of the slabs, trickled in a stream from the horizontal timbers, and rendered the church quite unfit for comfortable occupation. Where

the slates are small, the currents of air passing through the interstices counteract the evils of condensation, and there is great credit due to the ruling powers of any cathedral who have the moral courage to remove the heavy, costly, and difficult covering of lead from the roof of the edifice under their charge, and replace it with the lighter, cheaper, durable, and easily-repaired material of slate, a good example of which can be seen on Peterborough Cathedral. R. Y.

* * * Apart from the real question under discussion, it is not likely that large slabs would be used for the proposed purpose without a ceiling of some kind that would prevent condensation and its annoyances.

HOLLOWAY HALL, LONDON.

THIS hall, which has lately been erected, was opened on Tuesday evening last. It has a bold, handsome front of brick, with stone dressings and effective carving. The front portion contains committee-rooms, large library and reading-room, billiard-room, &c. The great hall is 112 ft. long and 47 ft. 6 in. wide, with a large room, 10 ft. high, below it, of the same size. The great hall has a dado, some 6 ft. high, of dark brown, then a few lines of colour, and cream-colour above, the ceiling (a panelled one) being nearly white, with simple red lines round each panel. The "Creation" was the oratorio performed at the opening meeting.

Mr. George Traflet was the architect, and Mr. Enoch the builder.

MONUMENTAL.

The Scott Monument in New York.—The pedestal of this monument, by last accounts, was expected to arrive by the steamer *Love* in a few days. On its arrival, it was to be taken, together with the statue (which still remained on the dock of the Anchor line of steamers), to the foot of Fifty-seventh-street, on the North River, from whence they would be transported to the Central Park. In the meantime the foundations were being prepared at the new site on the Mall, so that the work of erection would commence as soon as the granite reached the ground. The announcement was premature that the ceremony of unveiling would take place on the 20th of October.

German Monument in Liege.—A monument has just been completed in Liege to the memory of the German soldiers who died there in the ambulance. It consists of a column, surmounted by the German eagle; and four cannons are placed round it, connected together by chains, so as to form an enclosure.

Memorial in Higham Ferrers.—A monument has just been completed in the churchyard of Higham Ferrers, Northamptonshire, erected to the memory of Mr. A. R. Hacon, surgeon. It consists of a plain column of red granite, 15 ft. high, and weighing about 5 tons. The memorial was erected by the voluntary contributions of 1,160 persons, chiefly of the working classes.

COST OF HORSE AND CART WORK.

THE St. George's, Hanover-square, Vestry have received from a committee appointed to inquire into the management of the stable department, the following report:—

"There are two systems for the vestry to consider; first, that of buying eight horses to increase the present number to eighteen, besides hiring for the summer months eight additional horses to stand in the stables. Second, that of transferring the whole of the responsibility of buying and maintenance of horses, carts, harness, &c., to a contractor, thus relieving the vestry from the purchase of horses and carts. The committee having advertised for tenders, report that they have received the following from Mr. Perkins, for a term of seven years:—At per horse per week, 3*l.* 3*s.* 6*d.*; from Mr. Covington for five years, 3*l.* 1*s.* 11*d.*; ditto, for three years, 3*l.* 2*s.* 5*d.*; from Mr. Reddin for three years, 3*l.* 3*s.*; from Mr. Emerton for five years, 3*l.* 2*s.* 9*d.*; ditto for three years, 3*l.* 3*s.* If the vestry decide upon buying and keeping its own horses, there will be necessary at once an expenditure of nearly 800*l.* to buy eight first-class horses. If the vestry resolve to adopt the contract system, the committee recommends that the tender of Mr. Covington for three years be accepted.—Signed (Col.) Brownlow Knox, chairman.

Addendum.—From inquiries made by order of the committee, it is found that the horse and cart work of the principal metropolitan parishes is done by contract, and there is reason to believe that the same system obtains generally—some parishes letting the watering and slopping by lump sum contract, and others hiring daily as required. A return made of the cost of the stable department, for five years, ending Lady-day, 1871, shows that the average cost per horse, cart, and driver, including every expence except rent, is 2l. 19s. per week.

H. J. TOMPKINS, Surveyor."

After some discussion, the vestry decided to adhere to the present system, and not contract.

COVENTRY SEWAGE QUESTION.

SIR,—In your publication for Oct. 12th, under the head of "Settlement of the Coventry Sewage Question," you have conveyed the erroneous expression that some enormously expensive scheme of mine has been rejected. Allow me, then, to state that, so far from this being the case, the adoption of the method of precipitation in preference to the enormously expensive method of irrigation (not at all suited to the particular and peculiar circumstances of the city of Coventry) is consequent upon my earnest representations and advice. T. HAWKLEY.

* * * We simply repeated what the mayor was understood to say.

COLLIERY CALAMITIES.

HOW MANY? ECHO ANSWERS, "MANY."

AGAIN and again the colliery disasters occur, with frightful rapidity. Our Government complains that they are not a paternal government; colliery owners decline to do more than they must for preventing holocaust. Pitmen, be independent; organise a penny subscription, and a remedy will be presented from the ranks. Arkwrights and Stephensons still live: Not in England yet *ex-wisè-head*.

R. T.

THE ANT NUISANCE.

I HAVE mentioned to a friend in this country that which I have read in the last few numbers of the *Builder* on the "Ant Question." My friend has large experience in building, and considers himself to be familiar with the habits of all animals which interfere with the comfort of the householder. "My remedy," he says, "is one which is disagreeable for the time, but effectual. Let the places frequented by the ants be smeared with petroleum oil, and they will go elsewhere." Destroying the nuisance in its source he seems to consider impossible. I leave this suggestion to the appreciation of your correspondents. A SUBSCRIBER IN BELGIUM.

ST. PANCRAS VESTRY AND THE LONDON SCHOOL BOARD.

A SPECIAL meeting of the vestry of St. Pancras has been held, pursuant to the requisition of nineteen vestrymen, and have resolved:—

1. That in the opinion of this vestry the School Board for London has lost the confidence of the representatives of the ratepayers of this parish by a course of extravagant expenditure in erecting schools, which have had the effect of closing the schools hitherto supported by voluntary contributions, and more particularly in purchasing a site for 15,000*l.* for the erection of offices on the Thames Embankment, at an enormous cost to the ratepayers.

2. That a copy of the foregoing resolution, with a copy of the resolution adopted at the public meeting of ratepayers held in the Vestry-hall on the 15th instant, be forwarded to the Education Department of the Privy Council, and to the School Board for London.

3. That a copy of each of the foregoing resolutions, with a copy of the resolution adopted at the public meeting in the Vestry-hall on the 15th instant, be forwarded to each of the vestries and district boards in the metropolis, respectfully urging them to call a meeting of the ratepayers of their respective districts to take an expression of opinion as to the policy and expenditure of the School Board for London.

The vestry was very thinly attended, there being only some thirty-three or thirty-four members present, out of the 120 composing the vestry.

Mr. Watkins, in proposing the first resolution, charged the London School Board with extravagance, and doing injury to existing schools, without attending to the education of the very class they were called into existence to look after. He strongly condemned the expenditure of 18,000*l.* on a site on the Thames

Embankment for offices, charged the appointment of survey with being a job, and said before the building was finished and occupied it would cost 100,000*l.*

Mr. Hawkins moved as an amendment,—

"That in the opinion of the vestry the School Board for London should compel every child between five and thirteen years of age to attend an efficient school, and to [and should?] exercise the most careful economy in every department of their work."

The amendment, however, was negatived, and the original motion carried, with two dissentients,—the mover and seconder of the amendment.

Other resolutions proposed were also adopted.

NEW CORN EXCHANGE FOR BEDFORD.

The foundation-stone of a new Corn Exchange for the borough of Bedford has been laid by the lord-lieutenant of the county, Earl Cowper, accompanied by the mayor and other members of the corporation in their official robes, the Duke of Bedford, and others.

The Mayor addressed the company. Some twenty years ago, he said, the adjoining market had been erected, and it answered its purpose for its time. The requirements of the population had so increased that the erection of a new building became absolutely necessary.

Earl Cowper congratulated the town of Bedford on such an increase of trade as to require a new Corn Exchange.

The Duke of Bedford said that he was at that moment having a statue of John Bunyan,—who was so nearly connected with the town,—made; and if they thought it worthy of their acceptance, it would be a great gratification to him to present it to them.

The new building is to be in the Italian style, and its internal dimensions will be about 100 ft. long and 60 ft. broad. It consists mainly of one long room, forming the Corn Exchange, the various offices of the corporation being located in the basement. It will be lighted by three segmental domes in the roof.

Messrs. Ladds & Powell, of Bedford-row, are the architects, and were appointed by competition. The builder is Mr. Moore, of Bedford, and the cost will be about 7,000*l.*

PAYMENT OF ARCHITECTS.

SIR,—At the present time, when strikes are almost universal amongst workpeople, has it ever occurred to you that the principal reasons assigned for them applies equally to the professional man?

The cost of nearly everything since I commenced practice (a quarter of a century ago) has increased about 30 per cent, but the fee of 5 per cent,—which is the utmost ordinarily an architect can charge,—has never been raised.

Would it not be desirable that the institutions connected with architecture and engineering should consider this subject, and see if some revision of fees cannot be arranged?

I am quite prepared to hear it stated that a professional man should not place himself on a level with the ordinary "strikers"; but surely it is reasonable when not only the cost of living, but the very salaries of clerks and assistants are so materially increased, that some addition should be made to the emoluments of the architect and engineer, who appear at present to be about the only people unthought of. SENIOR.

WIVELISCOMBE CHURCH.

ON Wednesday the new chancel of St. Andrew's Church was opened. The church was erected about forty years since, and superseded a building chiefly of the fifteenth century, having carved oak-work in screen and benches, portions of which, with the old windows, were used in the present church. In common with all churches built at that time, the style is defective, but, thanks to the spacious arcade and height of ceiling, there is not any absolute barrier to improvement. At present the works executed are all in relation to the formation of a chancel, by inclosing a space within a screen westward of the shallow apse hitherto serving as a chancel. The central window of the apse has been built up, and a reredos of Corsham stone erected in lieu of it. This is divided into three gabled compartments, the panels enriched with monograms. A picture,

by Broughton, presented some years since by Mr. Collard, of Abbotshild, is hung over the reredos. The communion-table stands on a paved dais, and the floor is of ornamental tiles, by Messrs. Maw & Co., of the Brosley Works. The railings are on metal standards, illuminated with gold and colours. There is a descent of two steps to the choir-floor, on which are placed stalls for the clergy and choir, having metal coloured standards, with book-boards for the younger singers. The inclosing-screens, fixed on Bath stone, are of metal, coloured and gilt, by Messrs. Richardson, of London. The contractor is Mr. H. Davis, of Taunton; and the architects are Messrs. Giles & Gane, of London. It is proposed to reseat the whole chancel.

A BIG CHURCH FOR BRIGHTON.

THE Rev. A. D. Wagner has just commenced the erection of an immense building in Annet-street, within a few yards from the London-road, the first stone of which was laid on the 2nd of February. Mr. E. E. Scott is the architect, and the Messrs. Stonning, builders, London-road, are the contractors for this edifice, which, we are informed, will not only be the largest church in the county, but will contain as many superficial feet as any church in England, except the cathedrals. We have the following account:—Height from pavement to the spring of the roof, 90 ft.; from the pavement to the ridge of the roof, 135 ft.; 46 ft. space in the clear. There will be eight bays to the church, and the whole length of the building, when the chancel is built, will be 225 ft., so that it may be calculated to hold an immense congregation, all of whom are to be seated in chairs. The walls, which will be all brickwork, with stone bands, are of unusual thickness, as can be already seen. There is a very large semicircular entrance-arch of moulded bricks, of which all the arches will be composed. It is proposed to complete the building in about two years.

THE COAL TRADE.

THERE is a threatened stoppage of the South Staffordshire Collieries. The colliery engineers of the Black Country, having made a demand for an increase of pay to 5*s.* a day, and for a working day of eight hours, a deputation of men was received at a large meeting, specially called, of the United Coal Masters' Association. It was decided unanimously that the masters could not concede the demand of the workmen, and that they would be allowed to go out. If the men adhere to their resolution, nearly all the works in the district will be without fuel, and above 50,000 men will be locked out. No notification of a reduction has been made, nor is it considered probable that coal will be reduced this side of Christmas.

Matters are evidently coming to a crisis in the Scottish coal trade. The Messrs. Dixon, of Glasgow, one of the largest iron and coal firms in Scotland, have twice reduced the price of coal 2*s.*—that is, 4*s.*—within a week. Some of the principal manufacturers of bar-iron in the West of Scotland have determined to suspend operations until the market improves. One of the reasons given for this resolution is, that the cost of producing bar-iron involves, on account of the extravagant price of coal, a heavy loss, and that the demand for their material in the market at the present time is limited.

OPENING OF BAGSHAW HALL, TIDESWELL, DERBYSHIRE.

THE opening of Bagshaw Hall has been a subject of festivity at Tideswell, a town about thirty miles from Derby. The building and the fittings are the gift of Mr. John Bagshaw, one of the oldest residents in the town, and the site was presented by the Duke of Devonshire. The hall is principally intended for the use of the Tideswell Old Sisk Club, but it will also be let for public meetings and concerts, and the proceeds so realised will be applied to the club funds. The site of the building is in the Market-square, directly opposite to Mr. Bagshaw's house. The entrance is gained by two broad flights of steps, which are lighted by means of two gas-lamps fixed at the top, and on the ground on either side of the steps is separated from the street by an ornamental iron rail. Over the entrance-door is a clock which can be

illuminated with gas. The structure, which is of limestone, is after the Elizabethan style of architecture, and measures 88 ft. by 42 ft. At the right-hand side of the entrance-hall a door opens into a moderate-sized apartment, which will be used as a reading-room, and on the left is a similar arrangement for a committee-room. Over the entrance-hall and the two rooms already mentioned there is a gallery, capable of holding about fifty persons. The hall proper measures 50 ft. by 36 ft., the height from floor to ceiling being 21 ft., and is lighted by five large windows on either side. At the rear of the hall there is a small retiring-room, which also forms a back entrance to the building. A cottage has been provided for the person taking charge of the hall. The whole of the building is fitted up with gas, and heated by means of hot-water pipes. Mr. Samuel Howard, jun., of Stockport, was the architect; and Mr. Bullock, of Tideswell, the clerk of the works. The total cost of the structure is about 2,000l.

ST. NICHOLAS PARISH CHURCH, GUILDFORD.

At a vestry meeting of St. Nicholas's parish, held in the vestry of the church, to consider a report relative to the state of the roof, and to act thereon, a report which Mr. Molyneux had obtained from Messrs. Jackson & Shaw, London, builders, was handed in and read, and was found to confirm in every particular, a previous report of Mr. Teulon. Indeed, so insecure is the roof considered to be by those best able to form a sound judgment thereon, that the first step taken by the vestry was to authorise the churchwardens to adopt such measures as would be necessary for the securing of the present building, and the safety of the lives of the parishioners. That being done, the following practical resolutions were agreed to:—

1st. That it is inexpedient to attempt to put a new roof on the present walls of the parish church.

2nd. That a sum of 2,262l. having been promised towards the erection of a new church, on a new site near the rectory grounds, a committee be appointed to collect further subscriptions, and to take steps towards carrying out this object.

3rd. That a committee for the above purpose be appointed.

SANITARY AFFAIRS IN PADDINGTON.

The medical officer of health for Paddington, Dr. Hardwicke, has sent in his sanitary report on the parish for 1871-2 to the vestry authorities, and it has been printed by their order.

The density of the district population, the report states, is equal to that of Liverpool, Glasgow, and Manchester,—97.9, 94.8, and 78.6, respectively; being the highest density of population in twenty of the largest towns of the kingdom. Of the whole area of 1,280 acres in the parish, the open fields and part of Kensington Gardens in the parish are estimated at 256 acres, where there are, of course, fewer houses; but this only shows an increase of density elsewhere.

In speaking of the inevitable re-breathing of foul air in close rooms, the reporter notes that it is the duty of those who live in the parish but can remove elsewhere, when and where they like, for health, to remember that the poorer classes in general cannot do so, but are comparative fixtures, and that those favoured ones ought therefore to combine in improving the condition of their less fortunate fellow-citizens as far as possible. It is a scandal, he remarks, that the reverse of this is the rule in spite of all warnings and suggestions; and the industrial orders, like doomed men, look in vain to the Legislature for help.

From a table given it appears that there are six times the number of children amongst the working people compared with an equal number of inhabitants of the squares and mansions.

The filling up of made ground with road scrapings is deprecated as forming unwholesome sites for houses.

On the subject of a constant water supply, Dr. Hardwicke says:—

"In poor neighbourhoods it would be difficult to say what plan is best; in the worst kind of property (of which there is very little in this parish) where expensive brass taps would be stolen, injured, or left running, a stand-pipe from which the inhabitants could fetch water is the simplest and most economical; but on the better class of tenant house property the inhabitant will insist upon a draw-off tap inside the house, or some

where on the premises at least. The w.c. supply could then remain as now attached to the ordinary cistern, or abolished; a special water supply. The Public Health, at a small cost, can be fitted on to the constant supply pipe.

I think landlords must go a step further.—Those who let out floors and rooms to separate tenants ought to provide a separate water supply on each floor,—that is, a tap and a sink,—the one being quite as essential as the other."

HARDNESS OF WATER.

SIR.—Can any of your readers inform me why the rain-water which flows from our house roof, "covered with ordinary plain tiles" into a tank or cistern formed in a stratum of solid blue clay, is so hard as to be unfit for purposes to which soft water is desirable? Is it owing to some chemical action in the composition of the tiles, or attributable to the stiff and impervious clay?

G. BENTING.

TYPHOID FEVER IN VILLAGES.

A CORRESPONDENT of the *York Herald* says:—

"Unfortunately our authorities do not seem to note one of the facts of astronomy, viz., that it is not a necessity for large bodies to move rapidly. The Public Health (1872) requires (amongst other things) the appointment of an inspector of nuisances, and there is a serious urgency in this simple matter owing to the prevalence of typhoid fever in some of the villages of the county, a village which from its elevation ought to be one of the most salubrious spots about York, has had thirteen cases of this fever in a population of fifty, and three deaths. I mention this instance freely, as the epidemic is now subsiding. Other two villages I could refer to, in one of which fatal cases are occurring. The medical profession tell us that this fever is caused by moist air and bad water in the first instance, and then propagated by infection. I am therefore not surprised at typhoid fever in our villages, especially in the streets. The pure air of heaven permeates all readily, but the very doors of the dwellings, and there, in too many instances, it is poisoned by pestiferous drains, piggeries, dungheaps, and cess-pools. The beautiful well-water is poisoned by the sewage."

The local Poor-Law Guardians have it in their power, in the meantime, to vastly promote the health of the rural population by ordaining an immediate, independent, and periodical inspection and improvement of sanitary arrangements.

LIABILITY OF A WORKMAN FOR DESTROYING HIS WORK.

At the Sheriff Small-Debt Court, in Edinburgh, before Sheriff Hamilton, William Gray, joiner, Dalry-road, sued Peter Boyle, joiner, Pleasanton, for 3l. 18s., as the value of five window-frames destroyed by him on the 12th ult. It appeared that the defender was a workman in the employment of Gray, being supplied with wood to make the window-frames. He offered no objections on the score of incompetency, but on being finished the frames were found to be so mortised as to be unfit for the purpose for which they were intended. The defender admitted that the window-frames were made by him in a defective manner, but contended that as they were not destroyed willfully he was not liable. He did the work the best way he could, and having been dismissed, had raised an action for wrongful dismissal against the present pursuer in the County Justice of Peace Court, but lost his case. After a proof, the Sheriff held that the defender was liable for the damage done, because, if ordinary care had been taken, the work would have been properly executed. A remit was made to a person of skill to assess the damage, and the pursuer intimated that he would limit his claim to two guineas.

CHANGE OF BUILDER UNDER BUILDING ACT.

KNIGHTLEY v. WILKINSON.

In this case, heard by Mr. Bridge, Hammersmith Police Court, the defendant, Mr. Wilkinson, is the owner of a building estate at Hammersmith, upon which a large number of houses have been erected. Towards the end of last year, he let a plot of land to Mr. Foulkes, who gave a proper notice, and erected a carcass, but abandoned it at the end of December, when plate-ships. In this roofless condition it remained till July of the present year, when the district surveyor found men again working. The brickwork had been undertaken by one man, and the carpenter's work by another. Upon each of these a change-of-builder notice was served; but each returned it, saying he was not the builder, but working for Mr. Wilkinson, to whom a change-of-builder notice was also sent, but who paid no attention: hence the proceedings.

For the defence, the interpretation of the word "builder" was depended upon, but as the work of finishing was let out to several persons, the magistrate held that Mr. Wilkinson had control, after the manner in which builders usually control their undertakings,—that Mr. Wilkinson had stepped into Mr. Foulkes's shoes,—and he fined him 10s. and costs.

Notice of appeal was given.

CHURCH-BUILDING NEWS.

Messey Hampton.—The church here has been re-opened for divine service. The architect employed was Mr. James Brooks, of London, and from his designs a school-building for seventy children was completed a year ago. The restoration of the church was then proceeded with, divine service being conducted in the new school during the continuance of the work. Three fourth parts of the church have been renovated internally, in addition to external

repairs, and the erection of a vestry. In the nave the ceiling, and the western gallery, have been removed, dilapidated high pews have been replaced by open benches, and the buttresses of the central tower, which had been largely cut away for the greater accommodation of the high pews, have been restored. The south transept has received a new roof, and the masonry of the windows has been renewed. The nave, chancel, and south transept have been paved with Milton's tiles, and the western window of the nave has been filled with painted glass by Messrs. Clayton & Bell. The transepts are Early English, and contain two double-lancet windows, a copy of which has been reproduced in one of the new windows of the nave. The chancel is of the fourteenth century. It contains sedilia and a tomb, which have been repaired. The east window, the masonry of which was in a very shaky condition, has been taken out and refixed; and new freestone panelling has been fixed under the east window, with a view to a future reredos.

Sawbridgeworth.—The old parish church of Sawbridgeworth has been re-opened after having undergone restoration and repair. The work just completed was commenced about four months ago. Formerly the school children were scattered about in seats where they could neither hear nor see; now they have a gallery at the west end of the south aisle. The font has been rehabilitated, and, although composed of some 200 fragments, has all the resemblance of a short distance of a new font. The south door has been restored to its original proportions, and the steps down from it into the church have been moved back to the entrance of the porch. The windows, walls, pillars, and other parts have been repaired, and the masonry made good. Several of the monuments and mural tablets had to be removed in the course of the work, but care has been taken not to damage them. The work has been executed by Mr. John Egan, of Buckhurst-hill. The cost of the whole will amount to nearly 500l., which have almost, if not entirely, been already subscribed. The Ecclesiastical Commissioners have caused the chancel to be repaired, at an additional cost of 300l., which has been done under the direction of their architect, Mr. Christian. The upper doorway of the roof-loft has been brought to light during the restoration, and a carved head of an ecclesiastic was discovered in nso as a stop-gap. The gas is not yet laid on to the church, owing to a want of funds.

Chale (Isle of Wight).—The old church here has been re-opened by the Bishop of Winchester. The restoration was not undertaken before it was needed. Standing in one of the most exposed places in the island, the roof had fallen into such a state of dilapidation as to render it really dangerous. The restorations have been chiefly in the form of re-roofing, re-flooring, and re-pointing. In addition to these alterations, the tower has been opened up, and the arches have been relieved of the coating of whitewash with which previous renovators had disfigured them; and while there has been no interference with the prominent architectural features of the building, the church has been so improved as to afford increased accommodation.

Brighton.—A commencement has been made of the foundation for the Church of St. Martin's, to be erected in the Lewes-road, in memory of the late Vicar of Brighton, by his sons. The Rev. A. D. Wagner was present on the spot, examined the plans, and threw in the first shovelful of earth. The foundation-stone is to be laid next St. Martin's Day, and it is expected that the bishop of the diocese will be present at the ceremony. The contract has been taken by Mr. Jabez Reynolds, who will carry out the work from the designs and under the direct superintendence of Mr. Somers Clarke, jun., of Westminster, architect, who has appointed Mr. R. Hayward clerk of the works.

Didmorton.—A new church for Didmorton and Oldbury, to be called the Church of St. Michael and All Angels, has been consecrated by the Bishop of Gloucester and Bristol. It is intended for the use of the residents of the two parishes of Didmorton and Oldbury-on-the-Hill. The nave of the church is built in the parish of Oldbury, and the chancel in the parish of Didmorton. The foundation-stone was laid in the summer of 1871 by the Duchess of Beaufort. The funds for building were gathered chiefly from local sources. The stone, a hard white stone, was given by the Duke of Beaufort; and but a small balance of debt rests on the building. The style is Early English, the building being cruciform in shape,

ad consisting of nave and chancel, 85 ft. by 1 ft. wide, north and south transepts, an organ-trunk in the angle of the chancel and south transept; and it is intended at some future time, probably very shortly, to build an ornamental tower and spire at the opposite side wing, in the angle of the chancel and north transept, where the bell at present is temporarily hung. The wall stone is faced with Bath stone dressings, and the high-pitched roofs are covered with stone tiles. The ceilings are open-timbered, the principals being arched, and supported on projecting corbels. The windows are filled with stained glass, the chancel window being one of three lights. The building is warmed with hot air, the apparatus for which is put in by Messrs. Haden, & Trowbridge. The sacarium and chancel are covered with Minton tiles, and the altar-rail is a simple bar of oak, supported on ornamental iron brass standards. The architect was Mr. T. I. Wyatt, of London; and the builder and contractor Mr. Francis Brown, of Tethry. The cost of the building has been about 2,100l.

Portsea.—The foundation-stone of a new church, on a part of the glacis of the old fortifications on the landward side of Portsea, and which are now being levelled, has been laid by the Duke of Cambridge. The ground,—about an acre in extent,—has been given by Government, and representations made by the Bishop of Winchester, and adjoining a thickly-populated district which is principally inhabited by mechanics and the poorer classes and their families, and is also closely contiguous to all the great barracks at Portsmouth and Portsea. The church will contain 1,000 sittings, which are to remain free for ever.

Ashley.—The parish church here has been repaired. Messrs. Clark & Holland, of Newmarket, architects, prepared the plans and specifications of the alterations; and the contract, to the amount of 850l., was secured by Mr. R. Tooley, of the Church Restoration Works,bury St. Edmund's. The terms of the contract included the provision of a new chancel, with altar, north and south aisles, and organ-chamber, together affording extra sitting accommodation for about 160 persons. The structure is of stone, surmounted by a roof of the usual span and dimensions,—the frame of which is of hewn stained pine, and covered with the ordinary church tiles. The windows are of the cathedral plain pattern. The altar-rails are of iron. The extra expenditure, beyond the contract, will amount to something like 150l., the whole cost of which has been covered by a small rate and voluntary contributions.

Reading.—The alterations and enlargement of St. Mary's Church are almost completed. The west gable of the new aisle is coped with stone, finished with a cross, and contains a faintly traceried window, the principal mouldings of which are copied from the old two-light window, which formerly stood in the arcade now opened out between the transept and the new organ-chamber. The new aisle is covered by an open stained lead roof, with arched ribs, and the piers are relieved by plaster work between the rafters. The flooring, seating, and gas standards correspond exactly with the south aisle. The choir-seats and prayer-desks have been remodelled, and the chancel—which has always had a crowded appearance,—is thereby improved. The west gable and buttresses of the south aisle being, with the porch, the only unretored portions of the old fabric, are under the workmen's hands. The porch was much dilapidated, and is being restored, new windows inserted, and new galle coping and brass added is the gift to the church of Messrs. Wheeler, Brothers, the contractors, by whom the whole of the restorations, past and present, have been performed. There are six windows still requiring painted glass.

SCHOOL-BUILDING NEWS.

Monks Eleigh.—A new school, erected in the Elizabethan style by Mr. Hawkins, builder, has been opened in this place. The school consists of two lofty rooms, one 42 ft. by 20 ft., and the other 16 ft. by 20 ft., and will afford accommodation for about 130 children.

Sibson-cum-Stibington.—The new school built for the parish of Sibson-cum-Stibington has been opened. The building has been erected by Messrs. Richardson, of Stamford, at the entire cost of the late Duke of Bedford, and it will be supported by the present Duke. The school stands midway in the village.

Bernonsey.—The memorial stone of new schools in connexion with St. James's Church, Spa-road, Bernonsey, has been laid by Canon Gregory. The building is designed by Mr. R. Heskeith, of London, and is intended to accommodate 192 boys and 172 girls. The cost is estimated at 1,350l., of which 1,050l. have already been subscribed.

Manchester.—The foundation-stone of a new college for the reception of the Baptist students who are at present located at Chamber Hall, near Bury, has been laid in Brighton-grove, Rusholme, Manchester. The total frontage will be 115 ft., and the total depth 77 ft. Provision is made for the accommodation of about twenty-five students.

Padiham.—A new school-chapel has been opened at Hapton, Padiham. Four new Church schools, providing accommodation for 530 scholars, have been founded and completed in this parish since the passing of the Education Act of 1870. The last of the four has been opened at Hapton Bridge, with special services. This school, built by public subscription in the midst of a distant hamlet, will serve the threefold purpose of a day school, under a certificated teacher, a Sunday school, and a licensed chapel for Church services on Sunday and week-day evening. All classes have contributed liberally to the erection, which has cost nearly 1,100l., and is of Gothic design by Mr. W. Waddington, architect, Burnley.

Kemble.—A new school building has been opened here. It has been erected, together with a teacher's residence, at the sole cost of Miss Gordon, the lady of the manor. The elevation of the building is "in rock work." There is a playground at the rear. The contractor was Mr. William Newcombe, of Kemble.

Retford.—New Wesleyan Sunday and day schools have been opened here. The new building, designed by Mr. William Liller, is in the Gothic style. It is located in Grove-street. The principal room is lofty, commodious, and well ventilated, and the convenience of the interior is much augmented by the addition of four or five ante-rooms, into which scholars may be draughted when the largest room is too much crowded.

Nottingham.—School the foundation-stone of a new Congregational School has been laid in Kirke White-street. Mr. Simpson is the architect of the building, a portion of which faces Kirke White-street. It is considerably above water level, and on the entrances right and left there will be a green sward. The basement of the building is of brick-faced Bulwell stone, and supports a superstructure of dressed brick and Ancaster stone. The style is Decorated Gothic, and the school itself is 60 ft. long and 30 ft. broad. The height is about 30 ft., and the roof is composed of open timber. There are to be some large vestries behind, which may be used as class-rooms. There is a considerable portion of ground reserved for a chapel which will be built in due time.

Liverpool.—St. Peter's schools in Gilbert-street have been completed, and are in full working order. They are of a simple, solid kind, and consist of two large rooms, 70 ft. by 30 ft., with adjoining class-rooms and offices. The rooms are lofty, well lighted, and furnished with the most modern appliances for educational purposes. Accommodation is provided for 650 children. There are class-rooms, and retiring-rooms for mistresses and pupil teachers. Mr. Edmund Kirby was the architect; and the builders were Messrs. Nicholson & Syre, all of Liverpool.

Clapham.—A parochial school has been opened here. In its origin a committee was formed and plans obtained from Mr. John Day for schools to accommodate 122 children in two rooms, one for 72 boys and girls, and another for 50 infants, with teacher's residence detached; and tenders having been invited, Mr. R. Carter, of Bedford, entered into a contract to carry out the work, exclusive of cartage and school-fittings, for 1,146l., the several occupiers of land at the same time undertaking to cart the bricks and other materials in proportions calculated upon their respective acreage. The buildings consist of a mixed school for boys and girls, 42 ft. in length and 19 ft. in width; an infant school, 25 ft. long by 16 ft. in width, with separate entrances for the boys, girls, and infants; these are fitted with hat and cloak rails, and each has a slate lavatory. Attached are places for coats and closets for galls, brushes, and other necessities for cleaning and lighting the rooms, and Moule's patent earth-closets, with the latest improvements. A spacious earth-drying shed is

also erected, containing the stove for drying the earth. The mistress's house is a detached building. The whole of the interior woodwork is stained and varnished. The interior walls of the schools are hickwork distempered, and are from floor to ceiling 17 ft. in height. The principals only are visible, the ceilings being carried under the common rafters and in a line with the collar-beam. Ventilation is provided by means of zinc tubes, conducting the vitiated air into a foul-air flue, which is carried up in the chimney-shaft, two wide openings being provided in the ceiling of the large, and one in the small room. Fresh air is admitted through grated apertures in the walls covered on the inside with fine perforated zinc. The walls are lined to the height of 5 ft. from the floor with matched and beaded boarding, and the whole of the interior woodwork is stained and varnished. Red bricks are used generally in the buildings, with bands and devices of Staffordshire blue bricks, and the window-heads, copings, weatherings, and corbels are of Bath stone. The roofs are covered with plain tiles from Mr. Franklin's kilns, Marston, near Amphil. The windows throughout are the ordinary sashes as used in dwelling-houses. The buildings generally are very plain Domestic Gothic in style or character, as far as can be carried out, with roofs of a high pitch, and the western gable is surmounted by a turret, in which is a bell for the use of the school.

Leeds.—The Bishop of Brechin has laid the corner-stone of schools that are to be built in the parish of St. Saviour, in Cross Green-lane, Leeds. It is intended to make the new schools the centre of a district divided from the present extensive one of St. Saviour; and in order to complete this project, an iron church will shortly be erected. The piece of land on which the intended schools are to be erected has been presented by Mr. Francis Darwin, and the style of building is plain Gothic, from designs by Mr. D. Dodgson, architect, Leeds. The accommodation will be for 220 children, and the schools will be well heated and ventilated, and contain necessary lavatories, conveniences, &c. The total cost is estimated at about 1,150l., towards which the sum of 800l. has already been subscribed.

Leek.—Christ Church School, Compton, has very lately been enlarged and reopened. The cost of the enlargement will be about 800l. Most of this sum has been given. Mr. Edgar, of London, was the architect, and the work has been executed by Mr. J. G. Smith, of Leek.

Fleckney.—The foundation-stone of a new national school has been laid at Fleckney, by Mr. A. Pell, M.P.

Burnley.—The opening of new Church of England schools, which have recently been erected in the village of Worsthorne, near Burnley, has just taken place. The old school, which has been erected forty years, has become far too small for the requirements of the place. The new building will accommodate 300 children; and the entire cost, when fully completed, will be nearly 1,000l. The school is built on the best site in the village, the land having been given by the Rev. W. Thursby, the late vicar of the parish, and the late General Scarlett. This is the only day-school in the parish. Between 1,400l. and 1,500l. of the cost of the building have been raised.

Books Received.

The Water Supply of Bombay; being a Report submitted to the Bench of Justices of that City.

By their executive Engineer, HERCUL TULLOCH, Major, Royal Engineers. London: printed by W. J. Johnson, Fleet-street. 1872.

In this voluminous and able report, the author does not advocate any one special scheme for the requisite improvement of the water supply to Bombay, although on a previous occasion he did suggest a project for impounding water in the Toolsee Valley, which was set aside by the Justices, rightly, as Major Tulloch thinks, till fuller inquiry had been made on the whole subject. There have been various projects, such as those of Mr. Conybeare, Mr. Aitken, Mr. Walton, and Captain Tulloch himself. These projects are known by the names of the Kenney project, the Ewoor project, the Vehar lake extension project, the Kansa project, the Kamun project, and the Toolsee project. The author treats of all these projects respectively, ending with a summary and recommendations, after treating of the history of the Bombay water supply, describing

the country, and considering the questions of masonry versus earthen dams, masonry conduits versus iron pipes, and the advantages of a service reservoir, and the necessity for laying pipes above ground. The reporter recommends the bench either to carry out the Kennerly and Toolsee projects for a supply of 8½ million gallons daily, or to carry out the Kansas project for a supply of 13 million gallons. The volume is illustrated by numerous maps and other plates.

The Strength of Materials and Structures. By JOHN ANDERSON, C.E., LL.D. London: Longmans, Green, & Co. 1872.

ONE of the greatest mistakes that a capable writer can make, is the adoption of a misleading title, and this mistake has been made by Mr. Anderson. Dozens of persons reading the advertised title, "The Strength of Materials and Structures," will order this book, expecting to find it treating of the strength of all the materials used in buildings, and of the strength of buildings themselves, and will be apt, when they open it, and find that, with a trifling exception, it gives information only as to the strength of iron, and that the structures referred to are cast-iron pipes, tanks, and guns, to consider themselves taken in, and so will disregard the actual contents of the volume. The book includes a number of valuable experiments and much useful information within the limits the author has given it.

Miscellaneous.

Freeing the Metropolitan Bridges.—At the last meeting of the Metropolitan Board of Works, the Works Committee presented a report stating that, in their opinion, it is expedient to free the toll-bridges within the area of the coal and wine duties by an extension of those duties, and recommending that the subject be referred back to the committee, with authority to confer with her Majesty's Government thereon. Mr. Newton, in moving the adoption of the report, stated that the whole duties produced a total of 315,000*l.* per annum, of which the city of London received a little less than 100,000*l.* a year, and the Board a little more than 200,000*l.* These charges would expire in 1888, and the committee proposed to ask for their reversion, in order to purchase the bridges of the metropolis. Mr. Deputy H. L. Taylor urged that, as the Corporation of London had had the control of the coal and wine dues for so many years, the Board might at least have consulted them before wishing to have the expenditure of the whole of them. Mr. Newton deprecated any idea of hostility to the Corporation, and would willingly co-operate with them. It was proposed to raise the money in the first instance by loan. The motion was carried by 31 to 2, only the City members voting against it.

The Sewerage Works, Kidderminster.—The memorial stone at the pumping-station for the Kidderminster sewerage has been laid by Ald. Jefferies, in the presence of a number of the members of the corporation. The pumping-station is a little way out of Kidderminster, on the Stourport-road, and covered tanks are to be erected to receive the daily discharge from the main sewer. From the tanks the sewage will flow into a well, and thence it will be pumped a distance of four miles, to the highest point of the sewage farm, near Stourport. The ceremony was the laying of a dressed stone in the stack of the chimney of the engine-house. Mr. Fairbank, C.E., on behalf of the contractor (Mr. Joseph Walker, of Crewe), presented Alderman Jefferies with a mallet and silver trowel, each bearing a suitable inscription, and the stone was then formally laid. Mr. Fairbank gave some account of the works, and said he thought that, when completed, they would have the best and cheapest sewerage and water works in the kingdom. At Doncaster they were going to spend 100,000*l.* in improving the water supply alone, while in Kidderminster they would have a complete system of sewerage and water supply, and a freehold sewage farm of 170 acres, for considerably less than that amount.

Fall of a Chimney.—At the works of Mr. Donnell Buchanan, metal refiner, Anderston, Glasgow, a chimney, between 60 ft. and 70 ft. high, has fallen through the roof of an engineering shop. One person was instantaneously killed, but, with this exception, the large number of men in the shop escaped.

Proposed Additions to the Surrey County Lunatic Asylums at Wandsworth and Brookwood.—The Committee of Visitors of the County Lunatic Asylum, at Wandsworth, recommended, at the recent Surrey Sessions held at Kingston, that a sum of 20,000*l.* be granted for the erection of additional buildings at the said asylum. The intention was to provide for about 50 men and 100 women. For that part of the buildings for 100 females, the estimate for work was somewhere about 9,000*l.* On the motion for the adoption of the report, it was moved, as an amendment, "That any further progress in this question be suspended for the next six months." The amendment was lost by 27 against 9, and the recommendation of the committee was afterwards agreed to. The report of visitors to the Asylum at Brookwood was next read. The Committee of Visitors submitted plans for the accommodation of 100 male and 300 female additional patients, and recommended that the said plans be carried out at an expense not exceeding 55,000*l.*, including architect's commission, salary of clerk of the works, furniture, clothing, and every other expense. The recommendation of the committee was adopted, without discussion.

Accidents.—Holborn Theatre has had a narrow escape. Between two and three o'clock on Saturday morning last a fire, attended with a great loss of valuable property, occurred on premises close to it in Brownlow-street. One of the inmates gave an alarm, and the other inmates, in order to reach the street, had to roll down the stairs to avoid the flames, which were then crossing the street and fring the front of the premises opposite as well as the side windows of the Holborn Theatre Royal. Several hours elapsed before the fire could be extinguished. The injury to the theatre was confined to the scorching of the side window frames and the breakage of window glass. Some slight damage was done to the contents by water and smoke.

—At Eagley, near Bolton, two men were killed at the Church of England school, in School-street, which was being enlarged. They were fixing flags in an upright position, each flag being 7 ft. 6 in. high, 4 ft. wide, and 5 in. thick: the men had got six of these fixed temporarily, and were in the act of placing the seventh, when the second flag gave way, knocking down all the other six like ninepins. The deceased were crushed beneath the flags, and were killed on the spot.

Reopening of the Lady Chapel in Chichester Cathedral.—The Lady Chapel of this cathedral has been restored and reopened as a memorial of the late Bishop Gilbert. Sir Gilbert Scott prepared the plans, and, except the colouring of the groining—remains of which are seen,—the chapel now stands almost as it left the hands of its builder in the thirteenth century. The builder, singularly, was another Bishop Gilbert, surnamed Leofardo. The work has been carried out by Mr. J. Marshall, of Chichester. The stone work of the chapel has been thoroughly restored, with the exception of the carving of the capitals of the restored vaulting shafts, the sedilia and the mullions of the windows, to accomplish which a fund is now being raised. Several traces of painting on the walls have been brought to light. The floor is paved with tiles, from patterns of old tiles found during the restoration.

Fall of a Circus Gallery.—An accident has occurred at Mr. Hengler's circus in Sheffield. The structure is of wood, and was only recently opened. The place was crowded, and during some acrobatic performances a gallery which ran across the passage from the stables to the arena, suddenly gave way, and from thirty to forty persons were precipitated to the ground, a distance of about 14 ft. A panic seized the remainder of the spectators, and a great many rushed from the building. Seven persons were taken to the General Infirmary, and a similar number to the Public Hospital. The full extent of the injuries sustained by some of the other persons has not been ascertained. One of the lady performers was much shaken and crushed.

Diocesan Surveyors, Norwich.—At a meeting of the archdeacons and rural deans, held under the presidency of the Bishop of the diocese, for the purpose of appointing Surveyors of Ecclesiastical Dilapidation for the Diocese of Norwich, the following gentlemen were re-elected:—E. L. Blackharn, of Bernard-street, Russell-square, London, architect; J. H. Brown, of Norwich, architect; and R. M. Plipson, of Norwich and Ipswich, architect.

Edinburgh.—According to the *Scotsman*, a committee of the Edinburgh Town Council, charged to report on a better organisation for accomplishing the sanitary business of the city, have agreed to recommend the appointment of a Public Health Committee to look after such matters as the supervision of burying-grounds, lodging-houses, and underground or overcrowded dwellings; the prevention of smoke nuisance; the consideration of proposals for the establishment of new manufactories, and supervision of manufactories already established; the inspection of workshops, bakehouses, stables, &c.; the adulteration of food and diseased meat; and the prevention or mitigation of epidemic disease.

New Ventilating Fan for Mines.—The Monkland coalmasters have just inaugurated a new and better system of ventilation for coal-mines. A pair of patent fans have been erected for providing ventilation for two coal-pits. The fans are of the ordinary construction, but slightly hollowed towards the middle. They measure 5 ft. in diameter, and are driven at a speed of 600 revolutions per minute, and 33,000 ft. of air are sent out by the fans every minute. There are two sets, driven by a pair of horizontal engines, of 12-in. cylinders, the motion being direct from the fly-wheel. The fans, once erected, are kept working at a very small sum compared with the great consumption of coal on the old system, while the first cost of the whole apparatus, including a pair of engines, holers, &c., is only about 700*l.*

Sewage Irrigation, Windsor.—The drainage works for Windsor Castle and Frogmore House are approaching completion. At Old Windsor the Thames Conservators are erecting a new bridge over the navigation cut between the pumping station and the Ham, upon which the sewage farm is situated. The bridge will be of iron girders, supported upon buttresses of red brick, concrete, and stone. The pipes conveying the sewage from the station to the farm will be carried over the water on the bridge to the Ham bank, whence the liquid will be distributed over the field. The buttresses of the bridge are nearly finished, and the iron work will soon be placed in position. The pumping station is in a forward condition, while a number of soldiers from the Windsor garrison are engaged upon the earth-work of the irrigation field.

The Institution of Civil Engineers.—Mr. Thomas Howard, of the King and Queen Ironworks, Rotherhithe, who was for thirty-seven years an associate of this society, has bequeathed to it the sum of 500*l.*, free of legacy duty, which sum he has by will directed "to be invested and the interest thereof to be applied in such manner and under such conditions and instructions as the council of the said Institution may think most expedient, for the purpose of presenting periodically a prize or medal to the author of a treatise on any of the uses or properties of iron, or to the inventor of some new and valuable process relating thereto, such author or inventor being a member, graduate, or associate of the said institution."

Dunderran House, Walsall.—This house is situated in a conspicuous and pleasant site on the outskirts of Walsall, and was commenced early in the spring, and is now approaching completion. It is built of local red pressed bricks, with white brick bands, with Hollington stone dressings, and the whole of the external walls are built hollow, and tied together with iron ties, and there are grey marble columns to the porch. There has not been any contractor for the works, but Mr. William Kirkpatrick, the owner, has bought the whole of the materials, and employed his own men to fix. The estimated cost is about 1,100*l.* Mr. Ralph Chamberlain, of Walsall, was the architect.

Sewage and Cement.—The Local Board of Tunstall, Staffordshire, instructed Mr. John Elliot, C.E. (of Newcastle), to inquire into all the recognised systems of dealing with sewage, and to report to them on the subject. After examination of the principal irrigation farms and of the different precipitation processes, Mr. Elliot has advised the board to adopt General Scott's process of precipitation and conversion of the product into cement, of which we have before spoken. The cement made by the process, Mr. Elliot said, was very good.

Institute of British Architects.—The new session will commence on Monday evening November 4th.

A New Temperance Hall and Hotel at Barrow.—Last week a Temperance and Band Hope Conference was held at Barrow, and at one of the meetings Sir James Ramsden, bart., the mayor, presided, and spoke strongly against drunkenness, which he said was one of the great drawbacks to the rising town of Barrow. It transpired in the course of the proceedings that spacious temperance-hall in connexion with a hotel is about to be erected in the borough, and that Sir James Ramsden has given the site.

The Town Surveyor of Brighton.—The town Council of Brighton have shown their estimation of Mr. Lockwood's talents and his services to the town in the office of town surveyor, by raising his salary from 400l. to 500l. a year. "Mr. Lockwood," says the local Herald, "has now filled the office of surveyor for fourteen years, in the course of which the town has made unprecedented progress, and demands have been made on his talents and energy, both as architect and surveyor, such as have never been exceeded in any previous epoch, if, indeed, qualified."

Sanitary Arrangements, Vienna Exhibition.—We are glad to hear that the whole of the sanitary arrangements of the Vienna Exhibition have been entrusted to Mr. George Jennings, Baron Schwartz Senborne, as also the water supply and the drainage of the Exhibition buildings and grounds. Mr. Jennings may well accept this as a compliment, and will, we know, endeavor, to the best of his ability, to be worthy of the trust reposed in him.

New Submarine Cables.—After overcoming many difficulties, Sir Charles Bright has just completed one of the most arduous of submarine telegraphic undertakings,—that of connecting the United States with the majority of the West India Islands, and thence with South America, by 3,000 miles of cable. There is now also direct communication by telegraph with Adelaide, in South Australia.

The Surveyorship of St. George's, East.—There are sixteen candidates for the office of surveyor to the Vestry of St. George's, East, ordered vacant by the death of Mr. Andrew Wilson. Among these are Mr. George Wilson, son of the late surveyor; Mr. Arthur Harston, architect; and Mr. C. R. Peters, son of an influential member of the vestry.

New National Theatre for Copenhagen.—The King of Denmark has laid the foundation stone of a new national theatre, the whole of the royal family and the heads of the public departments being present. The members of the opera opened the proceedings by singing a hymn, after which the Minister of Public Worship delivered an inaugural address.

Vaults in the Roadway.—The St. George's, East, manover-square, Vestry have refused the application of Mr. Thompson, of No. 12, Canterbury-place, Lambeth-place, for permission to extend a vault at No. 46, Mount-street, Grosvenor-square, 22 ft. under the roadway.

Pictures.—Private views will be given on this Saturday (26th) of the Exhibition of Cabinet Pictures in the Dudley Gallery, Egyptian Hall; and of the Winter Exhibition of British and Foreign Artists, 120, Pall-mall.

Italian Marble.—The Italian journals state that the exportation of marble from Italy continues to increase, as is shown by the shipments from the port of Genoa during the first eight months of the present year.

Co-operation.—The Yorkshire Post states that the workmen in the Sheffield trades have combined for the purpose of erecting works and manufactories on their own account.

TENDERS

Table with 2 columns: Description of work and Amount. Includes tenders for villa residences at West Wood, Isle of Wight, and other construction projects.

Table with 2 columns: Description of work and Amount. Includes tenders for ice-well at Islington, alterations to Royal Oak, St. Luke's, and other projects.

Table with 2 columns: Description of work and Amount. Includes tenders for alterations to the Royal Oak, St. Luke's, and other projects.

Table with 2 columns: Description of work and Amount. Includes tenders for new premises in Plough-court, Lombard-street, and other projects.

Table with 2 columns: Description of work and Amount. Includes tenders for pulling down and rebuilding Nos. 416 to 419, Oxford-street, and other projects.

Table with 2 columns: Description of work and Amount. Includes tenders for sundry alterations and additions at the Inns of Court Hotel, Holborn, and other projects.

Table with 2 columns: Description of work and Amount. Includes tenders for general repairs, cleaning, and painting throughout, at the Inns of Court Hotel, Holborn, and other projects.

Table with 2 columns: Description of work and Amount. Includes tenders for the erection of five cottages, at Chiselhurst, Kent, and other projects.

Table with 2 columns: Description of work and Amount. Includes tenders for the erection of boat-house, on the bank of the Thames, at Putney, and other projects.

Table with 2 columns: Description of work and Amount. Includes tenders for the erection of cow-stables, at Putney, for Mr. F. J. Morrison, and other projects.

Table with 2 columns: Description of work and Amount. Includes tenders for works, at 94, North-road, Brighton, in new shop, and alterations and additions, Mr. John Hill, architect, and other projects.

Table with 2 columns: Description of work and Amount. Includes tenders for mansion, for the Rev. W. Smith, Woolmer Forest, Hants., Mr. John Hill architect, and other projects.

Table with 2 columns: Description of work and Amount. Includes tenders for drainage work, cesspits, and pumping machinery, at Industrial Schools, Mitcham, Mr. H. Saxon Snell, architect, and other projects.

Table with 2 columns: Description of work and Amount. Includes tenders for painting and general repairs, at the Shrubbery, Shooter's Hill, for Mr. Carter, Mr. G. Judge, jun., architect, and other projects.

Table with 2 columns: Description of work and Amount. Includes tenders for erecting residence, at Cudham, Kent, for Mr. S. Packman, and other projects.

Table with 2 columns: Description of work and Amount. Includes tenders for alterations, at the Castle Hotel, Childs Hill, Finchley-road, for Mr. Randle, Mr. George Stooke, architect, and other projects.

Table with 2 columns: Description of work and Amount. Includes tenders for loose boxes, Horseshall Hall, near Norwich, for Mr. Edward Birkbeck, Mr. John Norton, architect, and other projects.

Table with 2 columns: Description of work and Amount. Includes tenders for tenders for double stables, Crystal Palace Park Estate, Mr. John Norton, architect, and other projects.

Table with 2 columns: Description of work and Amount. Includes tenders for the City Temple, Holborn Viaduct, Messrs. Lockwood & Mawson, architects, and other projects.

Table with 4 columns: Description of work, For main Building, For Towers, For extra on main Building, and For extra on Towers. Includes tenders for various construction projects.

TO CORRESPONDENTS.

Subscribers Hydrology—Cancelled, having appeared elsewhere, W. D. (where are specimens to be sent)—J. S. (undesirable)—F. C. Messrs. P. & S. J. C.—W. H. S.—T. D.—R. T.—Rev. J. S.—J. T.—T. B.—R. A. H.—J. & Son.—H. H. H.—H. L.—R. Y.—R. W. R.—T. B.—W. & Co.—L. & M.—A. & R.—C. R.—J. L.—W.—A. & Son.—H. D.—Messrs. F. (next week)—Messrs. H. B. & B. (next week)—St. Andrew's (next week)—C. (next week).

Notz.—The responsibility of signed articles, and papers read at public meetings, rests of course with the authors.

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The Builder.

VOL. XXX.—No. 1552.

Curiosities of the Moscow Polytechnic Exhibition.



RUSSIA seems determined that Exhibitions, industrial and others, shall keep pace with the rapid extension of her railways. It is only a few years since an ethnological exhibition was held at Moscow, and two years ago took place at St. Petersburg the great Russian Industrial Exhibition, the largest ever witnessed in that country, and of which we gave an account in these pages. In the summer of the

present year was opened the Moscow Polytechnic Exhibition. This event took place on the day of the bicentenary of the birthday of Peter the Great, the founder of Russia's greatness and prosperity. It is perhaps not generally known that this is already the fifteenth Exhibition, held alternately at St. Petersburg, Moscow, and Warsaw, since Russia became a manufacturing country. Every exertion is now being made in Russia to promote technical knowledge and education. With this view, technical schools are being established; a technical society has been formed, which has its branches in the chief towns of Russia, and its corresponding members in every commercial and mercantile centre. The present Exhibition is intended to be the commencement of a polytechnic museum in Moscow, and it has been brought together rather as an instructive than a competitive show; and although not international, in the sense in which we are accustomed to regard such displays, every civilised country has contributed to its various departments and sections. Nor are the buildings containing the exhibits, in an architectural point of view, like anything which we are accustomed to associate in our minds with such undertakings.

The site of the Moscow Polytechnic Exhibition is the garden of the ancient Kremlin, at the foot of the castle wall. The peculiarity of this show is, that the exhibits are not contained in one single building, but are displayed in more than eighty pavilions and buts, decorated in the Russian style, sheds, and tents of all imaginary sorts and sizes. There are in all about twenty-seven departments, and the articles are so grouped as to bring out the qualities of each department without any regard to their national origin. As an exception, however, may be taken the department of rural domestic economy, which is almost purely Russian in its character, and that devoted to the country of Turkistan, which has characteristics entirely of its own. It is with these two departments that we propose to acquaint our readers. The most striking object in the department of rural domestic economy is what one might call a model in its natural size of a village church erected on the top of an eminence in the garden of the Kremlin; there is also a landowner's dwelling-house, a village school-house, a village hospital, an infirmary, a dispensary, and a village *crèche* or nursery. The church is constructed entirely of wood, the walls being formed of squared logs, in the architectural style of most Russian churches, with its bulb-shaped and gaily-painted domes and belfry-tower at its side—a style which gives such a

gay and picturesque appearance to the landscapes of the interior of Russia. This church is constructed to contain from 150 to 200 people. The windows, door-casings, shutters, cornices, and barrel-shaped pediments, and other parts, carved and painted in variegated colours, are made so as to be easily taken to pieces, removed and put together again, which can be effected without ever damaging the sheet iron of the roof. The guide to the exhibition informs us that the object of exhibiting this village church in its natural size is this, that it offers the advantage of the merits of this proposed new system of building being more easily examined, and affords an opportunity of judging of the proportions of the most prominent parts of the structure, of the various details, as well as of the convenience of arrangement; and at the same time the bringing together of all kinds of church appurtenances executed chiefly in the Russian style, and concentrating them in one place, serves to display their peculiar character, and illustrates the conditions necessary for producing them. The advantages claimed for this mode of construction with squared logs, which can be taken to pieces, is that it can be applied to all manner of wooden structures; it does not require, as with common round logs, weather boarding outside, nor any kind of boarding inside, where it affords more room, and a considerable saving in the cost of labour. Besides, another very essential advantage of this system, is pointed to particularly for Russia, and which can be easily understood, viz., that buildings of this kind can be produced in those parts of the country where wood is plentiful and comparatively cheap, and more particularly in those districts and establishments where, by the employment of steam power, together with the advantages of railway communication, the price of joinery and carpentry work is reduced to a minimum. Of such establishments there is one in Tver, belonging to Mr. H. D. Meyerovich, and another at Kolomna owned by the architect, Mr. P. C. Kamponi. The entrance to the church is from the side of the terrace near the belfry tower, and the visitor who wishes to view the interior and the articles therein contained is recommended to commence his inspection of the various groups and separate articles from the right-hand side, and make a tour of the church round to the other entrance, which faces the Troitsky Tower of the Kremlin. Here are shown in detail all the parts and decorations which are peculiar to the interior of Russian orthodox churches, such as ikonostases,* ikonas, or holy pictures, in the execution of which, as well as of all the other articles belonging to the interior of the church, the following objects were had in view;—to preserve as much as possible the simplicity and character suitable to an orthodox Russian village church; to acquaint both the specialists and the public with the most practical method of constructing and decorating ikonostases, manufacturing candelabras and candlesticks, and other church appurtenances in turnery, carved, and metal work, all of which being in point of artistic merit very little inferior to more costly articles of the same description; and to develop the local trades in Russia, which are carried on by thousands of workmen in scores of villages. It should here be remarked that these village factories form a peculiar feature of Russian industry which has been preserved for centuries. As an example may be taken the village of Kholoni, situated in one of the districts of the government of Vladimir, the inhabitants of which, considerably over 1,000, are entirely engaged in painting "ikonas," or holy pictures. From early boyhood to old age the peasant of Kholoni is constantly at work with his painting-brush and maulstick, but the productions are of the most miserable kind, owing

* The partition which separates the altar from the rest of the church.

to the rapidity and carelessness with which they are executed. Some of these "artists" are able to paint 600 faces in a week, and others can complete these pictures, 12 in. square, in the same space of time, single-handed. These ikonas are painted on boards made of the lime pine, fir, alder, and aspen. The colours, instead of oil, are mixed with the whites of eggs; and when the painting is done, it merely receives a coating of boiled linseed oil, and the ikona is finished. As might be expected, these productions are manufactured only for the use of the poorer classes. The demand must be enormous, considering that the peasant population of Russia is something like 60,000,000, and that every orthodox peasant has a painting of this kind hung up in the corner of his room, these pictures generally representing some favourite saint whom he holds in great veneration. At Kholoni ikonas, 12 in. by 12 in., are sold as low as 6s. per 100; and that village alone produces from 1½ million to 2½ millions of them yearly. They are sold wholesale, chiefly to the *ofenias*, or itinerant merchants, who travel from fair to fair over the wide expanse of the Russian empire. The different monasteries are also customers for these productions; but they are executed better, and the price is much higher. The supply of the raw material, i.e., the boards for painting on, is obtained in the winter time during Lent, when as many as 100 sledge-loads of them per week are brought over the ice from the other side of the Volga to Kholoni. In the village of Palekha, situated about 90 versts from the above place, the paintings produced are of a superior kind; they are executed in oil, in the Greek style, and are sold chiefly in the capitals of St. Petersburg and Moscow. Some of these paintings produced by peasants, it is said, are really beautifully done, particularly miniatures,—which is the more astonishing, since these village artists are totally uneducated, and have acquired the art of painting, as it were, intuitively. In the same manner the village of Pavlovo, in the government of Nijni-Novgorod, is celebrated for its lockmakers, where, besides cutlery, all kinds of tools are manufactured, some of which will bear comparison with the best Sheffield ware. Thousands of dozens of penknives are exported from Pavlovo to Persia. Great quantities of travelling-boxes are also made here, fitted with locks manufactured in the village, which are sent in whole cargoes to Khiva and Taskent, reaching even the frontiers of Afghanistan. The Pavlovo circuit extends over an area of 200 versts, contains 33 so-called settlements, all more or less engaged in the production of locks and hardware of that description. Vorsma, another village not far from Pavlovo, is also celebrated for this branch of industry. The government of Tver, again, is noted for its nail-smiths' villages, where a system of co-operative labour has lately been introduced, and supported by capital lent at a moderate interest by the local administration, which has considerably improved the position of the producers, who, like those of Pavlovo and Vorsma, or in fact all village artisans, have always remained entirely in the hands of fore-stallers and jobbers. It is not at all unlikely that at some future time not far distant we shall become large importers of the products of Russian village labour, particularly of articles in wood in connexion with building; for it cannot be denied that Russia possesses many advantages in manufacturing which are denied to other countries of Europe; her many industries need only to be developed and improved.

The following peculiarities of the interior of the church are pointed to as being novel in Russia in a structure of this kind;—the framed timbers supporting the roof, such as tie-beams, king-posts, and the rafters forming the same, all made to be taken apart and put together again; to the alms-box, fixed in the wall inside, with an opening on the outside for dropping in the

money. It should here be remarked that it has been the custom to place the box outside of the church, chained or locked to some fixture. Of late years these boxes have often been wrenched off and carried away. The shutters are made to lift up and down, without any kind of ironwork, and so constructed as only to be opened from within. In the middle of the church, and in the corners is arranged a collection of church-plates manufactured entirely in the Russian style. Of these, a set of silver with enamel is the most expensive; another, of silver alone, is of moderate price; and a third is made of non-oxidising melchior, suitable for the poorer country parishes. In front of the altar, forming part of the ikonostas, are what are called the Tsarskie Vorota or Royal Gates, leading into the *sanctum sanctorum*, and at the sides the north and south doors and ikonas. These are different ikonas from those which we described above: they are painted by professed artists, encased in silver and silver-gilt, the latter metal in *repoussé* work, forming the drapery of the figures of the picture. Some of the ikonas of the rich churches are encased in pure gold, and studded with precious stones. The rich merchants also affect this kind of ikonas in their homes, which are generally enclosed in an elaborate glass case. In this shape it is called a kiota, one of which is also shown in the church. A kind of night-light is kept constantly burning before this shrine, the gilt crowns and haloes of the saints reflecting the light in a thousand brilliant rays. The silversmiths of Moscow were celebrated already in the seventeenth century all over Russia for the production of holy pictures of this kind.

Among the holy pictures shown in the church deserves to be noticed a painting which was executed in commemoration of the miraculous escape of the present czar from the hand of the would-be assassin in 1866, at St. Petersburg. It represents four saints, with a guardian angel, and the Virgin Mary, the *fiat-days* of these saints corresponding to four events of the emperor's life,—his birth-day, baptism, coronation, and the day of his deliverance.

The royal gates are decorated in the ancient Russian style, the carved work being substituted by mouldings formed of a peculiar mass. Generally speaking, for a Russian church the whole ikonostas is simple. The gilding has been done in imitation gold, which looks as well as real, and has the advantage that it can be washed when dirty, while the cost is considerably less. Next to the altar in one of the corners is a carving in antediluvian (mammoth) ivory, in high relief, of a head of Christ with the crown of thorns heartily executed. Apparatus for heating and ventilation are also shown. Among other things is exhibited a model of a small chapel called a Tchasovnia, to be used in villages as a depository of the dead before burial, with the object of preventing hurrying alive, and also as a sanitary measure. The outside of the church in the summer time was decorated with all kinds of plants, with a lawn in front.

In the same garden of the Kremlin where the church stands is a full-size model of a landed proprietor's house. It is in the usual style of Russian wooden buildings which we described on a former occasion, but with a terrace and several additions and improvements borrowed from Western Europe. The house has a ground-floor, *mezzanine*, and *nansard*, the kitchen being built out. The ground-floor has ten spacious rooms, a corridor dividing the house into two parts; on the right is the dining-room, opening on to the terrace; to the left the drawing-room on the other side of the corridor, where also the study is situated. The ground-floor contains also a lady's boudoir and a school-room for the children. The staircase, with water-closet underneath, leads from the hall to the mezzanine floor, which is likewise divided into two parts by a passage, on each side of which are the bedrooms, lady's dressing-room, wardrobe-room, &c. The kitchen, built out in the yard, communicates with the main structure by means of a passage, near which is the bedroom of the cook, and a bath-room. In the kitchen are shown all kinds of crockery and cast-iron ware, hot plates, &c. The furniture corresponds to the destination of each room, and is most tastefully got up. Certainly there could be nothing more comfortable as a dwelling than this landowner's house exhibited in the Kremlin garden. In the front is a small garden laid out with great taste, with iron seats, and a gymnasium for the children. The village schoolhouse is a simple wooden building. It has a spacious schoolroom, with two rooms for the teacher,

There are exhibited all kinds of school furniture appliances, &c.

The village hospital illustrates the manner in which a common peasant's izba, or several of them together, may be converted into an establishment of this kind. Every requisite for the patients is here displayed. The village dispensary contains a general room for the out-door patients and a doctor's reception-room, and also a stock of medicines, with every requisite instrument and appliances, &c. The village crèche, or nursery, is an unpretending building, intended as a place of refuge for infants and young children, where they will be taken care of during the time the parents are engaged working in the fields.

The nucleus of the vast Russian Empire, the old czarism of Moscow, which since the reign of Ivan the Terrible has gradually expanded eastward, and from the time of Peter the Great southward and westward, has ever since continued to absorb territories, tribes, and whole nations almost imperceptibly to Western Europe, and so within the last eighteen or nineteen years acquisitious have been made in Asia, on the coast of the North Pacific an enormous territory gained in the basin of the river Amur, extending to the island of Sakhalin. Since the Crimean war also the Russian Government has permanently established its authority over the mountain tribes of the Caucasus, with whom it has so long been in a state of chronic warfare; and, what is most important of all, the territory of Central Asia known in our geography as Independent Tartary has added another vast area to the Russian dominions by the conquest of Turkistan, a territory extending beyond Samarcand, in the direction of our own Indian possessions. The Turkistan department of the Polytechnic Exhibition is most interesting both for its novelty and for the information it affords of a country which is almost unknown to Europeans. It is curious to reflect that these several millions of new Russian subjects, the inhabitants of Turkistan, consisting of tribes such as the Tadzhiks, Onzbeks, Kirghizes, and Sarts, are the remnants of the ancient Tartars their forefathers, who for nearly 200 years remained masters of Central Russia; and that the Kremlin, where the present Exhibition is being held, was during a great part of the above period the citadel and palace of the Tartar deputies in Moscow. The Turkistan department was formed by the members of the Turkistan section of the lovers of natural science on the means afforded by the governor-general of that country. The chief object sought is to acquaint the Russian general public and specialists with a country which has only recently become thoroughly accessible to explorers. This is already the fifth attempt in this direction. In 1866, immediately after the taking of Taskent, General Tcherniaev sent to Moscow a collection of the productions of the country. In 1867, Turkistan was represented at the Ethnographic Exhibition held in the ancient capital in that year. In 1869 there was a special Exhibition held at St. Petersburg of the productions of the country; and, lastly, in 1870, there were sent to the St. Petersburg Exhibition collections of articles representing the various branches of native industry. Some of these objects form part of the present display. We are told that the fresh researches which have been made in the country have enabled the committee to render the present Exhibition more complete and varied than all the preceding ones, and that, notwithstanding every effort, there are still many things wanting, owing to the incomplete information possessed upon several important questions. All this will tend to show what importance Russia attaches to her new possessions in Central Asia. The building containing the Turkistan collection is a model, on a large scale, of a Samarand *medresse* (ancient religious school). Nowhere in the country of Turkistan are there so many ancient Mussulman buildings of this kind as at Samarand, and offering such a variety in decorative art. Even before the occupation of

Taskent and Khodjent, the Russians often met with structures of this kind; but they were unable to form from them any just idea of these monuments of antiquity. The ancient buildings of Samarand, which at one period was a flourishing town, and the seat of learning of Central Asia, have been so far preserved that the remains of one structure serve to complete another, so that they afford the possibility of studying both the mode of construction and character of the decorations. One of the most characteristic styles of these buildings may be seen in the medresse called Shirdar, which stands on the market-place at Samarand,

together with two others, very similar in form,—Mirza-ulg-begi and Tili-Kari. The Shirdar, owing to its antiquity (it was built by Yalantash Bagadour, a descendant of Timour), its elaborate design and finish, and being in a better state of preservation, is more interesting, in an architectural point of view, than the others. The front of the building faces the market-place, and consists of a large pediment, 109 ft. high and 115 ft. wide, in which is formed a pointed arch, with a wall at the back, forming a very large niche, the pavement of which is reached by about five steps. On both sides of the pediment extend buildings of two stories, about one-third of its height, which terminate at the corners with round minarets. On the roof of the side-buildings, *i. e.* between the pediment and the minaret, are erected two small cupola-shaped towers. The whole of the facade of the building is decorated with coloured glazed tiles, formed into regular and very beautiful designs.

We want more space, however, than we can take in our present number, and must continue the subject in another.

THE "ECCLIASTICAL" ELEMENT IN ART.

ST. PAUL'S.

REFERRING the other-day to the article in the *Quarterly Review* on the decoration of St. Paul's, which has stirred sundry folk, not unreasonably, out of their propriety, we could not but point out and regret the exaggerated and, in places, abusive tone which detracted very much from the value which might otherwise have been attached to that essay. The effort to startle people by saying very strong things is often successful for the moment, but always brings its own revenge with it, not only in the determined hostility which it provokes from small minds, but in the mistrust both of the writer's entire honesty and of his critical ability, which such a tone of writing awakens in persons of calmer judgment. There is, however, one subject in regard to which the remarks in the article in question can hardly be said to be too strong (however we may feel surprised at the quarter from whence they come), and on which the most decided concurrence would probably be found among the best educated and most thoughtful readers. We allude to the raid made by the reviewer against what is called "ecclesiastical art,"—an attack which, from almost every point of view, is so entirely justified and justifiable, that although we have expressed ourselves on the subject more than once already, we cannot think it inappropriate to take the present occasion of returning to the charge, whilst the public mind has been in some degree aroused upon the subject.

The view taken by the *Quarterly* writer, in a passage too lengthy for quotation here, is that there never was in any great age of art such a thing as ecclesiastical art at all, in the sense in which that word is understood now. "Those who most advanced the art of painting," for instance, "were just those in whom the simple human element was most pronounced. Giotto, Masaccio, and Michelangelo had small regard for the ecclesiastical element. They painted in churches and for the church, but the church was very glad to get them to paint their own and not 'ecclesiastical' ideas." In regard to the three artists named in this quotation, there can be no doubt at least of the entire truth of the statement made; and we are inclined to assent to the broad statement as one which investigation will show to be correct in the case of all really great artists of all classes. Without, however, committing ourselves at present to an assertion which it would require considerable space and research to substantiate fully, our object is rather to indicate the fallacy of the popular art ideas in regard to ecclesiastical art in the present day, on general grounds, as well as in reference to the special object of the decoration of St. Paul's Cathedral.

It is in regard to the highest form of pictorial art,—that which includes the representation of the human figure,—that the subject assumes its most important aspect. In what light is it, then, that pictures of this class, in our Academy and similar exhibitions, have an intellectual interest for us? Excluding portraits, which occupy a special and peculiar position, our interest in representations of the figure is of two kinds. Such representations are to us visible emblems of an ideal beauty, imaginative

poems expressed to us through the medium of painting, as in such pictures as Leighton's "Summer Moon," or "Helios and Rhodes"; or they are representations of some phase of human life and character, historical or imaginary, which interest us by their appeal to our sympathy with humanity at large, with human hopes and feelings under all possible circumstances. This last class of pictures is that which appeals most widely and to the greatest number of minds. True to the declaration of our great poet, that "no touch of Nature makes the whole world kin," we find that a truthful representation of some incident of human happiness or sorrow, or even of humor and grotesque incident, comes home to the mass of the people, and interests even those who have no capability of judging of the artistic execution of the work; who cannot appreciate the finer strokes with which the story is told or the feeling displayed. Those who have the education or natural perception which will enable them to appreciate these more refined touches, have of course an additional enjoyment in the contemplation of the work. And when we come to consider the higher or ideal branch of figure-painting before referred to, we then contemplate a form of artistic expression which can only be adequately apprehended by those whose minds are prepared for it by a high culture and a naturally imaginative faculty; for this ideal art does not deal with human nature as it is, but with human nature and human form, in the grandeur or beauty which they may be supposed to be capable of attaining under certain conditions, and when freed from the defects and imperfections incident to actual life as we see it around us. And in art of this class the human form, or a sublimated ideal of it, is used in fact as a kind of type and symbol of the beautiful in the highest development in which colour and form can express it to our senses.

This is the real object, then, of the higher forms of pictorial art; to appeal, by pictorial representation, to our higher sympathies and aspirations; our sympathies with what is human, our aspirations after an ideal beyond what is human; or beyond, at least, every-day humanity. And it must be noticed, in considering the art in this manner, that the actual execution, the result of the whole, the general impression made thereby upon our feelings, is of far more importance to us than the arbitrarily chosen story or incident which has been the artist's basis for the idea set forth. In proper terms as the picture embodies more of the actual incidents of every-day life, in that proportion certainly we require to have a general idea of the nature of the situation which it was the painter's intention to set forth: in proportion as the picture departs from every-day life, and verges on the ideal, does its interest become broader and more comprehensive, appealing to us on the higher grounds of pure feeling, and freeing us from all necessity for detailed information as to the "subject" it illustrates. To exemplify: in "The Rent Day" we have a representation of the pathos of common life, evolved under circumstances connected with every-day social economy, and we are unable fully to enter into the point of the picture until we know what was the situation which suggested to the artist these groups of figures with their varied expressions of distress and perplexity. But, the general situation being understood, we have no need of further detail; it would add nothing to the effect of the work if we could have names and histories appended to the various figures; the interest lies in the expression of human feeling and character exhibited by the painter, in manifestations which we all recognise and understand at a glance. Again, in Faed's striking and powerful painting of an old woman resting by the wayside, exhibited at the Academy two or three years ago under the title "All by Herself," we scarcely even require this statement of the painter's intention, to enable us to enter fully into the spirit and meaning of the work. The subject here is removed further from the details of every-day life; its interest was of a broader and more imaginative kind; it is a typical representation of old age in one of its most impressive forms; and half a dozen other titles might have been chosen for the picture, equally suitable to it, and which would neither have added to nor diminished our interest in it. So again, when we come to a still more ideal type of subject, such as Leighton's "Helios and Rhodes" before alluded to; we are conscious that the mere legend which it professes to illustrate is of very little consequence to us in

looking at such a work; what we care for is the intrinsic beauty of the picture, which may suggest to us a score of beautiful imageries quite independent of the title arbitrarily appended to it. And where the display of artistic and intellectual power is of the highest order, even subjects less vague and visionary than this can be made to assert their entire independence of any definite statement as to their subject. Who, for instance, in looking with eyes of understanding at that magnificent painting by Giorgione exhibited at the Old Masters Exhibition last year, under the title "La Richiesta," would feel that any definite history or names attached to the two figures could add anything to its effect? The work could stand without such aids; it was simply a representation of human feeling in one of its highest and most impassioned phases; to have added names to the figures, had it been possible, would merely have been to limit its effect, to tie down to actualities that which was the more real from embodying one of the noblest and most comprehensive of ideals. And so we might illustrate by numberless instances, showing how, in the highest art, the beauty attained and expressed, is itself the object; and the so-called subject is merely the opportunity seized by the artist as the suggestion or basis for working out a new ideal.

But in the present day we are confronted by a species of art, having its own apostles and disciples, which claims to be regarded as something distinct from and superior to what we have been alluding to as the highest form of artistic embodiment of ideas. That the claim of superiority, if not always made in so many words, is practically insisted upon, must be evident when we consider how continually it is sounded in our ears by this eclesiological party, that art can have no such high mission as in the service of religion, and the decoration and beautifying of religious edifices; *a fortiori*, therefore, the art used in these objects must be supposed to be the highest of which we can avail ourselves. That it is also supposed to be something distinct in character from ordinary art, is evident from the frequency with which we hear it insisted upon, that the decoration in churches and cathedrals must be of an "eclesiastical" character. But when we come to examine wherein this distinctive character consists, we are somewhat puzzled. For instead of finding the most distinguished among our artists, and those of most original genius, employed on this work, we find that the artists who rank as distinguished therein are names almost unknown in the great world of art. And if we come to examine their productions, the discrepancy between the claims and the achievements of the "eclesiastical" school, is still more striking. We find a tameness, a feebleness of conception, which would stamp such works at once as hopelessly mediocre if shown on the walls of a public exhibition-room; and a deficiency in mere power of delineation, which would probably prevent them from finding a place in such an exhibition at all. In place of human interest and character, we find a sameness of expression which entirely fails to appeal to our feelings in any way; in place of the higher ideal beauty possible in art, we find stiff angular drawing and conventional attitudes repeated with mechanical regularity. What is the explanation of all this? How is it that art in our exhibition-rooms is, however defective, a thing of free, varied, many-sided nature and interests, while in our great edifices it is shorn of all these characteristics, and reduced to a single type, and almost a single expression? The explanation is, that we are here in a region where the order of things artistic is inverted, and where the interest of a pictorial delineation lies entirely in *what* is represented, not in *how* it is represented. We are called upon to admire and to be impressed by figures, not because they are grand or beautiful in idea and execution,—not because they embody some beautiful conception or ideal,—but because they are stated to represent some event or some personage specially interesting and venerable to the adherents of the religion which they illustrate. It is not really the figure itself that we are to be impressed by, but the fact that it is placed there as the sign or symbol of St. Peter or St. Paul, or some other name in sacred history. We say intentionally, "as the sign or symbol," for that is what this class of painting really is, and nothing more. This, which is trumpeted forth as the highest art, and supposed to be so by a certain clique of persons, is in reality the lowest, for it is that in which power and originality on the part of the artist is

considered of least account. It is, if the truth were told, only a somewhat elaborate development of what philosophers call "fetishism," which consists, to put it broadly, in attaching a conventional and arbitrary importance or reverence to something selected as a type or symbol for this purpose. With the savage it may be a stone or a tooth; with the modern eclesiologist it is a figure with a nimbus and some conventional symbol. And nothing indicates more strongly the real nature of this so-called art than the anxiety of its practitioners to be all right and according to precedent in their employment of the symbols attached to each figure. They are in one sense right enough in this; for it is only by such means that one can tell which is which among their lay figures; and in the scheme for the figure-decoration of St. Paul's, drawn up at the instance of the committee, a copy of which is in the library of the Institute of Architects, it is distinctly recommended that all the multitudinous saints therein set forth should, in addition to the proper symbols laboriously sought out for each, have their names inscribed under them: a wise provision certainly, since without this we should probably find ourselves, if the decoration scheme were carried out on the true principles of eclesiastical art, in no better plight than the children at the wax-work show, who, on asking vociferously, "Which is the Duke of Wellington, and which is Napoleon?" &c., &c., got no answer but—"Whichever you please, my dear; whichever you please!"

It is not our province to point out (though we may just refer to it as an undeniable fact) that all this multiplying of saints and symbols and orders of angels, &c., is directly contrary to even the religious spirit of the masses in the present day, and by nine ordinary men out of ten would certainly be stigmatised in the vulgar but emphatic monosyllable, "hosh." But, looking at it from an artistic point of view, is it likely that any artist of high intellect and genius would be willing to give his time and his mind to the elaboration of decoration for a great building on such a basis? Would he not rather find his genius starved, his powers stunted and repressed, by such a mechanical and soulless task? And in regard to the proposition for carrying out the display of this eclesiastical wardrobe over the interior of St. Paul's, we can only heartily wish that such a scheme had been rendered impossible by a complete decoration of the interior in the style of Wren's day, offensive as it would have undoubtedly been in many ways, rather than that his building should have remained only to become the prey of the nineteenth-century eclesiastical milliner. Even the decorative works of Verrio, the adopted Raffaele of the period, had, hopelessly vulgar as they were, had some salt of art about them,—a certain power and boldness of conception,—at all events, a perception of art as something apart from mere symbolism. But what are we to expect when we find proposals for depicting "Cerberus full of eyes," and an interminable list of saints, known and unknown, ticketed and labelled somewhat after this fashion: "St. Boctes: dress, a dark-coloured, tight-fitting tunic; symbols, a pot and a blacking-brush," &c. &c. Had the building to be operated upon been a Mediaeval cathedral, there would have been one shadow of excuse for such treatment, which does not exist in the present case. It might have been urged, with some show of reason, that the men who built the cathedral, and who believed in saints and symbols, would have decorated it so, and that to make it a complete Mediaeval work we should follow out the same method. Such an excuse in the case of St. Paul's does not exist. The building has no connexion, either artistic or moral, with anything of the kind; it is the embodied type of the artistic and religious feeling of the Renaissance, which was in every respect opposed to the Mediaeval feeling. And the symbolic and eclesiastical decoration proposed for it, though in minor ornamental details it may of course be harmonised with the style of the building, embodies as a whole things which nobody cares for or has any interest in now, although dilettanti who want amusement, and eclesiastical decorators, who find it a paying trade (as it should be, considering the amount of thought required to carry it out), may get up a fictitious enthusiasm on the subject. And it will be to the lasting discredit of the common sense and good taste of the present generation if they allow themselves to be persuaded to countenance and to provide the means for the so-called "decoration" of our great Renaissance Cathedral on a scheme which, viewed in the

light of the present day and in connexion with the higher possibilities of art, can only be described as an absurd and childish anachronism.

THE ARCHITECTURAL ASSOCIATION CONVERSAZIONE.

THE opening *conversations* of the new session was held at the Galleries, in Conduit-street, on Friday evening, October 25th. Although the weather could not be deemed thoroughly satisfactory, the rooms were completely filled. The president for the session is Mr. J. Douglass Mathews, for several years secretary, and to whom the present form and position of the Association are in many respects due.

The names of the successful competitors for the prizes offered by and through the Association, were announced, and the students heartily applauded as they came forward to receive their books from the president.

The following is a list of the prizes thus awarded:—

For Essays.—1st, to Mr. Fredk. P. Johnson, for Essay on "The Special Characteristics of Mediæval Architecture pertaining to particular Districts of the United Kingdom"; 2nd, to Mr. T. E. Holloway, for "A Life of Philippe Brunelleschi."

For the best Set of Designs in the Class of Design.—1st, to Mr. R. Morrison Marnock; 2nd, to Mr. H. W. Pratt.

For the best Set of Drawings in the Elementary Class of Design, to Mr. V. Trubshawe.

For the best Summary of Subjects treated at the Class of Construction and Practice, to Mr. V. Trubshawe.

For a Design for a new Mansion suitable for a Nobleman, offered by Sir W. Tite, C.B., M.P.—1st, to Mr. G. H. Blagrove; 2nd, to Mr. S. J. Newman.

For Measured Drawings from existing Buildings in England, erected previously to the Eighteenth Century.—1st Prize, offered by the Architectural Union Company, to Mr. W. J. Cudworth, for Drawings illustrating the Old Hall at Gainsborough, Lincolnshire; 2nd Prize, to Mr. H. G. McLachlan, for Drawings of the Chapel in the Tower of London and of the Gateway of Barking Abbey.

For the best Set of Sketches actually made on the Spot in Preparation for the above Prizes, offered by Mr. W. White, to Mr. W. J. Cudworth.

For a Design for a Two-light Domestic Window, offered by Mr. E. W. Godwin (Drawings made at the Rooms of the Association on six Evenings in this Month).—1st, to Mr. R. C. Page; 2nd, to Mr. J. W. Stone.

Mr. Mathews then delivered a short address, treating of the work of the architectural profession, and the opportunities afforded in this Association for special study and preparation. After noticing the duties of architects towards the general public and towards their employers, duties frequently leading to a contest between emolument and principle, due at times to the special needs, and at others to the injudicious prejudices of employers, he proceeded to remark on the valuable services that might be and are rendered by competent art critics. By their influence a desire for artistic, as well as utilitarian, design is fostered; and though individual architects may on occasion be harshly judged, a standard is erected that cannot remain unnoticed. The existence of such a standard is a support to the conscientious architect in his contention with the practical difficulties of his work, and the knowledge that he has approached it his best personal pleasure. Turning to some practical details, he remarked on the timidity felt often by architects in adopting or recommending very recently introduced appliances. Regretting any such tendency, he thought that some of the responsibility for the introduction of novelties should be borne by the client; that an employer should be urged to give some personal attention to the results to be obtained and the means at disposal, and a special warrant for anything experimental. A progressive character in building would more frequently be aimed at, even at the expense of greatly-increased personal trouble on the part of the architect, if his responsibility was thus somewhat lightened. An architect should also, as a matter of usage, have the opportunity of advising with specialists, so as to bring the best and most thorough existing knowledge to bear in the furtherance of his aims. As a solicitor consults a barrister on doubtful or difficult law, or a general practitioner a physician in intricate cases, an architect should be encouraged to obtain the best guidance on points of special difficulty, or out of the course of ordinary practice. Of the education of workmen something ought also to be said, in view of the wholly useless addition to the work of the architect, so frequently the result of want of care and want of skill on the part of the workmen, who should be prepared to readily undertake and faithfully and earnestly carry through whatever the mind of a practical designer can conceive. After treating of other obstacles to desirable results, and the means of overcoming them, the president proceeded to give a sketch

of the special work of the Association, instancing its body of members, between 500 and 600 in number, as a proof that a large number of the future architects of our time have entered into membership, and advertising to the fact that many architects in successful practice have studied in its classes as proof of real work done. With a wholesome confidence in each other, and the mutual forbearance practised in other liberal professions, the profession of architecture, in the hands of upright men and good students, he thought, would maintain in the world the position it had won, and thereby maintain for their art its proper place as the senior sister of the three arts,—architecture, sculpture, and painting.

Mr. T. Roger Smith, on being called upon, alluded to the hard things said, especially very recently, as to the position and nature of the profession; advocating, in fact, its complete suppression, or radical changes in its character. No doubt, we are less inclined to regard such criticism when we detect in it such admixture of error,—so little evidence of the work of a wise and enlightened judge,—such evident desire to say smart and telling things, and to disregard the actual world, and its tendencies and wants. But, roughly shaken by such criticism, we are thereafter ready to examine keenly for ourselves the professions and the actual service rendered by architects, and judge of them afresh. He, for his part, saw in the sudden demands, made by our quickly-moving society, for the rapid adaptation to fresh needs,—a demand also for specially educated men, ready for any emergencies, capable of infusing intelligence and power into all work directed by them, capable of using up every new resource to its full extent. When the rebuilding of Chicago had been carried on at a rate giving the completion of one building per hour during the last nine months, it sounded like the language of dreams to advocate, or consider possible, that a congeries of workmen should always be turned out to a large work, in order, by their joint efforts, to muddle out a successful whole. This accords little with the ordinary current of modern life. Seeing the class of talent and power required, and knowing intimately the internal working of the Association, he saw in it means of training,—supplementing the ordinary practical office education where most necessary, and testing by actual contest with other students the quality of each student's mind.

Professor Kerr stated, that he found the profession of architecture most unpopular,—the most unpopular profession of modern times. He considered its position most critical; and found the reason of this remarkable unpopularity in the prevalence of Fashion in Architecture. He had witnessed the Fashion before that now current at the flow and at the ebb; and awhile ago he saw the present Fashion at the flow. Now, he fancied that the tide is turning, and the signs of the turning are to be found in the dissatisfaction and doubt so frequently expressed. What is to be done in order to be prepared for such a change,—from the prevalent Gothic style? He would recommend an increased attention to the stone and mortar work of architecture. In proportion to the increase of skill in mere draughtsmanship, a skill of which English critics may now well be proud,—just in this proportion he thought he detected the loss of the solid qualities of good design. Study photographs in order of drawings, in order to correct this; and, in order to be prepared for new times, be more eclectic in the range of study. In the volume of art, read and mark well the learning and the lessons of more than a single page.

Mr. G. E. Street said that, with time at his disposal, he should be disposed to rebut Professor Kerr with zeal. He did not, in his experience, find his profession by any means an unpopular one,—rather the reverse. There is, it is true, within it and around it a strange habit of indulging in a sort of criticism not practised in some other professions, which leads casual and some other observers to erroneous conclusions. It is commonly said that Painters enjoy, Architects dislike, and Sculptors detest the works of others,—no doubt, an epigrammatic statement having some foundation. He hoped to see it become less justified,—by improvement of actual work and also by an altered tone of mind,—by a habit being acquired of first looking for what is good, instead of not looking beyond defects. If his voice could be listened to in practical counsel, he would say, confine yourselves to one style, learn it in all its range, and in all its details, and practise it,—less as the result of habit than of

strong conviction and attachment. In the designs by students shown that evening he found good evidence that, with life, and health, and perseverance, their authors would cover themselves with distinction in time to come.

Mr. T. H. Wyatt, president of the Institute, for himself individually, and speaking also for the council of the Institute, expressed the great interest felt in the work and progress of the Association, and wished good speed in every direction. His only advice to the students would be, in the language of Lord Salisbury, "to keep firm hold of one rung of the ladder till the next is securely grasped."

The Rev. W. Hutchinson, from his personal experience of the intelligence and ardour of a number of the members, whom he had been privileged to meet during the three excursions conducted by Mr. E. Sharpe, knew that the Association comprised many men of talent and devotedness, who were or would be agents in the progress of the ever-progressive architecture of modern Britain.

Amongst the drawings and other objects of interest were a set of studies, in colour, by Mr. E. C. Lee, in Italy and Sicily, made during his travels as holder of the Soane medallion,—buildings, Classical, Romanesque, and Mediæval; mosaics, costume and colour at Pisa and Assisi, landscape *enque*; a dozen water-colour drawings of Yorkshire abbeys by Mr. R. P. Spiers; sketches by Messrs. Belcher, W. Paris, J. O'Connor, Lewes, J. Sulman, J. Conder, T. Battersby, &c.; drawings of decorations by Messrs. Heaton & Co. (Trinity College Chapel, Cambridge), Green & King (Bolton Town-hall), Collmann, &c.; photographs illustrating the Northamptonshire excursion (views and details at Fotheringay, Warrington, &c.) by Mr. Robinson, of Stamford; furniture, and church-plate, and silken hangings, and the yet unfinished 1,000 Challenge Cup (and stand and cover) of the National Mosaic Union, exhibited by Messrs. Cox & Son; Lyons silk damask, Japanese paintings on silk, paper-hangings, &c., by Messrs. Green & King; cabinets in ebony, satin-wood, &c. by Messrs. Gillow. These, with other drawings, students' designs, rubbings, &c., covered the walls and filled the recesses of the galleries.

We shall hope to be able to report the satisfactory carrying out of the items of the syllabus issued for the session thus pleasantly begun.

THE LATE MR. E. C. HAKEWILL, ARCHITECT.

WITH great personal regret we announce that Mr. Edward Charles Hakewill, architect, died on the 9th ult., after a short illness, at Playford, in Suffolk. Mr. Hakewill was articled to the late Mr. Philip Hardwick in the year 1831, and soon after the expiration of his term of seven years he commenced practice.

The first work of importance upon which he was engaged was South Hackney Church, which remains at the present day, although erected more than twenty-five years ago, a good example of our revived church architecture.

He was elected district surveyor for the parishes of St. Clement Danes and St. Mary-le-Strand upon the death of Mr. Goldicut, who held the appointments; and, upon the division of the large parish of St. George, Hanover-square, into two districts, he exchanged into that portion known as the Hanover-square district. This he held until 1867, when the Metropolitan Railway requiring his house in Thurloe-square, he gave up the district and retired into the country, building himself a house at Playford, in the eastern division of Suffolk. It was his intention here to give up all practice of his profession; but when it became known that he had come into the country, his advice and assistance were sought in many directions, and the churches of Wickham Market, Sition, Stonham Aspall, Grandisburgh, and others, testify to his abilities and love for this branch of his profession.

Rushmere and Myland churches, which he had previously built, are also good evidences of his skill. But it will not be by his profession alone that he will be remembered. His loss will be felt by a large circle, by many who only knew him as a kind and generous friend, always ready to assist in any good work, always alive to the wants and necessities of his poorer brethren, and an intelligent and agreeable companion. He was an early member of the Royal Institute of British Architects. Mr. Hakewill married in 1853 the widow of Mr. H. Davidson, of Cantry, daughter of the late Mr. W. Monkhouse.

THE LATE GEORGE HEMMING MASON,
A.R.A.

MR. MASON died at his residence, 7, Thersenterrace, Hammersmith, on the 22nd ult., from disease of the heart, from which he had long been a sufferer. He was the oldest son of the late Mr. George Mason, of Wotley, North Staffordshire. He was educated at a surgeon, but having always had a passion for painting, he left surgery to become an artist. He studied for some years in Birmingham, and after travelling through France, Germany, Switzerland, and Italy, he established himself in Rome, and lived there for the best part of twenty years. Although well known as an artist to the English visitors of Rome, his works were not generally known in England until he exhibited at the Royal Academy his picture of a peasant family moving their goods in a cart through the Roman marshes, called "Nelle Maremme." This picture was exhibited in the International Exhibition in 1861. In 1858 he settled in England, and began to paint English subjects. The exquisite composition of his pictures, and their harmonious colour rapidly attracted the attention of artists, and he was made Associate of the Royal Academy; the public were equally charmed by the way in which the commonest outdoor incidents of peasant life, while absolutely true to nature were invested with a poetic charm not common in the British school. He exhibited many small works at the Royal Academy, all showing the same poetic feeling, in the same harmonious low-toned key, and with the same mastery of subtle composition of line.

"Catch," a boy watering horses at a pool on a rough stony common, and throwing an apple to a little girl; "The Cast Shoe," in which a belated horseman is crossing a moor, in a drenching shower; "A Girl driving Calves" to shelter from a coming storm; the wind blowing her hair and frock, and waving the branches of the trees, may be pointed to; but the pictures of English life that excited most public attention were—the "Evening Hymn," a troop of girls coming home from church in the twilight singing the evening hymn, a man with a dog looking on entranced by the singing; and the picture exhibited this year in the Royal Academy, called the "Harvest Moon." The former of these received the prize at the Manchester Exhibition.

Though blessed with an extraordinary fertility of invention, his finished works were comparatively few. The fastidiousness of his taste was such that, if it appeared possible to him to improve his pictures, he not unfrequently, to the very eye of completion, substituted one group for another; but his falling health prevented prolonged application to the easel. The fortunate possessors of his works will cherish them as gems; for, like Burns in song, he has invested the ordinary events of peasant life with an equally poetic charm. His friends will have to deplore the loss of the most amiable and genial companion, whose brilliant powers of conversation could enchant them the whole evening through. It is to be hoped that the Royal Academy will set apart a room for the exhibition of his works; for very many of his pictures, and most of his sketches from nature, and sketches for subjects of pictures, are quite unknown, except to a few friends, and yet nothing can convey so full an impression of the exquisiteness of his taste and the fertility of his invention, as many of these small sketches for pictures, destined, alas! never to be carried out. Those who have once seen his "Horses treading out the Corn in the Campagna," or his "Girls, dancing by the Sea," will not forget them.

Below is a list of his principal works:—
"Nelle Maremme;" "A Girl Dancing;" "Matlock," in the possession of Mr. E. L. Benyon;
"Catch," Lady Ashburton; "The Cast Shoe," Mr. Stewart Hodgson; "A Girl driving Calves," Mr. F. Leighton, R.A.; "Gipsies on a Moor," Mr. Arthur Lewis; "The Evening Hymn," "The Swans," "A Harvest Field," the Hon. P. Wyndham, M.P.; "Girls with Milk, taking Shelter from the Rain," "Wotley Rocks," Mr. Trist; a small Landscape, Mr. E. Sartoris, M.P.; a small Landscape, Mr. Cholmondeley; "The Harvest Moon," Mr. S. Eustace Smith, M.P.; "A Girl," Lord Westminster.

Society of Engineers.—At the meeting to be held on Monday next, a paper will be read on "Milford Haven, and its new Pier Works," by Mr. Henry Davey.

RE-OPENING OF RIPON CATHEDRAL.

ON Thursday last week, Ripon Cathedral was formally re-opened, after complete restoration, a sermon being preached on the occasion by the Very Rev. the Dean of York. The service was conducted in the choir, which was crowded with the *élite* of the city and neighbourhood. The work of restoration has been carried out under the direction of Sir Gilbert Scott. It is now ten years since the cathedral was given into the hands of the workmen. The first and most important work was to place the building, which, in 1861, had reached such an alarming degree of dilapidation as to threaten its absolute ruin, in a state of security, a labour of no small ingenuity, since it involved the underpinning of the two western towers, to supply them with new and secure foundations. At the same time, the low-pitched roof of the choir was replaced by an exterior roof of lead, raised to the original pitch, and the whole of the exterior of the building was thoroughly repaired. The next work was the renovation of the interior of the choir. The galleries and private boxes and closets which shant out the aisles were removed. The plaster canopies of the stalls were replaced by canopies of carved oak, exactly corresponding with the stalls at the western end of the choir, which, fortunately, had remained intact. The stone sedilia were removed to the easternmost bay of the chancel, and restored to their proper use. The whole of the choir and its aisles were re-floored, and to a great extent restated. The ancient arcading round the eastern wall of the chancel was restored, and a pavement of various coloured marbles laid down within the altar-rails. The choir was provided with an altar of suitable design and size; and lastly, the plaster ceiling was replaced by an (interior) oak roof, ribbed with gold, and decorated with various colours. The central tower and transepts also were thoroughly repaired. Carved oak ceilings were substituted for the sham groining which disfigured the transepts, and the lantern or central tower was enriched by a painted ceiling, bearing the emblems of the four Evangelists, with the "Agnus Dei" in the centre. All these works, besides extensive repairs in the chapter-house, library, and other parts of the building, were completed by the end of the year 1868, and the choir was reopened for divine service on January 27th, 1869. The last portion of this great work, that which has just been completed is the restoration of the nave, where an interior oak roof has taken the place of the flat ceiling. The new interior roof has had to be constructed without disturbing the exterior roof, although there are not 6 in. of space between the two roofs, the beams of which in some places touch one another. The new roof is ornamented with a variety of bosses emblematic of the Holy Sacraments, the Evangelists, &c. The work of restoration has cost, in round numbers, the sum of 40,000*l.*, of which the Ecclesiastical Commissioners have contributed 15,000*l.* The rest has principally been raised in the diocese of Ripon.

RE-OPENING OF ROCHESTER
CATHEDRAL.

THIS cathedral has been re-opened for divine service. The interior of the church has been renovated. The tower-arch has been thrown open, and the tower-window brought into view. This west window, perhaps the most interesting relic of the original church, has been repaired and reglazed. The tower-arch has been denuded of the accumulated plaster and whitewash of many generations, and now presents a bold relief to the west wall of the church. The marble basin which did duty for a font has been replaced by a massive octagonal font, the gift of Messrs. Alfred Smith, supported by clustered shafts, the design being somewhat plain, and the only decoration being a narrow floral moulding separating the shafts. The windows in the north and south walls have been improved, and in the east wall a new memorial window to the late Rev. W. H. Drage has been placed. This window is filled in with stained glass, the subjects represented in the three principal lights being the Annunciation, the Crucifixion, and the Appearance of our Lord after the Resurrection. A pulpit, upon a stone pillar, decorated with the ball-flower moulding, stands near the south gallery. The upper part is of wood, divided into panels by banded shafts. Open seats have replaced the stiff high-backed pews

on the floor of the church. The new communion-rail, which is somewhat heavy, is supported by a series of banded shafts, of the same design as those decorating the pulpit. The reredos is simple, and is composed of mosaic, alabaster, and Siena marble. A Latin cross ornaments the central compartment. The pavement within the rail and in its neighbourhood is of encaustic tiles. The fluted pillars supporting the gallery are painted chocolate and light red in the flutes alternately, while those which run from the gallery to the roof are treated in a similar manner, the colours used being light red and white. The front of the gallery is painted in different shades of a soft dark green, relieved by lines of buff. The walls and ceilings throughout the building are treated with varying shades of stone-colour. The organ is placed in the south gallery, and is ornamented. The old ponderous roof, covered with lead, has been removed, and replaced by a new one, covered with blue slate, and of a much lighter construction, and of less elevation than the former. The entire work has been carried out at a total cost of 1,400*l.*

SURVEYOR

FOR ST. GEORGE'S-IN-THE-EAST.

THE Vestry have elected Mr. George Wilson to this office. Some of the ratepayers complain greatly because it was not as usual submitted to public competition. If, however, the majority of the vestry had made up their minds to appoint Mr. Wilson, it was much better to do so at once than to give a number of gentlemen the trouble and put them to the expense of coming forward as candidates for an appointment that was already in point of fact disposed of.

THE BISHOP OF HEREFORD'S STAFF.

THE new pastoral staff, subscribed for by the clergy and laity resident in the diocese, has been presented by the Earl of Powis, on behalf of the subscribers, to the bishop. It was made by Messrs. Cox & Sons, of London, and exhibited in the International Exhibition just closed, and is carved out of a piece of oak which formed one of the pillars of the episcopal residence at Hereford, built about the year 1180. The tree of which the staff is made was growing long before the Norman Conquest, and possibly when the see was re-established, under the Saxon prelate, Putta, in the seventh century.

The height of the staff is 6 ft. 3 in. It is divided into four sections, the whole skill of the artist being chiefly expended on the upper portion, which is very elaborate. In the centre of the crook is the carved figure of our Lord, with right hand erect, and emblems of royalty in the left. The Agnus Dei is carved on the reverse. An angel with displayed wings, beneath the crook, carries a shield with the arms of the diocese. Silver is the only metal adopted, but the greater part of it has been oxidised, and relieved with gold and elaborate enamel work.

The projections of the staff are surrounded with metal bands, in which are set malachites and carnelians, cut in the ancient manner.

The lower projection bears the inscription,—
Pasce oves meas.—Evang. sec. Joan. xx. 17.

SHEFFIELD ARCHITECTURAL AND
ARCHÆOLOGICAL SOCIETY.

A GENERAL meeting of the members of this Society has been held at the local School of Art. The president, the Rev. J. Stacey, occupied the chair. On the table were a number of fine old engravings, kindly lent by Mr. Wilson, of Sheffield moor, and some photographs contributed by Mr. Syson. In the course of the evening two papers were read, the first by Dr. Syson, of Manchester, and the second by Mr. J. D. Leader, treasurer of the Society.

Dr. Syson spoke of the need for such societies as the one he was addressing. They exercised an influence upon domestic and public architecture, and did much to modify the very ugly buildings usually put up.

Mr. Leader's paper embraced the result of some inquiries he had made on the subject of Sheffield Castle and Manor Lodge, since April last, when he read a paper on that subject before the local Literary and Philosophical Society. He said, about four years ago an opportunity offered itself for an investigation on the site of Sheffield

Castle, which it cannot be too much regretted passed away without coming to the knowledge of this Society. In carrying out the works connected with the main drainage of the town it was found necessary to drive a drift right through the Castle-hill. The tunnel was at a considerable depth below the present level, being 18 ft. 6 in. below the surface of Waingate, and probably 40 ft. below the level of Messrs. Charles Chambers & Co.'s yard. It passed under the river Sheaf a little above the weir, at the back of the Alexandra Music Hall, and went obliquely across the Castle-hill to the end of Bridge-street. Having tunnelled under the river, the workmen bored through an alluvial deposit, in which numbers of bones were found, the antlers of deer, and other remains. Arrived at the Castle-hill the drift came upon the rock. To facilitate the work two shafts were sunk; one in Messrs. Chambers's yard, and the other nearer Waingate. In the first shaft a discovery was made that vindicates the authority of tradition against the incredulity of modern learning. Mr. Hunter mentions, only to dismiss as a fable, the old story of a subterranean communication between the castle and the manor. The excavators in sinking the shaft nearest to the Sheaf cut across a subterranean passage excavated out of the solid rock, and running in the direction of the Market-hall, but whether it extended to the manor or not we cannot tell. It was partially obstructed by debris, but was still some 4 ft. in height, and perfect as to its roof. The workmen never explored it; and, when the shaft was filled up, a rubble wall was built across the passage. In sinking the second shaft, portions of the Castle walls were found, about 20 ft. below the level of the ground; and a mason who saw them concluded that the Castle had been built of large rubble, with dressed quoins.

THE WEST LONDON DISTRICT SCHOOL, ASHFORD.

The brick-built buildings which arrest attention on the South-Western Railway, in the parish of Ashford, about midway between Ashford and Staines stations, are the result of the determination of the Local Government Board to remove from the workhouses of the parish of Paddington, the St. George's union, and the Fulham union, the children therein housed, and to place them in a thoroughly healthy situation, where they will be cared for, clothed, maintained, and educated in a manner intended to render them hereafter useful members of society. A district board of management was created for the West London School District, on whom devolved the selection of the site, and who, nearly four years ago, invited a select number of architects to furnish designs for the intended buildings. They selected those submitted to them by Mr. H. Collins, of Chesham, and from the drawings supplied from time to time by Mr. Collins the works to the school buildings have been carried out. In the early part of 1870 the board of management advertised for tenders, and the lowest,—that of Messrs. Bull & Sons, of Southampton (about 13,500*l.*), was accepted. This tender included, in the buildings proper, the supply and fixing of the water-tanks, gas-mains, gas-piping, pipes for hot and cold water, the iron-tube ventilators, and the railing enclosure to yards and playgrounds. There were, however, several additional contracts. The buildings, which were designed to accommodate 800 children, are now completed, and partly occupied.

The spacious dining-hall is fully 100 ft. long by about 50 ft. wide, and is about 33 ft. in height. Its roof is of wrought iron, by Moreland & Son, and has a bell-turret at the end next the front. At the junction of the walls with the ceiling is an enriched open *papier-mâché* cornice assisting the ventilation. The moulded red bricks are from Messrs. Bull & Sons's works; the white bricks from Poole. There are Bath-stone caps moulded and moulded sashes to all pilasters around this room. Light is obtained from twenty-six iron-sashed windows in the surrounding walls, each 12 ft. 6 in. high and 4 ft. 6 in. wide, with semi-circular heads. The marginal lights are glazed with toned cathedral glass; the other portions with Hartley's patent rough plate; in each sash there is a circular portion, 2 ft. 9 in. in diameter, made to open, by which means ample ventilation is obtained. This room is in the centre of the main building, the whole frontage of which is 82 ft.

All the dormitories have windows front and back. The sashes are in three heights,—first, a

pair of ordinary hung sashes, below a transom rail; the top or third sash is hung to transom with hinges made to open and fall-to with lines and pulley. There are also in each dormitory, constructed in the outer walls, twenty small flues for the admission of pure air through an air-brick on the outer face of the walls. On the inside, near the ceiling, the upper half of the number have perforated zinc panels, in wood frames; those near the floor have hit-or-miss panels on the face of the wall, to regulate the quantity of air admitted. The day-rooms and school-rooms have a proportionate number of these flues.

Every dormitory throughout the several buildings has in each chimney-shaft a flue or flues formed for the escape of vitiated air, and on the face of the walls internally, near the ceiling, are built in perforated bricks, communicating with these flues. The heat generated by the gas-burners absorbing the foul air passes through iron plates, 2 ft. in diameter, in the ceiling perforated, with which are connected iron tubes, 3 ft. by 4 ft. These run into the flues between the floors and ceilings, and over the top of the upper ceilings.

On the whole premises there are eight lifts, by Johnson, of Wandsworth-common; ninety-two Moulé's earth-closets, and in the lavatories the tilt-up washing-basins number 238. Gas-works are being erected by the Messrs. May.

It is thought that the total cost, including additional works, fittings, furniture, roads, &c., will be little short of double the amount of the original contract for the buildings.

Messrs. Bull & Sons's contract was carried out under the direction of Mr. Thomas Epps, the whole of the works being under the supervision of Mr. James Roberts, clerk of the works to the board of management.

PAVING IN MANCHESTER.

The highway authority of Manchester, having to rebuild the iron bridge over the canal at Gaythorn, determined to give a trial to Mr. Norton's patent bitumen and wood system of paving, instead of the usual stone sets, and during the past week workmen have been engaged in laying down slabs of this material, under the direction of Mr. Fullwood. These slabs consist of 1-in. deal boards, in two layers, one longitudinal and the other transverse, and on these are placed pitch-pine sets, 4 in. by 3 in., with the grain on end, the whole held together by and ceased in hitumen. These slabs are laid with their ends resting on 9 in. by 1 in. deal boards, laid longitudinally with the roadway, the intervening space being filled with sand, so as to give an even bearing surface. The work, when complete, is neat, and has a good appearance; but time alone can show how it will wear in so crowded a thoroughfare, and with so crowded a traffic as usually passes there. The time occupied in laying has been about as long as would be required to lay sets without a concrete foundation, although the patentee claims that his system requires much less time than any other, the slabs being made in the yard, and brought to the spot ready for use. The work has excited much interest.

SEWERAGE INQUIRY AT TORQUAY.

A LOCAL Government inquiry on the sewerage question was opened at the Town-hall, Torquay, on the 26th ult., before Mr. R. Morgan, C.E., for the purpose of hearing an application on the part of the Local Board for borrowing 55,000*l.* for a drainage scheme, and also to hear objections to it. The inquiry was continued through two other days, and excited much interest. Mr. Hooper showed the prejudicial impression that existed against Torquay in consequence of the evil of the existing state of things, however ill-founded, and no one knew how this would end if some remedy were not applied. It was absolutely necessary for the welfare of the town that the prejudice should be removed. Since 1867 there had been two had seasons, caused by popular prejudice. He knew that up to 1867 the progress of Torquay was very considerable; the number of houses built might have been numbered by hundreds; but how was the building trade affected now? Building operations had almost entirely ceased since that time.

Inhabitants deposed that it was absolutely necessary to remove the stigma from the town. Mr. Bazalgette, who gave evidence, had at first

advised a farm for utilisation, but circumstances had altered his opinion, and he advocated a scheme for pouring the sewage into the sea. He was badgered a good deal on his change of opinion.

Mr. Appleton, C.E., in the course of his examination, said he was satisfied that Mr. Bazalgette's reports up to 1871 were the result of his convictions, but that his present recommendations to go to Hope's Nose were the result of his instructions.

Mr. Carter, on behalf of the ratepayers, said he appeared for those who were of opinion that the present state of things ought to remain subject to some improvements, and that if these improvements were effected, the present drainage would answer every purpose. He thought every endeavour should be made to utilise the sewage on land, rather than spend 40,000*l.* in throwing so valuable a commodity into the sea. He drew attention to the fact that Mr. Appleton estimated a profit of 4,000*l.* a year by irrigation, and asked, in the face of this, if it was expedient to spend such a large sum in causing what would most probably prove a greater nuisance than at present.

At the close, the inspector, who must have had a hard time of it, from the length of the meetings, the conflict of opinions, and the vitiated state of the atmosphere in the room, recommended

* That the Local Board of Health obtain the services of those gentlemen connected with schemes they advocate, with a view to the preparation of a final and comprehensive scheme to be finally determined upon by the Local Board for dealing with the sewage of the town, and that when such is determined upon, fresh estimates be prepared and an application be then made for sanction to borrow the sum required—the whole to be under the jurisdiction and management of the Local Board, who may receive the assistance of the ratepayers' committee on the subject. In the event of no decision being arrived at as to the scheme to be finally adopted, the Local Board to call in an independent engineer, whose decision shall be final, and that no time be lost so that the works may be commenced during the present session of Parliament.*

COAL AND IRON.

THE Steam Coal Owners' Association have held a meeting at Cardiff, and passed a resolution reducing the market price of steam coal 6s. per ton. This step has been taken "in view of the general fall in the price of coal throughout the country." How is it, we should be glad to know, that the "general fall" has so little been felt in the metropolis, where coals remain at their highest point?

The export of coal from the United Kingdom (including coke and manufactured fuel), in the first three quarters of the year 1872, has reached the large amount of 10,997,526 tons, of the value of 7,208,767*l.* In the corresponding period of 1871 the quantity was only 9,358,730 tons, or less than in the present year by 788,793 tons; and the value of the export was only 4,489,962*l.*, or less by 2,718,805*l.* The export of September, 1872, is valued at about 21s. per ton. In the first three quarters of 1872, 1,657,441 tons of coal have been exported to France, 1,652,420 tons to Germany, 722,330 tons to Italy, 720,230 tons to Russia, 524,593 tons to Denmark, 484,007 tons to Spain and the Canaries, 401,329 tons to Sweden, 861,259 tons to British India, 358,675 tons to Holland, 209,371 tons to Brazil, and 2,998,868 tons to other countries. Seven years ago the entire year's export of coal did not reach 10,000,000 tons.

The export from the United Kingdom of iron and steel in all stages of manufacture has amounted in the first three quarters of the year 1872 to 2,608,883 tons, of the large value of 26,599,681*l.* In the corresponding period of 1871 the quantity exported was 2,381,916 tons, or less than in the present year by 220,967 tons; and the value of that export was only 19,337,896*l.*, being less than that of 1872 by the large sum of 7,252,785*l.* The export of pig-iron has increased from a little over three-quarters of a million tons upwards of a million, and the value of this year's export is more than double that of last year, having risen to upwards of five millions sterling. The export of railroad iron has rather decreased in quantity in 1872, but the value of the smaller quantity has greatly exceeded the value of last year's larger quantity, and amounted to above 7 millions. More than half this year's export of railroad iron, 378,053 tons, of the value of 3,787,493*l.*, went to the United States. The export of tin plates has increased this year to 1,899,166 cwt., of a value exceeding three millions sterling; 1,443,754 cwt., of the value of 2,262,852*l.*, have gone to the United States. The

export of steel, unwrought, has risen to 33,068 tons, of the value of above a million sterling, and more than half of this export has been to the United States.

THE SCIENTIFIC AND

MECHANICAL SOCIETY, MANCHESTER: SECTION I., ENGINEERING.

THE fifth monthly meeting of the session of this Society was held at the Trevoyan Hotel, the vice-president in the chair. Several gentlemen were elected members of the Society, and the honorary secretary then reported that the special committee which had been elected at the last meeting to devise some improvement and reorganisation scheme, for the Society, had held four sittings, at the first of which it was decided that no decisive steps be taken until a sufficient number of experienced, efficient, and influential gentlemen, representing the sections to be at present organised were added to the committee. At a subsequent sitting it was resolved that sections be formed, at least, one additional, viz., a chemical section; also that a reference library, reading-room, and museum, be established; and that the meetings be so arranged that all sections met on a different day, so that each member might attend any meeting he pleased. It was hoped that other sections would be formed in due course. The next business of the special committee would now be to construct as efficient a code of regulations as could possibly be done, and that was at present under consideration; and at the next monthly meeting, which was also the "general half-yearly meeting," the committee would be prepared to lay a complete arrangement before the Society for approval. The committee thought it also desirable that this Society should be known under a more suitable name in future, but as the utmost importance was attached to this consideration, no resolution had as yet been come to. Mr. Hacking then read a paper "On the Ventilation of Mines."

THE SYLLABUS OF THE INSTITUTE OF ARCHITECTS.

At the opening meeting of the session on Monday evening next, the president, Mr. T. H. Wyatt, will deliver an address.

The portraits of Professor Donaldson and of Mr. A. J. B. Horsford-Hope, M.P., past presidents, painted by Mr. Charles Martin, will be formally presented to the Institute, in the name of the subscribers.

The following papers have been promised, and will be read during the session:—

- "On Professional Esprit de Corps." By T. Roger Smith, Fellow.
- "On Arbitrations." By B. Fletcher, Associate.
- "Notes on the Architecture of Chester." By C. H. Heathcote, Associate.
- "On the Valuation of House Property in London." By E. T. Anson, Fellow.
- "On St. Peter's Orphanage and other Buildings in the Isle of Man." By J. P. Seck, Fellow.
- "On the Principle of Sub-Ordination in Design." By H. H. Statham, Associate.
- "On the Medieval Brickwork of Pommerania and Mecklenburg." By J. Tavorer Perry, Associate.
- "On the Old Hall at Gainsborough, near Lincoln." By C. Hadfield, Fellow.
- "On the Laying out of Cities." By J. B. Waring, Fellow.

RAILWAY AND DOCK WORKS IN YORKSHIRE AND THE NORTH EAST.

SEVERAL railway and dock works of an extensive character are now in course of construction, in the North-Eastern and Yorkshire and Lincolnshire districts, amongst which are the works in progress at the Royal Docks at Grimsby, where Messrs. Logan & Hemingway are now making several additions and enlargements. They have also just entered into a contract with the railway company for the construction of a dry dock, 300 ft. long, between the Fish Dock and the Clearethorpe Railway. The new railway from Whitley to Redon, through the Cleveland ironfield, which fills up an important gap in the North-Eastern system, is rapidly approaching completion, and will shortly be opened. Loft-house, which is situated on the north-eastern coast, and intersected by the new railway, is likely to be materially developed and benefited by the opening of the new line. Iron furnaces are about to be erected there immediately, and it is also proposed to make Loft-house an important shipping place by the construction of docks. The North-Eastern Company are also

about to construct a new short railway between Stockton and Middlesbrough, at an expense of upwards of 100,000l., together with new branch lines between Leeds and Wetherby, and between Knaresborough and Boroughbridge. A connecting line is also in course of construction from the Parkgate Ironworks, near Rotherham, to the Midland railway, whilst the Lancashire and Yorkshire Company are about to construct a new line from Clayton West to Huddersfield. The North Lancashire loop line belonging to this company, as also branches to Astley Bridge, near Bolton, and to Heap Bridge, near Bury, are in course of formation.

SCHOOL BOARDS.

London.—The Works Committee invited tenders for the erection of the Essex-street, Stepney, School, to accommodate 1,000 children. The following were received:—Axford, 8,644l.; Brass, 8,420l.; Nixon & Son, 8,390l.; Hill & Sons, 8,210l.; Webster, 8,120l.; Higgs, 7,987l.; Sheffield, 7,983l.; Pritchard, 7,877l.; Nightingale, 7,799l.; Cooke & Green, 7,767l. The committee felt it necessary to reduce the cost of the school, and the architect was instructed to revise his plans. The reduction thus effected amounted to 1,465l. 8s., and the committee recommended that the reduced cost of 6,311l. 12s. be accepted. The Works Committee also received tenders (already given in the *Builder*) for the erection of the Wilmot-street, Bethnal-green School, to accommodate 1,500 children, and recommended that the lowest tender, that of Mr. A. Sheffield, amounting to 10,389l., be accepted. The reports were agreed to. The report of the Works Committee was then brought up, and the following, amongst other recommendations, were agreed to:—That the tender of Mr. J. D. Hobson, of No. 7, Duke-street, Adelphi, amounting to 11,650l., for the erection of a school for 1,500 children on the site in Johnson-street, Stepney, be accepted (a list of the tenders will be found on another page); and that the supplemental tender of Mr. B. E. Nightingale, amounting to 89l., for the increase of the accommodation for infants from 240 to 400 in the Mary-street, Bromley School, be accepted. The Works Committee reported as follows:—

"The Board have now several sites, which are, or will be, immediately available for building purposes, and the Works Committee are desirous that no time should be lost in getting out plans for the schools to be erected upon them. With the present staff, the utmost that can be done by the architect is to prepare plans on the average for one school per week. The committee understand, however, that by increasing the cost of the staff by less than one-half, this average could be doubled. As it is of the utmost importance that no delay should take place in the erection of schools, the sites for which have already been secured, the committee accordingly recommend that the following additional officers be appointed for the architect's department, and that it be referred back to the Works Committee to make the necessary selection for appointment by the Board. Two senior draughtsmen, at a salary, in each case, of 140l. per annum; one junior draughtsman, at a salary of 80l. per annum; two traciers, each at a salary of 62l. per annum; an office boy, at a salary of 5s. per week."

The report was adopted.

Bradford.—Mr. Neill moved the acceptance of the tenders for Dudley Hill School, amounting in all to 8,486l. 11s. 6d. He explained that in this instance the tenders had been let in sections. On the recommendation of the architect the committee had agreed to accept them, subject to the approval of the Board. Although some of them thought that they had got low tenders, he might say that the school would cost 1,200l. more than the architect's estimate. They had at one time thought that this was to be one of the cheapest schools they were building, but it would be the highest priced school per child of any they had resolved to build. Still the committee did not see that they could get the work done cheaper, and they therefore recommended the acceptance of the tenders. The resolution was carried.

Norwich.—A ratepayer thus writes to the *Norfolk Chronicle*—

"A school is in course of erection in the parish of St. Michael at Colney, designed to afford the necessary cubic space for 200 children. That it is a handsome edifice no one who has seen it (for it is nearly completed) can for a moment deny. That it will be well built and will answer all requirements, the high character of the building firm and the professional repute of the architect afford a sufficient guarantee. The cost per head for this school will be 31. 10s. 6d., exclusive of the land upon which it is built, a little less than 2l. per head, the contract being for 1,230l. and the fittings being, I believe, to cost about 300l. more. Just across the water, upon a site of a deserted quarry, another school is to be built. It will be in a populous neighbourhood, and will be of sufficient dimensions to

contain 540 children. The cost, therefore, of cubic space should be smaller in proportion to that of a smaller building. I am informed that the School Board have already entered into contracts to build this larger school in the hamlet of Heigham, at the sum of 4,200l., inclusive of fixtures and gas, or in other words, at a cost per head of 74. 15s. 6d. If these statements be true, and I have no reason to doubt them, the School Board has something to answer for."

THE TRADES MOVEMENT.

Bristol.—The carpenters and joiners have resolved to apply for an increase in their wages of a halfpenny per hour from the 1st May next year. This would raise their wages to 7d. per hour, or—summer, 1l. 11s. 6d.; winter, 1l. 5s. 6d.; average in the year, 1l. 9s. 5d.

Bradford.—The operative stonemasons have issued the following circular to employers:—

"At a general meeting held in the Secular Hall, Southgate, Bradford, on Friday evening, the 4th inst., it was resolved that we give you the required six months' notice for an advance of 3s. per week on the present rate of wages; such notice to expire on May 1st, 1873. Owing to the present high price of coal, and the other necessities of life, it was thought expedient that this course should be adopted, as we are confident we are not asking too much, seeing that other trades, such as overlookers and others, are receiving 3s. to 6s. per week, and also that the banks of Scotland have advanced their employees 25 per cent. in some instances unqualified. We hope that there will be no suspension of labour when the time arrives, but you will generously concede our most reasonable request."

Kinghorn, Fifeshire, Scotland.—A strike of a somewhat novel nature took place a few days ago at Kinghorn Shipbuilding-yard, Fifeshire. It seems that the employees, who number between 300 and 400 men and boys, had been asked to agree to an alteration of the work-hours, which would do away with about half an hour's artificial lighting; but, instead of complying, they left the yard en masse.

ACCIDENTS.

London.—On the 26th ult., William Peace, bricklayer, was killed by falling from a scaffold in King-street, Southwark. Deceased was standing upon the wall of a house which was in course of rebuilding. A scaffold had been erected in front of the wall by means of bolts driven into it, to which brackets were fastened, the men working on hoards laid along the latter. Scaffold-poles were thus done away with, but there were no ropes provided to prevent a man from falling over should he miss his footing. Deceased fell a distance of 30 ft., and expired almost immediately from fracture of the skull. The jury, in returning a recommendation to the effect that steps should be taken to make the scaffold safer, and that on all such structures in future there should be some extra protection for the safety of the men.

Vienna.—A telegram from Vienna says the landing and adjoining wall of the fourth story of an unfinished house (3, Shottening) have given way, and large portions of the staircase were demolished. Many workmen and women were buried beneath the ruins. Several were killed, and eight were severely, and others slightly, injured.

Louisville (Kentucky).—A fatal accident has occurred at Louisville, Kentucky, involving the death of six persons. A new house being erected on Market-street, between Third and Fourth streets, four stories high, fell, crushing in the rear part of the two houses adjoining. The family of Mr. H. Nattes, a merchant tailor, consisting of himself, wife, and five children, and a journeyman named Lewis Johns, were buried in the ruins, and all killed. It is reported that the walls were put up too quickly before the mortar was well set.

OUTBREAK OF TYPHOID OR GASTRIC FEVER IN LANCASHIRE.

At Wesham, a village adjoining Kirkham, near Preston, there is at present an outbreak of typhoid or gastric fever, which has in two instances ended fatally, and which causes alarm amongst the inhabitants of that and the neighbouring villages. Mr. Tyndal, police superintendent for that and the Blackpool district, at the earnest request of some of those interested, examined the district, and found that the sewage at the lower part of the village was frequently hauled up the drains into the cellars of the dwelling-houses. Some of the ashpits were overflowing, and the back yards of most of the houses, which are very small, he found in a very filthy state; many of them containing one or

more piggeries close to the back doors of the dwelling-houses, and the manure from the piggeries remaining in the yards. He likewise found that there was a midden in the village near the public street, composed of garbage from slaughter-houses, which was highly offensive and injurious. Mr. Tyndal wrote a statement of the facts to the guardians of the Fylde Union, who are the sanitary authority for Westham, but they had not appointed their officers, in consequence of their awaiting further instructions from the Local Government Board. Mr. Noblet, at a meeting of the guardians, said that at Fleetwood they were awaiting the like instructions before they appointed their officers: the same at Blackpool and Lytham. The Rev. G. R. Brown said that something must be done at once, or the results might be very disastrous. The guardians were unanimously of opinion that immediate action should be taken in the matter. Mr. Birley moved, and it was unanimously carried, that Dr. Shawe and the surveyor of the Kirkham Board of Health should at once make a report, and that a committee appointed by the guardians should immediately on the reception of the report take such steps as were considered necessary for stopping the progress of the disease.

NEW CHURCH AT SOUTHGATE.

THE rapid development of the neighbourhood of Woodgreen (says the *London Daily Chronicle*) has called into existence religious and educational wants which are being principally met by local effort. A few months only have elapsed since the foundation-stone of a new school was laid in the district, and now on a piece of land closely adjoining, the corner-stone of a new church has been laid by Mrs. Harvey Lewis. The site, which was presented by Alderman Sidney, is on the Boves Manor Estate, Southgate, and immediately adjoins a road on which a number of detached villas have already been erected, and where building operations of an extensive character have been commenced. The church, which has been designed by Sir Gilbert Scott, R.A., will be built of Ancaster stone, with Bath stone dressings. Its length will be 10½ ft., its breadth 54 ft., and its height about 50 ft., and it is intended to accommodate altogether about 600 persons at one time. A bell-turret, 70 ft. in height, will be attached to the church, and immediately adjoining it a paragon will be erected. The builder is Mr. C. N. Foster, of Whitefriars, and he had already advanced the work considerably before the ceremony took place. Alderman Sidney, besides the site, has given 1,000*l.* to the endowment fund, and 2,000*l.* to the building fund; the Bishop of London Fund, 500*l.*; and the architect, 21*l.*

Sir Gilbert Scott was called upon to speak at the laying of the stone, and was warmly received, but assured his hearers that making speeches was not a part of his profession. All the thanks that are due, he said, are from me to Alderman Sidney, first for doing me the honour to place this work in my hands, and next for inviting me to attend this ceremony. I must disclaim having rendered any help to Mrs. Harvey Lewis; and if she was for a moment a pupil of mine I never met with one who was more apt. With reference to my having undertaken this work, it is an honour to any architect to be concerned in building a house of God, and I rejoice that I have designed many, but I only wish there were more of them than there are.

SCHOOLS OF ART AND OF SCIENCE.

Lewes.—There has been a large assembly of ladies and gentlemen—the former largely predominating,—in the County Hall to witness the distribution, by the Earl of Chichester, the Lord Lieutenant of the County, of the prizes and certificates gained during the year by the students of the Lewes School of Science and Art. The general report stated that the results of the examination in April last had been most satisfactory. In the second grade examination in free-hand drawing, five students had obtained prizes, their work being described as "excellent," and twelve passed. In model drawing, four had obtained prizes, and four had passed. In geometry, one had obtained a prize, and two had passed. In perspective, one had obtained a prize, and one had passed. Full certificates had also been awarded to Miss Bacon, Miss Colgate, and Miss Davey, for having passed in the four

subjects already named. In drawing of the third grade, prizes had been awarded to the students, and one student (Miss Turner) had been so successful in the national competition as to be the winner of the Queen's Prize. The report expressed regret at the resignation of Mr. Fisher, who had contributed so greatly to the prosperity of the school; he had, however, been worthily succeeded by Mr. T. W. H. Robinson. In conclusion, the report spoke of the desirability of building a new school. Towards that object, 500*l.* had been raised, and an appeal was now ready for circulation, inviting contributions for a further sum of 500*l.*, without which it would be impossible to build a school well adapted in every respect for the important educational work it was designed to carry on.

Saltire.—The distribution of the prizes of the art and science classes of the Saltire Club and Institute was made on Thursday in last week, Mr. Edward Salt, the president of the institute, occupying the chair, and Mrs. Edward Salt giving the prizes. There was a large gathering of the members and their friends. Mr. G. Morrell, the hon. secretary, presented a report, showing encouraging results; and then the speakers—Mr. Swire Smith and Mr. Frank Carzon, who had been invited to address the meeting—spoke of the value of art as an educator, and of the importance of the working man seizing the opportunities offered him. The institute has cost about 25,000*l.*—banks to the Salt family; and for the completeness of its appointments, and the artistic character of its elaborate decorations, is worth the visit of any lover of education.

Grimsbury.—The Hall of Science Company have accepted the tenders of Mr. John Surflet and Messrs. Coulson & Heywood, for the erection of their new building in Freeman-street. The amounts are 728*l.* 18*s.* and 347*l.* The hall will have a frontage of 40 ft., and will be 90 ft. deep. There will be two small rooms in the front, a large lecture-hall and two sitting-rooms at the back. The building has been designed by Mr. David Pick. It is to be completed by the 6th of April next.

A WHISPER FROM WINCHESTER.

Sir,—Now that the work of restoration among buildings similar to myself is being so liberally carried on, cannot something also be done for me? There is still too much paint and white-wash about me, with which Goths have disfigured me, to my great discomfort: the stone on my exterior needs a great deal of renewal, and cracks are appearing in some parts of my walls. My magnificent altar-screen sadly wants figures to fill its vacant tabernacles; the glazing of my windows might be improved upon, and I dare say there are other fanits in me, which Sir Gilbert Scott would gladly see corrected. I feel sure I shall meet with sympathy at the hands of the readers of your paper, and if those who do not know me will come and look at my nave, my choir-stalls and my chanceries, they will not consider me undeserving of such restoration as may be thought desirable.

WINCHESTER CATHEDRAL.

SOIRÉE OF THE WHITBY INSTITUTE.

THE *soirée* of the "Whitby Institute of Popular Literature, Science, and Art" has been held in St. Hilda's Hall, Whitby, under favouring circumstances, and with unabated vitality. Amid many vicissitudes this Institute has steadily persevered in its course. It is now in a more healthy and prosperous state than it was a few years ago, and it has the promise and the earnest of future success. The active secretaries, Messrs. Harrison & Tinley, and the *soirée* committee, were enabled, by the kindness of many supporters, to make excellent preparations for the re-union.

After the *soirée*, a public meeting for the distribution of prizes was held in the hall, which was crowded. The chairman (the Rev. J. B. Brodrick) said that the last year might not have been very eventful, but still it had been a period of decided progress. They had increased both their numbers and their means. They had found, as they had always found, that their greatest means of usefulness consisted in their library and classes. They had received fresh subscriptions for the one and fresh pupils in the other. It was a gratifying fact that some of their pupils had obtained prizes and certificates from the Society of Arts in connexion with the

Museum at Kensington, which it was his pleasing duty to distribute a few weeks ago. He hoped that the prizes then to be distributed would be incentives to further exertion.

The Chairman, after his address, distributed the prizes to the most successful pupils in the drawing and general instruction classes.

Mr. C. M. Palmer, Lord W. Phipps, and other gentlemen afterwards addressed the meeting. Mr. Palmer said he thought that hall was not capacious enough to be worthy of the annual meeting of such an institute, and he fancied they required to raise a larger institute, more in accordance with their wants. He then humorously advised them to get a capitalist to lay the foundation-stone of such a structure. He did not know a town where a large institute would be of greater advantage, because they were largely dependent on the finest description of art manufacture.

Of the celebrated Whitby jet, as an art manufacture, we some time since gave a pretty full account in the *Builder*.

COTTAGE HOSPITAL, HARROW-ON-THE-HILL.

A subscription having been raised at Harrow to provide for the town a cottage hospital, Mr. Charles Leaf kindly forwarded the scheme by presenting the necessary plan; and Messrs. George & Vaughan, of Argyll-street, were appointed architects.

The building just completed is on the Roxeth-road, and whilst at a convenient distance from the town, is yet in the country, and being opposite the school cricket-ground, amusement will be afforded to the convalescents.

The entrance is beneath a covered carriage-porch, and from its lobby access is obtained to the dispensary for out-patients without entering the building.

A well-ventilated hall and staircase occupy the centre of the hospital, and on the ground-floor are two wards and a sitting-room for convalescents; the latter, through French casements, opening into an oak verandah or porch provided with seats. This gives shelter in the front garden for a poor man to smoke a pipe on a warm day.

At the back of the hall are the kitchen-offices and the dispensary, and beyond the latter is the operating-room, lighted mainly by a skylight, and having a door into the yard. A special ward is attached to this room for severe cases that may require absolute quiet. Beyond this yard is the dead house, well lighted for *post-mortem* examinations.

The first floor contains three wards, nurse's room, bath-room, &c., rendered light and cheerful by ample window space.

The usual number of beds in the five wards will be nine, besides the additional bed in the special ward.

The roof provides a large spare room, readily convertible into a ward in the event of any infection breaking out.

There is no papering in any of the rooms, and in order to prevent the accumulation of cobwebs or dust, the internal angles of the walls in the wards are splayed.

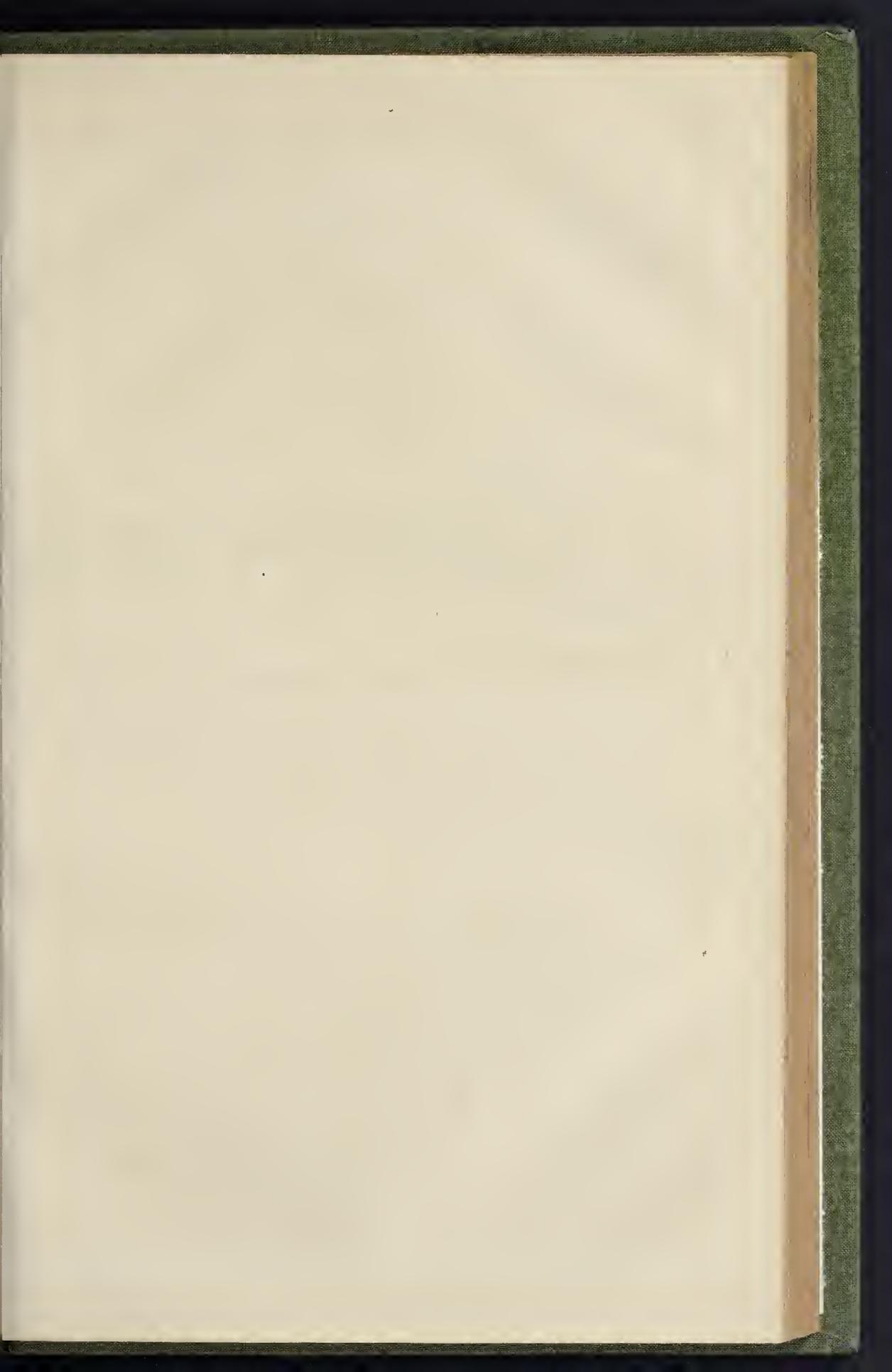
The ground-floor externally is of brickwork, with Bath-stone window dressings, while the upper story is weather-tiled, thus having a homely and countifed appearance. To prevent future outlay in paint, all the external woodwork is of oak; the window casements are of iron.

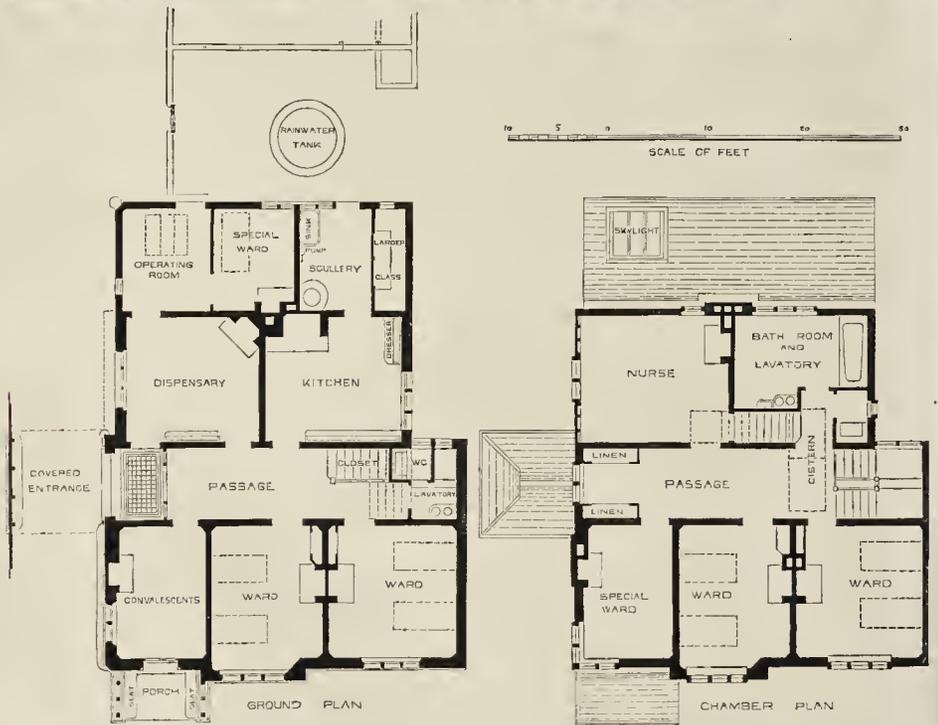
For ventilation of the wards there are large-hinged fanlights over the door opening to the passages, in which it is supposed there will always be a free circulation of air. This arrangement, though good in one respect, is questionable in another.

The builder is Mr. Lander, of Harrow, who has executed the work at a cost of about 1,500*l.*

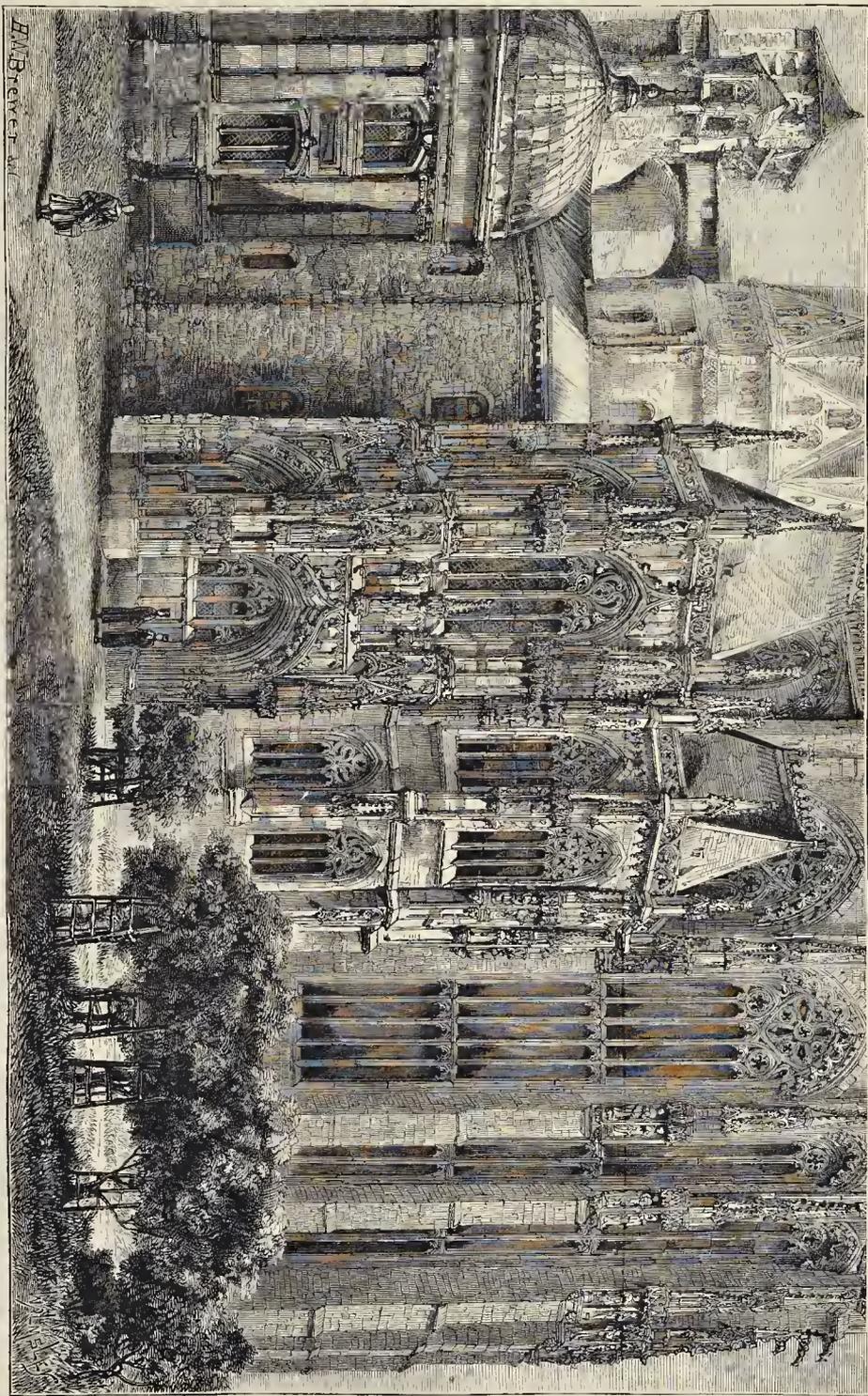
Harrow has for some time endeavoured to carry on the work of the hospital in a hired cottage, and we are glad to see that a convenient and pleasing building has now been erected with all the necessary appliances.

The institution of the Cottage Hospital, which we early urged and aided, cannot be too greatly valued; and we trust that, before long, a hospital will be found in each of our country towns, so impossible is it for the poor to have proper care and quiet in their own too frequently overcrowded and ill-arranged rooms. Payment, however small, should be required from the patients.





COTTAGE HOSPITAL: HARROW-ON-THE-HILL, MIDDLESEX.—MESSES. GEORGE & VAUGHAN, ARCHITECTS.



THE CATHEDRAL OF AIX-LA-CHAPELLE.



THE MINSTER OF AIX-LA-CHAPELLE.

The minster of Aix-la-Chapelle is celebrated including the most ancient of all the circular polygonal churches north of the Alps. Erected between the years 796 and 804, the nave or central portion of the building has preserved its original character, and when its mosaics have been restored (a work now in course of operation) under the direction of Monsieur Dehance, will give us a better notion of the general appearance of a Byzantine church than any other building in Europe, except only the churches of St. Mark at Venice and St. Vitale at Ravenna. It is not, however, of this more ancient portion the church at Aachen that we wish now to speak, but rather of the additions which it received during the thirteenth, fourteenth, and fifteenth centuries. These additions consist of a large nave-hall or narthex, erected in the thirteenth century, with a square tower above it. This tower was evidently intended to have been carried up considerably higher than it is at present, and probably capped by a spire or lantern. The great peculiarity of this tower is the fact that it is flanked by a semi-octagonal section on its north and south sides. Each of these terminates in a graceful apsidal chapel, retaining its original altar. It is singular to find chapels in this position, nearly 100 ft. above the floor of the church. These chapels are approached by an open gallery, which surrounds the four sides of the square tower, and also by a bridge, connecting the square tower with the upper portion of the dome above the vaulting. One of these singular little chapels and its connecting bridge are shown in our view. Beside two chapels are now in a sadly ruinous condition, but they are about to be restored from designs of Herr Becker, who has shown his ability and painstaking in his restoration of the eastern portions of the cathedral. The next, in point of date, and by far the most important addition to this church, is its noble choir, which commenced in the year 1353. It is one of the boldest and most daring works of the Middle Ages; in fact, had not its architect attempted outside all other works of the kind, he would have succeeded in producing a more pleasing and more secure building. As it is, the iron ties in the vaulting, and one or two settlements, show that he was more bold than wise in attempting to suspend a stone vault in the air. This noble choir is about 120 ft. long, of the same height to the crown of the vaultings as of the richest and most elegant decorated series of very fine staves. The thirteen great piers (each nearly 90 ft. long) are filled with terra glass, of good design, but crude and shabby in colour. A new bishop's throne, and a splendid altar-carpet, the latter from the designs of Herr Kleinertz, the decorator of St. Maria-in-Archie, at Cologne, are worthy of notice, as also some old pictures attached to the west end of the choir stalls.

The two apsidal chapels shown in our view probably contemporary with the choir. They entered from the circular portion of the choir. Their lower stories form the sacristies, treasury of the cathedral, and their upper portions are chapels, which are approached from the triforium or gallery of Charlemagne's church. They will be seen from our drawing, one of these chapels has rather an earlier appearance than the other, but, in all probability their erection nearly contemporaneous. These two chapels have been judiciously restored.

On the north side of the cathedral, close to the western extremity, and opening into the side of the polygonal nave, is a very large chapel, with aisles to the east and west. The plan of this part of the building is early Flamboyant, and is probably a work of the fifteenth century. The great window in the gable-end of this chapel is another apsidal chapel, which is similar to those shown in our drawing, and which of great beauty, a portion of which has been screened off, and serves as a chantry-chapel. The plan of this great transept are the same as those of the building connected with them. This was probably the chapter-house. There is also a porch of great beauty. Near to the west end of the cathedral is a small isolated chapel, which originally served as the baptistery to the cathedral. It is very much modernised, but beautiful panelling is still to be seen on the northern side.

The treasury of this cathedral is the richest in Europe, but its wonderful treasures have been so ably described by Canon Bock that we shall not attempt even to give a list of them. The presses which contain these marvellous examples of ancient church-plate are themselves well worthy of notice. They consist of three huge cupboards, each with two large folding-doors, and these doors are decorated both internally and externally with oil-paintings of great beauty, executed by an artist of the latter part of the fifteenth century. The great corona, the bronze railings round the triforium, and the bronze doors (which are evidently coeval with the building), are all worthy of careful examination. In fact, Europe possesses few more interesting churches than the Cathedral of Aix-la-Chapelle.

"THE MATERIALS OF THE ARCHITECT."

SIR,—I have read with some interest your able article under the above heading, in your last number, and agree with the major part of it. As regards the evidence of the Fire Brigade (London, I presume), that neither stone nor iron can be relied on when exposed to great heat, the question arises, what kind of material generally used in the building trade will stand the greatest heat. I believe the carboniferous rocks of Derbyshire, Staffordshire, and Yorkshire will resist fire better than either iron, brick, terracotta, artificial stone, or any other kind of stone generally used in the building trade; and if your space permitted, I would give you numbers of instances, but will confine my proof to two, where the heat was most intense, viz., the Midland cheese warehouses at Derby, and the old Soke Mills, on Wakefield Bridge, a few months back. The heat of the latter was so great that the iron ran down like water, and some of the stone was "red-hot,"—in fact, so hot, that some of it was changed from its natural white colour to that of the red Nottinghamshire stone, or similar to stone taken from the walls of a furnace. Nevertheless, but little of the stone had to be taken down for the rebuilding of the mills. Your following paragraph is so good that it will bear repeating, and ought, in my humble opinion, to be on the desk of every young architect; for it is rather his province than the builder's to be acquainted with the nature and properties of stone: "Actual experience of the power of any particular stratum of stone to resist atmospheric influence can alone assure the builder that he is working securely for the future."*

STEPHEN SEAL.

SIR,—I should like some additional evidence that, as stated in your article, headed "The Materials of the Architect,"—"hoop-iron bond built in, in mortar, is invariably an agent of destruction. I should like to hear the experiences of some of your readers on this matter before I commit the statement to my note-book as a fact.

R. L.

NEW WINDOW IN CHESTER CATHEDRAL.

The stonework of the east window of the chapter-house of this cathedral has at last been restored, and has been filled with stained glass to the memory of the late Dean Anson.

There are horizontal rows of subjects across the window, and these subjects illustrate the founding of the Abbey (of which the cathedral is part), its sustentation, and its dissolution; the last subject relates to the restoration of the chapter-house, in which there is a good likeness of the dean.

The first row at the top of the window relates to the life of Saint Werburgh, daughter of Walfines, king of the Mercians.

Next in order come a row of figures, all benefactors to the abbey, and some of them benefactors also to the town of Chester. First is Queen Ethelfreda, or Alfreda, daughter of Alfred the Great, and wife of Ethelred, Earl of Mercia. She was a woman of superior mind, and not only endowed the abbey, but in A.D. 907 liberally restored the walls of Chester after they had been destroyed by the Danes. King Edmund; King Edgar, who in A.D. 971 made Chester a station for the Saxons navy; Earl Leofric, who was appointed Earl of Chester by Canute; Hugh Lupus, the first Norman Earl of Chester (he brought from Normandy, in Normandy, a body of Benedictine monks, and at the instigation of

Anselm, afterwards Archbishop of Canterbury, richly endowed the abbey); King Athelstane; Earl Ranulph, to whom is due the honour of building the chapter-house; and King Henry VIII. follow.

Under the figures of these benefactors are five subjects, including the most striking events in the history of the monastery.

On the griaillie groundwork of the window are a number of shields, the most prominent position being given to those of King Henry VIII., Dr. Jacobson, and the late dean. The dean's arms are placed between the obverse and reverse of the corporate seal of Chester. The other armshere those of the city of Chester; the see of Chester, the ancient arms of Chester, Queen Ethelfreda, Hugh Lupus, Earl Ranulph, Dean Arderne, Dean Copleston, Dean Phillipois, and Dean Davis.

The window is very light in tone, made so that it should not overpower the interior of the chapter-house.

It was designed and executed by Messrs. Heaton, Butler, & Bayne, of London, under the superintendence of the Rev. Canon Blomfield.

BLOCKING UP THE EMBANKMENT.

SIR,—Allow me again to call attention (to what appears to me a stultification of all our efforts in making and paying for the Thames Embankment. At the Westminster Bridge terminus the St. Stephen's club is laying down the foundation for a structure that, when finished, will hide the clock tower basement from the view on the one side, and a view of the Embankment until you are upon it on the other side. It is making a splendid avenue, and then shutting the door to prevent your looking at it. Of course they have law on their side, but surely some step should be taken to alter the law, and save a great work from being a great failure. We have pulled down a street to open a view, and we are now allowing the space to be rebuilt upon.

COMMON SENSE.

PAYMENT OF ARCHITECTS.

SIR,—An architect complains that the old scale of 5 per cent. will not now remunerate him for the same services for which it was formerly a sufficient charge.

"Stentor" says he has been twenty-five years in practice. We must presume he has been engaged on the ornamental department of his profession, not in the financial, or he would better appreciate the difference between 5 per cent. on the old prices and 5 per cent. on the current rates of wages and building materials.

The fact is, an architect's remuneration is increased to the full as much as the rise in general commodities. AN ENGINEER.*

TUMBLE-DOWN HOUSES.

SIR,—I have had occasion, in times past, to call your attention to the "scamp-work" of London and the "jerry-work" of Liverpool, and to invite your condemnation thereof. To-day I have to do the same for Manchester.

One side of Lowcock-street, Lower Broughton, is being formed of some nineteen cottage houses, now in course of erection. These are being built in the usual "bandbox" style of the locality,—front and back rooms on the ground floor, front and back rooms on the first floor, with the addition behind of a small washhouse, with room over the same. The fronts of the houses are built of pressed brick, 9-in. wall, Flemish bond, the headers all broken, to make two, and be economical; and as our friends, the brickmakers, will persist in making pressed bricks much thicker than ordinary common bricks, the party-walls which are of 4½-in. work only, get no bond whatever throughout the whole height of the front,—simply a straight butt-joint, held together by the mortar, which is a fine, soft sand, entirely innocent of lime. Still, they held up together, and the front and back walls were complete, and the chimneys of the last half-dozen cottages were being built, on the morning of Friday, the 25th ult. On that day, and for many previous, we had much rain; and as the last straw broke the back of the camel, so the last storm broke the cohesion of the mortar—"Heaven save the mark!"—and down the whole came in one general collapse. The fronts of five houses fell into the street, and the party-walls, with their chimneys,

* See p. 836, ante.

* Nine other letters to same effect received.

flooring-joists, scaffolding, and workmen, came in one general ruin to the ground. By great good fortune no one was actually killed; but several, I hear, have received very serious injuries, and will be long before they recover. The builder, however, is nothing daunted, but, taking heart of grace, is rebuilding in the same manner, with no bond, but a little lime in his mortar,—hoping, doubtless, that this time, at least, he will succeed in getting his work complete, and drawing his pay before it falls again; but there ought, surely, to be some local authority who should have power to stop or prevent the erection of trashy buildings,—an authority which seems sadly wanting, and one not likely to be instituted so long as local Boards have the power to appoint, the members of the said Boards being often the greatest offenders in that direction.

E. G.

ST. ANDREW'S CHURCH, HOLBORN.

THIS church, after being closed for some months, was reopened for worship on Sunday, October 13th. The ancient tower, which was separated from the nave of the church by a screen-wall, with gallery in front, has been thrown open to the nave by the removal of the wall and gallery. The Gothic arch thus thrown open now unites the nave with the tower.

A ritual chancel has been formed at the east end, the floor-level of which has been raised 2 ft. above the floor-line of the nave, and choir-stalls have been arranged north and south of the same. The old high-backed square pewing has been removed, and substituted by new low oak seating. A new organ has been constructed, which, spanning over the Gothic arch before alluded to, rests upon the galleries on each side. The old windows have been removed, and new iron ones substituted, glazed with tinted cathedral glass. New and powerful sunlights have taken the place of the old gas arrangement, and the church has been heated by a system of hot-water pipes. A new clock, with Westminster chimes, has been erected in the tower.

Besides these structural alterations, the church has undergone a general repair and decoration. The nave ceiling and groined ceilings of galleries are in panels, of a tempered turquoise blue hue as ground colour, with margins in stone and vellum, and the enrichments in white. The hills grounds are filled with a classic diaper, in soft-colouring and white; the walls are a neutral of silver gray. The shafts of columns are finished in Indian red. The chancel ceiling is treated uniformly with that of the nave, with the exception that the enrichments to the panels are gilded.

The oak case of the organ is stained and varnished, and the pipes are artistically treated. The general oak work, including the new seating, has been stained and varnished.

The restoration has been executed from the designs of Mr. S. S. Teulon, architect, under the superintendence of his surveying clerk, Mr. J. Burford. The structural repairs and alterations were done by Messrs. Patman & Fotheringham; the new oak seating by Mr. Chapman, of Hanworth, near Norwich; the tile-work by Mr. McColla, of Parliament-street; and the artistic decoration to both church and organ by Messrs. Phillips & Son, of Baker-street, Portman-square. The organ is by Messrs. Hill, of Camden-town; the new stained-glass window in the tower by Messrs. Heaton, Butler, & Byrne; the new clock by Messrs. Thwaites & Reed, of Clerkenwell; and the glazing by Mr. Odell, of City-road.

THE PARKS.

SIR,—When you can afford the space, will you allow me to say a few words on a subject which has already been touched upon in your columns, and which is so far appropriate to them that it concerns one of the most prominent features of London? Any one returning from abroad,—as we are all doing at this time of the year,—must be struck with the contrast between the perfect order in which the public spaces and gardens are kept there, and the dilapidated state into which, with the exception of certain favoured spots, they are allowed periodically to fall in this country. The blame of this is partly attributable to the people. In France, and in Germany especially, no guards are necessary to preserve the grass from being cut up in every direction. But if the circumstances in our case are not precisely similar, something more might be done than has yet been attempted to keep

our large surfaces of grass in at least a tolerable condition. It seems to have been overlooked that the chief injury is not done by those who saunter in the parks for fresh air, but by the hundreds (perhaps thousands) who pass across them on their way to and from their business. The most direct path will of course be sought by these, and this suggests at once the principle on which the majority of the paths should be laid out. And since the gravel-path will only be used in wet weather, and as a guide, it is clear that to lay it out broader than is necessary (as in the case from the Marble Arch to the Serpentine) is only to extend the surface over which the grass on each side will be cut up. These considerations apply especially to Hyde Park, where, for military reasons, the paths cannot be protected by hurdles. It will be seen, too, even without a plan, that the paths in this park are not laid out in the best way to suit the public convenience. Since they were originally laid out every feature in the neighbourhood, and probably every object in view in designing them have changed. To take another illustration from St. James's Park, the gate opposite the Duke of York's steps, through which a stream passes most of the day, has no direct communication either with the water opposite or with the bridge, and the grass in front of it is consequently always in a disgraced state, in spite of the hurdles or the notice-board. The paths leading from this gate, parallel with the railings, are without beauty and of no particular use, as the paths outside the railings are as direct and shady. In fact, the whole of this part of the park requires relaying out; and as the paths would be short, they need not be necessarily straight. Then, where it is necessary to protect the grass, this can be done only by a better form of hurdle, which cannot be climbed over as easily as the present one. The dividing bars should not run horizontally, but vertically, so as to give no hold to the foot; and if the upper bar formed a curve they would be less easily vaulted over. These are a few suggestions which might be carried out with advantage; and it certainly is not too much to hope that, as there is so much less than usual to be done in the parks this winter, Mr. Ayrton might be persuaded to allow the whole thing to be undertaken for the first time, and perhaps finally, in a thoroughly effectual manner.

LEUT.-COL.

WRECK-CRUISERS IN CONNEXION WITH THE LIFE-BOAT SERVICE.

SIR,—It has occurred to me that wreck-cruisers might be put afloat in connexion with the life-boat service.

The wreck-chart shows the regions where wrecks are most likely to occur.

These wreck-cruisers should be able, furnished with all needful appliances, to keep the sea and watch the dangerous regions in any weather.

There is no doubt that Mr. Thornycroft, C.E., could design and have constructed an iron or steel steam-craft which would live in any sea, and be the means, with a brave and competent crew, not only of rendering invaluable assistance to ships in distress, but of saving hundreds of lives.

W. CAVE THOMAS.

PROPOSED REBUILDING OF ST. GILES'S CHURCH, DURHAM.

A SPECIAL meeting of the Architectural and Archaeological Society of Durham and Northumberland has been held in the vestry of St. Giles's church, Gilesgate, Durham, to consider the best means of preserving the existing historical features of this church, while complying with a desire on the part of the parishioners to enlarge its accommodation to meet the growing wants of the parish. The Rev. Canon Greenwell, who occupied the chair, while disclaiming all intention to meddle with other people's business, held that the church was the property of the Church of England, and of the whole kingdom, to which it was a record of the progress of time. On these and many other grounds their protection was claimed, and it was the duty of that Association to prevent the destruction of such a building. He proposed that Dr. Farrer, Mr. Longstaffe, Mr. Hodson, and Mr. Hodgson Fowler, form a committee to inquire into the subject, and report on what was best for all parties.

Mr. Longstaffe read a paper which he had prepared, descriptive of the church, which was founded on the 3rd June, 1112, by Bishop R. Flambard. The Rev. Mr. Hodson gave a state-

ment of the ancient features of the church, and expressed an opinion that if it were left alone it would last for a thousand years longer.

Mr. C. H. Fowler said that by throwing out an aisle and an arcade of arches on the south side, and moving the door on that part of the building forward, all the ancient character of the building would be preserved and the desired object attained.

The Rev. J. G. Norton, the newly-appointed incumbent of the parish, while expressing his admiration of the exterior, thought the interior most ugly and requiring rebuilding. He required that the church should be fitted with not less than 500 sittings, all of them free to the poor. The body of trustees had passed a vote approving his views, and pledging themselves to carry them out with the money at their command—about 1,700*l.* In conclusion, he said if the views of that meeting harmonized with those of the parish, he would avail himself of their aid. Mr. Le Keux seconded the chairman's motion, which was carried.

WAITING FOR THE INSPECTOR.

I HAVE just re-read your article, "What are we doing for Public Health?" in your number of October 5th, which is very interesting. I would say that the town council of this town (Louth) have invited a Government inspector to visit the town, and report upon the sanitary condition; but six weeks have elapsed, and he has not come. Two visits to the Government authorities have been made by the Government inspectors since the passing of the Public Health Act, 1872. The advice given is to wait for the Government code of regulations before doing anything. The Rural Board in this town has ninety parishes to care for.

W.

QUEENBOROUGH, ISLE OF SHEPPY.

ON Friday last the memorial stone of a public elementary schools was laid by Captain Comyn, the chairman of the Queenborough School Board. The new building stands upon the site of the old national school, and comprises a boys' school for ninety boys, a girls' school with accommodation for sixty girls, a class-room for the joint use of these two schools and also an infants' school for ninety children, the requisite cloak and basket-rooms, lavatories and usual offices. The building is of grey stone relieved with moulded and diaper brickwork, the roof high-pitched and finished with ornamented cresting, and the design generally will be of pleasing and suitable character.

The old most belonging to the ancient case of Queenborough, and which formed the boundary of the narrow strip of ground belonging to the School Board, is also to be filled and levelled, and the land thus reclaimed is to be used for the purposes of separate play-ground. The total cost of the works will amount to about 1,500*l.*; Mr. Naylor, of Rochester, is the contractor for the school-buildings, and Mr. Gamon, of Sittingbourne, for the earthwork and fencing, and the whole is being carried out under the direction of Mr. Benjamin Adkins, of Faversham, the architect to the School Board.

OLD AND NEW STAINED GLASS.

In the *Times* a few days since, Mr. Stuart Moore contributed an account of some interesting respecting the direct evidence afforded by contemporary documents extant amongst the fabric of Exeter Cathedral, as to the date and of the ancient glass lately discovered there. The course of his remarks, which he did not limit to their true value, he stated, with that conspicuous courage peculiar to amateurs revelling in half-understood technicalities, that the windows of the Lady Chapel "had figures under canopies, on fine grisaille grounds," the tracery openings "having pot-metal centres on grisaille grounds." The "grisaille" in question, further told us, was of a character "exquisite light and delicate," although in the same sentence he daringly declared it to be "boldly and richly executed." He further informs us that no case did it—the grisaille—resemble "gorgeously-stained abominations of the modern school of glass-painting."

As an artist, practising "glass-painting," should like to know why the word "grisaille" seems with the amateur so inevitable to produce the emotion which Mrs. Malaprop ascribed to

blesed word, Mesopotamia." If ever a hook
 will be written "on the curiosities of obfusca-
 tion," the chapter on "Grisaille" will be rich
 illustrations. The very ordinary traced
 pattern-work, in brown enamel on white glass,
 their remarkable in design, execution, nor
 ticular in the Exeter work, is, under the
 tion alluded to, declared unhesitatingly to be
 "exquisite," "bold," "rich," "delicate"
 "grisaille." The "grisaille" grounds of the
 "vases" are innocently stated to have "pot-
 tal" centres, as though the "grisaille" was
 necessarily as much of "pot-metal" as any
 "vase" could possibly be.

Then, we are told, *appropos* of the Exeter
 "grisaille," that it did not resemble the "gor-
 geously-stained abominations" of modern times,
 "moderns," in glass-painting as in other
 things, have no doubt much to answer for, just
 also the ancients have,—saying in glassing
 their gain in the effects of time and
 tation; but why the moral of grisaille should
 pointed by the disparagement of "gorgeously-
 stained effects," seeing that the noblest glories
 "stained windows" have resulted, not from
 "stained," but from the "gorgeously-stained"
 t works of Canterbury, Sarasbourg, Char-
 Milan, Florence, and Pisa, is a problem
 which only the amateur, soaring above the
 es of technical consistency, can solve.

EXPERIENTIA.

COMPETITION.

At a meeting of the River (Dover) School
 held on the 25th of October, it was re-
 solved to adopt the plans of Mr. J. Edwin
 son, architect, for the proposed schools.
 There were only three competitors.

THE RIVAL CARPENTERS' SOCIETIES.

The long-standing dispute between the London
 Manchester sections of the Amalgamated
 Society of Carpenters and Joiners, which affected
 interests of some 13,000 members and funds
 to the amount of about 20,000*l.*, has been brought
 to a satisfactory termination. After certain
 proceedings, the following were appointed arbi-
 trators:—Mr. John Kane, secretary to the Iron-
 ers' Society, Dartington; Mr. D. Guillo,
 secretary to the Ironfounders' Society, London;
 Robert Anstie, secretary to the Engineers' So-
 ciety, Manchester; Mr. W. Hicking, of the
 Iron Union of Carpenters, Nottingham; and
 George Odger, London. These have been
 sitting at the Bell, Old Bailey, for the last eight
 days.

The unanimous award of the arbitrators
 that the title of Amalgamated Society of
 Carpenters and Joiners should be conferred upon
 Manchester section, and that the locked-up
 fund be of two branches, Hoxton and Poplar,—
 should be equally divided between the two
 sections. The arbitrators passed a resolution
 strongly urging both parties to re-unite.

THE "ANGEL" IMPROVEMENTS,
CLERKENWELL.

Attention having been drawn to a paragraph under
 the heading in your issue of the 10th inst., I shall
 be obliged by your permitting me to correct one or two
 inaccuracies.

The meaning of the resolution adopted by the
 Metropolitan Board of Works (of deferring the con-
 sideration of the subject till next July) is simply that
 the Board will undertake to pay the cost, and then
 probably the superior Board will be required to
 be treated with them, as the gain is wholly on one
 side.

The difficulty of the passing traffic is by no
 means insuperable; for, if the tramway cars and om-
 nibuses are ordered to draw in beyond the narrow neck
 of which does not extend more than 25 ft., no incon-
 venience will be felt, as the road suddenly widens, &c.
 The committee of the Board of Works concurred in
 the opinion that a wider thoroughfare at that particular
 point was desirable, but it was so limited in extent,
 and profits to be derived from it being especially confined
 to the area they could not see their way to recommend
 it to be included in the list of Metropolitan Improve-
 ments.

The Vestry of Islington opposed the improve-
 ment as being a metropolitan one, and refused to con-
 tribute towards it if adopted on payment of half the cost,
 on the ground that by the judicious arrangements of the
 two as the passenger traffic could be so diverted as to
 be of delay in the transit of goods. Additional space
 given at that point by the removal of the Angel
 in a clock in course of next week, the Vestry of
 Islington has ordered that it be taken away forthwith
 that every available inch of ground may be devoted
 to it. It may be urged, however, that this is a refuge
 amidst of a crowded thoroughfare.

It is to be said that the buildings proposed to be removed,
 necessary for widening the thoroughfare, comprise
 2, St. John-street-road, and Nos. 355, 357, and 359,
 and the way in which you will see constitute more than
 100 ft. in extent.

The thoroughfare being not within, but on the outskirts

of the parish—one side of the road being Islington and the
 other Clerkenwell—it is scarcely likely that the latter
 would ever feel itself called upon to contribute half the
 cost if carried out, it being not a question of the improve-
 ment of the parish in any way, but purely and simply
 a question of providing for the public traffic. Even could
 it be deemed a local question only, the adjoining parish
 should be more interested in the matter than Clerkenwell,
 the improvement being rendered necessary, "mainly," as
 you say, "by the rapid growth of Islington."

If the improvement involved the removal of inferior,
 and the substitution of superior property, there would be
 some reason for thinking that Clerkenwell might be ben-
 efit; but as the present property is some of the best in
 the parish, it is doubtful whether we should not "gain
 a loss" by its removal. It is therefore obvious that the
 gain would not be "wholly on one side," and that "the
 benefits to be derived from it" would not be "especially
 confined to one parish."

Islington does not oppose the scheme upon its merits.
 They opposed the Street Improvements Bill, not upon its
 merits, but upon the question of how the necessary funds
 were to be raised, having in view some possible legislation
 upon local taxation; and therefore they felt bound, for
 consistency's sake, to oppose this upon the same grounds,
 though, doubtless, object to pay half the costs, as a
 local improvement, on the same grounds as Clerkenwell,
 viz., that they would not be pecuniarily benefited.

If the removal of the Angel, as proposed, is not
 for the purpose of adding to the space for traffic, but for
 the purpose of placing a lamp on the site, so as to afford
 more light and space as a refuge in this overcrowded and
 dangerous thoroughfare, I would not think that about 3,000
 vehicles pass each way through this narrow gorge daily
 according to police returns obtained in June last, and that
 the tramway traffic especially has considerably increased
 since then, I think you will agree, that though small in
 extent, there is scarcely an improvement more urgently
 required in the metropolis, as regards facilities for the
 public traffic.

ROBERT PAGE, Vestry Clerk.

TEMPLE BAR: PAST AND PASSING.

WARWORN Keep and Civic Warder,
 Arch against the City's border;
 London Wall and Roman gateway,
 Bridging o'er old Britain's great-way;
 Portal through which armed legions
 Passed to subjugate foreign regions;
 Phoenix pile, amidst many crèches,
 Rising from the City's ashes:
 Lasting on through years, the wonder
 Of all men who pass you under
 Praised, yet doom'd for being a scandal,
 By the great improving Vandal:
 For Temple-Bar, grim progress marches,
 To crush you, 'neath the Court of Arches. C. H. C.

IMPORTANT TO BUILDERS FORWARDING
MATERIALS AND WORKMEN'S TOOLS
BY RAILWAY.

An action was brought in Uxbridge County Court
 (Tuesday), by the Great Western Railway
 Company, by Mr. James Hickman, the younger, a painter
 and decorator, carrying on business at Uxbridge to re-
 cover the sum of 3*l.* for loss sustained by the delay in
 delivery of workmen's tools and decorating materials,
 entrusted to the Great Western Railway Company for
 delivery, as common carriers. It appeared that as far
 back as July 26th the plaintiff went to the Uxbridge Station
 on the Great Western line, and delivered a bag contain-
 ing 10 lb. of plaster of Paris, whitening, and several dis-
 temper brushes, addressed to himself at Londwater, to be
 left till called for, when it would be taken on to where
 the plaintiff and his men had a job.

He was informed by the railway officials at Uxbridge
 that the materials would either reach Londwater that
 night, or very early the following morning, which was on
 a Tuesday. The bag did not arrive that day, nor until
 Friday, during which time the plaintiff and his two men
 were kept idle at Londwater, expecting it by every train
 from Uxbridge. The consequence of this annoying and
 injurious delay was, both master and men being unable
 to proceed with their work, much to the annoyance of the
 parties employing them. The plaintiff was unable to get
 the tools and materials necessary at his job at Londwater,
 wishing to be particular, as the work would undergo
 a surveyor's inspection, the plaintiff purchased new brushes
 of the very best description, which cost 6*s.* 6*d.* each. He
 also had to pay his men the same wage as though they
 were at work, and he claimed for his own loss of time.

The company did not deny the neglect and delay, but
 objected to the amount of the claim. The judge, Mr. J.
 Whigham, in giving judgment, said the case was no doubt
 one of great importance to master builders, and also to
 workmen, who depended upon railway companies to
 forward materials and tools. It was also evident that
 railway companies were frequently made the object of
 actions by persons who entered the belief that the
 companies would be no losers by any amount of claim
 made against them; but that was quite an erroneous
 impression. He held that if a common carrier between
 Uxbridge and Londwater had undertaken to take these
 goods and had left them at a roadside inn, he would have
 been liable; and that a railway company was in a like case,
 and were bound to make compensation for the delay.

It, however, appeared to his view that the actual loss
 incurred was 1*l.* 10*s.* 3*d.*, and he should therefore make an
 order for payment of that amount with costs.

St. Andrew's Church, Lambeth.—This
 church has undergone a general renovation and
 cleansing. The organ has been removed from
 the gallery at the west end, and placed adjoining
 the chancel. The woodwork has been restored
 and varnished, the ceilings are treated in a
 pearl-grey, and the "Tables" written in gold
 text upon a deep blue ground. The several
 works have been executed by Messrs. W. Phillips
 & Son, under the direction of Mr. S. S. Teulon,
 architect.

PUBLIC BATHS FOR HANLEY.

THE foundation-stone of the public baths to be
 erected in Lichfield-street, Hanley, has been laid.
 The design of Mr. R. Dain, architect, Burslem
 and Hanley, for the erection of the building, was
 selected at the beginning of the year. The
 design is not at present to be carried out in its
 entirety; but sufficient will be done under the
 contract entered into with Mr. Matthews, of
 Hanley, builder, and Mr. Bickley, engineer, to
 provide accommodation for both male and female
 bathers which may be extended at any future
 time. The ground to be covered will be to the
 extent of 10,264 superficial feet. The building
 will be one story in height, except the central
 block facing Lichfield-street, which will be two
 and three stories. Provision is made for two
 swimming-baths, 55 ft. by 29 ft., one Turkish
 bath, and twelve private baths for males. One
 swimming-bath, 20 ft. by 15 ft., six private baths,
 and one Turkish bath for females. Also, wash-
 house, laundry, stores, boiler and tank-house, and
 bath-keeper's residence. The general arrange-
 ment of the ground plan may be said to consist
 of four blocks. The central block, facing Lich-
 field-street, will contain, on the ground-floor,
 attendant's room, store and Turkish baths for
 males; and on the first and second floors Turkish
 baths for females and residence of bath-keeper.
 On each side of the central block will be private
 hot baths for males and females with separate
 entrances to each, corridors from which will com-
 municate with the first and second-class swim-
 ming-baths for males, placed at the rear of the
 building. The second-class swimming-bath for
 males may also be entered, if desired, from Back
 John-street. Between the block containing
 private baths for females and the large swim-
 ming-baths for males will be the wash-house,
 laundry, chimney, boiler and tank buildings,
 with coal-yard and cart entrance thereto from
 Back John-street. The general character of the
 design is Gothic. The central portion, facing
 Lichfield-street, as already stated, will be two
 and three stories high. Over the female entrance
 will be a tower and spire, with staircase com-
 municating with the bath-keeper's apartments.

DISSENTING CHURCH-BUILDING NEWS.

Liverpool.—A new Congregational Church for
 the district of Toxteth-park has been opened.
 The church is situated at the junction of Aig-
 burth-road and Ullet-lane, and has been erected
 for the congregation of the church in South-hill-
 road. Since the church in South-hill-road was
 built, the population of Toxteth-park has greatly
 increased, and the building has consequently
 long been found too small for the district. About
 two years ago a movement was commenced for
 the erection of a larger church, and the founda-
 tion-stone of the new edifice was laid in No-
 vember, 1870. The church is in the English
 Gothic of thirteenth century. It is almost cir-
 cular, having two transepts, and has a tower
 with spire nearly 160 ft. high. In the arrange-
 ment of the interior the object of the architect
 was to form a large area without pillars, and the
 roof has therefore an uninterrupted span from
 side to side. The pulpit is of stone, carved, and
 is situated in an apse, the walls of which are
 tinted. The seats are of pitch-pine, and will
 accommodate 950 persons. The walls are lined
 with the diamond pattern. The architect was
 Mr. H. H. Vale, of Liverpool; and the con-
 tractors were Messrs. Wisbart & Irving, of
 Southport. The total cost of the building is
 6,678*l.*—The memorial stone of a new
 English Presbyterian Church has been laid in
 Catherine-street, in the presence of a large
 number of spectators. The church, which when
 completed will be one of the most prominent
 ecclesiastical structures in Liverpool, is intended
 for the congregation (the Anglo-Welsh branch of
 the Calvinistic Methodists) heretofore worship-
 ping at Windsor-street Chapel. The church will
 afford accommodation for 510 persons on the
 ground floor, and provision is made for galleries
 to accommodate about 300 persons more, making
 a total of 810. The building will be in the De-
 corated style of architecture, and will consist of a
 nave, two transepts, a spacious vestibule, space
 for stair for future gallery, an engaged tower
 and spire rising to a height of 127 ft., and an
 organ chamber. At the rear of the church will
 be a lecture-room capable of accommodating 400
 persons, two classrooms, a minister's vestry,
 porch and yard. The tower at the north-east
 angle will stand upon a massive plinth, on the

east of which will be a tower door, with a recessed and moulded arch. This doorway will be surmounted externally by a crocketed pediment, and finished with a fleur-de-lis. In the four sides of the upper part of the tower will be coped windows of bold design, filled in with louvres and tracery heads, and having weathered sills. Above them will be a sunk traciced parapet, at each angle of which rises an octagonal pinnacle, terminated with a wrought finial. The branch of the spire here commences, and a few feet higher are the lucarnes, surmounted by finialled canopies of original design. Above this the spire is almost plain, and completed with a light wrought-iron finial. The staircase will be entered by a moulded door, and within this staircase is an entrance to the vestibule similar to the one in the tower. The pulpit will be of Caen stone, and will stand upon a tiled platform, slightly recessed, immediately under the west window, by which arrangement the minister will be visible to every one in the church. Above this recess is a moulded arch, carried upon columns with floriated capitals and moulded bases. The transepts and organ-chamber will form a feature in the design, being divided from the nave by moulded arches, with columns, floriated capitals, and corbels. The whole of the windows will be traciced. The roof is to be open-timbered and of peculiar design, forming as it were externally a nave and aisles, but it is one span internally. The external facing of the church will be of shoddies, with Stanton yellow stone dressings, and the entire cost, inclusive of the land, will be about 5,000l. Messrs. John Parker & Son are the general contractors, and the architects are Messrs. T. E. Murray and G. H. Thomas, Liverpool.

Hereford.—The Eign Brook (Congregational) Chapel has for some weeks past been in process of demolition, to make room for a more commodious structure, to be erected from designs prepared by Mr. G. H. Haddon, of the firm of Haddon, Brothers, architects, Hereford and Great Malvern, at a cost of about 3,000l. The memorial stone of the new building has been laid by Alderman T. Rowley Hill, of Worcester.

Bailiff Bridge.—The foundation stone of a Methodist New Connexion Chapel has been laid at Bailiff Bridge. The new chapel is being erected from designs by Mr. F. W. Helliwell, of Brighouse. On the ground-floor is the school-room, 48 ft. by 36 ft., to accommodate 400 children. Class-rooms are attached. A short internal flight of stairs connects the school with the chapel above. The chapel will be 59 ft. by 36 ft., having coped windows, and panelled and carved ceiling. At one end is a vestibule, communicating by a broad stairway with the principal entrance. The children's gallery is over this vestibule. Opposite is the pulpit or rostrum, placed at the back of the communion, which is on a raised platform, railed off on three sides. Accommodation will be provided for 400 persons. All the woodwork will be stained and varnished. The chapel will be lighted by gaseliers from the centre of the ceiling. There will be a hot-water apparatus for warming in winter. The works have now advanced to the sills of the windows. The following are the contractors:—Masons, Messrs. L. & W. Crowther; joiner, Mr. B. Marsden; plumber, Mr. Jabez Wood; plasterer, Mr. W. Firth; painters, Messrs. Hirst & Barraclough; slater, Mr. D. Smithies, all of Brighouse.

Halifax.—The new Unitarian Chapel at Halifax has been opened. It has been erected on the site of the old one in Northgate-road. Mr. Davis was the architect. The total estimated cost of the building and fittings, not including the organ, which is not yet in the chapel, nor two memorial windows, given by Messrs. Ed Eaton, and other two memorial windows, was 4,000l.

Brighton.—The foundation-stone has been laid of a new Protestant chapel for "Bible Christians," who, however, repudiate all connexion with Chelsea "shakers." The "Bible Christians" commenced their ministrations in Brighton, in 1812, in a small chapel in Cavendish-street; but of late years have carried them on in Upper Bedford-street. The site of the new chapel is at the south-west corner of Montague-place, situated in St. George's-road, and facing the eastern end of Bristol-road. The building, which is being erected by Mr. John Fielder (of Chichester), from designs prepared by Mr. Thomas Lanson, architect (of Brighton), will be of red brick, with stone dressings for the doors and windows. The entrance will be covered by a porch, the corners on each side of which will be ornamented with a small turret. The general style of the

building will be Byzantine. The contract price is 2,650l. When completed, it will accommodate 450 persons, and provision has been made for a gallery at the southern end, should one be required.

Northampton.—A Primitive Methodist New Chapel has been opened here for divine worship. The building is a structure capable of seating 600, with a school affording accommodation for 300 children; also two large class-rooms, copper-house, &c. The exterior of the chapel is in a mixed style of Italian and Corinthian architecture. The interior has a horse-shoe gallery, the front of which is panelled with open ironwork, and at one end is the organ, which has been considerably enlarged and beautified. The ceiling is divided into four compartments, the whole being enriched with twelve centre flowers and gilt headings, &c. The fronts of the galleries, rostrum, &c., are tinted with lavender, pink, and gold. The acoustic properties of the building are said to be good. The new building is erected on the site of the old chapel. The plans and specifications were prepared by Mr. J. Kerridge, architect, Wisbeach; and the building has been erected by Mr. H. Rands, of March, Cambs.

SCHOOL-BUILDING NEWS.

Mansfield.—The opening of new national schools and of a new organ in connexion with St. Peter's Church, Mansfield, has taken place. The schools are in close proximity to the church, and they occupy a site which, together with a donation of 500l., has been given by the Duke of Portland. The accommodation afforded is for 350, namely, 200 infants and 150 girls, and the total cost of the works is estimated at from 1,100l. to 1,200l. The necessary funds have been raised by voluntary contributions. The new organ has been erected at the cost of the late Mr. Martin Furniss, one of the churchwardens. The instrument, costing about 540l., has been purchased of Messrs. Brindley & Foster, of Sheffield. It has about thirty stops.

Tibberton.—The foundation-stone of a Church of England national school, with house for teacher, has been laid in this parish. The building is to be erected on a site given by Mr. T. G. Smith, of Droitwich. The plan, designed by Mr. W. J. Hopkins, of Worcester, architect, is of a simple character. Mr. J. Smith, of Tibberton, is the builder.

PROVINCIAL.

Stafford.—At the termination of the last council meeting, the Mayor stated that Mr. Alderman Pochin had given him such instructions as would enable him to purchase, in the name of Mr. Pochin, a suitable site for the erection of a good public hall. There was a very eligible site in Crabtree-street, which would cost about 1,500l., and Mr. Pochin, in his desire for the public good, would at his own cost purchase the site for the benefit of the town. A vote of thanks was accorded to Mr. Pochin for his generous offer, and it was understood that immediate steps would be taken for carrying out the object in view, as well as for widening Crabtree-street and enlarging the market-hall.

Hastings and St. Leonards.—The St. Leonards Commissioners have disapproved of giving the projectors of a pier at St. Leonards another chance of carrying out their design. The Rev. J. Tottenham and others urged that the proposal to build another pier was not good (like the Eversfield-parade Pier) a project of the inhabitants so much as of strangers; and the common sense of the Commissioners could see no propriety in encouraging a speculation which was not locally popular.

Napoleon Relics.—By the death of Miss Isabella Mather, of Mount Pleasant, Liverpool, in her eightieth year, an interesting and valuable collection of miniatures will be added to the Liverpool Town Museum. About twenty-five years ago, when Louis Napoleon was in pecuniary difficulties, Mr. John Mather purchased from him or his creditors, through Mr. Joseph Mayer, a number of miniatures,—many of which were unique,—of the different members of his family, including the parents of Napoleon I., and of his most celebrated marshals. After Napoleon III. was declared Emperor he attempted to buy back the miniatures, but Mr. Mather declined to part with them, and by his will bequeathed them to the town on his sister's demise.

Books Received.

The Garden. Conducted by W. Robinson, F.L.S., author of "Alpine Flowers for English Gardens." London: 37, Southampton-street, Covent-garden, W.C.

The first volume of the *Garden* has been recently completed. It contains not only a great variety of matter connected with the laying out of gardens, and the principles by which the higher branches of horticultural work, in landscape or flower gardening, ought to be governed, but also many valuable hints, by various writers, as to the most correct and successful methods of connecting garden effects with those of architecture. Among the more prominent articles bearing immediately on the last-named subject are those containing discussions on the garden features of Versailles, and their successful blending with those of the adjacent palace, which are worthy of the serious study of architects who would wish the noble country mansions which they are erecting all over the kingdom to be fitly framed by judicious and harmonious surroundings. The articles on the great villas of the suburbs of Rome which arose during the fifteenth and sixteenth centuries, especially in connexion with the elaborately-designed garden features, are also well worthy of serious attention. Lastly, though not least in importance, we would call to notice the essays (especially those of the editor) in which the merits, or, rather, demerits, of modern gardens, designed with a view to the bedding system, and their invariable adjunct of ribbon-borders, varied only by geometrical masses of monotone colour, are treated of. The theories so forcibly urged in this section of his art should be diligently studied by all who are interested in those decorative features of horticulture which come into immediate contact with our houses, large or small. The editor, as well as several of his best contributors assure us, and apparently with sufficiently good reason, that the higher branches of horticulture are still in their infancy though symptoms of a rapid advance are now setting in; and the object of the publication is evidently to guide that advance in a proper direction. We can cordially recommend the publication to those members of the architectural profession who are interested in the progress of those branches of decorative horticulture which come more immediately in contact with the works of the architect; and we cannot close this brief notice without calling attention to a life of John Claudius London, commenced in the present volume, which promises to be exceedingly interesting and instructive. He was undoubtedly the hero of British horticulture and in other ways a very remarkable man. It will be recollected by many of our professional readers, that he was the founder of the *Architectural Magazine*, which was the first publication of importance devoted exclusively to the pursuits of that profession for the use of which the *Builder* was subsequently established, and it is admitted on all hands, that *London's Architectural Magazine* had, during the time of its publication, a marked influence on the progress of English architecture.

The Architects' Text-book of Useful Information for Engineers, Architects, Surveyors, &c. By FREDERICK ROGERS, Architect. London: Sprigg.

In the compass of 110 small pages, Mr. Rogers has booked a variety of information which will be found useful by students, especially as leading them to look farther elsewhere; and Mr. Francis Campin adds a Treatise on Civil Engineering occupying 125 pages, which speaks briefly but ably of waterworks, railways, canals, and so forth.

Books of this kind require very careful editing. In the architectural portion (to illustrate the observation), speaking of crushing weights, it is said of limestone,—“Upon three inch cubes [which by the way, may mean either of two things] Anglesea limestone, in four experiments, the average crushing weight was 7,579 lb. per square foot.” Provokingly diverse as the published accounts of experiments on stone and other materials are, all who know anything about the matter see that the above statement must be erroneous. Very soon after the author writes “the weight required to crush this limestone is 471.15 tons per square foot,” and the reader is satisfied that *for per square foot* in the statement, *per square inch* must have been meant.

Miscellaneous.

Opening of new Chime Clock and Bells at Walsden.—The new chime clock, which is now completed and fixed in the tower of St. Peter's church, Walsden, near Todmorden, has been set in motion, in the presence of the Bishop of Manchester, the vicar, churchwardens, and a large number of the inhabitants. The clock has been manufactured by Messrs. Gillett & Bland, chime clock factory, Croydon, and strikes the hours upon the tenor bell of 12 cwt., which can be heard for miles round, and chimes the four quarters on four other bells similar to those at Westminster Palace and St. Mary's, Cambridge. The time is shown upon two dials, each ft. 6 in. in diameter, the raised figures and minutes being gilt. The clock-frame is made of cast iron, on an improved horizontal plan, the advantage of which is that any single wheel can be removed at pleasure, without disturbing any of the other parts. It has a gravity escapement, and a compensated pendulum. The clock, including all the works, weighs over 1 ton, and is ft. 6 in. long, 3 ft. wide, and 3 ft. high. The hammer for striking the hours also weighs 1 lb. Messrs. Gillett & Bland are now making a great clock for Bradford Town-hall to strike a bell of 4 tons, and also a carillon machine, their patented system, to play fourteen tunes on thirteen bells, weighing altogether about 10 tons, which will cost about 5,000l.

Building Societies' Disabilities.—Among "slaughtered innocents" of the late session, the Building Societies Bill was one which deserved a better fate. Its principal object was to isolate the law of benefit building societies, and to remove the necessity of which has long been a burden to them. The *Law Magazine*, referring to it, says,—"First, the power to borrow must be limited, defined, and limited; and the directors and managers of these societies relieved of the heavy responsibility many of them have incurred in this respect. Second, provision must be made for the realisation of the properties of these societies, in the event of winding-up, by a method less ruinously costly than the compulsory process of the Court of Chancery. Third, the sense of legislation must be adapted to the present state of the law with regard to friendly societies, and to those more enlightened modern societies which tend to simplify the incorporation of societies, and to sweep away the cumbersome machinery of trusteeship. Few persons are aware of the extent of the transactions of these societies, and the amount annually distributed by them in the way of advances for building may be measured by tens of millions of pounds."

Mosing of Holland-street, Blackfriars.—London, Chatham, and Dover Railway Company have closed that part of Holland-street which passes under the Blackfriars passenger bridge, between Blackfriars-road and Green-lane, and the carriage traffic to and from Blackfriars, from the east side of the railway in Holland-street, is now diverted along Green-lane and Southwark-street into Blackfriars-road. The pedestrian traffic between the two points is, however, to a certain extent impeded, the railway company having constructed a subway, which is reached by descending flights of steps in Blackfriars-road and the land-street and Green-walk junction. The way is lighted with gas. There are iron gates at each end, which will be closed between 10 o'clock p.m. and five o'clock a.m., the foot-traffic being thus diverted round along Southwark-street and Green-walk into Holland-street. The railway company thus absorb into a goods station under the railway level an area of about 1,500 square yards, or nearly one-third of an acre in extent, in consideration of which they have converted Green-walk, between land-street and Southwark-street, into a thoroughfare for carriage traffic twenty yards wide.

rick-kilns.—In the design of Mr. A. Batchelor of Brockham, Surrey, for improved kilns for firing bricks, pottery, and lime, a series of distinct kilns are so arranged round one non-furnace as to allow of three of them being worked in rotation for drying, burning, cooling, while the fourth is in reserve, ready for refiring. The kilns save, according to the inventor, from four to five cwt. of fuel per thousand bricks, and reduce the ordinary time of burning from ninety-six to forty hours, result being obtained by utilising all the heat given off from the burning bricks.

Town Sewage.—Mr. A. Aird, of the firm of J. & A. Aird, of Berlin, engineers, writes under date of the 16th ult., to Mr. J. T. Mechi:—"About twelve years since the Prussian Government sent over a Commission to England to report on sewage works, and somewhat later (Gehim-rath Wiché prepared a detailed project for the town of Danzig (population 100,000), including a proposition to utilise the sewage water on the waste lands by the seaside at Neufahrwasser, two miles from Danzig. We have carried out the works, and the same have been in operation during the past twelve months. The Government made the house connexions compulsory, so that the sewage water is unusually strong. We have also undertaken the pumping, flushing, and maintenance for a term of thirty years, the municipality granting us as compensation the sewage water and possession of 2,000 acres of land for the same period. This land was partly forest, but chiefly a sandy desert, in which nothing could grow. We have this year planted and irrigated rather over 100 acres, with really marvellous results,—since May five crops of eye grass; potatoes and beetroot of enormous size."

Paper Wheels for Railway Carriages.—The contemplated introduction of paper wheels for railway carriages is again spoken of, this time in the *Philadelphia Ledger*. It is stated that a Connecticut railroad is about to make a trial of the so-called paper car-wheels under the forward truck of their locomotives. These wheels are costly, but run safely and easily. They have been known for some time to car-builders, but their introduction into general use has been prevented by the expense:—

"Sheets of common straw paper are forced into a compact mass by a pressure of 350 tons. The mass of paper is turned perfectly round, and by a pressure of 25 tons a hub is forced into a hole in the centre. This paper wheel, by a pressure of 250 tons, is next forced into a steel tyre, with a quarter of an inch bevel upon its inner edge. Two circular iron plates are then bolted on to the tyre to keep the paper filling in place. By this arrangement the steel tyre rests upon the paper only, and partakes of its elasticity. It is claimed that these wheels wear longer than those of any other description, injure the trucks less, and run with less noise."

Death of the Clerk to Metropolitan Board of Works.—Mr. John Pollard, who has for some years served the public as clerk to the Metropolitan Board of Works, died on Wednesday last week. For several months past the deceased gentleman had suffered severely from diabetes, and the Board, in consideration of the state of his health, allowed him a long respite from the performance of his duties. In 1868 he was appointed an assistant clerk to the Westminster Commissioners of Sewers, and he held that position under successive Sewers Commissions and the Metropolitan Board of Works until 1859. In that year Mr. Woolrych, one of the present magistrates at Westminster Police-court, resigned the office of clerk to the Board, when Mr. Pollard, as the senior officer, was appointed in his stead. The deceased was in his 57th year at the time of his death. We understand that the office filled by Mr. Pollard was worth 1,000l. per annum. Mr. J. E. Wakefield has acted as clerk to the Board during the illness of his chief.

A Cottage Hospital for Paulton.—A cottage hospital has been opened at Paulton, in Somerset, the ceremony being preceded by divine service at the parish church, and a sermon by Lord Hervey, bishop of the diocese. The want of a cottage hospital has long been felt in the district, which has a population of 10,000 persons within a radius of a mile and a half, and including as it does extensive collieries, the workers at which are liable to many dangers and accidents. Hitherto the patients have had to be conveyed to the Bath United Hospital, a distance of nine or ten miles. A house in Paulton, standing in a field, and well adapted for the purpose, has been taken and fitted up as a cottage hospital. The institution will be open to all cases of accident and illness, except those of a contagious character. Patients who are in a position to do so will be expected to contribute to their maintenance while within its walls, where clothing and all necessaries will be provided for them.

New Memorial Brass in Exeter College Chapel, Oxford.—We learn from the *Oxford Journal* that a memorial brass has just been placed in the chapel of Exeter College, in memory of Arthur Looman Burleigh, late Comptroller of the College, and of Cotham, near Bristol, where he died in May last. The work was done at the expense of the deceased's Undergraduate friends.

Proposed South London Museum.—A meeting of the inhabitants of South London has been held for the purpose of establishing a "South London Museum and Free Library." The chair was taken by Mr. F. J. Clements. It was stated that a committee, which had been formed of influential people in South London, had obtained a site for the proposed museum where the Rectory of St. Mary's, Newington, Newington-butts, which is, with the church, to be swept away, now stands. The cost of the proposed building would be between 30,000l. and 40,000l., and it was proposed to open it in two years. It was resolved "That the gentlemen present at this meeting are hereby formed into a committee, with power to add to their number, and that those who are supposed to be favourable to the project be invited to join."

Royal Architectural Museum.—A member of the Council (Mr. William Brindley) has arranged to deliver a series of Practical Explanations of the Architectural Ornament Casts in the Museum, with a view of increasing its usefulness and benefiting art-workmen and others interested, on four Saturday afternoons, to commence at a quarter past three, p.m. Admission free. Workmen will be welcome in their working clothes (the council say), but will best consult their own dignity by putting on a decent coat. The course will run:—"Saturday, Nov. 2, Greek, Roman, Romanesque, and Byzantine; Nov. 9, Norman, Early French, and Transitional to Early English (First-pointed); Nov. 16, Early English and Early Decorated (Early First and Second, or Middle-pointed); Nov. 23, Decorated and Perpendicular (Second or Middle and Third-pointed)."

Public Baths and Washhouses in Hackney.—A public meeting has been held in the townhall, Hackney, to consider the expediency of adopting the Public Bath and Washhouses Act of 1846. Mr. John Kelday occupied the chair. Mr. John Holms, M.P., was present, and a letter of apology was read from Mr. C. Reed, M.P. Mr. Runtz moved the first resolution, to the effect that the meeting, acting upon a resolution passed at a meeting of the vestry held on the 5th of April, considered that, as the question had been before the Parliamentary committee of the vestry for six months, the time had arrived for the ratepayers to take action in the matter. Mr. Johnson moved an amendment practically annulling the resolution, and, after a discussion carried on amid some impatience on the part of the meeting, the resolution was carried.

The Church Institute, Leeds.—The large lecture-hall has been decorated throughout by Messrs. Powell, Brothers, of Leeds, under the direction of the architects, Messrs. Adams & Kelly, of the same town. The wall decorations consist of a dull green dado, powdered with pomegranate in white and gold. Above this is an alternate treatment of the rose and the lily, whilst above this again the walls are lined out in courses of ornamental bricks on a greenish grey ground. It is also intended to have subjects from church history painted in all the wall panels; one, the landing of St. Augustine in Britain, has already been done. The hall has been further enriched by the introduction, in the east window, of stained and painted glass by the same firm who did the wall paintings.

The New Pumping Station at Pimlico.—The Metropolitan Board of Works have accepted two tenders from Mr. Webster, the contractor, who completed the Sewage Pumping Stations Nos. 1 and 2 at Crossness and Abbey Mills—the first, for the erection of the No. 3, or Western (Sewage) Pumping Station at the Grosvenor Basin, Pimlico; and the second, for supplying and fitting it up with engines, gear, and all requisites. The competitors were numerous, and there was a marked difference in the estimates, the accepted ones being respectively—for the buildings, 126,950l. against 135,950l. (highest); while for the engines, &c., Mr. Webster's tender was 56,789l. against 98,038l. (highest), and 55,810l. (lowest). Preparation is being made for the immediate commencement of the work.

Status of Sir Robert Peel.—Mr. Theed has completed the colossal statue of the late Sir Robert Peel, which he was commissioned to execute for Huddersfield. It is executed in white marble, and represents the deceased statesman in his official robes as Chancellor of the Exchequer, hearing a roll of parchment in his hand and addressing the Senate.

Great Extension of the Liverpool Dock Accommodation.—An elaborate report by Mr. Lyster, the engineer to the Liverpool Dock Board, is being circulated largely among the commercial associations of the port, and the proceedings of the special committee appointed to bring the matter to this bearing have been confirmed by the Board. Notice has been given by Mr. Forwood of his intention to move that the plans be included in the Bill to be promoted in the ensuing session of Parliament. The engineer states that the scheme in its entirety would take twelve or thirteen years to complete, if all taken in hand at once. The Dock Board, however, have the report still to consider and decide upon.

Old House at Putney.—Messrs. Adamson & Sons inform us that they are about to pull down a house in the High-street, Putney, known as Essex House, which was built in the year 1596, no doubt for the Earl of Essex. There are some very old plastered ceilings (of that date), with the royal arms of England and the initials of Queen Elizabeth upon them, and that queen is supposed to have passed some time at this house. They say that if any architect or other person interested in relics of the past wish to see the old house before it is pulled down, they will be happy to enable him to do so on application to their office in the High-street.

The Dock Excavations at Chatham.—During the excavations for the large docks and basin at St. Mary's Island, for the extension of Chatham Dockyard, from time to time the remains of large numbers of Frenchmen have been discovered who died during the time they were detained here as prisoners from the Peninsular war. The remains have been re-interred in selected ground, and a handsome monument is to be erected to mark the spot. The monument will be some 20 ft. or 30 ft. high, the base of it being very massive; it will be made of white and red polished marble, granite, and Portland stone, some of it being carved. The work is being executed in St. Mary's Prison.

Church Building on the Yorkshire Wolds. The vicar and churchwardens of Weaverthorpe, as representatives of the inhabitants of one of the most populous villages of the Yorkshire Wolds have presented Sir Tatton Sykes with a silver trowel, with ivory handle, beautifully carved; ivory mallet inlaid with silver; and other marks of the appreciation in which his work of church building and church restoration is held. Sir Tatton Sykes has, during the last few years, built and endowed a church at Thixendale, built a new church at Fimber, restored the church at Weaverthorpe, built a new church at Helpertorpe, and is now rebuilding the churches at Lutton and Kirby-Grindalby, all on the Wolds.

Baths on the Thames.—The Chelsea Vestry have received from Capt. Roberts, C.E., a letter stating he has made application to the Metropolitan Board for a concession of the foreshore within the area required for the Chelsea Embankment as a site for public baths, soliciting the vestry's moral support and an assurance that no assessment shall be made upon the property or building. The site would not interfere with the subway or the outfall sewer. The capital for the undertaking, and Mr. Webster, the contractor, were ready, he said, to carry out the works. The vestry took no action.

The Maidstone Public Gardens.—An interesting ceremony has taken place at Chillington House; Mr. Edward Hoar, on behalf of Mr. Jubus Brencley, having formally presented to the mayor and corporation of Maidstone, a deed conveying to them, in trust for the public of Maidstone, the gardens at the rear of the Museum building, purchased by and laid out at the sole cost of Mr. Brencley.

The Biggs' Memorial, Leicester.—The first stone for the Biggs' Memorial, comprising the pedestal for the reception of the statue in the Welford-place has been laid in the presence of numerous spectators, by the honorary secretary, under the direction of Mr. John Finn, of Leicester, stonemason, under whose superintendence is placed the fixing of the pedestal and statue. Money having been deposited on the stone by the honorary secretary, the workmen engaged were regaled with refreshments.

The Great Bell for Cologne Cathedral.—French guns are to be used for this, and the work has been commenced.

Analysts under the Adulteration Act.—A committee of the Whitechapel District Board of Works have been considering the question of appointing an analyst under the new Act, and have recommended that neighbouring Boards should be first of all written to, to know whether they would be willing to co-operate in the appointment of an officer conjointly. It was also resolved to make inquiries as to what the services of a competent analyst would cost. It thus appears that not much work is expected from a district analyst, which seems to mean that the Act will shortly be shelved altogether.

The Institution of Civil Engineers.—The fifty-sixth session of the members of this body will be commenced on Tuesday, the 12th of November. During the recess the premises occupied by the Institution in Great George-street, Westminster, have been elaborately decorated, especially the theatre, and additions have been made to the library.

New Church for Oxford.—According to the *Church Herald*, a large and handsome church is to be shortly erected in the parish of Cowley St. John, Oxford, in the memory of Dr. Longley, the late Archbishop of Canterbury, who was at one time curate of Cowley. A site has been secured, and it is proposed to erect the edifice at a cost of 20,000l.

Fire at the Post-Office.—A fire was said to have broken out a few days ago in the new Post-Office buildings in course of construction at St. Martin's-le-Grand. Although the rumour proved true, the fire was early discovered, and the flames, which were confined to a few shavings and beams, were extinguished ere a Fire Brigade engine arrived.

Society of Biblical Archaeology.—The session will be opened on Tuesday, the 5th of November, when several papers will be read, including "On an Assyrian Prayer," and "On the Religious Beliefs of the Assyrians," by Mr. Fox Talbot; and "On the Tomb of Jacob at Shechem," by Professor Donaldson.

Opening of a Russo-Greek Church.—The very unusual circumstance of the opening of a Russo-Greek Church in England, with an Englishman as the priest, took place on Wednesday in last week in Wolverhampton.

A Use for the Pyramids at last.—The Khedive of Egypt, with the spirit of a true utilitarian, has commanded a French engineer to convert the tops of the Pyramids into light-houses for the benefit of the Nile sailors!

Institution of Surveyors.—The first ordinary general meeting of the session will be held on Monday, November 11th, when the president, Mr. Edward Norton Clifton, will open the session with an address.

New Mansion for Lord Lorne.—It is said to be the intention of the Marquis of Lorne to build a new mansion at Macharoch, in Kintyre, larger and more substantial than the present one.

Truth in Hyperbole.—"See Naples and die," says an Italian proverb. "I saw it," says an American traveller,—"I saw it and survived; but it was a narrow squeak, for the stench of it nearly killed me."

The Southampton Dock Company's Offices.—The new building which we called of stone is, we find, faced with the *Exbury* white bricks, made by Messrs. Charles Hooper & Co.

The Female School of Art.—The exhibition of students' drawings will be open at 43, Queen-square, this Friday (November 1st), morning and evening, and on Saturday morning.

TENDERS

For the erection of a warehouse, Well-street, Cripplegate, for Mr. W. Williams. Mr. N. S. Joseph, architect. Quantities by Mr. T. J. Green:—
Hill & Son £1,200 0 0
Langmead & Way 4,197 0 0
Conder 4,069 0 0
Ashby & Son 4,020 0 0
Brass 3,963 0 0
Browne & Robinson 3,960 0 0
Kilby 3,847 0 0
Merritt & Ashby 3,810 0 0
Perry, Brothers 3,794 0 0
Henshaw & Co. 3,737 0 0
Crabb 3,742 0 0
Newman & Mann (accepted) ... 3,645 0 0

For building ten cottages at Wimbledon, for Mr. Thos. Lyon. Mr. J. Comfort, architect:—
West (accepted) £1,550 0 0

For schools, St. Peter's Park, Paddington. Messrs. Vige & Philpot, architects:—
Aitchison & Walker £1,198 0 0
Conder 1,128 0 0
Gregory, Brothers 1,060 0 0
Dove, Brothers 1,065 0 0
More 1,062 0 0
Longmire & Burge 1,045 0 0
Temple & Foster 1,034 0 0
Olsen 970 0 0
Thompson & Smith (accepted) ... 893 0 0

For oak fittings to retail portion of Messrs. Fulton & Sons' new premises, Reading. Messrs. Wm. & J. T. Brown, architects. Quantities supplied:—
Sheppard £268 10 0
Woodruff 682 0 0
Dunn 662 0 0
Barnicoat 648 0 0
Mathews 642 0 0
Aitchison & Walker (accepted) ... 490 0 0

For alterations and repairs to Primitive Methodist Chapel, Saffron-street, Commercial-road, London. Messrs. Thos. & Wm. Stone, architects:—
Langmead £287 0 0
Goodman 219 0 0
Thompson 217 0 0
Fitzgrew & Co. 196 0 0

For finishing two houses and stables at Queen's-gate, Kensington, for the West London Commercial Bank:—
Fish £752 0 0
Stimpson & Co. 739 0 0
Palmer 666 10 0
Knight (accepted) 624 10 8

For proposed new public elementary schools in Great Hunter-street, Southwark, for the London School Board. Mr. F. W. Roper, architect. Quantities supplied by Mr. A. L. Buzzard:—
Sewell & Sons £3,583 0 0
Thorn & Co. 3,398 0 0
Shepherd 3,388 0 0
Williams & Son 3,385 0 0
Dove, Brothers 3,275 0 0
Conder 3,242 0 0
Hill & Son 3,240 0 0
Wicks, Bangs, & Co. ... 3,170 0 0
More 3,071 0 0
Newman & Mann 2,986 0 0
Ennor 2,931 0 0
Marsland & Sons 2,900 0 0
J. & F. Coleman 2,850 0 0
Foster 2,850 0 0
Perry, Brothers 2,801 0 0
Roberts, Brothers 2,784 0 0
High 2,743 0 0
King & Sons 2,480 0 0
Merritt & Ashby 2,193 0 0

For new schools, Johnson-street, Stepney, for the London School Board. Mr. T. Roger Smith, architect. Quantities supplied by Mr. Thos. M. Richmond:—
Hill & Son £12,740 0 0
F. & J. Wood 12,693 0 0
Williams & Son 12,690 0 0
Newman & Mann 12,468 0 0
Dove, Brothers 12,475 7 6
Roberts 11,794 0 0
Ennor 11,753 0 0
Hobson (accepted) 11,550 0 0

For sewerage works at Southborough, Kent. Mr. William Henry Wright, engineer. Quantities supplied:—
Rison £4,887 5 6
Kershaw 4,713 17 0
Pollard & Goldsmith 4,575 0 0
Symonds & Co. 4,375 0 0
Marshall 4,200 0 0
Punnett & Son 3,733 9 9
Blackmore & Howard (accepted) ... 3,091 0 0

For the erection of warehouse and buildings on the Holborn Viaduct and Snow-hill. Quantities by Mr. W. Birdseye. Messrs. Fress & Lines, architects:—
Browne & Robinson £42,178 0 0
Brass 32,950 0 0
Myers 3,861 0 0
Hill & Son 30,288 0 0
Ince 27,787 0 0
Fish 29,300 0 0
Conder 25,408 0 0

For alterations to the "Lord Hill" Bayswater, for Mr. Gascoyne. Mr. Cotton, architect. Quantities not supplied:—
Kelly, Brothers £232 0 0
Capps & Sanders 735 0 0
Brown 715 0 0
Beach 647 0 0

For partly rebuilding 72, Ludgate-hill, for Messrs. Gabriel. Mr. W. E. Williams, architect:—
Kilby £1,097 0 0
Jacobs 1,045 0 0
Foster & Chapman 1,020 0 0
Marr 895 0 0

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Mr. M.—F. H. H.—M. D.—H. C.—H.—F. J. W.—E. J. T.—J. R.—W. C. T.—C. H.—S. B.—A.—G.—M.—T. W.—W.—G. T. G.—J. H. H.—J. R.—H.—& Co.—S. T.—W.—L.—S.—R.—E.—G.—R. A. D.—J. R.—J. W.—G.—C.—E. T.—A.—B.—Simple Simon.—Architect and Sub-Editor.—Old Architect.—Colonel P.—H.—S.—Subscriber.—W. S.—H.—F.—A.—L.—B.—J.—B.—C.—H.—N.—H.—M.—W. H.—W.—T.—A.—G.—A.—H.—Mr. S.—J.—A.—W.—E. A.—A.—S.—R. P.—T.—W.—G.—R.—C.—G.—W.—E.—F. (if for his master's work "an architect's pupil who has paid a handsome premium" may very rightly expect penials to be provided for his use).—J. B. C. (pres.). "Education in Scotland" (in type).—A Victorian Builder (in type).—"Craftsmen and Architect" (in type).
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GODFREY DEVEREUX HARRISON, Deputy Clerk of the Peace. Walslop, October 17th, 1872.

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J. L. DU PLAT TAYLOR, Secretary. East and West India Dock-house, Billiter-square, 22nd October, 1872.

UPPINGHAM UNION.—THE PUBLIC HEALTH ACT, 1872.—The Rural Sanitary Authority of the Uppingham Union are desirous of receiving applications for the APPOINTMENT of an INSPECTOR of NUISANCES for the Union, which comprises thirty-six parishes, and contains a population of 17,252, and an area of 48,236 acres. The appointment will, in the first instance, be to the 25th of March next, and the salary at the rate of 1200 per annum. The Inspector will be required to devote his whole time to the duties of his office; to make perfect sanitary surveys of the whole Union, and report generally upon its condition and requirements; as well as to perform all the duties of Inspector prescribed by the Sanitary Acts. Applications, with testimonials, to be delivered at the Office of the Union in the Morning of SATURDAY, the 3rd of NOVEMBER next. The candidates only whose testimonials are approved will receive notice to attend the meeting of the Committee at the Board-room, Uppingham, on WEDNESDAY, the 13th day of NOVEMBER, when the appointment will be made subject to the approval of the Local Government Board.

J. L. DU PLAT TAYLOR, Secretary. Uppingham, October 29th, 1872. WILLIAM H. BROWN, Clerk.

SUPERINTENDENT OF ROADS AND WORKS FOR THE PARISH OF HAMMERSMITH.—The Board of Works for the Parish of Hammersmith hereby give notice, that they will be prepared to consider APPLICATIONS from CANDIDATES, between the age of thirty and fifty years, for the above Office, on WEDNESDAY, the 6th day of NOVEMBER, 1872. The person elected will be to hold the Office for 12 months, to be held at Haggerston House, Hammersmith, W. on WEDNESDAY, the 6th day of NOVEMBER, 1872. The person elected will be to be paid the rate of 10s. per week, will be required to live on these premises, with the privilege of gas, fuel, &c. in consideration of which he will have to undertake the charge of the work premises, and perform all the duties attached thereto, and will have to devote the whole of his time to the duties of his office.

Information as to the nature and extent of the duties to be performed may be obtained at Broadway House. Applications to be in the Candidate's own handwriting, stating age and previous occupation, accompanied with testimonials, must be sent here on or before the 3rd of NOVEMBER in the morning of the 3rd of NOVEMBER, addressed to the Chairman, and have written thereon "Application for the Office of Superintendent of Roads and Works for the Parish of Hammersmith." No travelling or other expenses will be allowed.—By order, THOMAS EDWARD JONES, Clerk to the Board. Broadway House, Hammersmith, W. 29th October, 1872.

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WANTED, by a first-class PLUMBER and GASFITTER, a Constant SITUATION. Address, H. J. 2, Grove-village, St. Peter's-grove, Hammersmith, S.W.

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WANTED, by a Young Man, aged 27, a SITUATION as FOREMAN of JOINERS' WORK, with a good Reference. Has served three years' apprenticeship as a Carpenter and Joiner. Country preferred. Good references.—Address, No. 656, Office of "The Builder."

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WANTED, a Constant SITUATION, as good PLUMBER. Can do zincwork, and has no objection to fill up time in stone planing or painting if required.—Address, G. G. Plumber, 3, Tooting-place, Tooting Park, Holloway, N.

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WANTED, by a practical London Plasterer, to TAKE PLASTERING (Piecework). Good references given.—Address, 650, Office of "The Builder."

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The Builder.

VOL. XXX.—No. 1553.

Railway Facts and Promises.

THE Board of Trade has issued its official statement of the position of the railways of the United Kingdom at the close of the year 1871. Under the provisions of the Railways Act of last year, every company is now bound to make a special return to the Board of Trade, for statistical purposes. Wherever the blame may lie, it is not creditable to our character for organisation of intelligence to find that there is so much difference of result between two methods of inquiry, founded upon absolutely the same data. The present return credits the empire with the possession of 161 miles of railway at the end of 1871, short

of that of which we were said to be in possession at the close of 1870. We propose, however, not so much to enter into any minute detail as to inquire into the broad results of our great national means of intercommunication, both with reference to the present and the future. And we think that our readers will more readily grasp, and more easily remember, the inferences that we shall venture to suggest from the statistical aspect of the case if we offer them approximately round numbers, instead of copying exact details; which are important in arriving at accuracy, but which lose their value when apparent in an ultimate form.

So far back as the year 1866 the authorised capital of our railways had attained the amount of 620,000,000*l.* sterling. The actual expenditure of capital, however, up to last Christmas, we now learn was only a little over 550,000,000*l.*, showing a drawing in of earlier anticipations to the extent of 70,000,000*l.*, or more than ten per cent. of the whole outlay authorised by the legislature. The mileage stated is 15,376 miles, which may be compared with that of Franco on the one hand, and of America on the other, as being one-half as much again as the first, and about one-fourth of the second. We have before us the statements that the French lines, in 1867, amounted to a length of 15,639 kilometres; and that the United States railways, in 1871, made a run of 60,852 miles. The former had cost about 80,000,000*l.*; the latter, about 1,800,000,000*l.* Our own railway outlay, last year, produced the net earning of 49,000,000*l.*, or 4·65 per cent. on the capital invested.

These large figures are enough to show that a national interest of primary magnitude is here at stake. The last forty years have witnessed an entire revolution in the internal communications of this, as well as of most other civilised countries. The impetus given to production and to commerce has been unexampled. But what we wish more particularly to hold up to view is

this. Our railway property, in the Imperial ledger, may be regarded as the *per contra* of our national debt. The balance is almost exact. For, while the nominal capital of the latter is that of the former something in the proportion of 8 to 5½, the dividends are in an inverse ratio. We have 4½ per cent. on the latter against 3. Now, while to a private individual it makes little difference whether he draws his annual income from funds or from railway stock, the case is entirely different as regards the country. It is a case in which the whole is *not* equal to the sum of the parts. This paradox is explained when we inquire into the nature of the parts. When A. gains what B. loses, the gross gains of A. plus B. bear no relation to the gain of A. But the 26,000,000*l.* of annual income from our railways is direct produce. It is as much added to the national wealth as if it were so much more corn produced from our fields by improved cultivation. For while, it is true, the amount is made up by the contributions of passengers and freighters, we must remember that each journey and each despatch, on the average, not only pays its own cost, but is an actual source of profit to the traveller or the freighter. It is like money laid out in seed or in ploughing.

Our 550,000,000*l.*, therefore, are *bona fide* property, rooted to the soil, and earning a fair and tangible income, in addition to its incalculable results in accommodating the march of commerce. The 26 millions per annum which it returns is sheer gain to the nation, and good rent (*reditus*, return) to the proprietors. But the 23 or 24 millions which go to the fund-holder—as *reditus*, we freely admit, for money which he found for the nation at a pinch,—has to be raised annually by taxation. Good faith must be kept; but, as far as the nation is concerned, railway capital is to the credit, and funded debt to the debit, side of the account. The former may bewitch advantage increased, and largely increased. It would be a national relief to extinguish the latter; and every statesman endeavours, either by lightening the incidence of taxation, or by formal redemption, actually to reduce it.

Of our gross intake of 49 millions, 26½ millions are derived from goods traffic. When we compare, on the one hand, the cost, and, on the other hand, the return, of conveying a ton of goods and a ton of passengers, it is pretty clear that the development of the two branches of the carrying trade must be regulated by very different principles. In all great commercial undertakings, two opposing interests have to be regarded: those of the buyer, and those of the seller. The subject is complicated, at first sight, by the intervention of the merchant or middleman. But, as far as the purchaser is concerned, the distributor must be ranked together with the producer. Now the great problem which the managers of the railway companies have been endeavouring, for the last third of a century, to solve, has been how to procure the largest returns from the public. Whatever they have given of luxury of carriage, high velocity of transit, or moderation of fare, has been, so to speak, tentative. When they have had, or thought they had, a monopoly, they have run their shabbiest and most uncomfortable vehicles, and timed their trains to their own convenience, and not to that of the country. When competition has arisen, they have endeavoured by frequent, rapid, well-appointed, low-priced trains to take the bread out of one another's mouths. We are not imputing this to any company as a stigma; it is the natural and certain outcome of the principle of commercial competition. But it should be remarked that it is due to this cause, and to this alone, that statistical elements of comparison have been placed within the reach of the engineer. By trying how to gain traffic in one direction, and how to keep it in another, our railway companies have accumulated an experience

which would not, by this time at all events, have been otherwise gained.

Thus it will be remembered by those whose personal acquaintance with the subject stretches back to the years 1833 and 1834, that the main reliance of the engineer of that time as to his future passenger income was placed upon the first-class passenger. The mail coach was, indeed, the only guide as to traffic to which we could then look. Thus everything was planned, in the start, for a first-class traffic. Comfort in carriage, speed, station accommodation, all were designed for the same end. Nor was this all. Purposed discomfort and discouragement were thrown in the way of the second and third class travellers. The luxurious travelling saloons of the Great Western, which, when quite new, were unrivalled for their luxury, were contrasted with the odious cattle-pens in which the unfortunate third-class passengers were permitted to make a wretched use of the new means of transport. This was, perhaps, the extreme case; but the same principle was in operation on every line of railway, more or less apparently.

What do we find now to be the case? Let us ask the Board of Trade. Their return replies that nearly seven-tenths of the whole number of passengers are third-class; two tenths are second-class; one-tenth alone are found to be those first-class passengers on whose support, in the first instance, we principally relied. So striking and indisputable a fact ought not only to be borne in mind, it ought to be accepted as indicating the propriety of a reconsideration of the entire general arrangements of our railway traffic. Our system was, in the first instance, and to a great extent still is, arranged with an express reference to the special requirements of one-tenth of the passengers.

If we look at receipts, they are respectively from the first, the second, and the third class passengers—4,000,000*l.*, 5,000,000*l.*, and 8,000,000*l.* Nor must it be thought that the net profit derived from the three classes is to be estimated by a comparison between the numbers conveyed, and the amount earned. The total passenger receipts, including season ticket-holders, who do not figure in the above division, was over 18,000,000*l.* in 1871. While one-tenth of the amount (or perhaps, more accurately speaking, one-tenth of the 17,000,000*l.* before indicated) is less than the half of the fares paid by the best accommodated part of the passengers, it by no means follows that the latter are doubtfully profitable to the railway company. Luxury of accommodation, speed, all that depends on the carrying out of our original idea as to the true source of income, make it far more expensive to earn these four millions than would be the case if the attention of the companies were directed, in the first instance, to the practical and business-like conveyance of the bulk of their traffic; and, in the second place, to the provision, not often than once a day as a general rule, of those special luxuries, both of vehicle and of speed, which cost so much more to the line, and for which 10 per cent. of the travellers are willing to continue to pay.

We are of opinion, then, that a great change is indicated as necessary in the future management of our railways. The traffic which, properly regulated, will be the most lucrative in its net results is the third class. It is this, also, of which the future development may be made to assume the largest proportions. The facts before us show that the source of income thus open is one of incalculable fecundity. What a third-class traffic, properly organised, may amount to, must be inferred from the fact that this kind of traffic, hitherto so much discouraged, forms already seven-tenths of the whole in numbers, and eight-sevenths in actual returns.

We are not asking for anything Utopian. To see a Welsh cattle-driver, as we have seen him years ago, seat himself on one of the velvet

faucets at Swindon, and look round on the then unprecedented elegance of the refreshment-room with the art of a master, is a degree of communism not sought for. Moreover, it is one which, from the nature of things, could only be of very transitory duration. But what we advocate, and what we are sure must be done, sooner or later, by every railway that will hold its own, is, to make a serious and scientific application of the resources at their command to the best accommodation of the wants and habits of the great mass of their customers. To attempt to give more than a proper return for the fare is unwise. Luxury of vehicle is not to be expected; but decent convenience is. Drafty open carriages, made uncomfortable on purpose, should be rectified or abandoned. If not, perhaps some day they may be smashed. Great velocity, knocking everything to pieces in order to gain a few minutes of little productive value, is not demanded. But fair and reliable punctuality is. And so is the timing of trains, early and late, to suit the habits and requirements of the working man.

Again, it is not necessary to maintain a great establishment of porters to hurry with his luggage, arriving forty seconds beyond the time fixed for starting, to the goods van. The third-class passenger is rarely overburdened with luggage. What he brings he mostly carries for himself. In this respect, as in those of cost of vehicle, and of rate of running, he is a far less costly customer than the first-class passenger. But then ordinary, quiet, decent civility is due to him who is, we repeat, the best customer. Let no one feel that he need blush to ask for a third-class ticket. Let no one find that his production of one elicits a saucy sneer. *Suum cuique.* Luxury of attendance to those who choose to pay for it. Fair accommodation, as per bargain, to the man who travels by the cheap train as a matter, not of pleasure, but of business.

With regard to the goods traffic, the elements for dissecting the relative profit which it earns are not readily offered by the reports, nor indeed are they, in all particulars, easy to grasp. 67,000,000 tons of general merchandise have been carried for a charge of nearly 151 millions sterling. Of course the distance for which this has been done is a main feature in the cost. Of the 180,000,000 train miles run in the year 1871, about half are credited to the passenger and half to the goods traffic. But goods and mineral trains are so much intermixed that it would be very difficult to arrive at the respective gross and net earnings of these two descriptions of traffic. 10,000,000^l. have been received for the transport of 80,000,000 tons of minerals. Even these rough totals indicate the great error of the railway companies in grasping at that description of traffic that would, with far more advantage, be water-borne. We may roughly take the probable goods mileage as equal to the mineral mileage. (In point of fact, it must be larger, as the radius of the true mineral transport is restricted, and that of the goods is more proportionate to that of passengers.) Thus we have a ton of minerals earning $\frac{1}{10}$ of a pound, against a ton of goods earning $\frac{1}{10}$ of a pound, or as 125 to 231. The mineral trucks are less costly than some of the merchandise trucks; but the destruction both of plant and of permanent way that is due to this traffic is very large; and mineral traffic, to a great extent, is all in one direction, so that the cost of returning empty wagons, which is not at all felt in passenger traffic, and only to a limited and calculable extent in goods traffic, is here a constant source of expenditure. When we add the fact that the greater number of accidents are traceable to the interference of mineral (or sometimes mixed merchandise) trains with the punctuality of the service of the lines, we find another proof of the importance of reconsidering the question of water-carriage. The railway companies are already owners of much of our admirable but neglected system of internal water communication. In all cases where time is not an object, we strongly suspect that the dividends of the proprietors would be amended, though the nominal income of the companies might be reduced, by turning the mineral and heavy goods traffic on to the canals.

Four hundred and fifty thousand pounds have been paid, in the year 1871, by railway companies for damages, two-thirds of which were for personal injury, and one-third for damage and loss of goods. This charge amounts to 1.75 per cent. on the net earnings, and has reduced to 4.65 per cent. on the capital an average dividend that would otherwise have reached 4.73 per cent. Let every railway proprietor study these im-

portant figures. He is mulcted by this income-tax of 1l. 15s. out of every hundred pounds of his net returns, to pay for avoidable accident. Yes, avoidable!—that is the plain truth. Whether we trace the actual cause of collision to the overworking of underpaid men (a matter which is, perhaps, tending, rather abruptly to right itself); to the gross neglect of punctuality; to the attempt to convey over a line traffic which ought to flow through some other channel; or to some other cause; there is no doubt that railway accidents, as a rule, are avoidable. That the proprietor should not insist, at all events, on the adoption of that system of universal maximum assurance for every passenger which we have before proposed in these columns, is one of the things that we fail to understand. As it is, every railway proprietor accepts a tax of nearly two per cent. on his income, in order to pay compensation for accidents.

With reference to the relative proportions of length of railways completed in this country, in France, and in the United States, to which we above referred, the areas and the populations of the respective countries must be compared, in order to arrive at any instructive result.

Thus the 9,754 miles of French railways were distributed over an area of 210,000 square English miles, the population of which in 1866, was 38,192,064.

The 60,852 miles of American railways ran through a country of the area of 3,542,903 square English miles, of which the population, in 1860, was 31,574,919.

Our own 15,376 miles serve an area of 122,511 square English miles, of which the population, at the middle of the year 1869, was estimated by the Registrar-General as 30,611,305.

Thus, while we have a mile of railway to every 2,000 souls, the French have only about half that rate of accommodation; while, in America the figures give the extraordinary proportion of a mile of railway to less than every 600 inhabitants. But, on the other hand, while the United Kingdom has nearly a mile of railways for every eight square miles of territory, France has only a mile to every 21 square miles; and the enormous area which at present constitutes the United States, has only a mile of railway to an area of 59 square miles. This is a remarkable gauge of the energy and of the future of the respective populations. We give the actual figures for the satisfaction of our readers, as the results are so striking. The English area and population are given by the Registrar-General; the French and American by the Almanach de Gotha.

We must remember, too, that our total length of railways is yet by some 5,000 miles shorter than that of the turnpike roads, which, in 1854, were held by 1,000 separate trusts. And the minor system of highways and parish roads, which small-gauge railways will hereafter, we conceive, replace, are as yet undisturbed in their monopoly of accommodation, such as it is. Enough, we trust, has been said to show that in the anticipation of this future great development of our carrying facilities, and without losing sight, on the other hand, of that great rise in the price of coal, iron, and labour, which we recently showed (see *Builder* for August 18), must affect the forthcoming dividends, there is an important element of profit pointed out by the figures published by the Board of Trade; in a systematic and enlightened development of the third-class and second-class traffic, more especially the former.

NEW LIBRARY AND MUSEUM OF THE CORPORATION OF LONDON.

On the 5th of November about 2,200 persons assisted at the opening of the new library and museum adjoining the Guildhall, the Lord Chancellor, the Lord Mayor, and Dr. Sedgwick Saunders playing the principal parts in the ceremony. A remarkable collection of works of art had been got together, and literally covered every available foot of wall. This included some very fine pictures lent by Mr. Francis Cook, "Visconde de Montserrat" (the well-known wonderful portrait of Raffaele's "Fornarina," by Sebastian del Piombo; a capital Holbein, and marvellous Andrea del Sarto, attracting particular attention); Mr. Anderson Rose's collection of engraved portraits; Mr. Gardner's topographical collection; the Shakspeare autograph, and the Runic stone found far below the surface in St. Paul's Churchyard. This bears the figure of a stag, with the head turned backward, and is

covered with those volutes of a single line, which on many sculptured stones of even earlier time are found alone. The date of this most interesting relic is probably the ninth century. Close by, in a glass "table-case," was an important collection of autograph letters,—one from "O. Cromwell"; another signed by Buckingham; the letter of Nelson presenting the sword of the French admiral, Blanquet,—surrounded at the mouth of the Nile,—with the sword itself above the letter; and another by Wellington, speaking of the action of the troops in Portugal. In the next case were magnificent treasures lent by Baron Rothschild,—silver cups and tankards and very fine Limoges enamel,—grey and coloured,—dishes and beakers. Amongst a grand collection of old engravings, a fine impression of Albert Dürer's quaint "Journey of Sintram with his companions Sin and Death," stood out prominently, and some lovely etchings of Rembrandt's. In the microscopic room many of the "preparations" were extremely beautiful: the arrangement of feathers from the wing of a butterfly into a spray of fuchsias, for instance; the "peacock copper"; sections from the spines of some atomy thing. The aquarium in which the hippocampus, or sea-horse, kept floating about attracted continual attention. The peculiar arrangement of fin at the back of the little creature, which, when in motion, takes the exact appearance of a rapidly-rotating wheel, was therein displayed to advantage. In this apartment was the grand Satsuma vase, lent by Mr. Hewitt. It stands about 2 ft. high, is a very fine specimen of this ancient Japanese porcelain, and is, of course, almost priceless. Two Chinese screens beside it, belonging to the same gentleman, are likewise handsome specimens of carved and coloured openwork in ivory. The large modern majolica vases, placed lavishly everywhere, with rare plants in them, added greatly to the beauty of the brilliant scene. In the museum below, the large album given by the city of Vienna to the city of London in 1862, was a noticeable object. The drawings, with which this apartment was literally crowded, were too numerous to mention. Here, too, were ancient stone coffins, amphore, and other curiosities, many of them found under London,—interesting relics and evidences of its past history.

A full and comprehensive catalogue, including an introductory history of the library, has been published, and is a valuable record of the remarkable collection gathered together in the Library and Museum on this occasion. In connexion with the history of this important institution there will be no need to say hereafter,— "Pray remember the Fifth of November."

We make use of some official data in describing the new buildings.

They occupy the site of some old houses formerly fronting Basinghall-street, and extending back to the Guildhall. Their total frontage to this street is 150 ft., and the depth upwards of 100 ft. The structure consists mainly, as our readers know, of two halls, placed one over the other, with reading, committee, and museum rooms surrounding them. Of these two halls the museum occupies the lower site, the floor being level with the ancient crypt of the Guildhall, with which it will directly communicate, and is consequently somewhat below the present level of Basinghall-street. This room, divided into nave and aisles, is 83 ft. long and 64 ft. wide, and has a clear height of 20 ft. Large fire-proof museum-rooms on this floor, entered from the museum, are intended to hold the valuable archives of the City.

The library, above the museum, is 100 ft. in length, 65 ft. wide, and 50 ft. in height, divided, like the museum, into nave and aisles, the latter being fitted up with handsome oak book-cases, forming twelve bays, into which the furniture can be moved when the nave is required, on state occasions, as a reception-hall; one of the principal features in the whole design of this building being its adaptability to both the purpose of a library and a series of reception-rooms when required. The hall seems light, the clear-story over the arcade of the nave, with the large windows at the north and south ends of the room, together with those in the aisles, presenting a considerable area of glass. The oak roof, the arched ribs of which are supported by the arms of the twelve Great City companies, with the addition of those of the Leathersellers and Broderers, and also the Royal and City arms, has its several timbers moulded, and spandrels filled in with tracery, and contains three large louvers, for lighting the roof and thoroughly ventilating the hall. The aisle-roofs, the timbers

of which are also richly wrought, have louvres over each bay, and the hall at night is lighted by means of sun-burners. Each of the spandrels of the arcade has, next the nave, a sculptured head, representing History, Poetry, Printing, Architecture, Sculpture, Painting, Philosophy, Law, Medicine, Music, Astronomy, Geography, Natural History, and Botany.

The several personages chosen to illustrate these subjects are Stow and Camden, Shakespeare and Milton, Gutenberg and Caxton, William of Wykeham and Wron, Michelangelo and Flaxman, Holbein and Hogarth, Bacon and Locke, Coke and Blackstone, Harvey and Sydenham, Parcell and Handel, Galileo and Newton, Columbus and Raleigh, Linnæus and Cuvier, Ray and Gerard. There are three fireplaces in this room. The one at the north end, executed in D'Aubigny stone, is very elaborate in detail, the frieze consisting of a panel of painted dies, executed by Messrs. Gibbs & Moore, and the subject an architectonic design of a procession of the Arts and Sciences, with the City of London in the middle, emblematised by an enlarged representation of the ancient seal, viz., St. Paul and some Mediæval buildings with a river in the foreground. The quatrefoil panels on either side have the sculptured heads, executed by Mr. J. W. Seale, by whom most of the stone carving has been done, of Carpenter, the founder of the City of London School, who left certain books by will to the Guildhall Library in the year 1442, and Chaucer, the "Father of English Poetry." It is altogether a praiseworthy work. The two chimney-pieces at the south end are also carved and foliated with the words "Anno Domini MDCCLXXII." on the frieze of one, and "Domine Dirige Nos," the City motto, on the other, surmounted in both instances with the Royal, City, Middlesex, Westminster, and Southwark shields of arms. The screens in front of these fireplaces are executed in oak, the panels being inlaid with coloured foreign woods, and the bases of the screens forming dwarf book-cases which are fitted to receive large folio books. The whole of the furniture throughout the building is oak, and has been executed by Messrs. Cooper & Holt. The hall, with the rest of the rooms, is warmed by means of hot-water pipes, with open gratings in the floor.

Adjoining the library, on the east side, is the committee-room, which is lighted by windows looking on to Basinghall-street, and has a rounded wagon-headed roof, the principal ribs of which are supported on stone corbels, bearing the shields of arms of the several members of the committee specially appointed for the erection of this building.

The public reading-room, at the south end of the library, is a commodious apartment, 50 ft. in length by 24 ft. wide, lighted by a window at the west end, and also by skylights in the roof.

The building is entered by a porch having wrought-iron entrance-gates in Basinghall-street, and on the left-hand side of this porch is placed the marble foundation-stone, the scroll, containing the following inscription, being held by a cultured female figure, typifying the City of London, in bas-relief:—

"This Stone
Was laid October XXVII., A.D. MDCCLXXII.,
by
WILLIAM SHERWOOD SANDERS, M.D., D.L.,
Chairman of the Library and Museum Committee
Of the Corporation of the City of London,
During the Mayoralty of
The Rt. Honble. ROBERT BENEY,
HORACE JONES, Architect."

Passing through the porch, the lower hall is reached, from which short flight of steps descends to the museum. On the right of this hall is a room tiled up with cases around the walls, for the reception of books, &c.; and on the left, through an oak screen, the principal staircase is reached, the whole of the staircase is executed in stone, the balustrade being pierced with open tracery. The entrance to the reading-room is from the upper landing.

The total amount expended upon the building by the Corporation of the City of London, will be above 50,000*l.*, exclusive of the value of the land; but this amount includes the whole of the furniture and fittings, which are in keeping with the architecture.

The building has been erected from the designs and under the superintendance of Mr. Horace Jones, the architect to the Corporation. He committes mention with commendation, and doubtless with the concurrence of the architect, the good services of Mr. Chas. Bailey, his chief assistant.

The style of architecture is Perpendicular

Gothic, in accordance with that of the Guildhall. The work of the new Library was commenced in 1870, the contractors being Messrs. George Trollope & Sons; the fittings being supplied by Messrs. Cooper & Holt, the painted windows by Messrs. Ward & Hughes, the gas-fittings by Messrs. Dodson, and the hot-water apparatus by Messrs. Haden & Son. The solid parquet border, of oak, ebony, and walnut, in the committee-room, was laid by Messrs. A. J. Arrowsmith & Co.

The principal window (at the north end of the library) is seven lights in width, divided in height by a transom, and was presented by the ward of Aldersgate. The subject of the upper three middle lights is the introduction of printing into England. The scene is Caxton's printing-press in the armoury at Westminster, the centre figure being the printer showing Edward IV. and the Abbot of Westminster his works. Wynkyn de Worde is engaged at the press; in the background is a boy mulling the ink. The figures in the lights on either side are Gutenberg, the inventor; Wynkyn de Worde, the foreman at Caxton; and Pyenson, one of his workmen, who afterwards became King's printer. The other figure is that of Bishop Coverdale, the translator of the Bible. The lower middle lights have for their subject the purchasing of the library of the Bishop of St. Alban's for 50 *l.* weight of silver. The side lights have the figures of Whittington and Gresham, benefactors of this library in its early days; and Stow and Milton, London's famous citizens.

When we gave a view of the design in 1870,* and plans of the two floors, we said:—"There is every reason to expect that the new Library and Museum will reflect great credit on the Corporation and all concerned in the creation of them." We are glad, now that the buildings are finished, to be able to say that this anticipation has been in no way falsified.

THE PRESIDENT'S ADDRESS
AT THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the opening meeting of the Institute on Monday evening last, November 4th, the President, Mr. T. H. Wyatt, according to custom, delivered an address, first mentioning the steadily-increasing numbers of the Institute and the great facilities now offered to the architectural student for acquiring a proper knowledge of his profession,—facilities which, he feared, were not so generally appreciated as they might be. He referred especially to the establishment of art classes in the Architectural Museum, to the Royal Academy Drawing Class, and to the praiseworthy efforts towards self-improvement made by the Architectural Association. Adverting to the professional examination established some years ago by the Institute, he remarked that its rules had recently undergone considerable revision, with advantage to candidates, who might now present themselves either in the "Artistic" or "Scientific" section at one time, and who, on having passed successfully in both, would receive a certificate of professional proficiency, together with certain privileges in connexion with membership of the Institute. After referring to the financial condition of the society, the President alluded to the death of some of its members during the past twelve months. Passing on to speak of the Architects' Benevolent Institution, Mr. Wyatt urged the great claims of that society on the support of the profession, stating that its funds were far from adequate for their charitable purpose. He thought that the general conference held in July last had done good work in settling certain points of professional practice, and in drawing up a series of rules and suggestions for the better management of architectural competitions.

We take from his obituary notices the references to such of the deceased members as have not already been spoken of at any length in our pages, and print the remainder of the President's address.

MR. HENRY ASHTON was born in London in 1801. He was advised to Sir Robert Smirke, R.A., and on leaving his office went into that of Sir Jeffrey Wyatville, R.A., who was then engaged on important works at Windsor Castle, and with whom he remained up to their completion, and to the death of Sir Jeffrey. Mr. Ashton was subsequently employed by her Majesty to erect the

Royal Mews at Windsor, and the Kennels at Frogmore. Amongst the public works for which he competed were, the Houses of Parliament, the Nelson Monument, the new National Gallery, and the Great Exhibition of 1851. Though unsuccessful in these competitions, Mr. Ashton's designs were marked by considerable originality and taste, and great power of execution, for he was an elegant and artistic draughtsman. He was employed by the late king of Holland to make a design for a summer palace at the Hague, and for many years had extensive practice on the private mansions of some of the nobility and gentry of our own country, in many of which his works show evidence of considerable professional skill and fertility of invention. The buildings which he erected for the "Westminster Improvement Commission," in Victoria-street, and that neighbourhood, were amongst the first which offered to the inhabitants of this metropolis the advantages of extensive suites of apartments disposed "de plain pied," like the Continental and Scotch flats, which have this additional advantage, that they enable the architect to deal with larger masses of building in one frontage than he possibly can with the usual contracted breadth of modern houses, driving him to inordinate and inconvenient height to obtain the necessary accommodation for a family. His numerous private friends were well acquainted with his painter-like illustrations of his foreign travels, but beyond that there was the charm of a polished intellect, pungent wit, and a well-stored mind. He died on the 18th of March last, after a long and trying confinement to his room from partial paralysis.

MR. JAMES SPENCER-BELL.—I am unable to obtain particulars as to Mr. Bell's professional life. He was, fortunately for his own ease, in a position requiring little labour on his part, but he was attached to the profession he nominally followed, and for some time showed his interest in it by acting as honorary secretary to the Institute. He was a pupil of Mr. Railton's, but did not attempt to practise after the age of thirty. Mr. Bell travelled much, and was indefatigable with his pencil. He represented the borough of Guildford for some time in Parliament. He took an active part in the committees of the House of Commons, and was a diligent worker in several societies of a benevolent and religious character. He was in declining health for some time prior to his death, which occurred in February last, at the age of 52.

MR. WILLIAM JOSEPH BOOTH was one of the earliest Fellows of the Institute, his name appearing in the first published list of the members. He followed his professional studies in the office of his father, and imbibed a decided taste for Greek architecture, then almost the only, certainly the favourite style of the English school. He travelled in Italy and Greece, and at Athens had many casts made from the finest monuments of that city. On retiring from the profession he presented these casts to the Institute. Mr. Booth had a very refined appreciation of art in all its branches, and made a valuable collection of books and prints. The works he executed were chiefly for his own company, with whose committee he periodically visited their large property in the north of Ireland, where he designed many churches, schools, and farms. He left London to reside at Torquay, where he died. His widow, conscious of the interest he felt in the Institute, presented several of his architectural books to the library. He was a man of modest retiring habits, a devoted lover of his art, and of a benevolent generous disposition.

MR. WILLIAM POWELL, an associate, who died of consumption, in the spring of this year, at the age of thirty-two, was a pupil of Mr. Whitehead's and a member of an old Kentish family residing at Lenham. He was an excellent musician, and otherwise accomplished as an artist. In his very short independent professional career, Mr. Powell was the architect of the schools and literary institution at Lenham, and of some villas at Forest-Hill and Sydenham. Mr. Powell is spoken of by those who knew him well as an amiable and honourable man, and one whose early death cut short a very promising future.

MR. H. J. WILLIAMS, an associate of the Institute, was the son of Mr. Herbert Williams, a fellow of the Institute, and surveyor to the Drapers' Company. His death occurred from an accident on the ice. He was associated with his father, and took a considerable share in designing and carrying out the new Drapers' Hall. He also had the credit of redecorating

* Vol. xxviii., pp. 681 to 687.

the Church of St. Michael, Cornhill, which was originally restored and decorated some years since by Sir Gilbert Scott. Our associate was also a student at the Royal Academy. He was much esteemed by all with whom he was brought in contact, and his career opened with considerable promise.

Mr. ARTHUR BAILEY DENTON, who died on the 3rd of October last, at the early age of twenty-eight, was an associate of the Institute, and a pupil of Mr. Blomfield's. He was an intelligent and industrious pupil, with considerable habits of business. Mr. Blomfield speaks of him as one for whom he had a great regard, and who would, he thinks, have done very creditably in his profession, and made a valuable member of the Institute. He superintended the working out of all the architectural drawings and details in his father's book on "The Homesteads of England," and took the architectural department in his father's office.

I was somewhat severely taken to task a year or two ago for not including in the obituary I laid before you the names of *all* architects who had died during the past year, and I was accused of exclusiveness or ignorance! Gentlemen, I shall again lay myself open to the charge, and confine my remarks as to the lives of those members of our profession who were members of this Institute. The sad list is quite long enough as it is, and the lives and works of other architects not belonging to us find abundant opportunities of being fully described and (when deserved) duly honoured in the architectural publications of the day. As an exception proves a rule, so I think there may be cases in which a departure from that rule is permissible, and such a case I believe will be the mention of Mr. Wightwick's name. He was probably more generally known as the author of several works on professional subjects than as the practising architect; and he was thus far specially connected with our Institute that on two separate occasions he presented books and drawings to our library, and competed for and carried off the silver medal of the Institute, for an essay on "The Architecture and Genius of Sir Christopher Wren."

Mr. GEORGE WIGHTWICK for many years lived at Plympton. His early career was briefly described by himself in a short poetical effusion, entitled "On my Retirement after Fifty Years' Voyaging over the Waters of the World:"—

"An orphan'd infancy, an anxious youth,
A struggling manhood, with its loss and gain."

Mr. Wightwick was born in Flintshire in 1802; and was articled in 1817 to Mr. Edward Lapidge, architect, of London. On the expiration of his articles, he spent some time in Italy, and on his return went into the office of Sir John Soane, when he published his first work, "Select Views of the Roman Antiquities." He subsequently settled at Plympton, where (to use his own words) he had "a considerable and ever-increasing practice." His principal works were the Orphan Asylums at Plympton and Devonport, the South Devon and Plymouth Hospital, additions to the Cornwall Lunatic Asylum, important additions to Theguma Castle and to Thegurbam House, and several of the principal terraces and street-houses in Plympton. Mr. Wightwick was the author of several works connected with architecture,—such as "The Palace of Architecture," "Hints to Young Architects," &c. He retired from practice, and settled at Portishead, in Somersetshire, in 1855. Mr. Wightwick was deservedly a great favourite with the Literary and Artistic Society of Plympton. As a student of dramatic literature, few would excel him in the rich fund of knowledge with which he illustrated his Shakespearean readings. He gave to the Institute during his life a large number of illustrations, which he had prepared for the numerous lectures on Architecture he gave from time to time, and in his will bequeathed to us copies of his literary works, and a considerable number of the drawings he made during his residence abroad.

Last year I was able, through my brother's kindness, to give you some particulars of the interesting work going on in Germany, Austria, and Belgium; to that list I have now little to add. The award of the first prize for the Houses of Parliament in Berlin is in itself a very important act. However little satisfactory to the disappointed candidates, and to many others, that award may be, it is no doubt an important step towards the realisation of a great European work. In Vienna, the erection of the Austrian International Exhibition cannot fail to be full of

interest as a matter of constructional science and artistic treatment. Under the former head, the authorities have sought the aid of our countryman, Mr. Scott Russell, whose experience and fertility of invention in such matters are well known, and for the taste and elegance which will be brought to bear upon its decoration and its accessories, we need have little misgiving. We have seen on more than one occasion how readily and artistically the Viennese can deal with such matters.

In Holland, the completion of the fine church of St. Catherine, at Eindhoven, by our honorary and corresponding member, Mr. Cuyppers, of Amsterdam, deserves special mention.

In France, borne down as she now is by the weight of her terrific debt, and still more, I fear, by the incuhus of utter uncertainty as to her political future and the antagonism of parties, it was not to be expected that there should be much architectural progress; but I think we must all be pained and surprised at the apathy or failure of the students in architecture which has been reported. Europe can ill afford to lose France as one of her leading spirits in the pursuit of an art under any one of its civilising forms: so all here will join with me in wishing her a speedy resurrector from her many troubles. The Americans, free from such drawbacks, seem to be exhibiting their usual energy in numerous public and private buildings, where expenditure seems boundless, and where the scale on which their buildings are erected seems to bewilder. Imagine, in one town, three new hotels building at the same time with 830 rooms, 475, and 275 respectively. In their town of Chicago alone more than 1,000 buildings of the first class have been erected since the great fire, valued at 40,000,000 dollars: great as have been the precautions against a recurrence of such a calamity as visited their city but lately, little or no control has been exercised over the architects' designs, and as an evening contemporary, no doubt truly, says,—"The amusing confusion of orders and schools in the new Chicago is startling. It was inevitable, and does not prevent the revival of the city being even more startling than its original growth."

In our own country I think the architect has little to complain of, as far as the demand for his services is concerned. There has seldom been a time in which the national prosperity of a country has shown itself more fully developed in the erection of costly private dwellings for her citizens, in handsome and capacious public buildings for her municipal and county requirements, banks and insurance offices for her commercial pursuits; in the care and re-erection of almost numberless churches and places of worship for every sect and calling; hospitals and asylums and homes for the afflicted in body, or mind, or estate; and, though last not least, in the erection of schools without number.

It would be, probably, difficult to ascertain what proportion of these works has been entrusted to the architect on the faith of his own special qualifications, and how many have been the result of competitions. I am inclined to believe it would be found that the former cases predominate. That this should be so is not, I think, so surprising, seeing how unsatisfactory almost all the results of modern competitions appear to be to the competitors, if not to the public. Certainly we have not yet succeeded in England in arriving at the form of tribunal, whose decision shall inspire confidence, and the office of the present referee is about as disagreeable and thankless as can well be imagined. How far the "General Regulations for the Conduct of Architectural Competitions," which were approved and adopted at the General Conference of Architects in June last, may, if generally acted on and honestly carried out, remedy this unsatisfactory state of things, remains to be seen; certainly it will not, unless they are resolutely insisted upon by all architects entering on the competition. We have now before our eyes a most interesting and important competition still undecided. I allude to that for the Edinburgh Cathedral. One of our members (Mr. Ewan Christian) has, I understand, been called in to report and advise on this subject, and if abundant knowledge and experience, and the most unquestioned integrity, can ensure a satisfactory and equitable decision, then I think the distinguished competitors who are engaged on this "concourse" should wait with confidence, and accept his award without murmuring (at least to the minimum extent to which human

nature is capable). Since I addressed you last year we have seen in the metropolis the rapid advancement or completion of several important public works, such as the Albert Memorial, the Chapter House at Westminster, the group of buildings for the learned societies in Piccadilly, and the adjacent works for the Royal Academy, the new Post-office, and the Guildhall Library in the City.

In addition to these there are still in progress other important works, some in their infancy, such as the Law Courts, the Natural History Museum at South Kensington, &c., and others in a more advanced state, such as the Home and Colonial Offices in Whitehall.

I purposely avoid dwelling on the numerous important works now in progress, or lately completed in the provinces and in the sister kingdoms. They are from week to week so well illustrated and so abundantly described in the architectural publications of the day, that any fresh recurrence to them would be unnecessary and tedious. Their name is "legion," and many of them do great credit to the advanced architectural taste or knowledge of the day.

Last year I indulged in some mild criticisms on the architecture of some of the public buildings in progress, or undergoing the ordeal of public criticism. I thought I had done so carefully, and without the possibility of giving offence; but as I subsequently found that an interpretation was put upon my opinion which I had not intended; that an importance was attached to it from my official position, which it would not otherwise have been entitled to; and, though I am personally I have much regard, and for whose ability and power I have every admiration, I have determined to avoid a recurrence of such contretemps, and from this chair to express no opinion on the architectural merits of the works I allude to. I retain, of course, my individual privilege of criticism, and of that which is so dear to an Englishman, the right to growl and grumble. I trust I may ever exercise that right with moderation and care, and with a due regard to the feelings of others, to the difficulties and drawbacks they have had to contend with (of which the critic frequently knows nothing, and cares even less). Gentlemen, I wish that in our profession there was, as a general rule, somewhat more consideration for the sensitive feelings of others; less of the self-sufficient criticisms we have so frequently and so satirically thrown about on the works of others. I believe in no profession is such licence condemned by the public.

I hear this custom condemned by the public. What with an unusually long obituary, and a certain amount of preaching, my address has up to this time, I fear, been of a very lubricious character. The few remaining remarks I have to offer will be of a more cheerful and congratulatory nature.

All here will, I feel convinced, be glad to think that another member of our profession has received such honour at the hands of his sovereign as is sometimes accorded to English architects. Nor is it less gratifying to us to feel that, with the honour, Sir Gilbert Scott has received the still greater boon of restoration to health. His many friends will desire that he should not trespass too much on that restoration, but that as he deals with the numberless cathedrals placed under his care, tenderly and conscientiously, so should he deal with his own health, that he may be spared many years to enjoy his honours.

It will be remembered that much interest was created last autumn by a letter which appeared in the *Times*, from Mr. C. Tyrwhitt Drake, describing the ruins of Baalbek as "fast perishing from neglect and wanton deprecation."* I was requested, as your president, to put myself into communication with Lord Granville, the Secretary of State for Foreign Affairs, with a view to see if some steps could be taken to check such desecration. Nothing could be more courteous, or show greater interest in the matter, than the action taken by Lord Granville and by Lord Enfield. The result has not been less satisfactory, for Lord Granville has forwarded a communication made to the Foreign Office to the effect that "the Turkish Government would itself take measures for the preservation of the ruins of Baalbek."

Not less important, nor less interesting to the members of this Institute, was the continuation of a grant from Government for the excavations at Ephesus, which had been conducted with such

* See also letter in our volume for that year (xlix, p. 1004) from Mr. J. D. Crace.—Ed.

perseverance and signal success by our countryman, Mr. Wood, for a period of thirteen years, and which promised "to restore to the world one of the most renowned edifices of ancient times, the Temple of Diana of the Ephesians." This interest found a vent in the presentation of a memorial from the President and Council of the Royal Institute of British Architects to Mr. Gladstone as First Lord of the Treasury. On the 24th of July last I had the honour to receive a letter from that gentleman to this effect:—

"Downing-street, July 24th, 1872.

Sir,—Mr. Gladstone desires me to acknowledge the receipt of the memorial from the President and Council of the Royal Institute of British Architects on the subject of the excavations now proceeding at Ephesus. I am directed to call your attention to the Supplementary Estimates for 1871 Services which have been presented to the House of Commons, in which the amount of £3,000 appears for the excavation of the Temple of Diana at Ephesus, being a moiety of the sum of £6,000, required to complete that work; and I am to express Mr. Gladstone's hope that the decision which has been arrived at by her Majesty's Government may be satisfactory to those on whose behalf you have presented this memorial.

I have the honour to remain,

Your obedient servant,

W. B. GEDDON.

T. H. Wyatt, esq.,

Gentlemen, the memorial we presented stated truly that the temple (so lost to the world for more than 1,600 years) had always excited deep interest amongst historians, students of classic art, and writers on Biblical archaeology, and that to architects it had been a subject not only of interest, but of some perplexity, arising from statements of certain peculiarities in its design peculiarly unique, and which hitherto had been difficult of elucidation. It was not to be doubted that so accomplished and so devoted a student of classic art and classic lore as Mr. Gladstone would share in the general desire to see this mystery unravelled and these treasures collected in our own glorious department of Grecian antiquities in the British Museum. As has been well put elsewhere, "England is once more to make up by the spirit of enterprise (of which she has abundance) for the love of knowledge (of which she has not so much)." English spades are, as heretofore, to clear the way for German spades; nor is the spade, as was for a moment threatened, to be thrown aside in mistake after the first shovelfuls.

I will not suppose that the precious fragments now in Great Russell-street have not been visited by all present. If, however, there are any here who have not yet seen them, let them lose no time: they will be abundantly repaid, whether they go to study history or art. It has been truly said that "their historical value cannot be overrated; their artistic value is considerably greater than has at present been recognised; and they belong to a school of design which is full of genius as well as of skill and training." I hold that it is an honour to have aided, in however small a degree, in the furtherance of this precious work, and I can fearlessly ask the approval of the members of this Institute for the action taken by their council in the matters of Baalbek and Ephesus.

Since the foregoing was written, I have been informed by one well qualified to speak on such a subject, and whom you have honoured by the award of the Queen's gold medal, that amongst the recent additions to our knowledge of ancient architectural art, one of the most important has been the discovery of a Sassanian palace in the desert behind the Dead Sea by the Rev. Mr. Tristram, in the spring of the present year.

This palace, which dates from the first year of the seventh century, is the only specimen of the decorative style of that age which is known to exist, and supplies, in part at least, the missing link that was wanted to connect the styles of the West with those of India, and enable us to understand much in the Saracenic architecture of Persia and India which has hitherto been wrapt in mystery.

The details of the building, which are of extreme beauty and delicacy, will probably soon be published by the discoverer, and will no doubt prove a most interesting addition to our knowledge of the thousand and one styles in which mankind has expressed the idea of beauty and fitness in our noble art.

At some later period in the session I have reason to hope that Mr. Ferguson (who is my informant) will be able to give us some further information on this interesting discovery and show us some photographs of its details.

Mays at the British Museum.—A correspondent complains that certain map-publishers do not send their works to the British Museum, or they are not to be found in the catalogue.

THE WINTER EXHIBITION AT THE FRENCH GALLERY.

FORMERLY the Winter Exhibition at the French Gallery bore nearly as distinctive a character as that for which the summer season has so regularly taken the credit of appropriating. It was better worth appropriating a time ago than it is now: before our cousins—German, and brothers—in mutual esteem—French, who can paint, were so sure of kind welcome to house-room and honour at the Royal Academy of Great Britain.

It used to be the case, that when at Lammastide the doors were closed on all further opportunity of wondering at the proficiency of Continental artists, at the delightful grace and ease with which a paint-brush could make itself generally understood, if it expressed an intention or a sentiment, in its best French language, some consolation lightened the regret at losing it, in the pleasant recollection of how often in the interregnum this foreign power of excellence had been taken advantage of to help in showing that we at home had a share of a similar power; for though the British pictures that were to be seen on these walls when the fogs of November, and the darkness common to it, and its nearest sequent months, took holiday, and allowed of it, were never the chief works of the painters contributing them; in this respect, for one, differing from so many instances provided in the carefully selected examples of the French, Belgian, and other schools, that Mr. Gambart and Mr. Walhs, have furthered in celebrity; yet they numbered amongst them enough of what were admirable and delightful to make the Winter Exhibition at the French Gallery one of the pleasantest resorts to be chosen on a clear, cold day; a luxurious place of shelter from a shower on a wet one, or from the valuable clouds of dust that March may bring on a dry one. There is a change for those who love change; the nice comfortable room remains, but its decoration for Christmas-time is no longer all English.

"And a good job, too!" some will say; but "All for the worse," say we.

Second and third rate pictures of foreign schools show no great difference from those of similar status at home; for it is only by the best instruction that the best learning is to be acquired.

So much has been said and written in comparison of foreign and native artists, the desirability of an English painter becoming like a French painter, and of other unational and unartful results, that the question remains to be asked, "if, allowing for all the exquisite qualities that characterise the best Continental artists, a British painter who attains the nearest approach to perfection that the conviction of the learned deem possible, would not be less like the very best of any other nation's best painters?" Our Royal Academy has held, and holds at the present time, a *quorum* of the ablest painters in the world; but of these some have done their best, and others will never do the best they could do.

The present collection of pictures, though the authors of them are of various countries, affords very little opportunity for comparison: all alike of a mild order of merit, they ask but for a similar degree of acknowledgment, such as patient devotion of clever labour to small effect can exact.

Mr. T. Faed, R.A., is a conspicuous contributor. The force and dash of his splendid method of laying on beautiful colour gives a value even to so small a matter as his portrayal of a village coquette arranging her hair. "The Cottage Toilette" (45) is killing to every object near this artful representative of warm complexion: the glass before her tells others as well as herself how highly she is to be prized—and priced. In quite another form of attractiveness, the "Britanny Milk-girl" (137) of M. E. Hublin will offer proof that styles may vary, like languages, and yet be truthful. For the precision of drawing and firm solid painting with which an ordinary peasant maiden has been depicted in her quietest and most natural mood, like plain print as opposed to autograph, makes it the more easy to read and judge of the author's excellence: yet, for the indescribable charm that appears to vitalise Mr. Faed's damsel, there are many who would prefer it, and think the consummation of all artistic skill best attained when the necessary means of obtaining it are quite lost sight of in the successful result of their application,—the success itself. "A Turkish Dancing-girl" (94), by M. E. Vernet Lecomte, suggests more academical perfections than may really belong

to her (N.B. No doubt is imparted by this of her dancing capabilities). The head and massive throat and arms from elbow downwards seem disproportionate with so narrow shouldered and slight a torso that the little body presents. However, this may be really intentional; and some ballet-girls are more than metaphorically "all legs and arms": it would be a pity to think otherwise, with such excellence of workmanship that this production displays.

Admirable technical qualities constitute the chief claim to such interest as is excited in the spectator of a very melo-dramatic representation of one of those scenes from French history that illustrate the national chronic disorder,—Revolution. The royal family at "Versailles, October 6th, 1789" (127), are depicted awaiting the invasion of the mob. The king, in the resignation of despair, is seated, surrounded by a demonstrative group of terrified ladies and children, amongst whom the queen alone shows any indication of being at all equal to the situation, and this indication is not sufficiently marked to realise one's conception of the heroic Marie Antoinette. The figure kneeling, in a distraction of terror and grief, is very graceful, and forms one of the most beautiful points of colour in the picture, throughout which a fine sense of it is manifested. The artist, M. G. Bencure, may more justly boast of power than of his control of it. If size and a very obtrusive framing of strong assertion go for anything, Mr. E. Long is exceptionally powerful, too; indeed, it is very well known he is, though his ambitious attempt to become classical and correct does not help very well to prove the fact. "A Dorcas Meeting in Rome,—Fourth Century of the Christian Era" (58), looks so little like former, proper, emanation, and so like the work of a less-experienced master, dominated and howled over by combined admiration of M. Alma Tadema and Mr. Dobson, R.A., that only with the unfinished and best portion of its composition,—the Spanish Gipsies,—a picture, though unfinished, in themselves,—to help at a guess, could this clever painter be identified. By-the-bye, Mr. Dobson is a contributor to the present exhibition; but his children "In the Garden" (143) will not assist much in proving how he could have influenced Mr. Long; for though he idealises, as does M. Le Jeune, A.R.A.; and how pretty his peasant children are "At the Spring" (3), or as "Gleaners" (145), though tamed by an artificial grace, it is by more important productions they are both best known. Similar acknowledgment is due to similar trifles that winter exhibitions give opportunity of showing and make known as pretty things that leisure from harder work gives birth to; but art can elaborate trifles until they become exhibitive of art's utmost manipulative resources. Patient devotion to completeness, even so far down as to the fit expression of a shoe-tie, will account in no great degree, unless the object aimed at is some end in view beyond mere show of wonderful but wasted means. "The Garde-lettre" (66), by M. F. Verhas, that would only out-Follet *Le Follet*; and "The Jewel Casket" (100), by M. E. Moche, are examples to assist at explanation.

If Mr. T. F. Dicksee agrees with many others in the wish that museums, and all places for intellectual cultivation, should be open on the day of rest, why does he not say so? To paint such an opinion is far more difficult (55). Far better would it have been had he proved bow tawdry and forced are M. H. Schlesinger's idealities, "Fiorella" (72), and the loose-limbed female at home with "My Nancy Perroquet" (93); for these productions gain praise from those who contemn and despise Greuze! "Death of Manon Lescaut" (16), and "Ophelia" (17), by M. J. Bertrand, are not favourable specimens of French art.

If it were possible to designate any emanations from M. E. Frere, poor and trivial, "The Schoolboy at Home" (47), and the girl "Feeding the Rabbits" (155), might well be a basis for a one-sided argument.

"Evening at Home" (19), very agreeably and broadly painted by M. Crackorski; "The Country Lawyer" (25), C. Schlosser; and "Their First Bottle of Champagne" (120), by the same; "Feeding the Chicks" (27), J. Trayer; "A Severe Mistress," T. E. Duverger; and "Off to the Wars" (48), by the same; "Toddles" (63), by J. Morgan; "Friends" (69), by F. D. Hardy,—a poor indication of what Mr. Hardy can do; "The Young Invalid's Birthday" (73), by M. E. Moulain, would be very bad in a bad collection; "The Toilette" (76), very clever, but spoilt by the reflection of

so ugly a face as the glass shows; "A Brittany Peasant's Home" (79), by L. Caille; "A Decisive Move" (80), by A. Casanova, tessellated and lined by hard finish; "The Ante-Room" (83), in which a widowed mother is waiting to learn if her daughter's accomplishments can be sold for much less than they were bought, to keep the wolf from the door, by E. Delfosse; and "Road-side Shelter" (116), by J. C. Thom, give a fair idea of what the collection is comprised of.

Mr. A. H. Tourrier's smaller replica of his clever picture, "Drilling Recruits of the League" (89), is a notable item; and Mr. A. E. Mulready's metropolitan Arabs, though their ragged draperies are peculiarly unaffected by London dirt and smoke, and their pretty faces have a scented-soap-washed look, are attractive, whether as "Wandering Minstrels" (41) or "Echoing the 'News of the Day'" (62).

There are pleasant bits of landscape here and there, amongst the comparatively few contributions of this kind; and some sheep, by Mr. T. S. Cooper, R.A., with a study of "Black Cane and Head of Deer" (12), by Mr. Ansdell, R.A., give a little variety where a good deal more is wanted.

THE FEMALE SCHOOL OF ART.

THE school in Queen-square, Bloomsbury, under the direction of Miss Gann, is making satisfactory progress, and has carried off many prizes. A national gold medal and Princess of Wales's scholarship has been awarded to Miss Emily Selous (now Mrs. Fennessy), for an original study in modelling, and a head from the antique; the Queen's gold medal and a national bronze medal, book prize, and third-grade prize, to Miss Alice Blanche Ellis, for an original design of a fan, and other drawings; the Queen's scholarship, value 30*l.*, and a bronze national medal, to Miss Emily Austin, for water-colour drawings; a national silver medal, to Miss Julia Pocock, for an original study in modelling; a silver medal, to Miss Ellen Hancock, for a study from nature in tempera; national book prizes, and third-grade prizes, to the Misses Elizabeth A. Dorrington and Anne Elizabeth Hopkinson, for water-colour studies; third-grade prizes, for water-colour drawings, designs, and other drawings, to the Misses Ellen Ashwell, Louisa Baxter, Elizabeth Hodge, Eleanor Manly, Mary Ann Pickering, Jennie Moore, Edith Tegetmeier, Mary Whiteman Webb, Charlotte Amelia Anstee, Susan Ruth Canton, Alice Hanslip, and Rosalie Watson. The subject of Mrs. Fennessy's work is Cimabue, seated as at work; a lifelike figure, highly creditable to the artist. Sir John Bennett's prize, a gold watch for the best design for the front and back of a watch, has been awarded to Miss Ireson, who has given the vivacious knight full value for his money. Miss Alice Ellis came second. We must note, with a view to improvement in that direction, that the drawings made in the school from casts of architectural ornaments are for the most part somewhat hard and uncertain.

THE WATER-SUPPLY QUESTION: SHEFFIELD.

THE difficulty of supplying Sheffield with water may be measured by the number of Acts of Parliament the Waterworks Company have found it necessary to obtain. Since 1830, when they started, they have been getting an Act of Parliament about every six years, on the average; and yet they have fine moor-land on the west of the town from which to gather water, with an average rainfall of nearly 40 in. in depth. The two causes of their having always been short of water in the town are,—first, that they have promised to give the millowners in compensation more water than was their due; and secondly, they have wasted a great part of that they retained for the town. Speaking on a question of water-supply, at the Institution of Civil Engineers, about two years ago, Mr. Hawksley said of the Sheffield Waterworks, in respect of the loss to the town by the great quantity of the company's water abstracted to supply the mills, and other bad arrangements, that they formed the most important case that had ever presented itself in this kingdom; and one may, without much fear of misconstruing his argument, say, that had it not been for this undue quantity given or allowed by the Legislature to the mills, and had the loss by evaporation not been underrated, there would always have been plenty of

water for Sheffield. In February last the House of Commons asked for copies of all reports made by Mr. William Pole to the Board of Trade and the Home Office, in 1870 and 1871, on the constant service system of water-supply, and in his report on the Sheffield Waterworks, dated February, 1871, he says, the domestic supply of the poorer districts had theretofore been obtained largely from underground cisterns (supplied with water by the company), which have formed a peculiar feature in the water arrangements of this town. A cistern, or tank, holding perhaps 600 to 1,000 gallons, is excavated in a courtyard surrounded by small houses, and is lined with brickwork, and covered in with flag-stones, one of which is left movable, for access. The tank is supplied by a pipe and ball-cock from the company's main, and the water is obtained for the use of the houses by a pump fixed in the yard, the suction-pipe of which dips into the tank. These cisterns are, of course, objectionable, in a sanitary point of view, as the water is liable to be fouled by drainage from the yard and privies; and it is such a troublesome process to clean or even to examine them, that neither is often done; but the great objection to them by the water company is on account of the opportunity they give for waste. The tanks often leak, the ball-cocks get out of order, and then waste may go on continually, unseen and unsuspected, to an enormous amount, and for a great length of time.

There were at the date Mr. Pole made his report about 1,330 such tanks in Sheffield; but, under regulations made in the previous year, the company were causing them to be disused for water purposes, and, in substitution for the underground tanks, as a simple plan, one or more stand-pipes are erected in a courtyard, supplied directly from the main, and from which the inhabitants can draw water at all times. This is a gain to the inhabitants, as it saves the trouble of pumping, and the quality of the water is, of course, much better; but in most cases it is preferred to supply the water into each house, for which purpose a lead service-pipe is introduced over a sink, and furnished with a simple tap at the end. The number of baths in Sheffield is small, and they are confined to the best houses, so that they form no important element of waste. The few baths in Sheffield being confined to the best houses, there can be none at all where they are most wanted; for who that has been in Sheffield will deny that they are rather more wanted there than elsewhere? The Lancashire woman, finding herself crowded in a third-class carriage, angrily cried out, "There's always 't' most thrutching where there's 't' least room"; and if she had had to speak on a question of water-supply she might have said, with equal truth, there is always the least water where it is most wanted.

The Act of 1853 imposed on the company the duty of giving a constant supply, with, however, the proviso that the enforcement of constant supply should be delayed; that eight hours' supply per day was to be given immediately; twelve after four years; and the full constant supply was to be given in ten years after the passing of the Act (that would have been in June, 1863), if required by the town council. The Act of 1860 authorised the company to make regulations to prevent waste or misuse of water supplied by them; but it was provided that these regulations must be subject to approval or modification by two justices of the peace. When approved by the justices, the rules and regulations were to be compulsory on the consumers. When the time came, in 1863, for giving a constant supply the corporation made no demand for it, but in February, 1864, they made inquiry of the company whether they were in a position to give it. The company were, in fact, not able to give a constant supply, because the new works that they had been hurrying on to meet that demand,—the most important work being the Bradfield reservoir,—were not completed. About the beginning of March, however, the bank of that reservoir had been brought up to its top level, and the water was allowed to accumulate, and the reservoir was nearly full by the 11th; but about midnight the bank gave way, and something like 100 million cubic feet of water, or more than 600 million gallons, were suddenly thrown down the narrow and steep valley, causing immense loss, for which the company had to make compensation; and to enable them to do that, they obtained an Act in the same year, which contained a clause postponing the adoption of constant service, until the 29th of July, 1869, when it was to be

put in force, if required by the town council, under the penalty of paying no dividend. When the proper time arrived, the corporation required the constant service to be given, and on and after the day fixed by the Act, the water was turned on for the whole twenty-four hours. The immediate consequence was an enormous waste of water. During the month of July, 1869, the consumption had been about 4,500,000 gallons per day, or 2½ gallons per head per day, the population being 210,000. In August, immediately after the introduction of the constant service, it rose to 8,500,000 gallons, or 40 gallons per head per day. This was very alarming to the company, and they proceeded to prepare a set of rules and regulations in accordance with the powers given them in the Act of 1860, which were submitted to the justices at the end of September, 1869. On the 4th of November, the justices opened the public inquiry which, from its nature, extent, and cost, forms, says Mr. Pole, one of the most remarkable episodes in the history of water supply. This inquiry, it was thought, might only occupy a few hours, but it was protracted over three months, owing to the antagonism between the company and the corporation, each side calling a long array of witnesses, and the money spent on the proceedings was enormous,—estimated at between 8,000*l.* and 10,000*l.*

In February, 1870, the justices adopted and published a modified set of regulations, to the following effect:—

After a period of six months from the date of the instructions, all service-pipes were to be of lead, and of at least the following weights, except that when the diameter is more than 1 in., the company may require the pipes to be of cast-iron, of such weight as they may consider necessary:—

Lead pipes,	in. diameter,	5 <i>lb.</i> per yard,
"	½ in.	7½ "
"	¾ in.	9½ "
"	1 in.	11½ "
"	1½ in.	16½ "
"	2 in.	22½ "

The joints are to be of the kind called a plumbing joint, and not a blow-pipe joint. All drawing-cocks, stop-cocks, and ball-cocks, are to be of hard brass. No overflow or waste pipes to cisterns are allowed to be used, other than detective or warning pipes. These consist of pipes brought from the top water level of the cistern to the outside of the house, and the ends placed at such a level above the ground that they can easily be seen, and any run of water from them detected by the company's inspectors. The ball-cocks of the cisterns therefore have to be kept in working order. Every water-closet is to be provided with a waste-preventing cistern, and the valves of the closet-pans are to be worked by brass rods, at least 3-16ths of an inch diameter, and not by wires or chains. Every bath is to be provided with a well-fitted and perfectly water-tight ground outlet plug or cock.

The consumption of water at Sheffield is about 6,500,000 gallons per day. The number of houses laid on (at the date of the report) 47,000, and the estimated population about 225,000. This gives a consumption for all purposes of about twenty-nine gallons per head per diem. The total quantity of water supplied in 1870 by meter for trade purposes was 226,000,000 gallons, and for corporation purposes 14,500,000 gallons. The consumption per head per diem may be divided thus:—For domestic purposes, twenty-six gallons; total, twenty-nine gallons.

The amount expended on the works of the company before the bursting of the Bradfield reservoir was 415,000*l.*; but now, including the cost of the damage done, it is something over a million. The dividends on the ordinary shares were, before the accident, 5 per cent.; now they are 3 per cent. Before the accident, the water-rate had been about two-thirds of the maximum allowed by Act of Parliament to be charged, and in 1853 this reduced rate was made law; but after the accident, the Act of 1861 raised the rates 25 per cent.—that is, to about five-sixths of the maxima allowed by the original Acts.

The whole history of the Sheffield Waterworks shews the impolicy of leaving such a public duty as that of supplying a town with water in the hands of a private trading company. If the works from the beginning had been in the hands of the corporation of the town the rates would, in all probability, have been much less than they are,—allowing for some bad management even then.

NOTTINGHAM ARCHITECTURAL ASSOCIATION.

On Wednesday evening, October 30th, a meeting of the above Society was held at the School of Art, Mr. T. C. Hine, President, in the chair, when Mr. S. Dutton Walker, F.S.A., the honorary secretary, read a paper "On the best Means of making the Society useful." We subjoin a few paragraphs.—

I hope to see the day when a disgrace to the town will be swept away: I allude to the ruinous state of Nottingham Castle, and although I am personally a strong conservative of every structure and every thing having anything of an archaeological feeling about it, I do think that in this case the transposal of our ruins castle into a Science and Art Museum would be eminently advantageous. I hope to see a museum there in which we as scientific men may find examples of the many varied scientific productions which are almost daily being brought out. For instance, terra-cotta in its various forms; locks, with their thousand combinations; moulded brickwork, the manufacture of which, I holdly say, after knowing what has been done in North Italy, is but in its infancy; stone samples, with their geological description and localities; specimens of iron in their wonderful variety; details and examples of constructive sanitation; in fact, all novelties connected with and bearing upon the science and art of our profession should there be found; and this Society should encourage the establishment of such a museum with all the warmth and by all the means at its disposal. In fact, and in few words, we should have a provincial South Kensington; and our Association should be the curator, and use its lover in giving the necessary impetus to art and science studies in Nottingham.

In a modern poet's words:—

"In art and in science exists no division;
As the hilt to the sword or the oord to the bow,
So science and genius unite in communion,
Both facts to elicit and grace to bestow.
There is harmony, ever unseen, unsuspected,
In the forces of Nature, the powers of the mind;
And when by the counsel of talent directed,
The soul of the student that union shall find.
No art without science has risen or flourish'd,
No science is lovely when wanting in art;
They are flowers of one stem, by one influence nourish'd,
Twin rays from one sun, of one system a part."
—H. B. Cooper.

This brings me to another part of my subject, which is the establishment of a reference library. We all know how costly many of our professional books are, and though opinions may differ as to the use and value of many which are published, there is no doubt that both the art and science departments of our profession would be improved by a more thorough knowledge of their literature. It is, I believe, not generally known that the authorities of South Kensington distribute artistic and scientific books on loan, and there is no doubt that, to a society like our own, properly and permanently established, an application of this character would be treated with the highest respect. I have personally, through the School of Art, studied various books in this way. And here I may remind you of the admirable list of books recommended by the Institute Examination Council, which I have not now time to quote, but a copy of which can readily be obtained. (See *Builder*, July 13th, 1861.)

There is in my mind a strong conviction that, as a profession, we are not advancing so rapidly as we might. When I regard the character of the education which the young of the present day have every means of obtaining; when I consider that, at our Mechanics' Institutions, our working men are being taught, not only the elements, but some of the higher branches of scientific knowledge—such as geology, botany, geometry, steam, applied mechanics, chemistry, &c.—I feel, that, unless some steps be taken these working men will be stepping into the places our professional men should not have left vacant.

I need not say how strong is my conviction that a course of study at a school of art should be the starting-point in the career of every student. How often do we find that many pupils have been taught to sketch a landscape before they knew how to draw a straight or a curved line, or how often they have been instructed in water-colour painting previously to the acquisition of the knowledge of free-hand drawing.

At the close of the paper an animated discus-

sion took place; and Mr. M. O. Tarbotton proposed, and Mr. F. Bakewell seconded, a vote of thanks to Mr. Walker for his suggestive paper. After this the meeting resolved itself into a very pleasant *conversazione*.

ALEXANDRA PARK.

Two meetings were held at the Mansion House, on the 4th inst., on the subject of the preservation of the Alexandra Park. The first, at which the attendance of persons disposed to advance, or to guarantee, 1,000*l.* each towards the purchase, was very thinly attended; the second, intended to attract those who are really very deeply interested in the subject,—the working classes,—was larger. No result but a self-stultifying resolution was arrived at in either case.

The gist of the matter lies here, and it is remarkable to see men of known position step upon a platform without having grasped it. The owners of the property would be only too happy to dispose of it to-morrow; and, no doubt, would submit to sacrifices in order to do so. But, if unmanageable, and hitherto unproductive, the property is one of great *bona fide* value. No owner, be he man or company, will aid in the putting up of such a property to sale by a kind of Dutch auction. The Mansion House Committee say in effect, "Name your lowest price, and we will try to get it, in guinea subscriptions." The proprietors say, "We will not trouble you to do anything of the sort. If you come prepared to buy, we will enter into the subject as matter of business; if you only come to us for a leverage by means of which to hawk about our property, you had better stay at home."

TO SOFTEN HARD WATER.

The following are Dr. Frankland's directions for performing this operation:—

To soften 500 gallons of the water supplied by the Chelsea, West Middlesex, Southwark, Grand Junction, Lambeth, New River, or East London Company, shake thoroughly 14 oz. of quick-lime (chalk-lime is the best) in a pailful of water, stir up the milk of lime, and pour it immediately into a cistern containing, at least, 30 gallons of the water to be softened, taking care to leave in the pail any heavy sediment that may have settled to the bottom in the few seconds that intervene between the stirring and the pouring.

Fill the pail again with water, and stir and pour as before. The remainder of the 500 gallons of water must then be added or allowed to run into the cistern from the supply-pipe. If the rush of the water thus added does not thoroughly mix the contents of the cistern, this must be accomplished by stirring with a suitable wooden or iron paddle. The water will now appear very milky, owing to the precipitation of the chalk which it previously held in solution, together with an equal quantity of chalk, which is formed from the quick-lime added.

After standing for three hours the water will be sufficiently clear to be used for washing; but to render it transparent enough for drinking at least twelve hours' settlement is required. Before softening, Thames water has a brownish-yellow tint, when viewed in a cistern 4 ft. or 5 ft. deep: this is owing to the presence of coloured organic matters in solution; but after being softened and settled, it displays the blue-green tint of pure water, and resembles the Rhone as it emerges from the Lake of Geneva, the water of which has, in fact, been deprived of its organic colouring matter in a perfectly analogous manner, viz., by agitation with the mud of the glaciers of the Rhone and Zermat valleys. The chalk mud precipitated from Thames water by milk of lime performs the same functions as the glacier-mud of Switzerland in removing coloured organic impurity from water.

The water supplied to London by the Kent Company being considerably harder than the Thames and Lea water delivered by the other companies, 500 gallons of it require 16 oz. of quick-lime for the softening operation.

Such are approximately the proportions of lime required to soften the London waters, and, by observing these proportions, a tolerably satisfactory result will always be obtained; but, as the hardness of these waters is subject to some variation at different seasons, it is necessary, in order to produce at all times maximum softness, to vary the proportions of lime in a corresponding degree. To enable the operator to do

this, a very simple chemical test is employed, viz., a solution of nitrate of silver in distilled water. This solution has the property of striking a yellow or brownish-yellow colour when it is added to water which contains a very minute trace of uncombined lime. During the final running of the remainder of the 500 gallons of water into the cistern as above described, a dessert-spoonful of the milky water should be from time to time taken from the cistern and put into a white tea-cup containing a couple of drops of the nitrate of silver solution. If a brownish colouration be produced, the alkali lime is still in great excess, and more hard water must be admitted; but if the tint produced be a very faint yellow, only just visible, the proper proportion of lime to hard water has been attained, and the inflow of the latter must be stopped.

This process of softening is only applicable to such water as owes its hardness entirely or chiefly to the carbonates of lime and magnesia held in solution by carbonic acid. All the water supplied to London is of this character, and so is the water generally which is derived from chalk, limestone, or oolite districts.

Any water which softens by being boiled for half an hour will be softened to an equal extent by this process.

It deserves to be mentioned that the patent for this valuable process, invented by the late Dr. Clark, having expired, the public are now free to use it; but the antiquated system of intermittent supply, which is still maintained in London, opposes a serious obstacle to its adoption in private houses, on account of the necessity for performing the operation in the few minutes during which the water is daily delivered from the companies' mains.

THEATRE ROYAL, HAYMARKET.

The interior of this always-pleasant resort has been handsomely decorated, under the superintendance of Mr. G. Somers Clarke. The style adopted is Pompeian,—more Pompeian, in fact, than Pompeii,—and the result is somewhat dark and heavy. The panels, moreover, of the box-fronts are all so precisely similar as to suggest that they come rather from engraved blocks than the hand of a painter. The ceiling represents a velarium strained round the outer diameter of it; and the central portion is made so bright with "little stars," as to lead to the belief that Juliet has at last fulfilled her threat and cut up Romeo.

In the proscenium-cave Mr. Thomas Ballard has painted a picture on a gold ground, typifying the Rehearsal of a Roman Comedy. A new fairy comedy, by Mr. W. S. Gilbert, is announced as in preparation, and is looked for anxiously by all who are interested in good dramatic literature.

COAL AND IRON.

The price of coal in Bristol is considerably less than it was a few weeks ago. The best local coal for domestic purposes may now be obtained for less than 1*l.* per ton.

On the 1st of August last the price of the Stratford Collieries Company's old Silkstone coals was quoted at 20*s.* per ton at the pit's mouth. These coals are now being offered at 16*s.* 6*d.* per ton at the pit, being a reduction of 3*s.* 6*d.* per ton.

A meeting of a large number of South Yorkshire coalowners has been held at the King's Hotel, Barnsley, for the purpose of considering the present state of the coal trade. After some discussion, it was resolved that the members of the South Yorkshire Coal Association, and the owners of pits generally, should, if necessary, reduce the price of steam coal to the extent of 2*s.* per ton. It may be stated that the demand for steam coal is just now only moderately active, and at many of the pits the coal is accumulating.

The coal trade of Durham keeps very firm on the whole, as compared with the Tyne and other districts. Whilst some classes of coals have succeeded 3*s.* or 4*s.* per ton on the Tyne, the demand in South Durham, where there is such a large consumption for ironworks, has kept up the price. Some few collieries are selling coke at about 37*s.* 6*d.*, but the general figure for best is scarcely less than 40*s.* Households, 17*s.* to 20*s.* at pit. About 12,000 tons of coal and coke were sent into Cumberland and Lancashire from Durham collieries last week for iron-making, and

about 59,000 tons into Cleveland for a like purpose.

But whilst in some districts colliery proprietors have met and decided to reduce prices, others have agreed upon quite an opposite course.

One lesson meantime that has been partially learnt by hundreds and thousands of householders is that good fires may be kept with a considerable economy of coal if care be exercised; and this and the falling off in the iron and other trades of the country is acting as a warning to coal-owners that there may be a limit to their rapacious demands.

There can be no real reason for the large advances in the price of coal that have taken place during the past few months; and whatever may be said of the increased price of labour, it cannot account for a tenth of the increased amount asked for coals. We should advise all consumers to use the utmost economy, whether in the furnace, the kitchen, or the drawing-room, as this course will exercise the most beneficial influence on the owners of coal-fields, and have the greatest tendency to reduce prices.

By the monthly circular of Messrs. Higginson, of Liverpool, we learn that the quantity of coal exported in September, was 1,076,091 tons, against 1,171,244 tons in the corresponding month of 1871, showing a decrease of 95,153 tons. The particulars are—From the Northern ports, 549,933 tons; Yorkshire, 79,649 tons; London, 3,166 tons; Liverpool, 56,804 tons; Severn ports, 279,875 tons; and Scotch ports, 106,674 tons. The increase was—Yorkshire, 14,185 tons; and Scotch ports, 15,099 tons. The decrease—Northern ports, 80,024 tons; London, 6,013 tons; Liverpool, 8,311 tons; Severn ports, 30,089 tons. Total, January to September, 9,246,876 tons; same period last year, 8,715,271 tons. Increase, 531,605 tons.

The leading ironmaking firms are preparing circulars announcing a further drop in finished iron. The last drop of 40s. on bars, and 60s. on sheets and plates, brought out only few specifications. Customers will now learn that the drop is repeated, making a total drop of 4l. on bars, and 6l. on sheets and plates. Thus, at two falls nearly half the late immense aggregate rise has been abandoned. Pigs must fall proportionately. Wages cannot be altered till Christmas, when, however, the men look for an advance.

THE DULWICH COLLEGE MANAGEMENT NEW SCHEME.

PROPOSED NEW SCHOOL BUILDINGS IN CAMBERWELL, SOUTHWARK, AND BISHOPSGATE.

The scheme of the Endowed School Commissioners which has just been issued for the future management of Dulwich College, and the disposal of the large property belonging to the foundation, provides for the expenditure of a large sum of money in the erection of new school buildings in the several parishes above-named, all of which are included in the benefits to be derived from Alley's foundation, and in other districts near London, south of the Thames. According to the proposals of the Commissioners one of the first duties of the governing body will be to raise 60,000l., or, with the consent of the Charity Commissioners, 80,000l., by sale of some of the real property of the college. The sale of the college property, and the raising of the sum named, are made obligatory on the governors, within one year after their constitution. Out of the money so received the governors are to appropriate 20,000l. in the purchase of sites and the erection of school buildings in the parish of Camberwell. One of these schools is to be for boys, and the other for girls, and each school is to have accommodation for 300 children. The schools are to be called "Alley's Middle Schools," and the nature and extent of the education to be given, as detailed in the scheme, proves that the school buildings must necessarily be of considerable dimensions. The scheme next provides that 10,000l., out of the 60,000l. thus raised, are to be expended in the purchase of sites and the erection of four schools in the parishes of St. Saviour, Southwark; St. Botolph, Bishopsgate; St. Luke, Middlesex; and in another district south of the Thames, the scheme providing that the last-named school is to be near London. Thus, according to the scheme of the Commissioners, six schools are at once to be erected in the metropolitan districts out of the proceeds of the sale of the college estates, at an expense of 60,000l.

As regards the celebrated picture gallery at

Dulwich, the scheme provides that the governors, with the sanction of the President and Council of the Royal Academy, are to make provision for the custody of the pictures in the present gallery, or elsewhere in Dulwich, the erection of a new gallery in Dulwich being suggested; and the Commissioners further propose that, after paying the expenses of management and maintenance of the gallery, instruction should be given, out of the remaining income, in drawing and designing, to a certain number of boys and girls.

THE LIVERPOOL CORPORATION AND THE PUBLIC PARKS.

PROPOSED SALE FOR BUILDING PURPOSES.

It is only within the last few years that Liverpool, which before that period was almost destitute of them, has been in possession of public parks for the recreation and benefit of its large population. Loud complaints were made by the inhabitants that there was no large city in England so badly off in this respect, and the result was that the corporation, at a very large cost, had public parks laid out at the various outskirts of the town, and one of these—Sefton-park, at the south end—has only just been completed. Amongst the parks thus formed, one at the east end, called Shell-park, was opened a few years ago. It was so called out of respect to a late alderman of that name, who, in his place in the town council, proposed its construction out of a number of fields belonging to the corporation. Shell-park, although small—being only about 20 acres in extent—has, since its opening, been exceedingly popular as a place of resort for the very large and increasing population by whom it is immediately surrounded, and more especially, so far as the juvenile population is concerned, it very much, in this respect, resembles Kennington-park. At the eastern boundary of the park, running north and south, is a fine thoroughfare nearly a mile in length, and upwards of twenty yards in width, called Shell-road, and immediately adjoining this road are the lodgings for her Majesty's judges when on circuit. The east side of Shell-road is laid out for villa residences, of which several have already been erected, and overlook the park. Within the last few weeks considerable surprise has been caused in the borough by an intimation that the finance committee of the corporation have resolved upon disposing of the park for building purposes, and the announcement has evoked a strong feeling of dissatisfaction, not only on the part of the residents adjacent to the park, who complain that their favourite resort for breathing fresh air is about to be invaded; but it is further urged that the corporation are about to commit themselves to a most unwise step in practically reversing the general demand for open spaces in densely-populated districts, and permitting what has for some years been an area for healthful recreation, to be covered with hundreds of dwellings of an inferior character, to the injury of the sanitary condition of the neighbourhood.

STAINED GLASS IN EXETER CATHEDRAL.

SIR,—Your correspondent "Experientia," "an artist practising glass-painting," has fired such a volley of inverted commas and subtle sarcasm at me for not understanding the technicalities of his art, that I hardly dare to answer him; but as he has perverted the meaning of my letter, I must do so at all hazards. To my description of the side windows of the Lady Chapel I adhere. Any reasonable person, with the slightest knowledge of stained glass, will understand what I mean by "figures under canopies on a grisaille ground, with flowing borders to the lights, the tracery openings having pot-metal centres on grisaille grounds." "Experientia" complains that I describe this grisaille absurdly. I do not describe it in particular. If he will read my letter with common care he will see that I describe the character of the windows of the choir generally as "of exquisitely light and delicate grisaille, bold and richly executed on greenish white glass of various shades, with a fair proportion of colour cleverly disposed." I think my description will be found to be sufficiently lucid for ordinary folk. I am sorry it displeases "Experientia." I will beg him also to note that I describe, not the grisaille, but the glass of the choir generally, as differing from

the gorgeously-stained abominations of the modern school of glass-painting. Since, however, "Experientia" describes the glass at Exeter as "very ordinary traced pattern-work in brown enamel on white glass, neither remarkable in design, execution, nor material," I care very little for his anonymous criticism, for it is clear to me that he has not studied it as it should be studied, but, like other eminent artists practising glass-painting, he has passed over the fragments of it as of little value because they did not agree with his ideas of what stained glass should be. Happily the task has fallen into better hands, and Mr. Drake's intelligent care has rescued Exeter from the fate of too many of our cathedrals. Its beautiful windows will not now be filled with glass (so well described by Mr. Edmund Sharpe) of all the colours of the rainbow, with figures whose attitudes and drapery may be of the thirteenth, and whose faces and hands are of the nineteenth, centuries, the backgrounds to the subjects being of no century at all, and the general effect of the design being half Mediæval, half modern, and altogether nondescript;—the proportion of colour, four-fifths rufy, blue, green, purple, and yellow, to one poor fifth of white and light. The delicate workmanship and graceful design of the stonework of the windows, which must have cost the architect so much thought and care, will not now be degenerated into picture-frames for the glorification of artists who practise glass-painting. God's glorious light, for which the architect so amply provided entrance, will not now be blocked out, or only used to show to what extent of bad taste garish colours can be placed in juxtaposition in a Decorated window; but Exeter will be seen as its architect designed it,—a model of the art of its period.

Far be it from me to decry the use of colour in its proper place. I am heartily willing to agree with "Experientia" that the noblest glories of stained windows have resulted from the gorgeously-stained works of Canterbury, Strashourg, Chartres, Milan, Florence, and Pisa; but I think "Experientia" will find that all these examples exist in buildings of an earlier or later period of architecture than Exeter,—buildings whose style is massive and hold, and has no pretension to elegance or delicacy of workmanship, and the more simple the stonework the richer will be the glass and the smaller the proportion of (dare I use the word?) grisaille. As the style of architecture becomes lighter and less massive, so the glass follows it, and we have more and more grisaille and less colour, till we reach the Decorated period, a period it is my misfortune to admire, and then we have windows such as I have described at Exeter, in which I am able to prove that the proportion of colour to white glass very slightly exceeded one-fourth of the entire window. Here it is that I cry out against the rage for colour. Put colour in its place, by all means. Enrich a sombre, massive building with it, and succeed; but do not destroy the grace and elegance of our Decorated cathedrals by blocking out that great essential element of their beauty,—the light. When will our glass-painters take heed of these things, and condescend to learn from their predecessors? When will they cease to put bad imitations of thirteenth-century glass into Decorated and even Perpendicular windows? When will they leave off mixing colours in a way no "artist" ought to be capable of doing? Simply when they cease to degrade their art into a trade and to sell glass at per square foot or square yard, according to pattern, with plenty of colour for the money. Simply, when they will condescend to learn that their art should be subservient to, though aided and assisted, that of the architect; that his design is first to be considered, and that theirs must harmonise with his. I speak of course of glass to be placed in ancient buildings, and I refer not to the works of Hardman and a few of our best artists, who are far above my poor criticism, but to those of the trade of glass-painters generally.

STUART A. MOORE.

New Masonic Hall for Liverpool.—The corner-stone of a new Masonic hall for Liverpool has been laid by Brother the Right Hon. Lord Skelmersdale, V.V.P.D., Prov. G. M., with full Masonic honours. There was a numerous attendance of brethren in their Masonic clothing. In the evening there was a banquet at one of the principal hotels in the town, with a large attendance, Lord Skelmersdale presiding.

THE POLLUTION OF RIVERS.

NATURE, in her purification of water, performs one of those chemical transformations so consistent with the earth as the habitation of man; but she requires from us, in return, obedience to her laws, and the retribution of disease and death is frequently the result of their neglect. The Romans were aware, in the construction of their aqueducts, of the necessity of affording every facility for the aëration of their water in its flow, and for lessening its turbidity by means of depositing basins in the line of their conduits. More than 300 years before the Christian era they abandoned the Tiber as the source of their consumption, and sought the purer springs of Tusculum for their supply. With the experience of 2,000 years, we are not only content with sewage-polluted water of our rivers, but we have been doing all we can, even with this burden upon it, to render its self-purification impossible. If we were dealing with the mighty rivers of America, the result would, perhaps, be scarcely apparent, and there would be some little reason in the excuse now being made by manufacturers that rivers are the natural drainage for the refuse from their works; but with our rivers, which are only streams, in comparison, it is folly to suppose that the length of their flow, or the body of water they contain, can effect a process of purification sufficient to render it fit for domestic use. They are either the natural drains for our refuse or they are the natural water supply of our towns; in England, with its population and industry, they cannot be both. What are we to expect, then, if we set the laws of nature at defiance, but that they will operate against us?

When populations are becoming yearly more consolidated and condensed; when cities are absorbing to themselves, as they are, the rural population, and crowding that which should be a neighbourhood into a street, and those who should inhabit a house into a single room,—they need not in the polluted air of their dwellings an extra poison to be brought to them by the means of one of their necessities of life. In addition to this, the cisterns in the dwellings of the poor are often in inaccessible places, or, at any rate, where they cannot frequently be cleaned, in courts where light and air come through the circumscribed areas which are left by the surrounding walls. Our mechanical filters, consisting, it may be, of sand and gravel to the depth of 7 ft. or 8 ft., are but feeble imitations of natural filtration; and, while they remove the objectionable impurities in suspension, are powerless to but a very limited extent to remove those which are in solution. A greater depth of material, and a higher standard of purity in the rain which falls upon the earth give effect to the operation, which yields to us natural springs of water, or enables us to reach it by the means of wells. Pleased with its clearness, and satisfied that it is consequently pure, the consumer often receives his water, after mechanical filtration, burdened with the deadly seeds of malignant fever, for the water has been so poisoned in its progress to the works that nature is powerless, either by aëration or aggregation, to render it fit for use.

The natural filtration of water through permeable strata, which sends it forth again from subterranean springs, is nowhere, perhaps, more apparent than when it passes from the surface through peat and sand. I have been shown a distinct line of filtration, where the suspended impurities have been deposited in their passage through the sand, and above this line the sand is completely leached by the action of the acid from the peat, and below the line of filtration the sand is unacted in colour, and the water is frequently hardened by the transformation, we are told, of what remains in it of organic matter into nitrates and nitrites; but the impurities which floating water gains from vegetable decomposition, as accumulated in its passage through the air in the form of rain, are as nothing in comparison to those which the refuse of manufacture, the high state of cultivation of agricultural land, and the sewage of towns contribute to our rivers; and we have only lately awoken to the truth by the increasing and reiterated discoveries of science. Much of our sanitary neglect is doubtless to be attributed to the tendency in all classes to avoid that which is not easy and close at hand; we will not often take the trouble, for a future convenience or a prospective advantage, to adopt an immediate remedy: to be satisfied with what we have,

rather than trouble ourselves greatly to improve it, has been, at least in sanitary matters, the doctrine of the past. In matters of less importance than bodily health we are often considerably more energetic; things which were formerly the luxuries of the few may now be said to be the requirements of the many; and yet in the matter of baths and personal cleanliness we are infinitely behind the ancient inhabitants of Rome. What we have lost by this inaction, as a nation, in moral and social advancement, it is impossible to tell; but we do know, beyond dispute, what we lose by it every year from preventable disease. A keener perception and clearer intelligence is only the natural result of improvement in physical health; and the lethargy which burdens the mind of an unhealthy frame may be read in the department and social existence of thousands of the dwellers in our crowded courts and lanes; even in the provinces, too, and in rural districts. The energy that once was successful in contending against this moral degradation departs and leaves behind it simply the animal desire,—we cannot say to live,—but to exist.

BYRON GIRAUD.

THE NEW ROMAN CATHOLIC CEMETERY AT MALTA.

The Malta Government having lately enforced extramural interments, a new cemetery has been prepared for the purpose, in the open country, nearly midway between the chief city of Malta and the populous towns within the Cottonera lines, about two miles from the Valetta Gates.

The cemetery was commenced in 1862, and was opened for public interments on the 1st of July, 1872. It is beautifully situated on a gentle declivity, having its principal entrance at the lower extremity, and a church towering with its acute spire on the higher ground.

A broad avenue, planted with trees, leads to the main gate, which opens on to a spacious circular piazza, having a large cross in its centre, ornamented by trees, shrubs, and flower-beds, and surrounded by two blocks of buildings flanking the gate, and an arcade for tablets, semicircular on plan, facing the main entrance. The building to the right of the gate comprises the residence and registry-office of the priest, who officiates in the cemetery church; the other contains the keeper's lodge and a mortuary chamber, intended for the reception of corpses. Each of these buildings has a separate garden attached to it. The arcade is intended to contain tablets, with inscriptions to the memory of illustrious men. At each end of the arcade a carriage-road, lined with trees, ascends with a gradual incline in a zig-zag direction towards the summit of the rising ground, intersecting each other in front of the elevated esplanade on which the church is situated. These two roads border this esplanade, join behind the church, and abut at the back entrance of the cemetery. A foot-path, 466 yards long, intersects the cemetery in a longitudinal direction and in a straight line from the central arclway of the arcade in front of the principal entrance, to the back entrance, separating the whole ground in two grand divisions. The eastern division contains thirty-two sections, and the western twenty-nine sections. Each section is intersected by footpaths, which form several compartments (103 in the eastern sections, and 144 in the western). Each compartment is occupied by graves, and interspersed by flower-beds and trees.

A gallery crosses the whole length of the cemetery, under the aforementioned footpath. It carries the superfluous rain-water out of the cemetery, and a 4-in. cast-iron main-pipe, with branch communications, placed therein, communicating with a grand reservoir of water at the top of the hill, and outside the back entrance, affords the means of irrigating the whole grounds of the cemetery.

This necropolis is enclosed by a wall 1,504 yards long, and the aggregate length of its two carriage-roads is 2,103 yards. It covers an area of twenty acres of land.

In the centre, and on the most prominent portion of the ground, rises the cemetery church, under the title of the Virgin Mary Addolorata. The architecture of this church, and that of all other buildings in the cemetery is in the modern Gothic style. The plan of this church

is cruciform. It comprises a nave, with aisles, terminated by transepts and chancel; on either side of the chancel there is a sacristy, one either side having a private entrance for the clergy, and a staircase leading to the crypt underneath. The nave is divided by an arcade of four bays on either side supported by piers, with moulded bases and carved capitals representing lilies and roses symbolical of the Virgin. Above the nave there is a clearstory of six windows on either side. Between each of these windows are carved stone corbels supporting the principal ribs of the roof. The bays of the nave arcade, which open into the transepts, have no clearstory. Their arches, extending the whole width of the transepts, spring from the same level as that of the nave arches, but they extend higher up. The groined ceilings of the church are divided into compartments by beams, and into panels by ribs, having enriched bosses at the intersections and crisp in the panels. The church is decorated externally with buttresses, pinnacles, parapets, windows, and roses with carved tracery. The tower is of three stages. The organ-stage, which is over the entrance-door, has a gallery projecting into the nave; this stage is gained by a stone winding staircase. The tower is surmounted by a spire, having two heights of windows. From a carved finial which finishes the top of the spire rises a gilt cross. The chancel is raised 1 ft. over the pavement of the nave and transepts forming two steps. The church contains three altars. The length of nave and chancel is 73 ft. 3 in., and the breadth across transepts is 57 ft.; the width of the nave is 19 ft. 3 in.; of chancel, 17 ft.; of transepts, 16 ft. 3 in.; of aisles, 10 ft. 6 in.; the height from the floor of the nave to the outer ridge of the roof is 50 ft.; the height of the tower and spire, from the pavement to the highest point, is 116 ft. All the windows are filled in with stained glass, geometrical lead work, and ornamental quarry glass (from Messrs. Cattam & Co., of London), representing,—the chancel window,—the Assumption of the Virgin Mary, having on each side two subjects from the life of Mary, and in the tracery the Holy Ghost descending. The transept windows,—that on the right,—the Crucifixion in the centre, and on either side the Adoration of the Magi, the Baptism, the Agony in the Garden, and the Ascension; in the tracery, the Holy Father. The subjects of the other window, on the left, are:—Our Saviour in the centre, and the Four Evangelists on either side; in the tracery, the Transfiguration. The tower window is filled in with geometrical leadwork with coloured borders in lights and tracery. The eight aisle windows are filled in with ornamental quarry glass, having in the central light and in the tracery the Apostles and Disciples; the ground of these windows is ornamented alternately with the monograms of our Saviour and of the Virgin Mary. The twelve clearstory and four vestry windows are filled in with grisaille and ornamental quarry glass.

The roofs are covered with zinc from Messrs. Tyler & Co., of London. The clock is by M. A. Sapiano, of Malta; and the bells were cast in the foundry of Messrs. S. Cauchi & Sons, of Malta.

To the east of the church, a quadrangular structure serves as a deposit for corpses that cannot be buried at once in their proper graves. This place of deposit is partly subterranean, but it rises 5 ft. over the ground. A staircase on each side leads to the terrace, in the centre of which the entrance stands, having a staircase descending to the vaults underneath.

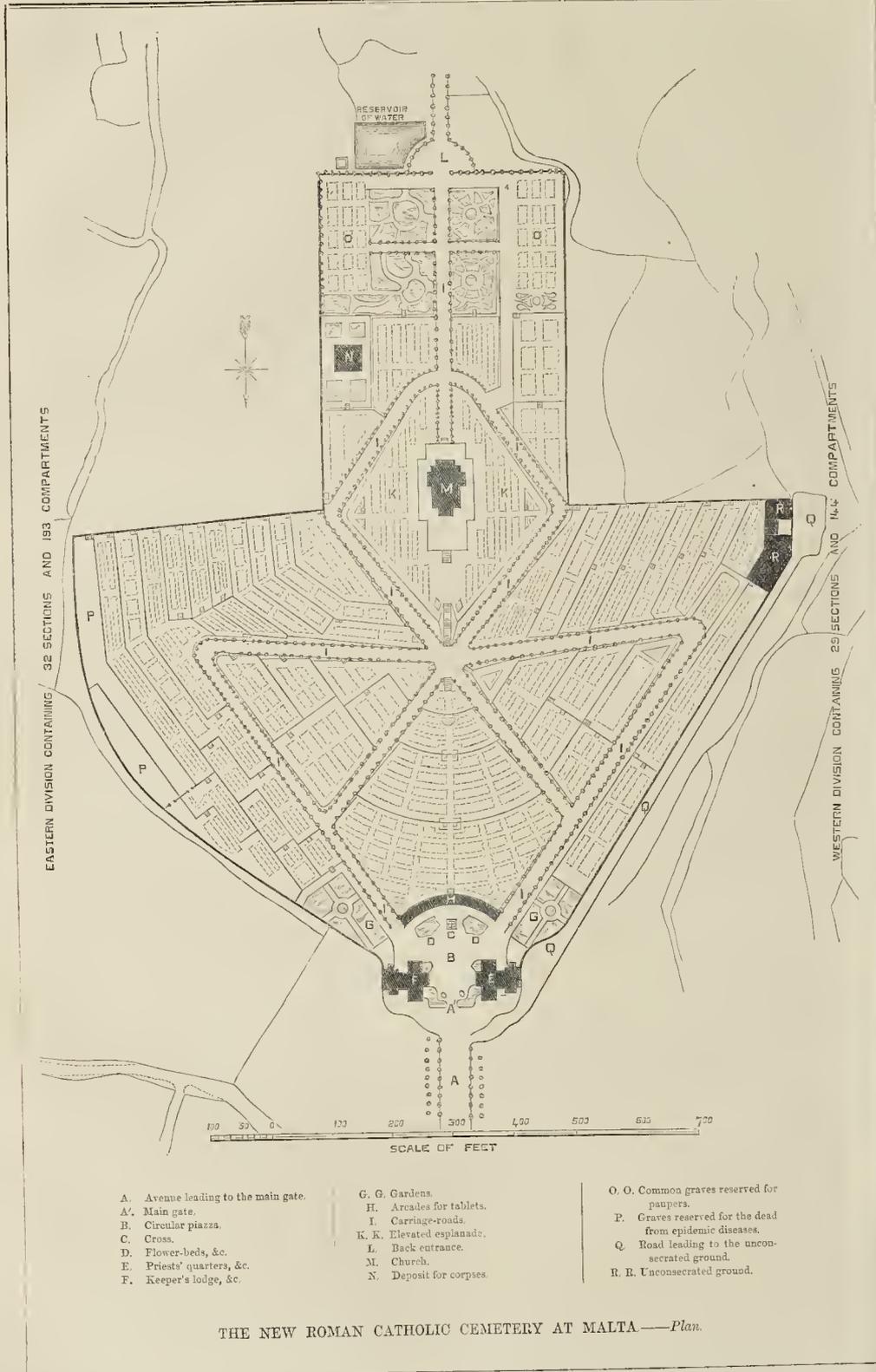
In the crypt under the church are tombs for the secular and regular clergy.

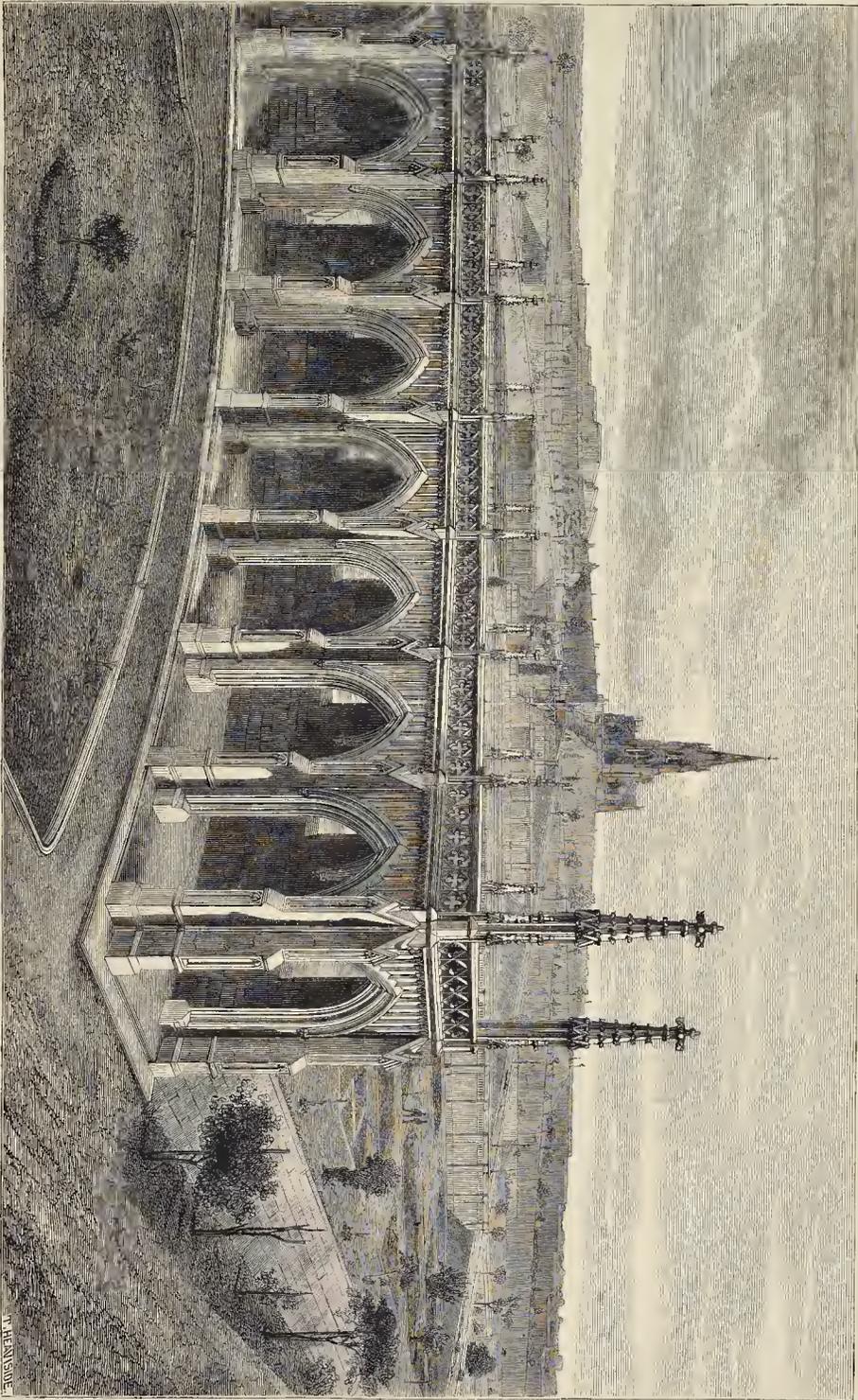
The greater part of the area of this cemetery is for the interment of the public in general; two spaces are, however, reserved,—the one to the south being intended for paupers, and the other to the east for the dead from epidemic and contagious diseases.

To the right of the lower main entrance, a road running externally along the boundary wall of the cemetery leads to an unconsecrated portion of the ground intended for the interment of Roman Catholics who, for religious reasons, may not be admissible into consecrated ground.

The material used is the Malta sandstone, from the quarries of Tad-Danil, near Mtaibiba.

Mr. E. L. Galizia, chief Government surveyor, is the architect of this cemetery, and of all the buildings we have described; and all the works have been executed under his direction.





THE CEMETERY DELL'ADDOLORATA, NEAR VALETTA, MALTA.—MR. E. L. GALIZIA, ARCHITECT.

W. HENNING



CRAFTSMAN AND ARCHITECT.

Str.—A writer in the *Quarterly Review* has been creating a sensation of late by his architectural criticisms on our modern buildings and their designers. His views are in nowise novel, but, from the style of his treatment and the volume of his opinions have been given to the public, considerable interest has been awakened, and a less considerable has been awakened, the thoughts of many on architectural subjects, the said many never having had previously any settled opinion of their own on the matter under discussion. At what particular period of the world's history the craftsman ceased to be the architect, or to what extent craftsmen were architects in days long past, there is little evidence in book form or MS. materials, as far as I am aware of, to show. By a system of deduction there can, of course, be an amount of possible evidence evolved in support of the belief that the master workman was both a craftsman and an architect, and, consequently, a designer and an artist. From the building of the Pyramids to the building of the Parthenon, or from the construction of the Roman Wall in Britain to the days of William of Wykeham, architecture at home and abroad achieved many triumphs and met with many reverses; but at the earlier as well as at the later date who can dispute that an organisation of building labour did not exist? Allowing for all the modifications and changes effected by modern society, the brickmaker, quarryman, stonecutter, or mason, the bricklayer, the carpenter, the woodcutter, splitter, or Sawyer, and some other branches, existed in the building line thousands of years ago abroad, and probably upwards of 1,500 years ago in this island. Now, which were the master workmen, *i.e.*, the architects, in the days of Alfred the Great or William of Wykeham? The prelate was the architect in the last instance, and in learning this and other facts about his life and career, we do not find any statement as to his being either originally a mason or a carpenter. History does not tell us who were the architects of all our early and splendid cathedrals, churches, and abbeys, and we are still in darkness how many of the said architects were masons or carpenters, or other craftsmen. There were undoubtedly master workmen, chief men, or foremen, in early building operations, as well as now; but who will inform us of the proportion of architects or craftsman-architects each large building embraced? Which was it, the carpenter or the mason, supplied the designs, and which the inspiration? Was every grand design manufactured on the modern principle of pin-making? Did one supply the idea, and another the drawing materials; a third the plan, a fourth the elevation, and a fifth the working drawings, and so on through theory and practice, each craftsman in his own respective branch pleasing his own sweet fancy and agreeing with his brethren? Is it possible that all the wonderful harmony of our ancient buildings was obtained, both in design, plan, and ornamentation, by entrusting them to the erection of some half-dozen architects representing the different branches of trade?

To carry the notions of the writer in the *Quarterly Review* to its limits, it presupposes something like the above condition of things. Consistency is generally absent in arguments which are ventilated before they are well considered. A little thought and common sense must convince any one who possesses some experience and practical knowledge of architecture and building operations that there must have been always one chief directing mind,—an architect or “master workman,” if you will,—from whom the general design emanated, and who always (during his time), more or less, controlled the erection of the building. In the method employed in construction or putting together of several portions of the work, or in ornamental details, it is most likely that the craftsmen of old were allowed great latitude, and in their own peculiar ways embodied a good deal of thought, and displayed a good deal of ingenuity and fancy, in the execution of their work. One thing is, however, practically certain, that they did not work at random, and that they were amenable to the designer or architect. The custom of long ages has established an organisation of labour in building operations, from the designer or architect down to the excavator, and it is the sheerest folly to suppose that we can so revolutionise society as to make it possible that our competent craftsmen, masons, car-

penters, bricklayers, and so forth, can all become architects, sculptors, and painters,—artists and workmen at the same time,—and that, if it were possible, ordinary building operations would go on as usual. There is one thing that may be granted,—architects may be craftsmen, and craftsmen architects. Masons have before now become sculptors, and carpenters, bricklayers, and masons architects; but as soon as they become such they cease to be workmen, in the ordinary sense. None of them, to my knowledge,—and I have an experience of the professional practice of a few,—led to any new reform in architectural practice. It would not be amiss, in my opinion, however, for the future race of architects to become practically, as well as theoretically, acquainted with one or two of the leading branches in the building trade. For a youth intended for the architectural profession a novice of some period in the workshop or building would be a great advantage; and actual work performed by him in such capacity, first as a craftsman, and, secondly, as a foreman or clerk of works, would in no manner be derogatory to the subsequent dignity of his profession as architect. Although modern craftsmen-architects have not been many nor very distinguished, for lack of requisite education, working drawings have been distinguished for plainness. Knowing the wants of workmen, architects who were once craftsmen are, as a rule, easy to follow in all their details. This in itself is one great advantage, even though their elevation betray as yet no great inspiration or advance in the direction looked to by the *Quarterly Review* writer. Although I see both the possibility and the probability of a great change in architectural creation being effected by the training of the workman and the utilisation of his latent talent, I cannot, as a whilom workman myself, see any possibility at all of our building workmen becoming a race of angels.

There can be no comparison as far as the art of the sculptor and the painter and the architect is concerned. If it be contended that the latter should be a *bona-fide* craftsman as well as an artist-architect, he must needs be, to carry out the theory now ventilated, a “jack of all trades” as well,—a general building operative, or at least a sort of “three-branch hand.” The sculptor certainly designs and executes, but his little microcosm is his own studio. He is given a block of marble: he sketches, he models, and by actual workmanship creates the embodiment he previously designed. The painter is also a workman as well as an artist, and is necessarily a draughtsman as well as the architect. There is a subdivision of labour in sculpture and painting as well as in architecture, and in the former art there are very few large pieces of statuary but have been partly executed by several hands. The construction of a palace or a cathedral from its design to its execution admits of no comparison whatever with the routine of the sculptor's or painter's art. Architecture embraces many professions or callings; sculpture and painting only one. As sculptors and painters in the past had a great deal to do with the ornamentation of buildings, it would be quite as reasonable to expect that they should be architects and inspired master-workmen, possessed of a practical knowledge of architectural design and building execution, as to expect that our architects should be master-workmen in the sense of the *Quarterly Review* writer. All admit that there is great room for improvement in architectural design, but that improvement will not come through any hot-headed process applied to either the architectural or operative community. Time will produce a higher class of architects, and a more skilled class of craftsmen; the former possessing a more practical and technical knowledge of the trades on which their profession depends, and the latter becoming more versed in the principles of design and construction, and consequently executing their work with a greater artistic taste. A well-planned building, be it a dwelling, church, or palace, is in itself a piece of workmanship to be proud of, and in the region of original designing and planning, and all its details in architectural and building construction, there is a quite sufficient and ample field for the architect. I would by all means elevate the craftsman and improve the architect, but I would do no party to preaching an inconprehensible logic that, however it may please for the season, is certain to become one of those Dead-Sea fruits, turning to ashes and disappointment upon the lips.

As to the question of men designing works and

leaving others to execute, there is nothing at all strange in this, any more than in statesmen making laws, and judges and magistrates administering them. It is of course possible for an architect to design as an artist, and execute as a mason and an architect. What then? Think you, if Sir Christopher Wren worked the stones and performed the carvings, as well as designing St. Paul's, his great work would have presented any marked difference, supposing he accurately followed the drawings (whether these were all his own or not being an open question)?

If a real improvement in architectural designing is earnestly desired, let a system of model construction be insisted upon in all great public and ecclesiastical works, and that the construction of these models be under the eye of an architect. Let him insist, in all great works on which his fame and character are to rest, that a model be first made,—the expense, of course, to be paid by the clients. If models had been first made of some of our recent public buildings and some more in course of erection, much that is faulty in the design would have been remedied. It is nearly impossible for architects, no matter what their experience may have been, to see in their mind's eye or produce by any process of paper-drawing the appearance that certain portions of some buildings will present when completed. The exigencies of site will lead to the divergence from ordinary methods of construction, but it is only when the model is seen or the actual building put up that an alteration is seen to be necessary. Therefore I would strongly advise the construction of models, believing that it is one of the plainest, most practical, and feasible modes of developing an improvement in architectural design, and tending to the improvement and elevation of both architecture and handicraft.

A CRAFTSMAN.

THE NEW REREDOS IN GLOUCESTER CATHEDRAL.

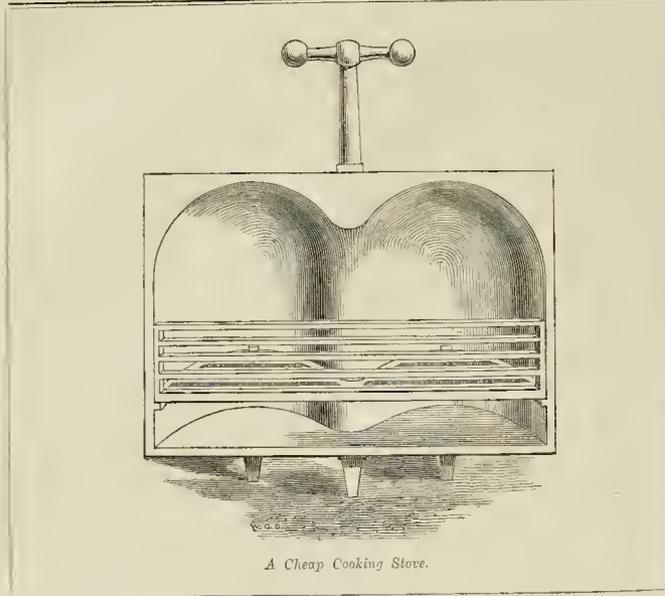
This work of art, the gift of the Freemasons of the province towards the restoration of the cathedral, is now nearly finished. It is 17 ft. 6 in. in width. A horizontal line of carved stone extends across where the communion-table will be placed. Above this arc seven niches, filled alternately with statues and sculptured groups. The subjects, from left to right, are,—Moses hearing the tablets of the law; group, the Nativity; St. Peter; group, the Ascension; St. Paul; group, Entombment of the Saviour; David hearing the harp. The central one, the Ascension, is 5 ft. in height; and the side groups are each about 4 ft. 3 in. high. The statue of St. Peter is of Painswick stone; the other figures and the groups are of stone from Mr. Wingate's quarry, at Crickley Hill. Over the figures and groups are wrought canopies; above these are three open pinnacles, with statues of angels; and surmounting the central pinnacle is the cross, 27 ft. from the floor, but not interfering with the view of the east window of the choir. The groups and statues are by Mr. J. H. Redfern, of London, sculptor; and the other portions of the work have been executed by Messrs. Farmer & Brindley, also of London. The restoration of the south porch is now nearly completed.

THE FREE-BRIDGE MOVEMENT.

On Saturday night last, a densely crowded meeting, convened by the Metropolitan Free-bridge Association, was held at the St. John's School room, Waterloo-road, to consider the recent decision of the Metropolitan Board of Works with reference to the toll-bridges of the metropolis. Mr. George Hill (Lambeth Vestry) presided. The following resolution was unanimously adopted:—

“That this meeting has heard with satisfaction the announcement that the Metropolitan Board of Works has taken the necessary steps to introduce into Parliament a Bill having for its object the freeing of the metropolitan bridges from toll, and pledges itself to render every assistance in its power to the Board in its endeavour to effect one of the most important metropolitan improvements—an improvement which will remove a direct tax from the shoulders of thousands of the poorest of the population, and will contribute to the well-being of all classes of the community.”

It is to be hoped that the object in view will now be carried out, both for the sake of convenience to the public and advantage to house property generally in the various districts to be benefited. It is an object which has always had our sympathy and aid.



A Cheap Cooking Stove.

ECONOMICAL ROASTING STOVE.

The accompanying view illustrates a stove of cast-iron, which I have in constant use in my kitchen in Florence.

The meat or poultry or game is placed in a tin oven like that called a Dutch oven, but instead of being square, this is made so as to fit the front of the iron stove, and arched over at the back.

The spit on which the meat is placed is provided with a side prong that fits into holes made at the side of the tin oven, and into which holes the prong is moved as the meat is cooking, where a movable "jack" is not in use, so as to turn all parts of the meat to the fire.

Charcoal is placed in the iron stove, and when kindled, the tin oven is placed before it. The quantity of charcoal expended in cooking well 6½ lb. of meat was 2½ lb., at a cost of less than a penny. The heat concentrated in the arches of the iron stove causes less time to be used in roasting. The size of the stove is 19 in. wide by 13½ in. high; the depth of the arch is 4½ in. The cost in Italy of the stove is eleven francs, and the tin oven, six francs, making in English money about 13s. There is no smoke from the charcoal to preclude the stove being placed on a table, on the stone floor of a kitchen, or any side stone projection of the fireplace. The operation of cooking by charcoal is cleaner and quicker, requiring less care and attention than coal. Surely charcoal could be imported into England from Belgium and France in sufficient quantities to make it serviceable in reducing the consumption of our coal. The cost of charcoal is about 2s. 10d. the 100 lb. (on the Continent).

I cannot too strongly recommend the use of this simple economical mode of roasting. A saving would thereby accrue of all the enormous amount of coal used for "making up" the kitchen fire preparatory to roasting.

Square 9 in. iron pans could be used, 4 in. in depth, to contain charcoal, on which could be placed a saucepan with compartments for holling. F. C.

Harrow Public Hall Company.—A company has been formed, under the Limited Liability Act, for the purpose of erecting a public hall in Harrow. The necessity for such a building has long been recognised. A site in the High-street, nearly opposite the King's Head Hotel, with a double frontage, can be secured for a term of 99 years, at a ground-rent of 35l. per annum. Mr. C. F. Hayward has been appointed architect, and has supplied designs for a building to cost 3,000l.

* Means of escape for the fumes ought nevertheless to be provided.—Ed.

THE LEICESTER SEWAGE WORKS.

A NUMBER of gentlemen interested in the utilisation of sewage met last week at the Sewage Works, Leicester, their object being to witness the working of the sewage-drying and pulverising machine recently erected there by Messrs. Milburn & Co. The machine itself consists of an iron floor, about 6 ft. wide and 30 ft. long, which is heated by a furnace underneath. At one end of this floor the sewage is placed, in a damp state, and, by means of the apparatus above, is gradually moved to the other end. In its course it is subjected to the action of a series of dividers, between which it passes, and which prevent it caking. On leaving these dividers the sewage passes underneath some bars or pulverisers, and is ultimately scraped off at the other end in a dry powder, sufficiently fine for sowing, and easily removable. The experiments showed that the machine was capable of turning off manure at the rate of 651 lb. in the hour, or nearly a ton in three hours. We are informed that about 8 tons of wet sewage are converted into a ton of dry manure, and the cost of doing this with coal at 12s. a ton is about 4s. a ton. After the process had been witnessed for some time with apparent satisfaction, the company adjourned to the Bell Hotel, where they partook of luncheon.

THE NEW BUILDINGS AT THE LOUGHBOROUGH-ROAD STATION OF THE CHATHAM AND DOVER RAILWAY.

DURING the last few months large works have been in progress at the Loughborough-road Station of the London, Chatham, and Dover Railway Company. The opening of the new loop-line to the Crystal Palace, which commences by a junction with the company's main line at Loughborough, has necessitated a very considerable enlargement of the station, at which three of the company's lines now converge,—the Metropolitan Extension between Ludgate-hill and Victoria, the main line, and the new Crystal Palace loop line.

The new buildings, and other arrangements, which are on a very extensive scale, have just been completed, and the station, now called the "Loughborough Junction," is intended to be opened on Thursday next, the 14th inst. The arrangements include the erection of new booking-offices, on the ground-floor, with spacious waiting-rooms; six long and commodious platforms, with ladies' and gentlemen's waiting-rooms, and other conveniences attached; together with wide corridors under the several lines of railway, from one extremity to the other, which have been ingeniously and skillfully formed by cutting through and connecting the

arches supporting the respective converging lines. The new booking-offices have been erected on the triangular piece of land between the Metropolitan Extension and the main lines, close to the point of junction between the two lines named. The building is only small and limited in extent, although the interior arrangements are very complete. We understand that it is the ultimate intention of the company to erect a much larger block of offices on the site, of finer architectural proportions, the remainder of the large area of the company's land in front being partly laid out for carriage approaches to the station buildings, whilst the rest will be set apart as a cab-rank.

The passengers to all the three lines of railway, on leaving the booking-offices arrive at the respective platforms by passing along the corridor already named, in connexion with which there are spacious staircases, 8 ft. in width. The several platforms, all of which are covered, are supported by substantial and ornamental arches of yellow and red stock brick, the flooring of the main-line platform, which is asphalted, resting upon iron joists. The average length of the platforms is about 320 feet, and the ladies' and gentlemen's waiting and retiring rooms in connexion with the Crystal Palace line more especially are large and commodious. The entire area of the station as reconstructed, with its network of rails, and new buildings, is now upwards of two acres in extent, and, when opened, is expected to be one of the most important junctions on the company's lines. The works have all been designed and carried out under the superintendence of Mr. Mills, the company's chief engineer; Mr. Risson, of Brixton, being the contractor.

IMPROVEMENTS AT THE LAMBETH VESTRY-HALL.

SOME time ago the Lambeth Vestry determined upon making considerable alterations and improvements in the vestry-hall at Kennington-green, and for this purpose they appointed a special committee to inquire into the subject and report to the Board. The committee have just presented their report, and they recommend extensive alterations and re-arrangements. Amongst other improvements they propose that the Board-room be raised 13 ft., and the underneath part converted into four committee-rooms separated by two corridors, one 54 ft. in length by 9 ft. in width, running from the back to the front of the building, and the other at right angles to the first, 19 ft. by 5 ft. They also propose that an entirely new suite of rooms be erected for the hall-keeper, and they estimate the expense of the proposed alterations at 3,500l. At the discussion which took place on the subject, the proposal was favourably received by the vestry, but the further consideration of the subject was deferred for a month, in order that the plans might be examined, and it was also suggested that the plans be lithographed, and distributed amongst the members.

A VALEDICTORY DINNER.

THE dinner given to Mr. Thoms, on the 1st inst., at Willis's Rooms, in recognition as well of his social qualities as of his services to literature as Editor of *Notes and Queries*, was presided over by Earl Stanhope, and attended by about 12 gentlemen, more or less well known. The chairman, in proposing his health, showed cleverly the value of such a publication. Cases might be mentioned, he said, in which, if regard were paid to one set of observations only, very erroneous conclusions might be formed. Thus, a person leaving the Thames might ask who was the principal authority in the neighbouring district. He would be told the Sheriff of Middlesex. The same person might make the same inquiry in the Red Sea—say at Jeddah—and he would again be told the Scherif of Mecca. If the inquirer relied on the resemblance of name he would be inclined to suppose that there was close kindred between the two officers. But had the Arabic scholar would at once have shown that "scherif" was pure Arabic, and some Anglo-Saxon student that our word "sheriff" came from quite a different root—the shire-reeve or chief civil officer of the county—so that there was not the smallest connexion between the two words. Again, suppose inquiry made by a person into the derivation

"equerry." He would find it meant a mounted attendant on a prince or princess, riding on horseback by the side of a royal carriage. A Latin student would say, of course, the word must come from *equus*. But here, again, a student of French would correct him, and show that "equerry" came from the old French *escuyer*, the bearer of a shield, and had, in fact, no connexion with *equus* or *equus*. So, very plausible explanations were often entirely delusive; and reasons which seemed perfectly clear so long as they were derived from a single source, here quite another aspect when other minds were directed to the same point.

Mr. Thoms replied in effective and touching words. Professor Owen, answering for science, launched into a lecture on its present position, and was obliged to break off suddenly. Lord Doughton, who spoke for literature, "the muse's friend, himself a muse," did what no one else could have done without a tumble;—laughed at the utterly useless character of what was treated in *Notes and Queries*, and yet never ceased to admit the usefulness and value of the publication itself. Mr. Shirley Brooks, called up by the toast of the Press, made a merry little hit in flouting the guest of the evening, whose opinions on longevity are well known, with the intelligence that he would find a confidante in his breakfast-table next morning, the said confidante turning out to be the *Morning Post*, established November 2nd, 1772; and Dr. Doran, replying as the new editor of *Notes and Queries*, told capitally a capital story, and applied it admirably. Lord Lytton, Mr. Moran (of the United States), Mr. W. D. Christie, Sir Edward Smirke, Sir Frederick Pollock, and some others lent their sweet voices, and the evening was spent pleasantly and well.

WINCHESTER WHISPERS.

SIR,—In your number of the 2nd inst., you publish a letter headed "A Whisper from Winchester" to which my signature is attached. I beg to state that it is no letter of mine. I am sorry to say that I am little troubled with paint but with whitewash, and what few cracks I have are not recent, but as old as my walls, and they give me no trouble. Some of my pinnacles certainly need restoring, my altar-screen also would look better filled with figures; otherwise I am very well cared for. I am, however, seriously oppressed by the two bell-floors in my lantern-tower over my choir. I should be very pleased to have these removed, and also my choir-screen removed, so that those who come to worship in my ave might see into my choir.

(The mark of Winchester Cathedral).

A BIG CHURCH FOR BRIGHTON.

SIR,—I have read in the *Builder* of the 26th of October that the Rev. A. D. Wagner has just commenced the erection of an immense building in Ann-street, Brighton. There is a fact which should be taken into consideration for the advantage of a congregation attending a church. It is known that the voice can only extend to a certain distance to enable the congregation of otherwise to hear distinctly; and at the time St. James's Church, Piccadilly, was erected, it was considered a model for other churches, in regard to the capabilities of hearing distinctly. It is the same in regard to height.

OPENING OF THE NEW MARKET HALL, WHITCHURCH.

THE NEW Market Hall was opened amid the ringing of bells and the flaunting of flags, on the 15th ult. The new building, which was erected by Mr. Stringer, of Nantwich, is commodious. The front portion is in the Gothic style of architecture of the thirteenth century. A gable as a central feature terminated by a bell-turret, with lancet and cardinal points, has been carried to a height of 72 ft. The front portion of the building consists of a corn exchange, about 56 ft. in length, by an average width of 32 ft., having three separate entrances. Adjoining are placed the offices of the Local Board and their board-room; above these apartments and occupying the entire first floor is the large public-room, 63 ft. 6 in. in length, 41 ft. in width, and about 24 ft. in height to ceiling. The general market is situated immediately behind the front block, and is 126 ft. in

length by a width of 60 ft. In it there are sixteen butcher-stalls, 116 butter-stands, and eight stalls for vegetables. Beyond the general market is a market for cheese sales, 61 ft. long and 78 ft. wide. A large raised cheese-stage, 60 ft. by 35 ft., is also provided. On the south side of the cheese-market are eight lock-up offices for higglers. The fish-market is 35 ft. long and 17 ft. in width, with separate roof and ventilation, and stands are furnished with broad slate slabs, with complete arrangement for drainage.

OXFORD ARCHITECTURAL AND HISTORICAL SOCIETY.

IT HAS been decided to continue the series of walks and excursions commenced in 1870. On Saturday, November 9, it is proposed to meet in the hall of St. John's College, where the rev. the president will receive the members, and the Rev. H. Deane, M.A., will give a lecture on the college, and conduct the party over the buildings. From here the party will go to St. Giles's Church, where the vicar, the Rev. G. F. West, will make some remarks upon the history of the building. It is the finest specimen of the Early English style existing in Oxford. On the 16th, Jesus College and St. Martin's Church at Carfax, and the ruins of St. Peter-le-Bailey Church, will be visited.

An ordinary meeting of the Society was held November 6th, when the Rev. J. S. Treacher M.A., read a paper on "Early Printing and Engraving."

THE ARCHITECTURAL MUSEUM.

A VERY respectable and intelligent body of workmen, about 150 in number, assembled on Saturday afternoon last, in the Museum, and Mr. W. Bindley, read a paper introductory to his proposed explanations of the casts, treating chiefly of the Egyptian and Classical times. Norman, Transitional, and Early French work, will be treated of on (this) Saturday, 9th. It may be useful to hint to the reader, that the place is not very well adapted for teaching, and that he must keep up his voice if he wishes to be heard.

OPENING OF ST. STEPHEN'S SCHOOLS, SPITALFIELDS.

THESE schools, in which secular instruction will be combined with religious teaching, have been opened by Bishop Claughton. The schools present a frontage to Quaker-street, Brick-lane, near the Bishopsgate Terminus of the Great Eastern Railway, and are in close proximity to St. Stephen's Church, with which they are connected. The building is of brick, from a design by Messrs. Stone, architects. The edifice has three stories. Each story is capable of accommodating 200 children. There are schoolrooms for boys, girls, and infants, into which the latest improvements are said to have been introduced. The largest room is the infant schoolroom, which can upon occasion be used for religious meetings. The dimensions are 50 ft. by 33 ft. The other rooms are nearly corresponding in size. There is a drill-ground below the schools. The cost of the building has been 6,000l., derived from voluntary contributions and the Government grant in aid. Accommodation is provided for 600 children in the institution. The works have been twelve months in progress. The schools are opened free from debt, so far as the structure is concerned.

SANITARY MATTERS.

The Drainage of Richmond.—The committee of the Richmond select vestry have applied to the Local Government Board for sanction to borrow 20,000l. to enable them to execute a scheme of sewerage for the district. Mr. J. T. Harrison, C.E., the Government commissioner, held an inquiry respecting the application at the vestry-hall, and having heard all the arguments for and against the application, said he would advise the Local Government Board on the subject, and inform the vestry of the result.

The Utilisation of Sewage.—A conference has been held at Southsea to discuss the practicability and desirability of introducing carbon into the purification and utilisation of sewage, by means of a system invented by Mr. Edward C. C. Stanford, F.C.S. Lieut.-General Lord Templeton, K.C.B. presided, and the company in-

cluded representatives of the military and naval departments. Colonel Synges, R.E., entered into an elaborate exposition of the main features of the system, and an interesting discussion ensued. The "carbon system" is now being tried at Glasgow.

WARE AND HERTFORD.

MR. T. W. GRINDLE, C.E., has been appointed engineer to the Ware Union Board, to survey and carry out the necessary sanitary arrangements for the fifteen parishes and townships comprised within the union under the recent Public Health Act. The same gentleman has just now completed a re-arrangement, at a cost of about 2,250l., of the deodorizing works, originally constructed for the purification of the sewage of the town of Hertford before passing into the river Lea. The scheme now in operation includes lime and chloride of lime, both of which are added to the sewage as it enters the tanks; the matter is then allowed to subside till clear, when it passes over weirs formed of white glazed tiles, which are so arranged as to allow the effluent water to escape in a quantity corresponding to the amount of sewage which enters the works. From these weirs the water is carried into the filters, which are composed of finely-crushed coke, and from thence it passes through a conduit 1,000 yards in length, and eventually finds its way into the river Lea.

HOOP IRON BOND IN WALLS.

SIR,—I read with much surprise in your paper of the 26th October, under the heading of "Materials of the Architect," of the injurious effects of hoop-iron, when used as bond in the mortar joints of brick walls. This question is raised by "H. L.," in the last issue of the *Builder*.

I must say that my own experience is directly opposed to the statement made in your article. I have used slight hoop-iron as bond in mortar joints for the last five-and-twenty years, and never saw or heard of any but the most beneficial results from its use.

A fellow tradesman has just had to remove a wall he built twenty-five years ago; the hoop iron is as clean and tough as when it was laid in the work; the mortar appears to have altogether stopped the corrosion of the metal.

About ten years ago I built a garden-wall near the sea, of grey stock bricks, with Hailling lime mortar. As the soil was very treacherous, I used much more than the usual quantity of iron-hoop bond. I have looked carefully at the wall within the last few days, and cannot see a single joint that has failed.

Under these circumstances I must be excused when I hold the opinion that the use of slight hoop-iron in mortar joints in brick walls is one of the best uses, and can seldom be used but with advantage. I readily admit that it would be quite as well if laid in cement.

A CANTERBURY BUILDER.

THE IRON CHURCH AT PRESTONVILLE.

WARREN P. ROBINSON.

THIS was a claim of 45l. 1s. 6d., at the Brighton County Court, for furnishing certain plans and specifications for the building of a church at Prestonville. The case was heard before the following jury—Messrs. F. Bury, Geo. Brown, W. W. Buckman, Alfred Beckwell, and James Balguy.

Mr. Penfold appeared for the plaintiff; and Mr. Gell for defendant, a clerk in holy orders.

It appeared, from Mr. Penfold's statement, that plaintiff, who was a draughtsman and modeller, had been for some time acquainted with the defendant (a curate at Emmanuel Church), who was desirous of erecting a church at Prestonville, which, he estimated, would cost 2,000l., if he could raise the money. Plaintiff was instructed to prepare plans and certain models and specifications for the proposed edifice, and of which he was to superintend the building. Plans were prepared, but the money was not forthcoming, and plaintiff was then instructed to superintend the building of an iron church, which, it would be remembered, was burnt down about the 5th of November of last year.

The defence made by Mr. Gell was, that the plaintiff had charged most exorbitantly for the plans, tracings, and specifications, and he called Mr. Laisson, surveyor, in support of his statement; but, after the case had lasted about three hours, defendant denying the statement of plaintiff, the jury ultimately found a verdict for plaintiff, damages 40l. 8s. 6d.

There was another jury case on the list, in which the son of the plaintiff sued defendant for work done at the same place as a builder; but the hearing was adjourned for a fortnight.

WHITEHAVEN BATHS COMPETITION.

SIR,—I hope none of your younger readers will be tempted to compete for the above baths, until the committee give a straightforward statement of what remuneration they are prepared to offer. At present, they require a statement of terms from architects. I presume the cheapest will win.

I do not fear that established architects will enter for the competition, which is at the best but a very little one, but I fear that some of the younger men who are just entering business, and have some spare time on their hands, or some young gentlemen engaged in offices, may consider that it is a nice little thing well within their power and time, and so go in. Let them remember that when they are older men the position of the profession will be, to a certain extent, what they have made it; and

if for a microscopic chance of present gain they encourage this sort of attempt to lower the status of the profession, they will surely to some degree suffer, when in their turn they take the place of the older men in the business.

If there were no responses to this sort of advertisement, committees would soon cease to spoil your advertising pages with their economical offers.

FORSEYER.

P.S.—In this competition, "Rejected designs will be returned if required."

WATFORD PUBLIC LIBRARY COMPETITION.

The committee have informed the architects who sent in designs for this building, that the following designs have been selected out of the fourteen sent in:—

The design deemed by the committee best,—
"Non quo sed quo modo," Messrs. Sedgwick & Son, Watford; second, "Faith," Mr. John Ladd, 4, Chapel-street, Bedford-row, London; third, (without motto), Mr. P. J. Byrne, 53, High-street, Windsor.

The committee propose to exhibit all the designs in a public room in Watford.

THE NEW COUNTY LUNATIC ASYLUM, CHARTHAM, KENT: COMPETITION.

The design of Messrs. John Giles & Gough, 28, Craven-street, Strand, has been selected, in a limited competition, for this asylum, to accommodate upwards of 1,100 patients.

LADIES' READING-ROOMS.

SIR,—As you have at all times been a champion of the true interests and rights of women, you will doubtless have many fair readers. I therefore beg to suggest, through the medium of your widely-circulated journal, that these should interest themselves in the establishment of ladies' reading-rooms in the most frequented thoroughfares of the metropolis and great provincial towns. Refreshments, too, might be supplied at these rooms.

The unprotected female often knows not where to rest during waiting intervals in town, and I believe the establishment of such rooms would be profitable to either individual or collective enterprise. But if not, the suggestion ought to be carried out by public subscription.

THOUGHTFUL.

PLANNING OF THE NEW LAW COURTS.

SIR,—I see in some of the papers that Mr. Street is now engaged on the contract drawings for the new Law Courts. I think the legal profession would be grateful to him and to you if he would furnish to the *Builder*, and you would be willing to print, a detailed sketch (which he could now, doubtless, easily have made) of a court such as he proposes to make them. The success or failure of his great building will mainly turn on the practical convenience of the courts; and as, no doubt, they will be all alike, at least in the main principles of their design, I think lawyers in general would be very glad to learn precisely what Mr. Street proposes to do for them, from a drawing sufficiently detailed to convey an accurate idea.

TEMPLAR.

* * * We should be quite willing to comply.

STATE OF CARDIFF.

The inquiry recently held here by the Rivers Pollution Commissioners has shown a very bad state of things existing. The whole of the sewage of Grangetown is discharged into the Taff below the bridge. All Cardiff, Canton, and a part of Llandaff are supplied with water from the waterworks. The soil of Canton is very porous, and there are about 1,300 cess-pools, which rapidly fill up, the matter flowing over to the backyards of the houses. There are plenty of wells near them, and the soil is seen flowing into them. There are frequent complaints. Houses run from 4s. a week up, the majority of them being working men's houses. Many of them have no other water to drink but from the wells. No stand-pipes, and they are compelled to use the water pumps.

Per Contra.—An Irish gentleman, of a mechanical turn, took off his gas-meter, to repair it himself, and put it on again upside down, so that at the end of the quarter it was proved that the gas company owed him 3l. 7s. 6d.!

VENTILATION OF ROOMS.

SOME of the Liverpool papers publish a plan which they describe as Dr. Elliot's (of Carlisle), and as exhibited by that gentleman at the meeting of the British Medical Association in Birmingham:—

"The peculiarities are to be seen in the upper panels of the door (being made to open downwards into the room, or to fasten up, as required); the roller of the blind so placed (a foot from top of window, and so far into the room) as to suspend the blind on a level with the inner surface of the wall, instead of close to the top, and up against the window, as usual; and the bar of wood, dark coloured, placed, whenever wished for, beneath the lower sash, so that a chink is left, across the middle of the window, excluding rain and all avoidable dust, yet admitting air very freely, but with a strong upward direction to the ceiling, by which means it is thoroughly tempered and seasoned, as well as dispersed like a shower near the ceiling, before descending for use. A screw fastener inserted at each end of the open chink, being passed through the thickness of the lower sash, and only half through that of the upper sash, secures the window effectually against being opened from the outside, without, of course, breakage of panes."

The plan, however, is not exactly Dr. Elliot's: it was set forth in our pages a long while ago, and has been largely acted on.

Books Received.

On Diet and Regimen, in Sickness and Health; and on the Interdependence of Diseases, and the Diminution of their Fatality. By HORACE DOBELL, M.D. Fifth and revised edition. London: Lewis, Gower-street. 1872.

IN this edition of a standard work already noticed in the *Builder*, the author has introduced, amongst the new matter, some useful remarks on ventilation and heating, as well as a valuable letter from Mr. G. E. Pritchett, architect, on house drainage and other kindred subjects. Mr. Pritchett writes so as to force attention on the most indolent-minded purchasers of things as they are, as proprietors, buyers, or tenants of dwelling-houses. For example, he says:—

"If you are about to purchase or hire a nice-looking newly-built house, do not for a moment suppose or take for granted that the drains are 'all right,' for in many new houses the drainage is only run out a little way from the walls, and not led anywhere, but left for some one to complete after his family has been struck down, and who upon digging up his flower-beds and destroying the growth of his shrubs and everything else, pursues the drains, finds that they are choked, and full of worms and black stuff, and go nowhere."

Whether you occupy an old or a new house and premises, caution is equally necessary. Look at your surface-gratings, whether in your paths, your stable-yard, your conservatories, porches, lobbies, or wherever they may be, with great suspicion, especially in dry weather. People will sometimes say to themselves, when walking about premises, "Wherever does that smell come from?" little thinking that the water has evaporated from the traps. These surface drains should not be connected with sewer drains at all, but should have a separate service of pipes.

See where the rain-water descending pipes run to: look well at the joints of those vertical pipes. If you notice discoloration of the paint at the joints, you may know at once that they are connected with some cesspool or sewer-pipe."

"Formidable sums of money are being spent in draining towns so as to lay on sewer-pipes by means of pipes to our very bedroom doors. Is this right?"

A First Book of Mining and Quarrying, with the Sciences connected therewith, for Use in Primary Schools and Self-Instruction. By J. H. COLLINS, F.G.S. With Numerous Illustrations. London: Lockwood & Co., Ludgate-hill. 1872.

THIS little work is intended much more to show what has to be learnt by the miner and quarryman than to impart actual knowledge. Still, a good deal of useful information will be found in its pages. We have observed a sentence or two about blasting with gunpowder, but no hint as to the variety of blasting-powders lately coming into use, such as dynamite, pudrolite, &c. The author, however, must be well enough acquainted with the subject, as he is lecturer to the Miners' Association of Cornwall and Devon.

Cassell's Technical Manuals: Colour. By A. H. CHURCH, M.A. Cassell, Petter, & Galpin, London.

A Few Hints on Colour and Printing in Colours. By P. B. WATT. London: W. J. Adams.

THE first of these treats of the laws and theories of light and colour in a way to interest the reader, and ends with practical remarks on coloured glass and colours of pottery and porcelain, mineral pigments, enamelling, gold and silver, lacquering, coloured marbles, &c. The author of such a technical treatise is a very competent one, Mr. Church being professor of chemistry in the Royal Agricultural College at Cirencester.

He regards Maxwell's new theory of colours, which Mr. Benson, architect, has done much (in the *Builder*, and afterwards in a separate form) to advance, as being conclusively proved by his experiments, although in actual work with pigments themselves he thinks the older theory affords a more immediate though often a less exact answer to any question which may arise.

The "Hints" under the second title given, appeared first in the pages of the *Lithographer* and were intended chiefly for those connected with the lithographic art. The text, however, has been made applicable to colour printing in general.

VARIORUM.

SPEAKING of cast-iron steam pipes, the *Nautical Magazine* says,—
"The testing of cast-iron pipes is much more satisfactory than the testing of wrought-iron work. The limit of elasticity of the latter is, as we have shown above, at not more than one-third of its normal strength. Wrought-iron, therefore, cannot, without risk of injury, be tested to much above one-fourth of its breaking strain, for the limit of elasticity should not be passed, but as the limit of elasticity of cast-iron is above 80 per cent. of the ultimate cohesive strength, the hydraulic test can be carried very nearly to the full factor of safety required for wrought-iron boilers. This will, of course, be the case in all materials in which the limit of elasticity approximates towards the breaking strain."—We take from "Cassell's Technical Educator" for November a paragraph on "Amateurs' Lathes:—"
"Turning is such an interesting art that it is not surprising its practice is very far from being confined only to engineering works. Indeed, from the earliest age of the lathe it has been a very favourite instrument of amusement with persons having leisure and a taste for mechanics; and amateur turning, both plain and ornamental, is now so extensively practised, that not only are lathes and apparatus specially designed for such work, but the construction of such mechanism has become almost a distinct business. The distinctive features of lathes used by the amateur and ornamental turner are lightness, high finish, and the power of being applied to the execution of a great variety of work not usually performed in the lathe. Some of the simple forms of lathe may be termed amateur lathes; but the lathe best of all suited to the amateur mechanic is light screw-cutting lathe of about 5-in. centre with treadle motion, and carefully designed slide rest. Such a lathe as this, when provided with the necessary tools and apparatus, is capable of executing almost any kind of light work, and altogether a most useful instrument."—The recent decision of the Emperor of Germany having brought Vancouver Island into notice, *il va sans dire* that Mr. Wylde has published a map of the island, showing the San Juan Boundary as awarded by the Emperor. It shows also the line contended for by England. Oddly enough, Vancouver's Island is not named on the map, but as the adjacent parts are, can he easily guessed at.

Since our readers were furnished with an account of the reforms that were being effected in the drainage of Windsor Castle, these works have been pushed rapidly forward, and will be entirely completed before the arrival of Her Majesty's Windsor next month. The *Lancet* says,—
"The alterations at the castle itself are, indeed, already finished, and the late heavy rains have given to separate system a full and successful trial. Additional ventilators, not contemplated in the original plan, have been fixed to the old soil-pipes, and their outlets have been in all cases carried completely up to the battlements of the castle. The overflow of pure water from all the cisterns and fountains has been intercepted and conducted outside the castle walls, but is so abundant, and at so high an elevation, that some plan for its utilization should be adopted. The drains at Frogmore, and at the adjacent buildings, will be entirely completed in a few days. Numerous ventilating shafts have been fixed along the course of the drain, and, when near roads and houses, are carried up walls or trees. None of them are furnished with charcoal or any other filtering medium."—*Old Merry's Month* (Warne & Co.) adapts itself successfully to a juvenile public.—*Little Folks* (Cassell) for November includes no fewer than forty pictures, and a sort of stories, for 6d.—*Ocean Highways* for November (32, Fleet-street), contains a comprehensive chapter of the Island of San Juan, which we may regard as pronounced San Wan. The territory

until lately in dispute is about 400 square miles of island-studded sea, the islands varying from two miles to twelve miles long. The value of San Juan Island is simply strategic. The writer of the article says,—"The decision of the German Emperor is in defiance both of the words of the Treaty, and of its spirit, and will entirely destroy all trust in the impartiality of any future arbitration from that quarter."—A letter from Rome, according to the *Art Journal*, states that the event of the day is an important discovery in the Forum Romanorum, made by Senator Pietro Rosa, so well known for his excavations in Rome, Ostia, and the Villa Hadriana. "Under the remains of the tower of the Middle Ages, standing near the column of the Emperor Phocas, which formed the *ultima Thule* of the excavations in this quarter of the city, and served as an abutment to the arches over which the road was made, the fragments, pretty well preserved, of a bas-relief have been found. At two different places of this tower, separated by a space of about 18 ft., and serving as fundamental supports below other materials to it, stand pieces of walls, taking up a space of nearly 50 ft., still upright in the ground, covered on both sides with a closely-fitting row of marble slabs, from 5 in. to 6 in. thick, containing precious sculpture, which served evidently as ornaments of the rostra. This row shows in its upper part traces of having borne a railing, and may have surrounded originally the platform of the tribune. On the outside, towards the listening multitude, the marble slabs illustrate remarkable events having reference to the history of the Forum, in order of time, executed by masters of no ordinary skill in bas-relief. The crescent which they have formed begins with the Rminal Fig-tree, and ends with the Lotus-tree. Splendid forms on this remarkable monument rise already out of the rubbish and mud which have covered it for centuries, and not only the historical representations, but also the well-executed monuments of the background, will serve to make this extremely important discovery a source of enlightenment on the topography of ancient Rome."

Miscellaneous

Fatal Scaffold Accident.—The corner of Westminster has held an inquiry at St. George's Hospital respecting the death of Jeremiah Murphy, a mason. Patrick McKay, a mason, stated that for some months past a pole scaffolding had been erected outside Kent House, Knightsbridge. About 35 ft. from the pavement there was a footing of deal boards for the men to work on, outside of which was a scaffold-pole used as a landing for huge masses of stone which were raised from the ground, rested upon the pole, and finally moved into position. The deceased, two labourers, and witness were standing upon the scaffold superintending the landing of a block of stone, weighing 5 cwt. As the block was placed upon the pole one end snapped, and the deceased, who had one foot upon the pole, was precipitated to the ground and instantaneously killed. The pole was but 1½ in. to 2 in. in diameter where it snapped, and was old. The jury returned a verdict of "Accidental death," expressing an opinion that the pole in question was not at all fitted to bear so heavy a weight as 5 cwt., and that in future great care should be taken in selecting larger poles for such purposes.

London Association of Foremen Engineers and Draughtsmen.—At a meeting of this society at the City Terminus Hotel, Cannon-street, on Saturday night last, after a paper by Mr. Thomas Webster, F.R.S., "On the Promotion of Practical Science and Technical Education by Museums of Inventions established and maintained by the surplus of the Inventors' Fee Fund," the following resolution, proposed by Mr. W. Lloyd Wise, and seconded by Mr. D. Campbell, was carried by acclamation:—"That this meeting considers the Patent-Office Museum at South Kensington totally inadequate to the requirements of the age, and is of opinion that, after suitable provision has been made for the efficiency of the Patent-office, a reasonable proportion of the surplus funds arising from the granting of patents for inventions should be devoted to the establishment and maintenance of a more comprehensive museum of inventions for the advancement of practical science and technical education."

Geologists' Association.—At the opening meeting of the session 1872-73, held at University College, on Friday evening, November 1st, the president, the Rev. T. Wiltshire, M.A., occupied the chair, and an address was delivered by Mr. Hyde Clarke, "On the Influence of Geological Reasoning on other Branches of Knowledge." The influence of geology on the general thought of the age, in confirming and rendering general the habit of observation, was ably dwelt upon; and Mr. Clarke proceeded to show that the determination of stratification had exercised a powerful effect on modern thought, since with it were connected the ideas of succession and progression. The vast duration of the globe shown by geology harmonised with the boundless extent of the material universe, of which astronomy gave us evidence, and in like manner geology had afforded support and assistance to zoology and ethnology, as well as to philosophy, while it had rendered great service to theology, by the broadening influence of its teaching. The president, in calling for a vote of thanks to Mr. Clarke, said geology taught us most cogently the wisdom and goodness of the great Eternal.

Opening of the New Convalescent Home, Saltburn.—This structure has been opened for the reception of patients. The building is of white fire-brick, and was designed by Mr. Olliver, of Newcastle-on-Tyne, architect, and the work carried out by Mr. Robson, of Darlington. The aspect is western, and the new Home is the first object seen by travellers approaching Saltburn. The principal sitting-rooms face the west, and they are all lofty, and of a cheerful character. One side of the house is set apart for males, and the other side, corresponding in size, for females. The sleeping-wards vary in size, and contain from three to nine beds each. These also face the west. The entrance-hall and passages are floored with encaustic tiles. The lavatories, baths, and other conveniences are well arranged near to the respective suites of rooms. The dining-hall is spacious and well lighted, as, indeed, is the whole of the building. The kitchen is also large and airy. The building is adapted for receiving fifty patients. Members of the Pease family, of Darlington, have had it erected at a cost of upwards of 12,000l.

Proposed Restoration of the Priory Church at Brecon.—In pursuance of a numerously and influentially signed requisition by the freeholders, residents, &c., in the archdeaconry of Brecon, a public meeting was convened by the high sheriff, and held in the Shire-hall, Brecon, to consider the best means of raising a sufficient sum to complete the restoration of the Priory Church. The high-sheriff of the county (Mr. Jayne) presided, and among the large assembly were the lord-lieutenant of the county, Lord Tredegar, and the bishop of the diocese (St. David's). The meeting resolved that it was desirable to complete the restoration of the Priory Church, and that the report of Sir Gilbert Scott be received and adopted. A number of gentlemen, including the high-sheriff, the lord-lieutenant, the members for the county and borough, and the mayor and corporation of Brecon, were appointed as a committee to solicit subscriptions, and generally to carry out the restoration. The meeting also pledged itself to use every exertion to carry out the object in view.

Opening of the New Covered Market, Bradford.—The new covered market, which has been erected by the Bradford Corporation, has been opened by the Mayor. The interior of the market has cost about 17,000l., and it contains 117 shops and stalls, most of which have been already let, and will produce a revenue of 2,400l. per annum. The market is surrounded by a number of shops, which front Kirkgate, Darley-street, and Godwin-street; and when these are finished, the total expenditure will have been about 35,000l. It is intended at some future time that the space at the back of the present building shall be enclosed, if it is found that extension of accommodation is needed. To complete the whole scheme, it is estimated that a further expenditure of 10,000l. will be necessary, which will make the total cost of the market 45,000l.

General Line of Buildings under Metropolitan Local Management Act.—An article has been bringing together several recent decisions will be found in the current volume of the *Solicitor's Journal and Reporter*, p. 929, the number for October 26th.

The Enlargement of the Sheffield Infirmary.—The new wing to the Sheffield General Infirmary has been opened with an interesting ceremony. The new building stands at right angles with, and is about fifty yards from, the old structure, with which it is connected by an underground passage, which can, in case of need, be hermetically sealed. It is erected of stone, in a plain style. There are four wards, each 50 ft. by 27 ft.; lofty, well lighted, and well ventilated. Connected with them are lavatories, sculleries, nurses' rooms, and so on. The resident medical officers' rooms are on the top story; and on the basement are the scullery, kitchen, and larder. The total cost is about 12,000l. Mr. Henry Currey was the architect; and the contractors were Messrs. Chambers & Sons, of Bishop Monkton.

Slag Bricks.—The prospectus of the Tees Scoria Brick Company (Limited) has been issued. The Company is formed for the purpose of purchasing the right of working in the Tees district a patent taken out by Mr. Woodward, of Darlington, for the utilisation of slag. The capital of the company is fixed at 10,000l., which is divided into 1,000 shares of 10l. each. Hitherto, the daily accumulation of refuse material from the ironworks has involved not only the waste of large quantities of land, but also serious expense for removal. For the future that refuse material, by Mr. Woodward's patent, is to be converted into bricks, tiles, slabs, and blocks suitable for building, paving, flagging, flooring, &c.

The Widening of Ludgate-hill.—At the meeting of the Metropolitan Board of Works last week, the Board came to a resolution to "contribute one-half of the cost (estimated at 50,000l., exclusive of professional charges) of further improvements proposed to be effected by the Commissioners of Sewers of the City of London in Ludgate-hill, such contribution not to exceed the sum of 28,000l., and that it be paid to the Commissioners on a certificate by the architect of this Board of the completion of the work." It is intended to widen Ludgate-hill the width of the railway bridge, as far as Martin's-court, nearly opposite the Old Bailey.

The Ornamental Water in Victoria Park. The First Commissioner of Works has ordered that the large lake (five acres) and the lower bathing lake shall undergo a thorough cleansing process precisely similar to that of the Serpentine. Messrs. Mowlem & Co. have already opened a culvert connecting the large lake with the main sewer, through which the water is being drawn off. The culvert of the lower lake is constructed with large earthenware pipes, and between the joints the roots of trees have insinuated themselves, and prevent the slightest outflow of water. This will necessitate the pulling up and relaying of the entire length.

The Bristol Timber Trade.—Notwithstanding the advance in prices of most kinds of timber and deals, the demand continues active, says F. K. Barnes & Sons' *Monthly Timber Circular*. The importation into this market is beginning to show some falling off, and was last month nearly 4,000 tons register less than in October, 1871. The stock is moderate of most kinds of wood, and of some descriptions almost bare. There can be no question now as to the state of prices for the next twelve months; the foreign shippers have already commenced selling at prices quite 20s. higher than last year, and we believe considerable business has been done at the advance; with this in view, as well as the limited quantity of wood on hand here, prices will continue to rise for many months to come.

Junior Examiner, Office of Works.—In the open competitive examinations for the situation of junior examiner in the Office of Her Majesty's Works, to be held November 28th, the limits of age for the situation are twenty-two and thirty. The examination will be in the following subjects, viz.:—1. Handwriting; 2. Orthography; 3. Arithmetic (to vulgar and decimal fractions); and 4. The requisite technical knowledge, including an acquaintance with the terms and processes of building, such as to enable the candidate to prepare and examine building accounts.

Portsmouth Docks.—The contractors on Monday week commenced operations upon this great undertaking. A gang of men are now employed clearing the ground for the erection of workshops, stables, &c., and the works will be pushed on as rapidly as possible.

Sale of Property in Brighton.—A recent property sale, by Messrs. Wilkinson, included the freehold house, No. 22, Grand-parade, let at 40l. per annum, which realised 630l. Mr. George Atree has also had a property sale. The following prices were realised:—For the freehold house, 34, Buckingham-street, 510l.; 33, Mount Sion-place (freehold), let at 19l. 10s. per annum, 255l.; Mount Sion Cottage and workshop adjoining, of the estimated rental value of 20l. 16s. per annum, 200l.; a ground-rent of 16l. per annum, arising from property in Centurion-road, 305l.; 19, Tiddy-street (freehold), 310l.; 19, Surrey-street (freehold), let at 22l. 2s. per annum, 285l.

The Rise of Middlesbrough.—Though there is a new dock being built by the North-Eastern Railway Company at Middlesbrough, at a cost of above 100,000l., which is approaching completion, the shipping facilities of the River Tees will not, it is stated, be thereby made adequate to the requirements of the greatly increasing trade which the progress of the iron manufacture of the district imposes. A project has, therefore, been set on foot—the cost of which is variously estimated at from 200,000l. to 250,000l.—to construct new docks, jetties, &c., on the foreshore reclaimed by the Tees Conservancy, about four miles below Middlesbrough, near South Bank.

Streeter's Carriage Indicator.—Mr. Streeter has patented an invention, intended to do away with the check-string and speaking-tube in carriages. It consists of two dials, one placed inside the carriage and the other on the dash-board. The handle of the dial inside is connected by a chain with the outer dial, and by a simple and instantaneous motion directions can be telegraphed to the driver. The attention of the latter is attracted by a gong or bell, and by glancing at the dial he can tell whether he is to "stop," "turn to the right" or "left," "go slowly," "go fast," "proceed home," &c.

Bavarian versus Austrian Workmen.—The manager of an equestrian company received permission to erect a circus in the Prater of Vienna. He invited the local builders to send in tenders, the lowest of which was 80,000 florins, and the highest 130,000 florins. The manager, however, found even the lowest tender too high, and contracted at Munich with a firm for erecting the whole circus for a sum of 45,000 florins. All the parts were finished in Bavaria, and the building was put together by Bavarian workmen.

Technical College of Glasgow.—A meeting of the General Committee of the proposed Technical College has been held in the Mechanics' Institute, when a report by the Finance Committee was read. The Finance Committee report that the subscriptions intimated to them up to the present time amount to 11,050l. The committee think this result very satisfactory, considering that the amount has been given by thirty subscribers, of whom twenty-two are members of the General Committee.

Destruction of the new Oxford Music-hall, London.—This hall, as many of our readers must know by this time, has been again destroyed by fire. The destruction is more complete than before, the body and balcony of the hall having been nearly burnt out, and the roof destroyed, and the rest of the building and contents damaged. On the last occasion, if we rightly remember, it was believed that the fire originated in the balcony seats, from cigar-ends, matches, or such like, setting fire to combustible matter in the stuffing of the seats.

Society of Engineers.—At a meeting of this Society, held on Monday evening last, Mr. Jabez Church, president, in the chair, the paper read was "Ou Milford Haven and its New Pier Works," by Mr. Henry Davey, C.E. The author advocated the extension of piers and engineering works for ship accommodation in the Haven, his reason being that the estuary, from its geographical position, as well as for other important reasons, was admirably adapted for an extensive export and import commerce.

Proposed Emigration of Half-a-Million Labourers.—The Birmingham News is desired to announce that a number of influential gentlemen, despairing of a satisfactory settlement of the land question, are making preparations whereby will be offered a scheme of emigration for half-a-million of the agricultural population of this country.

The Museum at Antwerp.—The great series of large pictures on canvas by M. de Keyser, which were ordered to be executed on the walls of the vestibule of the Musée at Antwerp, is finished, and has been "inaugurated." These pictures are monumental in their character, and their subjects are events in the artistic history of the school of Antwerp. The labour devoted to their production has been enormous; it has occupied the artist for ten years.

Statue of Dr. Whewell.—Mr. Woolner has completed the statue of Dr. Whewell, which is of the heroic size. After being exhibited in the Royal Academy, it will be placed in the ante-chapel of Trinity College, Cambridge. The commission to execute this figure was given to Mr. Woolner by the authorities of the college; and the work will be placed near the artist's "Lord Macanlay." It represents the Doctor seated in a chair.

Hastings.—Mr. Butterfield, architect, has examined St. Clement's Church, Hastings, in company with the Restoration Committee, in order to ascertain what steps should be taken. In order that a full view might be obtained from the street, Mr. Butterfield stated his opinion that a large portion of the earth in the churchyard should be removed, and the town-ball be entirely cleared away.

Proposed Coleridge Memorial.—With reference to the 100th anniversary of the birthday of Samuel Taylor Coleridge, October 31st, it has been determined to commemorate it in his old school, Christ's Hospital, by a memorial (probably some commemorative group in silver or bronze), to be called the "Coleridge Memorial," and to be held each year by that ward which has most distinguished itself in the work of the school.

Gloucester New Schools of Science and Art.—A meeting of the general committee of subscribers was held in the new building, at which the accounts of receipts and expenditure in the erection of the building were presented and passed. It appeared that the total cost of the building, site, and fittings, had been 5,460l., and the receipts, including the Government grant, 4,560l., leaving a deficiency of 900l.

A Museum for South London.—The proposal for the establishment of a museum in South London has been very favourably received. At a meeting in the Westminster Assembly-room, the question has been discussed, and a committee appointed to take steps for carrying out the project, for which numerous promises of public support have been received.

Articles of Silica Paste.—In the *Revue Chimie*, M. Müller describes a process of forming ornamental and useful objects of pure silica. The silica is reduced to an impalpable powder, formed into a paste, and moulded. When heated to bright redness, the grains fuse together, become very coherent, and form objects of great durability.

Restoration of Great Horwood Church. At a meeting in the vestry-room of Horwood parish, the rector in the chair, it has been resolved to restore the church, and a committee has been appointed to carry out the work and receive subscriptions, to which the rector and his friends will liberally subscribe.

Health Officer for Bradford.—At the usual monthly meeting, the town council have agreed to appoint a public officer of health for the borough, at a salary of 500l. a year, it being a condition that the gentleman appointed should resign his private practice, although he might hold another public office.

Strike in Belfast.—A strike has arisen in the building trade at Belfast, in consequence of a resolution of the employers that on and after the 1st of November the workmen should be paid by the hour instead of a fixed sum per week, as hitherto. The workmen held a meeting and resolved to stand out for the old system.

The New Co-operative Hall, Heckmondwike.—The inauguration of this new co-operative hall took place a few days ago. The hall and stores have been built at a cost of 9,000l. The hall will accommodate about 900 persons.

Rochester Church.—To the particulars of this church we have already given, we may add that the heating apparatus was supplied by Messrs. J. & H. Redfern, of Hanley.

TENDERS

For the erection of new brewery and additional tun-room at Stamford, for Messrs. Melbourne, Mr. George Seammell, architect. Quantities supplied by Messrs. Curtis & Son:—
 Pattison £1,885 14 6
 Brown 1,980 0 0
 Richardson 1,898 0 0
 Halladay 1,815 0 0
 Hutson 1,738 0 0

For warehouse, St. Mary Axe. Mr. H. H. Collins, architect. Quantities supplied by Messrs. Batstone & Hunt:—
 Moreland & Co. £3,417 0 0
 Henshaw 2,734 0 0
 Newman & Mann 2,650 0 0
 Oliver 2,320 0 0
 Merritt & Ashby 2,345 0 0
 Kirk (accepted) 2,496 0 0

For alterations and building works at 94, Regent-street. Mr. H. H. Collins, architect:—
 Merritt & Ashby £841 0 0
 Cohen 835 0 0
 Colls (accepted) 825 0 0

For making roads, West London District Schools, Ashford, Middlesex. Mr. H. H. Collins, architect:—
 Jones £887 14 6
 Richardson 858 0 0
 Helton 736 0 0
 Kirk 717 0 0
 King 704 0 0
 Bell 694 0 0
 Cole 613 0 0
 Nicholson (accepted) 575 0 0

Fittings to the Schools.
 Oliver £1,895 0 0
 Kirk 1,893 0 0
 Richardson 1,863 0 0
 Merritt & Ashby 1,824 0 0
 Sale 1,457 0 0
 Moreland & Nixon (accepted) 1,429 0 0

School and Chapel Fittings.
 Edwards £747 10 0
 Freighton 683 0 0
 Neaton 606 0 0
 Sidebottom & Co. (accepted) 562 0 0
 Turner 549 0 0

Gas Fittings to the Schools.
 Strodie & Co. £277 0 0
 Comyn, Ching, & Co. 258 0 0
 May & Co. 213 0 0
 Farraday (accepted) 453 0 0
 Hodge & Co. 441 0 0

For a Friends' meeting-house at West Hartlepool. Messrs. Alexander & Henman, architects:—
 Purden & Glass (accepted) £696 5 0

For the erection of a smithy at Portmadoc, for Mr. R. Jones. Messrs. Roberts & Morrow, architects:—
 R. Griffith £210 0 0
 Hughes 200 0 0
 O. Griffith (accepted) 180 0 0

For schools, Kender-street, Hatcham, for London School Board. Messrs. J. Gale & J. P. Manning, architects. Quantities by Mr. D. J. Brown:—
 Nightingale £8,955 0 0
 Ashford & Co. 8,825 0 0
 Sheffield 8,481 0 0
 Browne & Robinson 8,190 0 0
 Brass 8,150 0 0
 Scrivener & White 8,150 0 0
 Crockett 8,130 0 0
 Higgs 7,963 0 0
 Cook & Green 7,865 0 0
 Nixon 7,636 0 0
 Cooper 7,631 0 0
 Carter 7,605 0 0
 Mann 7,494 0 0
 King & Son 7,355 0 0
 Shepherd 6,750 0 0

For elementary schools, Old Castle-street, Whitechapel, for the London School Board. Mr. E. Biven, architect. Quantities supplied by Mr. Thomas Nixon:—
 Gammon & Sons £10,910 0 0
 Shepherd 10,349 0 0
 Wood 10,183 0 0
 Hill & Sons 10,104 0 0
 Coleman 9,998 0 0
 Ennor 9,850 0 0
 Sewell & Son 9,622 0 0
 Oliver 9,585 6 6
 Wicks, Bangs, & Co. 9,550 0 0
 Ashby & Sons 9,550 0 0
 Dove, Brothers 9,475 0 0
 Henshaw & Co. 9,390 0 0
 Newman & Mann 9,241 0 0
 Cander 9,173 0 0
 King & Son 9,173 0 0
 Foster 8,969 0 0
 High 8,963 0 0
 Roberts 8,989 0 0
 Perry, Brothers 8,977 0 0

For schools, Harper-street, Mr. R. W. Edis, architect. Quantities by Messrs. Goodman & Vinnall:—
 Conder £8,900 0 0
 Perry, Brothers 8,720 0 0
 Hill & Sons 8,183 0 0
 Wicks & Bangs 7,696 0 0
 Sewell & Sons 7,655 0 0
 Ashby & Sons 7,790 0 0
 Adamson & Son 7,771 0 0
 Dove, Brothers 7,725 0 0
 Wood 7,695 0 0
 Bull & Sons 7,646 0 0
 Coleman 7,537 0 0
 King & Son 7,449 0 0
 Shepherd 7,409 0 0
 Newman & Mann 7,325 0 0
 Marsland & Son 7,244 0 0
 Roberts 6,966 0 0

For schools, Gloucester-street, Stepney, for School Board, Messrs. Lee, Brothers, & Pain, architects. Quantities supplied by Mr. W. Pain:—

Marshall & Sons	£13,500 0 0
Myers	13,268 0 0
Nixon & Son	12,160 0 0
Connell	12,147 0 0
Brass	12,134 0 0
Higgs	11,977 0 0
Marshall & Sons	11,832 0 0
Bayes & Ramage	11,450 0 0
Wicks & Baugs	10,984 0 0
Wood	10,973 0 0
High	10,650 0 0
Sheffield	10,568 0 0
Asby & Sons	10,365 0 0
King & Son	10,340 0 0
Thorn & Co.	10,199 0 0
Conder	10,095 0 0
Foster	10,050 0 0
Emor	10,042 0 0
Hill & Sons	9,998 0 0
Newman & Mann	9,978 0 0
Nightingale	9,973 0 0
Shepherd	9,930 0 0
Cooke & Green	9,875 0 0
Ferry, Brothers	9,800 0 0
Roberts	9,535 0 0

For stable, coach-house, and storage, Barnet, for Mr. H. J. Tibbarn, Mr. A. J. Rouse, architect:—

Peterson	£233 0 0
Miller	215 0 0
Jennings (accepted)	168 0 0

For erecting premises No. 10, Leicester-street, Leicester-square, Mr. Frederick A. Dovey, architect. Quantities supplied by Messrs. Strudwick & Menzies:—

Manley & Rogers	£1,467 0 0
Scriver & White	1,424 0 0
Bullivant	1,391 0 0
Kelly, Brothers	1,390 0 0
Newman	1,389 0 0
Asby & Sons	1,264 0 0
Temple & Foster	1,184 0 0
Leungn & Way	1,159 0 0
Atchison & Walker	1,065 0 0

For alterations and repairs to Nos. 34, 35, and 36, Fashion-street, Spitalfields, Mr. F. H. Shill, architect:—

Harris (accepted)	£338 10 0
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For repairs, &c., to eight houses in Union-court, Spital-fields, for Mr. F. H. Shill, architect. Quantities not supplied:—

Bridgeman, Nuttall, & West	£789 0 0
Hatten	722 0 0
Ellis (too late)	615 0 0
Harris	520 0 0
Lovell & Co. (accepted)	617 0 0
Berge	497 0 0

For taking down the chimney-shaft at the St. Pancras Industrial Schools, Levensden, Woodside, Herts, and for building a new shaft for the St. Pancras guardians, Messrs. Richardson & Waghorn, architects:—

Alternative design.	
Kelly, Brothers	£233 0 0
Chilwell	405 0 0
Wall	400 0 0
Shumrun	444 0 0
Waterman	420 0 0

For the erection of Nos. 91, 93, and 95, High-street, Camden Town, Mr. G. Waghorn, architect:—

Mann	£3,275 0 0
Kelly, Brothers	3,270 0 0
Hyde	3,120 0 0
Scriver & White	2,985 0 0
Manley & Rogers	2,983 0 0

For additional infants' school to schools in Mary-street, Bromley, for the School Board for London, Mr. Lucy W. Ridge, architect. Quantities supplied by Mr. Riddett:—

Nightingale (accepted)	£264 0 0
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Troubled Floors (by some odd accident we have received from four different correspondents a question which amounts to this—"Under the present price of labour, which is the cheapest in laying a quantity of flooring—wood or iron tonguing?" The wood tonguing, if properly done, with tongue cut across the grain, would cost most.)—A. R. K. (there is a small part of Kent, or in the Middlesex side of the Thames, nearly opposite Woolwich).—W. L. B. (unnecessary).—W. E. M. (thanks).—D. F. (thanks).—E. T. B. (next week).—J. J. (next week).—B. Hamerton (letter posted to address given was returned).—L. Jun. (next look back for himself).—A. H. E. C. P. F. N.—O. A. R.—S. D. W.—F. W.—T. R. S.—H. H. Y.—F. R.—K. W.—E. F. R.—W.—H. P.—J. R.—K.—G.—J.—C. C. T.—E. G.—O.—M.—E. D.—W. L.—Mr. B. J.—W.—E. R.—F. H. S. A.—H.—T. R.—F.—S.—G.—R.—M.—D.—Joiner.

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WANTED, by the Advertiser, a SITUATION as OUTDOOR FOREMAN. Has had the superintendence of Great-draughtsman, good testimonials, and Carpenter by trade. Address, W. D. A. Union-place, Lambeth-road, S.E.

WANTED, by the Advertiser, a SITUATION as IMPROVER in the PLUMBING, as a Three-Branch Man. Has been six years in the trade. Wages not so much an object as improvement in the above.—Address, G. W. 20a, Thomas-street, Oxford-street, W.

WANTED, by the Advertiser, aged 31, a SITUATION as OUTDOOR FOREMAN, or as General Foreman in a good jobbing shop.—Address, T. 15, Thornton-street, Islington-road, S.W.

TO PLUMBERS, BUILDERS, &c. WANTED, by a young Man, a thorough PLUMBER, a SITUATION or JOB. Task work taken.—Address, PLUMBER, No. 3, Mallinson-road, Battersea, S.W.

WANTED, by a young Man, a SITUATION in a JOINER'S SHOP, or with a Strainer Hand. Wages moderate, if constant. Aged 24.—Address, T. J. 25, Sutherland-street, Finsbury.

TO CARPENTERS, BUILDERS, AND OTHERS. WANTED, by a young Man, a good CARPENTER and JOINER, a PERMANENCY. Well up in the branches, and quick at jobbing.—Address, H. B. 275, New Kent-road, S.W.

TO MASTER BUILDERS AND PLUMBERS. WANTED, by a young Man, a CONSTANT SITUATION as PLUMBER, or on a JOB. Can do plain site work, painting, and glazing. Wages not so much an object in other work if required.—Address, G. L. No. 2, Malvern-road, near Junction, Kilburn.

WANTED, by a respectable young Man, who has had several years' experience in the timber trade, a SITUATION as CLERK or FOREMAN in a yard or mill. Can measure well, either by the standard or by the gauge, as to ability, &c.—Address, C. H. 102, Brompton-road, S.W.

TO PLUMBERS AND BUILDERS. WANTED, by a thoroughly good Plumber and Plain Zinc-worker, a SITUATION or JOB. Well up in all branches of plumbing.—Address, E. 8, Bayham-street, Camden Town, N.W.

TO TIMBER MERCHANTS. WANTED, by a respectable young Man, who has had several years' experience in the timber trade, a SITUATION as CLERK or FOREMAN in a yard or mill. Can measure well, either by the standard or by the gauge, as to ability, &c.—Address, C. H. 102, Brompton-road, S.W.

TO PLUMBERS AND BUILDERS. WANTED, by a thoroughly good Plumber and Plain Zinc-worker, a SITUATION or JOB. Well up in all branches of plumbing.—Address, E. 8, Bayham-street, Camden Town, N.W.

WANTED, by an ASSISTANT, of seven years' experience, accustomed to prepare Finished, Working, and Detail Drawings, Land Surveying, and can assist at Taking out Quantities, or at SOUVENIRING, at a moderate salary. Resident testimonials.—Address, E. C. 3, Burton New-road, Lisson.

TO ARCHITECTS AND SURVEYORS. WANTED, by an ASSISTANT EMPLOYMENT, who has had some years' experience. Is a neat draughtsman, and prepares plans and details from Finish sketches. Good references can be given.—Address, B. P. The Priory, Fratton Bridge, Portsea.

TO ARCHITECTS. WANTED, by a neat DRAUGHTSMAN, an ENGAGEMENT, to PREPARE DESIGNS (of stone) from rough sketches, detail or working drawings. Satisfaction guaranteed. Address, M. B. Ferncroft, St. Nicholas-road, Upper Tooting.

TO CATHOLIC ARCHITECTS, ENGINEERS, SURVEYORS, AND CONTRACTORS. WANTED, to PLACE INDOORS a well-educated YOUTH, aged 16, with a good taste for drawing, and either of the above for term of years.—Address, with full particulars, to J. M. care of Mr. Pickering, Bookeller, Boyton, Hart.

WANTED, by a first-class HOUSE and DECORATIVE PAINTER, WRITER, GRAINER, and GILDER well-versed in drawing, and making out patterns for decorations, cutting stencils, or printing or painting, &c.—Apply to R. W. Post-office, Madamshouse, Whiston-cum-street, W.C.

TO BUILDERS AND CONTRACTORS. WANTED, by a practical Man, an ENGAGEMENT as FOREMAN of MASONS, in town or country. Well up in church work. Good references can be given.—Address, W. T. 9, Brookly-street, Liverpool-road, Islington.

WANTED, by a practical Bricklayer, a SITUATION as WORKMAN or CHARGE of a JOB.—Address, A. G. No. 15, Denney-street, Stepney, E.

TO BUILDERS, SLATE MERCHANTS, AND QUARRY WANTED, by a practical Man, a RE-ENGAGEMENT as QUARRY MANAGER or FOREMAN of MASONS. Has a thorough knowledge of drawing and machinery work. First-class references can be given to clerks of trade. Aged 24. Good testimonials.—Address, J. R. care of Mr. Garrett, High-Brompton, S.W.

TO BRICK MANUFACTURERS AND OTHERS. WANTED, by an experienced Man, a SITUATION as MANAGER or FOREMAN in a BRICK-FIELD, or in any occupation as superintendent of out-door labour. First-class references can be given to clerks of trade and capability. Address, S. T. Post-office, Hayes, near Uxbridge.

WANTED, by an experienced London Foreman, a RE-ENGAGEMENT as GENERAL FOREMAN, CLERK of WORKS, or take entire Charge of Job. Bricklayer by trade. Just completing a large job in the country. Good references.—Address, A. N. care of Mrs. Cope, Upper Portland-street, St. Martin, Nottingham.

TO PLUMBERS AND BUILDERS. WANTED, by an experienced young Man, a SITUATION as PLUMBER or THREE-BRANCH HAND. Can do plain zinc work. References if required.—Address, J. G. 123, Portland-road, Stottville Hill, W.

TO BUILDERS AND CONTRACTORS. WANTED, a RE-ENGAGEMENT as GENERAL FOREMAN, CLERK of WORKS, or to Take Entire Charge of Job, or a SHOP FOREMAN. Carpenter and Joiner by trade. Good references and testimonials.—Address, T. G. 3, Ravensworth-gate, Falmouth.

TO BUILDERS, SAW-MILL PROPRIETORS, AND OTHERS. WANTED, by an experienced Man, a SITUATION as SAW-SHARPENER or to WORK any kind of saw in the above line. Thoroughly acquainted with all kinds of steam-engines, and capable of doing all repairs.—Address, J. F. P. New-place, Paradise-street, Rotherhithe, London.

TO STEEL-BUILDERS, BUILDERS, AND OTHERS. WANTED, by a young Man, a JOB or CONSTANT PLACE as PLUMBER or THREE-BRANCH HAND. Can do plain zinc work. Town or country.—Address, J. H. No. 8, Bishopsgate-place, Frederick-street, Crosswell-road, Brixton-hill, Surrey.

TO ARCHITECTS AND SURVEYORS. THE Advertiser wishes for a permanent ENGAGEMENT as a JUNIOR, aged 21. Four years' experience.—Address, G. 7, Old-barn-street, S.W.

TO BUILDERS AND OTHERS. THE Advertiser is open to an ENGAGEMENT as GENERAL MACHINIST. Can sharpen or work iron or circular saw, or a hand saw. Can brace his own saws.—Apply to L. D. 10, Brixton-street, Wandsworth-road.

TO TINDER MERCHANTS, SAW-MILL PROPRIETORS, &c. THE Advertiser, aged 36, is open to an ENGAGEMENT as MANAGER, TRAVELLER, or BOOK-KEEPER, in Town or country. Good references. Thoroughly experienced.—Address, 720, Office of "The Builder."

STAIRS.—A first-class STAIRCASE HAND. I do not WANT a JOB, either Day or Piece-work, or as SHOP or OUTDOOR FOREMAN. Town or country.—Address, W. B. 1, Ingeneir-place, Broad-street, Golden-square, W.

REQUIRED, a TEMPORARY ENGAGEMENT, by a first-class PERSPECTIVE DRAUGHTSMAN and COLOURIST, in a Jobby News-office, 1871, in London.

RE-ENGAGEMENT, as FOREMAN or CLERK of WORKS, in a Job. Just completed large job in country. Joiner by trade.—C. G. No. 16, Rutland-street, Piccadilly, S.W.

EMPLOYMENT WANTED, by a young Man, as PAINTER, GLAZIER, and TAFFERANOR.—Address, J. H. 10, Leffer-road, Old Ford.

EVENING EMPLOYMENT required by a BUILDER'S CLERK. Aged 22. Damaged after six p.m. Satisfactory accounts prime cost, &c. made up.—Address, A. C. 2, Post-office, 75, Aldersgate-street, London, E.C.

CIVIL ENGINEER and ARCHITECTS ASSISTANT wishes EMPLOYMENT.—Address, ENGINEER, No. 31, South Clerk-street, Edinburgh.

CLERK of WORKS.—WANTED, a RE-ENGAGEMENT, by a thoroughly practical and experienced Man. Aged 40. Prime cost, &c. made up.—Address, STAFFORD, 41, Wharton-street, Lloyd-square, Finsbury, W.C.

A GOOD PLUMBER is in WANT of a SITUATION. No objection to fill up time in other branches. Address, B. C. 6, Commercial-road, Lambeth.

The Builder.

VOL. XXX.—No. 1534.

Curiosities of the Moscow Polytechnic Exhibition.



IN the Moscow Exhibition, the pavilion containing the collection of the Turkistan department is a model of the buildings described in our first article,* represented in a restored state, the decorations being taken mainly from the Shiridar, and where they are defective or wanting, substituted by designs from other structures of the same kind. Some portions have been altered a little,

to suit the requirements of space and the situation of the building. The pediment is reduced in scale, and the same proportion has been observed, as far as possible, in the dimensions of all its parts; only the side walls of the building have been made comparatively higher. The cupola-shaped turrets on both sides of the pediment are not shown here, but the turrets on the minarets remain in their original form and place. The designs in their original configuration may be said to be of two kinds: to the one belong designs which are produced by a combination of regular geometrical figures and lines made of small squares and oblong glazed bricks, or they are formed of simple Arabic inscriptions; the other is already more refined and carefully executed work in mosaic, the design appearing in the shape of flowers, leaves, and inscriptions. In the former there are only three colours besides the red ground; in the latter there is a great diversity of colours, the design being formed of small bricks, of different shapes, beautifully joined together. Of particular interest are the corner decorations above the vaulted niches. Here are to be seen innumerable variations of one and the same design in detail, which at first sight appear as one design. At the corners over the arch of the pediment are painted two lions, with a rising sun behind them and hind legs running before them.

The principal gates are enclosed within a railing, and it is this part which is used, properly speaking, as a place of devotion by the people living in the Medresse. The entrance to the yard or court at the back is through two side-wickets. The interior of the structures containing the Turkistan department is arranged in the following manner:—The entrance through the left door leads to a small gallery constructed in the style of the country, with small pillars surrounding a miniature garden, the flowers being such as are generally cultivated by the natives and a few wild specimens.

In the large hall to the right are arranged various collections belonging to the sections devoted to geography, natural history, technology, and rural economy. Then follows, outside, the ethnological section, which is most interest-

ing, as it gives one an idea of the type, character, and mode of life of the people of Turkistan, for which purpose are shown, (1) a bazaar, containing several shops, with its usual surroundings; (2) the inner court of a Sart's house; (3) a Sart's room on the woman's side of the house; (4) models of Sart's houses; (5) figures representing types of other tribes in Central Asia; (6) a Kirghiz yorta, or tent, with its arrangements, and a scene representing the everyday life of the Kirghizes, formed of figures in the natural size; (7) Sarts' summer tents. In order to render the bazaar as much like reality as possible, a scene is introduced in front of it of people going to market: there are Duvans, female Sarts, a Sart on an ass, and a Kirghiz on an ox, leading two camels loaded with Kirghiz household goods, and a female Kirghiz seated on one of them. These are supposed to be wandering out into the Steppe, for the purpose of changing their abode. A street-waterer is represented watering the bazaar, &c., and an arba, or Sart's cart, stands close by. The Duvans mentioned above form a mendicant order of monks in Central Asia. They go about the streets and bazaars soliciting alms, for which purpose they usually carry with them a vessel formed of a gourd, which they use as a depository for the victuals they receive. Some of them chant as they go along sacred songs; others carry a kind of chafing-dish of clay, with hot coals, into which they strew aromatic herbs. Their costume is different from that worn by the other inhabitants of Turkistan; they have a morose appearance, and all are very dirty in their person. This order is very common in Central Asia. There is also another order of Duvans that are neither monks nor beggars, who live in towns, settlements, and villages, in families, who occupy themselves with commerce, agriculture, and the breeding of cattle, and who are not to be distinguished from the regular population, only they wear a peculiar kind of cap. This order is also very common. To all appearance, the Duvans seem to be divided into small communities, having no connexion with each other, forming a kind of religious brotherhood, each subjected to its own Ishan, or teacher; but this is not the case. The Ishans constitute the highest ecclesiastical authority; and, owing to identity of interests, calling, and condition, form a secluded society. They have extensive connexions, and exercise a most powerful influence over the people and their affairs. It may be said that the Duvans are in a state of unconditional subjection to their Ishans, who exercise a power over them which has no parallel on earth. If an Ishan orders a Duvan, or several of them, to follow him without saying whither, they are compelled to go, leaving even their occupation and families. This is not all. If an Ishan orders his Duvans to kill anybody, if even a Mussulman, saying at the same that the Shariat (the dogmatical Mussulman law) requires it, the Duvans are bound to obey. The initiation into this order is very simple. A Mussulman has only to give his hand to an Ishan, and he becomes his Murid, or disciple, from that moment. To give one's hand to an Ishan is tantamount to giving him one's soul, body, and estate, to dispose of as he likes. Among other things, the Ishans occupy themselves with treating the sick with different kinds of herbs and extracts, but they mostly pretend to heal by reading prayers over their patients.

The Kirghizes are nomads. In the winter they wander in the lowlands, near the shores of the rivers and lakes grown over with rushes, and in sandy places, where they can get shrubs for fuel. In the spring they proceed to the Steppe, where they find fresh grass for their cattle, and the nearer the summer approaches the higher they get to the mountains, so that in the middle of the summer they wander in the mountains themselves, reaching even the line of everlasting

snows, where the cattle can always find fresh and juicy grass; towards the autumn they descend from the mountains again, and so wander the year through in this manner. Cattle are constantly provided with fresh fodder. During these wanderings the camel is the only beast of burden employed by the Kirghizes. It carries all the household goods, the young and the old, and the dwelling itself. This roving from place to place of the Kirghizes bears a festive character, and is celebrated by them with great rejoicings. This is partly due to habit. They do not become attached to any particular spot: they soon get tired of remaining in the same place. This moving from place to place is also owing to economical, or rather domestic, considerations; for when the old spot becomes exhausted, and there is no more fuel or fodder to be got, they are compelled to seek fresh pastures. If the spot chosen by the Kirghizes happen to offer plenty of fuel and an abundance of food for their cattle, they will remain there the whole winter, and move only a small distance in the summer, as the area they occupy becomes exhausted. Generally speaking, the Kirghizes do not roam in the winter time, but establish themselves in some convenient spot until the spring. Some of the rich Kirghizes employ from 20 to 100 camels in their wanderings.

Owing to the absence of proper roads in the country, the natives usually travel on horseback, and the native cart, or arba, a very primitive two-wheeled conveyance, is only used for carrying goods. The Russians are, however, introducing regular post-roads, and no doubt, ere long, railways will also be established in Turkistan. The women of the fixed population, the Sarts and Tadjik, according to the Mussulman law, are compelled to cover the face when abroad. The married women wear for this purpose a kind of thick veil made of horsehair. The young girls cover their faces with a sort of muslin kerchief, through which only the outline of the face is visible. The costume worn by the women is invariably the same, and on this account it is said it is difficult for a husband to recognise his own wife in the street unless she has something extraordinary in her gait, is unusually tall or uncommonly short, or has any other outward peculiarities. In Turkistan a female is inviolable in the street, and is at liberty to go wherever she likes. They walk slowly, gracefully, and their gait is modest. In every town with any pretensions in Central Asia there is a peculiar class of labourers called waterers. The heat of the atmosphere and the dryness of the air calls for a continual watering of the streets, bazaars, &c., and it is for this purpose that the waterer is called into requisition, who is paid by the shop-keepers for his trouble. But besides, every rich Sart, and generally speaking every large establishment, such as a mosque or medresse, have their own waterers, who are, however, engaged in other household duties as well. Thanks to the watering of the streets, courts, and gardens in the towns of Central Asia, the extreme dryness of the atmosphere is obviated, and in places which are well and carefully watered the air becomes even humid. We have been describing the aboriginal inhabitants of Turkistan; on the same platform are figures representing types of other nations living in that country. The figures are those of a Hindu, an Afghan, a Jew, and a Persian. There are only a few Hindus in Turkistan, who are engaged chiefly in money-lending at the rate of from 2 to 3 per cent. per month, a simple receipt on a scrap of common paper only being required of the borrower when known to the lender. Since the introduction of the Russian administration of justice, however, the Hindus have adopted the forms and regulations prescribed by the Russian law in relation to such transactions.

The number of Jews or Djougouts in Turk.

* See p. 857, ante.

istan is far greater than that of either Hindus or Afghans, and they may be reckoned among the fixed population of the country. The Turkistan Jews afford a striking example of the vitality of their race. They have lived in this country for several centuries, and it is probable that they were settled here even before Mahomedanism was introduced. During the whole of this time they have suffered oppression and persecution, yet have remained intact, retaining their religion and the customs of their forefathers, although like the Mussulmans, they shave the head, wear the costume of the country, and the women cover their faces when abroad. How hard was their lot before the occupation of Turkistan by the Russians, may be imagined from the fact, that they were not allowed as witnesses against Mussulmans, consequently had no power of prosecuting them in a court of justice; they were prohibited from riding on horseback, or wearing fine apparel; they were compelled to go about in a common khalat, or kind of dressing-gown, and to wear the Kirghiz baggy kalpak, as a covering for the head. Into some of the towns they were not even admitted. They now enjoy all the privileges of their former rulers. Petty trade and money-lending is their chief occupation, and they do a little in illicit distilling, as they did formerly, under the Mahomedan sway. After viewing all these figures, it is interesting to enter the bazaar, and visit the several shops, &c., contained in it. The bazaars of Central Asia, both large and small, have the same characteristics; a small bazaar is a large one in miniature. The streets and passages are dirty, partly protected from the rays of the sun by awnings made of rushes; the air is damp, heavy, and in the winter the smells are unbearable. The shops are small and low. Besides being the place for trade, the bazaar is the centre of nearly the whole of the public life of the town, and a greater part of handicraft activity. Here in shops, quite open in the front, jewelry is manufactured, turvery and cabinet work executed; boots and goliobes are made, and table-cloths and coats embroidered. In the same place are locksmiths, copper-smiths, blacksmiths, slaughter-houses, eating-houses, tea-rooms, and baths, and in close proximity may be found tanneries and soap-boiling establishments. Sometimes the shops are of two stories. The top one is called the "balliakhana," which is usually occupied by the shopkeeper, his assistants, or his bachelor sons engaged in the business. Every evening after business is over may be heard the sound of the tambourine accompanying the dance of the hatches. These hatches form a peculiar class of young boys, celebrated for their beauty, who are hired as dancers at the so-called men's evening parties. The first shop we come to in the model bazaar is a barber's shop. The aborigines of Turkistan, being Mussulmans, invariably shave the head, and as we have observed, even the Jews are compelled to submit to this operation, which should be looked upon rather as a religious ceremony than the force of habit. For this reason the barber's shop is a considerable feature in the towns and settlements of Central Asia.

In the bazaars of the larger towns the barbers' shops are open-fronted, or people are simply shaved in the open air. Although this trade has been carried on for centuries in Central Asia, everything about it is rough and primitive. The eating-houses of Turkistan are represented by a room fitted up in the style of the country, and among the cooking utensils is shown a boiler, or kind of steaming apparatus, in which pelmens, or pasties, are cooked by the natives. The steamer is constructed in four divisions, the bottoms of which, except the lower one, are perforated like a strainer. When in operation, it stands fixed on a vessel with water. The raw pasties are placed in the lower compartment, and the steam cooks them. When ready, they are placed in the other compartments, to keep hot. A pillow of rice is also a favourite dish, and is prepared much in the same manner as in other countries of the East. The tea-rooms of Turkistan are another feature. These establishments are very common, and are extensively patronised. They are conducted entirely by the batcha pretty boys, mentioned above, who form a kind of attraction for the natives. The tea is served, ready-made, in a copper kettle, and a single cup serves for two or three customers to drink out of. No sugar is supplied, nor anything else, so that any one wishing to enjoy his tea properly must bring with him a supply of raisins, dried apricots, cakes, &c. A handkerchief is spread on the floor instead of a tablecloth, and the

articles are emptied out on to it from the girdle, where such articles are usually deposited. The trade of embroidering is carried on extensively in Turkistan, and embroiderers' shops are here, among the rest. This art is practised entirely by men, Sarts and Tadjijs. Women are not at all acquainted with this branch of industry. Since the Russian occupation of Turkistan this business has increased very much, owing to the demand which has sprung up for articles of this kind in both the capitals. The ready-made clothes-shop comes next, where a number of khalats are shown in different varieties. These coats are made entirely by women. Then comes a shop, or store, where are sold all sorts of spices, sweetmeats, and fresh fruit in the summer. Here can be bought also, flour, rice, onions, sugar, ribbons, beads, &c. Next to the shops comes the interior court of the Sarts' houses, i.e. the court on the women's side of the house, adapted to the requirements of the harem. A covered gallery, in which the room-door opens, is constructed round the court. In the middle of the court of a Sart's house there is generally a small pond, surrounded with trees, on a raised platform, called a "tourpak." In the latter case the pond is at the side, or situated in the garden, if there is one, attached to the house.

The tourpak is resorted to in the evening, at night-time, when the weather is fine. It is kept very clean, and is covered with felt rugs, paillasses, and carpets, and even with silk counterpanes. The court is also kept clean, and scrupulously so among the rich. The houses of the poorer sorts are usually provided with steps of clay leading to the flat roof, to which the women and girls of the house resort in the evening to take a peep at the passers-by. It is used also as a playground by the children. The houses of the Sarts have, properly speaking, no windows; they are furnished instead with a kind of door, with an extra opening above: the latter among the richer Sarts being protected by a lattice, and in the winter covered with oiled paper. The doors invariably open on to the court, and for this reason there are no doors leading from room to room. The interior arrangement of the rooms of course depends upon the rank and means of the proprietor; their measurement is usually from 12 ft. to 21 ft. long by 12 ft. to 14 ft. wide. The walls are invariably furnished with niches, some of them serving as receptacles for the bedclothes, and so on, in the day-time; others have cupboard fitted in them, and are used for keeping all kinds of household utensils. The wealthy have these niches decorated with very pretty carving in gypsum, and are divided into small compartments by shelves. Stoves and fireplaces are not used, and in a town like Tachkent, with its 70,000 inhabitants, there are only five houses having stoves in their rooms. The walls are of brick and glazed tiles of various colours. The ceilings are sometimes painted in fantastic colours; the floors are either of clay or bricks, and are covered with carpets or felt rugs. The Sarts' room contains three figures of females, life-size, in the model dwelling-house: one of them, the mistress of the house, dressed in rich apparel; the two others representing the servants of the establishment.

In the gallery round the yard described above, are small models of Sarts' houses, illustrating the methods of constructing houses in Turkistan. The dwelling-houses and other structures are built entirely of lumps of clay, which are held together by wooden frames, with the exception of buildings like the Medresses and a few mosques in some of the large towns, which are constructed of burnt bricks. In constructing their houses, the inhabitants of Turkistan dispense with the foundation, merely fixing the frames into the ground, and they are covered from the inside and outside with thick lumps of clay, smoothed off and then coated on both sides with plaster made of clay mixed with finely-chopped straw. The richer people have these walls whitened in the inside with alabaster. The flat roof is also made of clay, and is formed in the following manner. Beams of poplar are placed on the walls, at a distance of about three quarters of a yard from each other; between these are fixed rounded sticks placed close to each other. This, properly speaking, forms the ceiling of the house. Then the beams are covered with a layer of rushes about 7 in. thick, which is again covered with a layer of earth; all this is then plastered with the composition of clay and chopped straw about 1½ in. in thickness. It is said that a skilful and careful workman can

form a perfectly water-tight roof in this manner; generally speaking, however, the work is slovenly done, and the roof begins to leak whenever the season is unusually wet. The roofs of some of the better houses will last ten years or more. The rich often have their houses constructed of two stories. In this case, of course, the framing forming the lower story is made stronger, and thicker beams are employed on the walls.

In the Turkistan department are also displayed all kinds of building materials, such as lime, clay, bricks, and marble. Owing to the absence of forests, wood is dear, and cannot be extensively employed; the chief material used in the erection of houses, as we have seen, being clay dug out on the spot where the building is carried on,—the bricks in use are only sun-dried, kiln bricks being seldom employed. Slabs of lime-stone are also rarely used, as well as marble; of the first are built only the foundations of large buildings, such as mosques, and slabs are used for the floors of the same. Of the second are made bases of columns, monuments, and such like; wood being employed only for the skeleton frames of houses, the ceilings, as described above, and for jambs and doors. As specimens of wood for building purposes are shown beams made of the poplar, and pieces of walnut-wood for making doors. This dearness of wood has made the joiners and carpenters of the country very careful in the working of that material; the axe, which plays such an important part in Russia, is scarcely used, the saw being mostly employed. The high price of wood is also the cause why all joiners' and cabinetmakers' work is so slightly made, and finished only on the side exposed to view. The turner's craft is limited to things of small dimensions. On the other hand, the carver has a more extensive field for exercising his ingenuity. The woods employed for cabinetmaking and turnery work, of which specimens are shown, are the following,—the willow, juniper, pear, apple, plantain, apricot, peach, also poplar and hirc. Of appliances and instruments used by the natives there are also specimens, such as lathes, grindstones, carpenters', joiners', and cabinetmakers' tools, but they are very rude and primitive to look at. Samples of workmanship are also exhibited, in the shape of doors of walnut-wood, window frames, and cupboards. Among the curiosities of the Turkistan department may be classed also a collection of musical instruments, such as copper horns, drums, tambourines used at festivals and at the men's parties, and a peculiar kind of drum used in hawking to frighten the birds from their hiding places amongst the reeds and the lares from the bushes; the hawks are trained by the natives to attack a bird or hare with equal facility. There is also a curious collection of idols worshipped by the inhabitants professing Buddhism. They are:—Dintchouk, the father of mankind; Bakchee, the god of fortune; Ayonchee, the prolonger of life; Bunkuba, the follower of Bakchee; Maiduir, the god of health; Manzouchire, the god of the Khans, &c.

CONCRETE BUILDING.*

Materials.—Half-measure of Portland cement; half-measure of air-slacked lime sifted through a fine sieve, mixed together dry. Seven measures of sand and gravel, if possible, of all degrees of fineness, from peas to large eggs, or stones broken to pass through a 2 inch ring,—the finer should just fill the intervals of the coarser materials. Then all to be mixed together dry and measured. The mixture of cement and lime to be then added, and mixed dry, and the whole tempered with as little water as possible: any more than will just moisten the whole is in excess. The most convenient mode of mixing is to prepare a sufficiently large mortar-board,—say, 5 ft. by 10 ft.; at one end form a shallow box, with three fixed sides, the fourth side, next the middle of the hoard, movable. The sides to be as many inches deep as the concrete is to contain measures of material,—if one to seven, it should be 8 in. deep. At 7 in. from the bottom fix a lath all round the three fixed sides. In using, the ready-mixed sand and shingle should be thrown into the box up to the level of the lath-gauge; the surface should be levelled and struck with a straight edge resting on the top of the gauge; the cement and lime

* Read at a meeting of the Architectural Association of Ireland, by Mr. J. H. Owen, M.A., President of the R.I.A.I., Nov. 14.

should then be added, and the surface struck also. It is plain that by this means the materials and measures in the exact proportions directed to be used are attained. The movable side should then be withdrawn (this side can be fixed in its place when required, like the tail-board of a cart), and the whole mass well mixed together. The best tool for this purpose is a long-handled rake, like a four-pronged fork, with the prongs sent down about 4 in. When the mixing is complete, water should be added gradually, not thrown on in quantity, while the heap is still being turned, until the whole is sufficiently moistened, when it should be at once carried away to the work. Where practicable, it is desirable that the mixing should take place under cover.

It must be constantly borne in mind that by rightly using concrete we ought to get, as the result of the operations, a continuous slab without joints, and of equable strength in every direction, and not admitting of any motion, except as the result of fracture of the mass. In all brick or stone building the several parts are joined together by material of inferior strength, and the parts are capable of motion, whenever a local strain is applied, the pressure resulting from which exceeds the resisting power of the building. This should not be the case in concrete building. With concrete, the whole wall, from end to end and from top to bottom, should form one continuous slab of artificial stone; and to attain this, not merely must each course be continuous in itself (for obvious reasons, the work must be carried up in courses), but it must be attached—cemented firmly,—to the courses above and below it; and to effect this, it is only necessary to leave rough surfaces, and take care not to add any fresh concrete to a dry surface or edge. If any previously-laid stuff has dried, either in the same or in a lower course, moisten it, not to excess, before adding fresh concrete. For this purpose an ordinary garden watering-pot, with a fine rose, will be the most convenient tool.

It is plain, from what has been stated, that a foundation of concrete may be of much less bulk than one of masonry or brickwork. Considering that a 4-ton railway-engine, travelling at forty or fifty miles an hour, and therefore acting with an impact infinitely exceeding the dead weight of the wall of any ordinary house, is borne by a sleeper 9 in. wide resting on about 9 in. of ballast, there seems every reason to believe that a small footing would be ample. To take another illustration: a man of average weight,—say, 15 stone,—is able, with Indian snow-shoes on, which each would be under 2 superficial feet in area, to stand on and walk over the surface of snow without sinking to any extent. The weight of a concrete wall 30 ft. high and 12 in. thick would be nearly three times the weight of a man, but the solidity or power of resistance to pressure of any ordinary soil in foundations is infinitely greater than that of snow. In wet or marshy ground I would recommend that the breadth of the footing at top should be increased by one-fourth, one-third, or one-half, even up to doubling it, forming the sides to the same batter of one to four, but without going deeper, unless it be found, on making trial, that a reasonably good foundation can be got at a moderate depth, in which case an ordinary footing should be laid on the firm stratum, and the wall commenced at its finished thickness so much lower down.

The most embarrassing site of all to build on is when one portion is soft, and others hard and solid. The best plan is not to build on such a site at all; but if it must be done, I would recommend to reduce the footing on the hard ground down to having hardly any, or even no offset at all, and largely increasing the breadth of footing over the soft parts, so as to approximate as nearly as possible to an equal subsidence over the whole area. No rule or measure can be laid down as to the extent to which this should be done; we can only get a rough idea of the variation in quality from the different penetrations of a bar driven with about the same force into both sorts of soil; but where such differences exist, I think it would not be a bad plan to dig, in the soft places, a trench below the level of the intended concrete footing, and of about 2 ft. greater width, and fill it in with gravel without lime or cement, and level it to form a bed for the concrete footing. The additional resisting power would be nearly, if not quite, equal to that of the same amount of concrete.

It may not be amiss to give here an extract

from Viollet le Duc,* describing the foundations of the great cathedral at Amiens, which he had an opportunity of examining down to the very bottom. He describes it as consisting "of a layer of brick earth, 16 in. thick, placed over a virgin clay; next is a bed of concrete 16 in. thick; next, fourteen courses of from 12 in. to 16 in. in thickness each, of rough blocks of a sort of chalk, full of flint, and very hard, which comes out in large masses; above this are one course of coursing stone and then courses of freestone under the surface. . . . Behind the facing of the foundations is a filling of large pieces of flint, of hard chalk, and coursing stone, grouted (noyé) with a very hard and well-made mortar. On this artificial rock rests this immense cathedral. At Notre Dame, in Paris, the foundations are also made with extreme care, faced with strong quarry blocks of great thickness, the whole resting on a good soil: that is, on the lower sand of the Seine, which is coarse, and of a greenish colour. As for the piling which is generally believed to be under the masonry of most of our great cathedrals, we have never found a trace of it." And in a note he adds,—“It is the same with this supposed piling under Notre Dame de Paris and Notre Dame d'Amiens, as with so many other myths current for ages as to the construction of Gothic buildings. It would not be possible to construct a great cathedral on piles. These buildings can be founded only on broad footings; the masses to be borne varying considerably in elevation, the primary condition of stability required a formation perfectly homogeneous, and capable of continuous resistance under the surface.” Without endorsing all that is said as regards piling, in this respect M. Viollet le Duc seems to be led away by the enthusiasm inspired by his subject. We have in the last sentence an exact description of a perfect foundation, and such as you can only be sure of getting by using concrete.

We will turn next to what in ordinary specifications would be comprised under the heads of Mason, Bricklayer, Stonemason, and Paviser, and, in substituting cement for each and all of these, we must bear in mind the nature of the material proposed to be used, and the qualities belonging to it which distinguish it from the materials in ordinary use. The only operations it undergoes are mixing the materials and casting them in a mould; for, however it is applied in detail, or whatever we call the machinery employed, it comes practically to this, that it is cast in a mould (though the moulds differ in some respects from those in ordinary use for other materials), and when so cast the whole mass is homogeneous, without joints, of great cohesive strength, and impervious to moisture. We shall never rightly appreciate concrete and the mode of using it, unless we put out of our heads that it is a mixture of cement and gravel, and all associations with ordinary combinations of lime and brick or stone. We shall best realise the work to be done if we fix in our minds the idea of cast iron. Just imagine a sort of iron which can be moulded cold, in a leisurely manner, and which is only about one-twelfth as strong as common iron, and you have then the right sort of ideas with which to begin working in concrete. There is only one other element to bear in mind, but it is too important not to mention it separately, and it is this,—that every other material used in building, except the hard granites and most compact limestones, depreciates with time and exposure, and requires an initial excess of material to be used, and all sorts of surface applications constantly renewed to preserve it; whereas Portland cement concrete is permanent and durable under all circumstances, and increases rapidly and enormously in strength, and continues to increase,—but in a continually diminishing ratio,—for as long as observations have up to the present time been made with it. This is a most important quality, as it enables us to use it with great economy of material, and with the certainty that if it bears the weight imposed on it at first, it will continue not merely to bear it, but will become continually more able to bear it as time elapses.

The first portion of the “mason's” work to be settled is, of course, the walls. For an ordinary two-story house, with walls not exceeding 24 ft. high, 9 in. is quite sufficient thickness. For walls above that height I would recommend that the thickness should be increased by about 3 in. for every 6 ft. added to the height,—of course taking advantage of the occurrence of

the floors to reduce the thickness. As concrete hardly arrives at its initial strength in less than a month from the time of mixing, it is evident that it is very unsafe to fill up the walls to a great height with too much rapidity. I believe that it will be the safest course to build at the rate of only about 3 ft. in height per week; and then let the work rest and consolidate for 6 ft. per month, which at first sight may appear to be slow progress; but, considering the great rapidity with which the internal finishing of a concrete house can be carried on, the total time occupied in building would not exceed what would be required with ordinary materials. In building the walls, as in the foundations, care must be taken to moisten the surface of old work before adding fresh concrete; and this, as before stated, is best done by watering through a very fine rose. As a concrete wall is intensely hard, its surface will be subject to damp from condensation. In inferior houses this may probably be met sufficiently by covering the inside surface with very rough mortar plaster, and washing it with two or three coats of thick lime wash; but for houses of a better class the walls may either be battened or built hollow. If battening be decided on, provision must be made for fixing the battens as will be described hereafter. If the walls are to be built hollow, the simplest course to adopt is to lay on the footings a series of brick on edge, tailing with the spaces to be filled by the inner and outer concrete walls, and set about 3 ft. apart, and on these to lay a piece of plank in the direction of the length of the wall, tapered on its cross section and notched to pass down an inch or two in the bricks, which it will keep in their places during the operation; the concrete is then filled in and well rammed up to the level of this plank core, after which it is removed, and another course of bricks is laid, breaking joint with the previous course, and the operation is repeated. As regards the thickness of these walls: the inner wall should not be less than 4½ in. thick, nor the outer one than 8 in., and of course the concrete must be carried the full thickness of the wall round all openings.*

THE ESCURIAL AND ST. JAMES'S PALACE.

SENTIMENT IN ARCHITECTURE.

THE unfortunate fire at the Escorial called attention to a subject which but for it might have long been unthought of. Spain is a kind of *omni-de-way* place, in somewhat curious and exceptional circumstances. It is half Oriental to begin with, and so gives a sort of midway idea of a nationality between the pure Orientalism of the opposite coast of Africa, and the “Westernism” of Europe generally. Some people seem hardly to know whether to call Spain “civilised” or not. We hear it called bigoted Spain, improvident, incapable, and even pitiable; but nevertheless Spain has had a history, and a telling one,—a language none better, a literature and an art, and an architecture; and so certainly a “nationality” and an individuality of its own. To develop the vast resources of Spain according to the general view, nothing is wanted, at least in the way of a commencement, but railways in all directions. Railways give birth to towns, towns to population, and populations—at least all modern ones—dig into the earth, and cultivate it, and build upon it, and fairly “subdue” it,—a not a little expressive word, for *subdued* it may be said to be in every sense. But all countries have a past as well as a present, and a future. Spain certainly has had a great past, and one of the memorials of that past is this very palace of the Escorial, just so nearly destroyed by “fire from heaven.” What, therefore, is the Escorial, and what is there especially remarkable in it, or about it, that makes it architecturally interesting? To us there seems a good deal. And, again, is there any building in this small island which has any sort of similitude, in any way, to it, not in an architectural or building sense merely, but in “sentiment”? Is there any sentiment in modern architecture?

Now, the truth is that this famous Palace and “Tomb” has but little pretension to a place in architectural history, if parity of details, and elaborate ornament, be the test points of architecture. It is a structure which rather comes

* “Dictionnaire d'Architecture,” iv., pp. 175-7. Art. “Construction.”

* To be continued.

under the head of "building" than architecture. That it contains 1,000 outer windows, and 1,500 inner windows, and 1,200 doorways, and that there are in it, among very many other things of note, 32 leagues of space to walk in, does not make "architecture" as a fine art, any more than do our immense railway stations and vast blocks of warehouses, and miles upon miles of brick streets. What really makes the Escorial world-famous, and mentally and visibly interesting, is the *sentiment of the place*: the why it was built, the by whom it was built, and more than all perhaps, from the expression it conveys to us of the sentiments and feelings of the time in which it was reared. All this it most certainly does. We would again ask, is there any "sentiment" in architecture, as things go, and if so, will it raise a mere building into the rank of architecture? This is a great and a new question, for it may very well be doubted whether we, in this practical age, have any time for sentiment in building. All things are too practical for it; we build for use, and not for sentiment, or feeling, whether in marble or in brick. A railway station is, of course, a pure matter of utility and business, as is a common house; and a church is, after all that is sometimes said, really nothing more. A practical want is supplied, and that is the end of it; for if there be any sentiment, it is borrowed from the past. But with the vast edifice, or rather many edifices, with which we are now concerned, all this is reversed. Philip of Spain had as it was many palaces in which to take up his abode, and to live happily, or gloomily, as he best could; but none of them satisfied him, not even those which romance itself may almost be said to have reared, and wherein any one with an imaginative faculty might well have dreamed away existence; but these did not suffice. A new sentiment was needed, and a building wherein this sentiment might find expression, and place in which to work; and it must be confessed that no greater harmony could well exist between the mind of a man, and the material structure in which the man chose to live and die than this. Its very place among the solitary mountains in which the vast pile of building was placed, the bare simplicity of the architecture of it, and the main idea itself, and to which all else is subordinate and accessory, viz., that of a church to live in, or as close to as could be, and a tomb ever to contemplate, and in certain time to lie in: all expressed in a way not often paralleled, even in past days, the feelings and sentiments of the builder of it, and in as complete a way as can well be conceived. If the Escorial contains no architecture, it certainly has that which might have created it. When we think of our plain and mentally simple way of doing things, it is not a little strange to think of such a place, filled with an ever-present "darkness," and in which even the distant successor of the gloomy founder never missed the opportunity of lighting up this gloom—midnight gloom,—to say all that is possible in this world for her dead ancestors who lie entombed in it! Such is sentiment. May we not therefore fairly contend that there is "sentiment in architecture, or say, if you like, building?" And that such sentiment, whether wise or not, is not now the question, will go a good way towards raising the bald and simple into the great and artistic. So the old Romanesque, or Norman architecture, as we love to call it, of this country, the plainest of forms, and with the least of ornament, always has seemed to us to possess a dignity and solemnity and grandeur which even the best of the pure Gothic does not possess, and "sentiment" doubtless has a good deal to do with this. The ways and manners and feelings of the old Norman knights and their "retainers," and their religion, who can do more than dream of them? It must be borne in mind always that man does not live by "bread alone," but must have a something else, even if it be but a romance or an Escorial to dream about.

But the Escorial was not only a church and a tomb, it was and is yet also a palace, though a deserted one; and being so full of all that is strange and romantic, and beyond the things of every-day existence, it must be of some interest to know of any building, all bustle and business as it is, which is at all or in any way like it. We do not mean in plan, and arrangement, and architecture; but in sentiment and forgotten or almost forgotten use. We say in London. Well there is, truth to say, St. James's Palace—a place that seems to be, as it were, waiting to be "improved off the face of the earth. One cannot

help wondering why it continues to exist, covering, as it does, such a space of valuable building ground. Yet to our minds it is a very remarkable structure. Like the Escorial it is not remarkable for its architecture. It is as severely simple and plain as it well can be, quite as much so as the Spanish palace. It is out of use, too, for it is only now and then, in an almost accidental sort of way, that it is utilised. There is a chapel,—the chapel royal,—in it which now and then wakes up into a sort of life, in a strange enough way too. There are courts in it, and windows enough, and doors, and staircases; but for all that, the palace is the abode of silence and almost forgotten things. In the "Ambassador's Court," but for the noise in the distance, one might fancy oneself in the very Escorial itself. It lies low, and seems almost buried, and but for the traffic, such as it is, through it, it would really be in sentiment a complete counterpart of the old Spanish palace. Of course the origin of it was different; it did not come of the desire of a recluse for a "church and a tomb," but it sprang up in an age so totally different from the present that the "sentiment" at work in the origin of its building was almost as strange to modern men and ways as was that of the Escorial itself. We do not here mean that the architecture of St. James's is not worth a little study; to our mind it is. The plan of the building, irregular though it be, would seem to be not a little convenient for palatial purposes, and certainly far superior to what Buckingham Palace can afford, for the state drawing-rooms in it have a quaint and old-fashioned dignity about them which could hardly be in any more modern and "improved" building. We hope to see it preserved for its own sake, and as a lesson to those who fancy that architecture consists in ornament and decoration, and as one of the old landmarks of a past and fast disappearing way of aristocratic life. It is good to preserve the memory of some things, even if dying out and their origin almost forgotten. St. James's Palace is of this kind, and no one can go through it without some impression of a hygone day springing up in his mind. We see our forefathers in these quaint places. There must be, then, something in architectural sentiment, and something to be got out of a building "educationally," even when it does not contain any very impressive architecture or ornamental details, and is nothing but a plain brick or stone or granite structure, with doors and windows and rooms strange to look at, and of whose precise use we can but speculate at leisure, and imagine anything, and people, as we love to do, with forms long since dead and forgotten. "Sentiment" in architecture! Can we expect any in the future, and of what kind is it to be? All fancies of the past go, and well educated out of us; another Philip of Spain an impossibility. Even the Spaniards are emphatically told to make every effort to rid themselves of the strange fancies which made the Escorial a reality. And if Spain, still more enlightened England must amend all these old-age ways and modes of thought and feeling, and turn to something else for "sentiment,"—even architectural sentiment. If there are those who, fond of architectural puzzles and hard questions, want a something to speculate upon and to test the strength of their "imaginative faculty" by,—why here it is!

PRESIDENT'S ADDRESS: INSTITUTION OF SURVEYORS.

At the opening meeting, November 11th, the president, Mr. E. N. Clifton, after glancing at the position and prospects of the society, and congratulating the members upon the evidences of its growing usefulness, said:—The difficulties in the way of the disposal of the sewage of large towns do not seem to be less than heretofore, nor to have been relieved in any way by the energetic endeavours of corporate bodies to find some solution to this difficult problem. It is true that, under legislative pressure and legal threats, the authorities of many towns have carried on investigations and instituted costly experiments with a view to the discovery of some plan of escape from their embarrassment; but little else has resulted from their efforts than the usual crop of conflicting recommendations and reports, making the difficulty of choice not less onerous and bewildering than heretofore. It is remarkable that, of the rival systems under trial for years past, not one has headed the others so much in the race for supremacy as to

make its adoption, in any particular case, a matter of unhesitating selection.

The result of the determined effort made by the borough of Birmingham to escape from the network of injunctions and Acts of Parliament in which it was involved, is hardly calculated to afford much encouragement to those who looked to the elaborate and costly inquiry which preceded the application to Parliament as likely to evolve some system, which, tried upon a scale which should put its merits or demerits beyond contention, might serve as a guide to other and smaller towns similarly circumstanced. As a preliminary step, the town council appointed a committee, with power to collect information from all sources, to invite the opinion of experts and men of science, and to recommend some definite plan for adoption. How thoroughly and exhaustively their work was done a perusal of the able report issued last year by the committee will show. Reports were received from the committees of the various systems; the relative merits of the filtration, precipitation, and irrigation methods were carefully considered; and visits of inspection were paid to various sewage-farms in different parts of the country. It was decided by the committee that the precipitation system was too uncertain in its operation and too costly for application to the sewage of a population of 345,000 persons, and a daily minimum sewage flow of something like 16,000,000 gallons. Neither did the so-called filtration system commend itself to the committee. The irrigation system was next considered, and found more favour, but the question arose whether, in adopting that system, it would be better to distribute the sewage over a small area of land, having regard mainly to its purification by filtration through the soil,—making its agricultural uses a secondary consideration,—or proceed upon a plan of perfect utilisation over a large area of land, with a view to a commercial profit on the undertaking. For the former purpose, it was estimated by the advisers of the committee that from 175 to 300 acres of land would be sufficient, but, as the supply of sewage would be constant, it was resolved, in order to avoid "clogging" the land, to recommend an area of 850 acres, with an intermittent supply to various parts of the land in succession. In order to fully utilise the sewage of Birmingham, according to the plan pursued in smaller places, it was estimated by one eminent authority on the subject that something like 10,000 acres of land, with an expenditure of a quarter of a million of money in the mere drainage and preparation of the ground, would be necessary. It was, therefore, resolved by the committee to recommend the smaller area and the adoption of the system known as "downward intermittent filtration."

Setting aside all questions of private rights in land,—and with which there is a tendency, just at present, at least, sufficiently marked, to interfere in a somewhat arbitrary fashion,—and entirely dismissing the question as between the Corporation and the land-owners, there remains behind one matter of regret. It is, that a scheme of the highest and most pressing sanitary importance—one, moreover, which was forced upon the Corporation by legislative pressure, and in the preparation of which the highest scientific and practical knowledge of the subject was brought to bear—should have proved abortive. It is difficult, under the circumstances, to resist one of three conclusions:—either that the Legislature has been premature in insisting upon a sanitary revolution inconsistent with the existing state of our knowledge of the best methods of sewage disposal or utilisation; that enactments which contemplate the diversion of the sewage of enormous populations from the river drainage system, and its distribution over vast areas of land, in a country so thickly populated as ours are altogether, and in the nature of things, impracticable; or, the contrary being the case, that powers should be conceded to corporations of large towns, enabling them, upon a basis of fair compensation, to override the wishes or the opposition of land-owners in the endeavour to comply with the terms of an otherwise impossible requisition. It may be, and no doubt is, in many cases, an extreme hardship that owners of land should be called upon to relinquish property possessing, to them, elements of value, for which money is no sufficient compensation. We must not lose sight of the fact, however, that it is not a little hard upon the ratepayers of large towns to be denied an avenue of escape from statutory statutes and injunctions of the most uncompromising kind, save by the purchase of land at a price five and six times in excess of the market

value,—a price which, in many cases, represents payment for not only the proprietor's actual commercial interest in the land, but for his prejudices, his ignorant opposition to anything new, and, not seldom, his avaricious desire to make capital out of the embarrassment of his urban neighbours.

Among the most remarkable of the awakenings of the public mind within recent years is the movement—which may be said to have had its commencement early in the present century,—towards a national care for those matters of public health which come properly within the range of State control.

It may be that the intimate correlation of dirt and disease had failed to impress itself upon the minds of our fathers; that the local authorities of the day were endowed with sufficient power to deal with such matters; or that, the general habits of the people being less sedentary, and the population more sparse, it was not till those conditions became altered that the full effects of such indifference to the main origin of disease came into action. Certain it is, however, that in the foul cesspools, open middens, overcrowded burying-grounds, and ill-ventilated dwellings of that time the desolating epidemic waves which swept over this country during the cholera years, found, if not a percentage, at any rate an alliance, and taught us (though in a sorrowful fashion) a lesson for which we can hardly be sufficiently thankful. Much has been done since that time to improve the health of towns, and some little—though but very little—towards the same end in rural districts.

It is worth while observing here that the attention of sanitarians is so much directed, at the present time, to the question of the effluvia of sewage, that there seems to be some danger of their forgetting the importance of completing the system of house-drainage, and attending to the perfect collection of sewage matter and refuse.

What shall I say of the state of things in rural districts? Are our villages really those abodes of health and pure air which the fancies of those who contemplate them from a distance delight to picture them? Is the village brook, with which we associate such pleasant thoughts, really what we fancy it, or is it a pestilent stream, laden with the contributions of the scores of privies which hang over it and the pigsties which drain into it? And which is victorious in the struggle for mastery, our old friend the honeysuckle round the porch or the filthy pool of refuse at the gable-end, which lies reeking in the sunshine? No doubt, much has been done to improve our country cottages in the mere matter of breathing-space; but in all that relates to the application of a real sanitary system we have scarcely moved since the days which, a few pages back, we visited with such reproaches. It is little more than four years ago that a fever epidemic of almost unexampled violence broke out in the village of Tering, in Essex. Public attention was much excited by the circumstance, but the usual lassitude soon got in, and men's minds settled down upon the complacent conviction that there were special features in the Tering case to account for the epidemic, and little or nothing has been done since to improve the sanitary condition of most of our villages. The residents in country districts may be, and, no doubt, are, fairly healthy; but it is due mainly to their outdoor lives, and in spite, not in consequence, of their surroundings.

Although "The Public Health Act, 1848," provided for a thorough system of control, and for the appointment of a staff of inspectors, the powers reposed in the General Board of Health may be taken, in the main, as intended to be supervisory rather than initiatory. In particular cases where, for instance, the death-rate had reached a certain maximum, the Board was empowered to institute inquiries and direct measures of prevention; but its powers were, in most instances, to be put into operation only by the application of a certain proportion of the inhabitants, for an inquiry into the sanitary condition of the locality. It was also invested with power to direct the appointment of local boards to carry out its instructions in places where its interference was needed.

In the year 1854, considerable changes were effected in the constitution of the Board, and the period for which it was created having expired, its powers, with certain modifications, were transferred to a new Board, consisting of a president, the Secretary of State, and the Presi-

dent and Vice-President of the Board of Trade. This Board exercised its functions until the year 1858, when it ceased to exist. After that time, such of its powers as related to disease were vested in the medical department of the Privy Council, under the able direction of Dr. Simon, such other powers as it possessed being transferred to the Secretary of State. Under the Local Government Board Act, 1871, the whole of these powers have been vested in the new Board constituted under that Act.

In the year 1858, the statute known as the 21 & 22 Vict. cap. 98, more commonly as the Local Government Act, was passed. The general effect of this Act was to render the sanction or approval of the General Board of Health, or of the Legislature, unnecessary,—the ratepayers, or proprietors in any district, adopting the provisions of the Public Health Act as they should see fit. The Local Boards were thus emancipated from the control of the General Board of Health; but the consent of the Secretary of State was still necessary in all cases where the Local Boards sought to take property compulsorily.

This Act may be taken as a concession to the principle of local self-government, and great good was expected to result from its operation. It was, however, essentially permissive, and the voluntary adoption of its provisions here too much of the complexion of a self-inflicted fine to secure it a very large measure of success. No broad and systematic attempt has as yet been made to provide proper sanitary authorities for every local administrative area, if I may use the phrase, although abundant machinery had been provided to meet the cases where epidemics or pressing inconveniences had induced single places to apply for State intervention.

It has long been felt that some comprehensive measure which should map out the whole country into sanitary districts, provide for the appointment of qualified sanitary and medical officers to those districts, and abolish the jumble of local boundaries, was urgently needed. Some such measure is that which received the Royal assent at the end of last Session under the name of "The Public Health Act, 1872," but whether it exactly fulfils the requirements above mentioned is very questionable.

The main effect of the new measure is to parcel out the country into urban and rural sanitary districts, the Act reciting that "from and after the passing of this Act, England shall be divided into sanitary districts, to be called respectively urban sanitary and rural sanitary districts." The Act also defines the authorities who shall, in each case, preside over the respective districts. Every district is called upon to appoint a "medical officer or officers of health, an inspector or inspectors of nuisances, a clerk, and a treasurer, and such other officers or servants as it may deem necessary." Powers are conferred upon the New Local Government Board, enabling it, when necessary, to amalgamate sanitary districts, or to transfer districts from one category to another, and to merge small districts, constituted such for special purposes, into the larger ones to which they are contiguous, or upon the boundaries of which they encroach wholly or in part. The Act also very elaborately defines the elective and voting authority, and guards against voting in a double capacity. Borrowing powers are also conferred upon local Boards, and provision is made for combined action for the purposes of improvements extending beyond the boundaries of any one district.

Thus the machinery, at any rate, is provided, by means of which the sanitary matters of the whole country may be regulated, under some law not yet in existence, with less confusion and conflict of authority than heretofore. I say less, for it is difficult to see how it is possible, without the appointment of a class of independent, State-paid inspectors, invested with great powers, and without local interests or ties, to insure such a supervision of sanitary matters as to render the measure really operative.

The address treated of several other topics, and elicited the thanks of the meeting.

The Embankment and Charing Cross.—The Metropolitan Board of Works have instructed their solicitor to prepare notices for an approach through Northumberland House to the Embankment, but that will only be proceeded with in the event of the arrangements with the Duke being satisfactory.

THE INAUGURATION OF THE NEW OBSERVATORY IN FLORENCE.

The earnestness with which the new observatory in Florence was inaugurated on Sunday, the 27th of October, marks a new era in the advance of experimental, inductive,—we may say, true,—science. It forms a new proof of the progress now making in Tuscany, and sends us back to the times of Bacon and Galileo, the great apostles of the Renaissance of human reasoning and philosophy.

All who know Florence will remember well the Torre del Gallo,—the old grim square tower, looking like an old English country church, and which is usually known as "Galileo's Tower," whence for so many years the great man sent forth the fruits of his labours to the scientific world. With vast and fertile brain, but living in an age of moral weakness, any heroic strength he might have displayed under other circumstances was annihilated by the atmosphere of corruption and deceit which he breathed; and, great though he was by the light bestowed on him, he yielded before his pursuing enemies, and, in spite of his inward convictions, denied his doctrine, modifying this act with the half-uttered, "*E pur si muove*" ("But it does move").

Ascending from the Porta Romana by the road to the Poggio Imperiale, the hill called Arcetri is reached, chosen for the site of the new observatory. It is but a short distance from the old Galileo Tower, and at nearly the same elevation. The new building is severe in style, grey coloured without, the façade looking direct south. The entrance-hall, adorned with marble busts of the king, Galileo, Amici, Plana, and portraits of the most eminent astronomers, is reached by a handsome flight of steps. Thence, by a room through which the telegraphic wires pass, we enter a room destined for scientific observations. To the left, a portrait of Galileo looks down on the astronomical instruments already fixed on the solid rock. A staircase leads thus to the upper story, with a movable tower that surrounds the great telescope of Amici. This is fixed in the rock, by which it is secured against the slightest perturbation in the building, the flooring being placed over transverse arches, skillfully constructed by the engineer, Boccini. The solid casings of the telescope are from the Benini Foundry. The walls of the tower are covered with photographs, executed in America, representing divers phases of the comet Donati; and on an elegant pedestal is a marble bust of Arago. On the east and west sides of the central tower are terraces, whence the beautiful panorama of Florence can be seen on one side, and on the other richly-clothed hills dotted with villas. An external winding staircase leads to the cupola surmounting the tower.

Unfortunately, Professor Donati—the hero of the day, we may say, the instigator and great promoter of the enterprise, and already appointed as director,—was prevented being present, owing to a fall that he had had the previous day, causing contusion of the knee. Professor Targioni read the speech already prepared by Donati, of which we add some short extracts. It must be prefaced that in the autumn of 1869, three scientific congresses were held in Florence,—the International Medical, the Geodetical (for measuring degrees in Europe), and that of several Italian astronomers, to discuss the observations to be made of the total eclipse of December, 1870. All the members of the congress assembled on the hill of Arcetri to visit the preparatory works for the new observatory. That day, the 26th of September, saw the inauguration of the commencement of the work of which the completion was celebrated this 27th of October, 1872.

Mentioning this fact, Donati proceeded: "These learned and illustrious guests came to this spot to render homage to the glorious memory of the great Galileo, who, on this very hill passed the last years of his laborious life; and because it had been decreed that here should arise a new temple, consecrated to the culture of those sciences into which that great genius infused a vigour of new life." "Thou, not far from here, but on a spot less elevated, existed only a narrow temporary shed to receive the great refractor of Amici, which later will be replaced by a magnetic observatory. But the actual spot on which we are assembled, has always been the fertile field of an industrious colony. Ceres, therefore, has only yielded it to Uranus. Now is seen accomplished this solid admirably-disposed edifice, of which

in 1869 the designs alone could be exhibited to those who assembled here."

"Let all the disagreeable occurrences connected with the erection be obliterated in the grateful pleasure of seeing its completion. It is pleasing also to recall that many learned and experienced men, when visiting the spot during the course of the construction, approved so highly of the enterprise, and urged me to persevere in the completing of the means to so great an end. Among others came the Russian astronomer, Struve, the learned director of the vast observatory at Pulkowa, a thoroughly regular scientific palace, of which he is prince, who had deplored incessantly the unhappy condition of our observatory, and whose voice of authority reaching the Government, added no little influence to the realisation of the project. The numerous and unanimous co-operations lent for the carrying out of such a work should encourage all those who know how hitherto it has been impossible that the strict operations of physical science can flourish, if an efficacious protection be not at hand to assist. Without material force, nowadays, languishes also scientific force; if the former is defective, the latter diminishes. Woe be to the people who do not know how to prevent the breaking of such a connecting link. This observatory is not raised to satisfy any circumscribed need, and still less any private caprice; the feeling was common throughout Italy, that at last an observatory should be raised, worthy of modern times, and a reform of this kind he made where, through the powerful impulse of the great Galileo, arose that celebrated school whose motto is 'provando e riprovando,' and whence issued the first regular rays that illumined the world with a new and fertile light. Historical eras—dates of empires—are little in comparison with that glorious and memorable era which Galileo marked in science; and I venture to affirm that the rising in Italy of an observatory such as this, will mark in future scientific history a date almost as important and memorable." "And undoubtedly our nation has not been nor is behind others in the study of the stars; and you, my excellent brothers in science here present, are a proof of it; and if we except the celebrated observations of Piazzi, and a few others (which constitute the foundations of the mechanism of astronomy, because they were made in remote times, and with instruments and in places incapable of producing the precision arrived at in modern times), all the other works and discoveries are to be attributed more to individual exertions and our happy climate than to an established law for maintaining in due honour most glorious scientific traditions."

Praises were lavished on the architect Jacchini, who designed and constructed the edifice, and on Boccini for his efficacious aid. For the future of the great undertaking, Donati noted with reason how much its useful results depended on the supply of a complete set of scientific instruments for which he confided in the generous liberality of the Mæcenæ who had joined in erecting the building.

AN INTERNATIONAL TECHNICAL DICTIONARY.*

A book has been published which will be found of considerable utility in technical circles. It is an abridgment of "The Technological Dictionary," by Drs. Rumpf, Mothes, and Unverzagt, and contains most of the words in use in German, French, and English arts and manufactures, with their equivalents in each of these three languages. The original work includes technical terms used in the sciences, and is therefore of much greater bulk. Savans will have to refer to this dictionary as before; but the artist, architect, contractor, manufacturer, and commercial man will save himself trouble by consulting the present abridgment. Words from the department of mathematics, geometry, heraldry, gun-casting, and horing, have been discarded in this pocket edition, as well as words of rare occurrence among metal-workers and pyrotechnists; while, on the other hand, some terms have been added which are not to be found in the larger work, but which are likely to prove useful in the conduct of foreign business.

* A Pocket Dictionary of Technical Terms used in Arts and Manufactures. English, German, and French, abridged from the Technological Dictionary of Rumpf, Mothes, and Unverzagt. With the addition of Commercial Terms. London: Trübner & Co., Paternoster-row, 1872.

Apart from the absolute necessity of giving the correct designation of objects and processes in commercial and artistic intercourse with foreigners in their own language, it is highly instructive to compare the different words in use by the three nations to express the same thing. Sometimes we are struck with the general resemblance of terms, as in the German equivalents for heat (*wärme*), cold (*kälte*), fire (*feuer*), water (*wasser*), and numerous other instances; sometimes with the ease with which our own language expresses with a few letters an object that requires double the number of syllables before it can be written or spoken in another tongue, as in the instance of *water-bath*, in contrast with the German *wasserbadapparat*; or our simple *statement*, or old-fashioned *reckoning*, in opposition to the German *rechnungsanszug*; as frequently, perhaps, with the corresponding difficulty; sometimes with the serious importance, or comical consequences, of the omission of a single letter in a translation, or the substitution or addition of one; or of the addition of a hyphen only, as in the work before us, in *journey-man*, by which an ordinary worker appears in the guise of a traveller, or by the omission of one, as in *horse hound*, by which a product of the vegetable world is raised to that of the animal kingdom; and as we turn over page after page we are always brought face to face with a sense of the value of the study of languages in all attempts to trace out the history of man and his works, as well as of the extra light, size, and interest it imparts to our individual shares of the world.

A German merchant, settled in England, has contributed the mercantile terms, as well as the names of all articles mentioned in Custom-house tariffs, to the work before us. To be candid, we must premise it would have been well if the English section of the work had been placed in the hands of a competent Englishman for a closer scrutiny for errors than a German merchant could give. It is notorious that we have idioms no foreign scholarship can master, and the merchant in question has proved himself no worse than the generality of his compatriots in allowing, occasionally, a blunder to remain uncancelled. Every one, we might conclude, who is settled in England, is familiar with the signal, "All-right," now in use by omnibus conductors, cab-drivers, railway guards, and the general public, as an indication that the driver can put his vehicle in motion. But the German writer has it "All's-right," evidently confusing it with "All's well." Again, he writes a *cog* of herrings, for a "keg." Queer combinations, reverses, and explanations take us, too, sometimes, by surprise. We come to "hilder-stap" for "step-ladder," "master" of the works" for "clerk of the works," and "plumbery" for "plumbing." These are, however, scarcely chargeable to the merchant, whose assistance is stated to be confined to mercantile entries. What, we would ask, is a label-corbelt-table? or a nebule-corbelt-table, or case-bay-table, or plank-way cleaved wood? or a chestnut-tree, or a cloak-room with reference to "cees"? The error in the last word is clearly traceable to a mistake as to the origin of the word, which with us is a chamber in which cloaks and coverings are deposited before guests enter rooms full of company, and bears no reference to the *cloaca, mazina* or otherwise. Then as to the participle of "rivet," instead of solving a doubt often manifested as to doubling the consonant, we have "riveted bolt," and are referred to "bolt," under which the word is "riveted," while "riveting" has a second t in parenthesis, giving a riveter an option as to being right to a T, but to which a riveted girder would demur.

As a set-off to a few short-comings of this kind, we may speak with all praise of the fulness with which many items are given with all their variations. We have called attention, before now, to the difficulties attending the use of different names for the same object or process in various localities. Mortar, as one of our recent correspondents remarked, composed of lime and sand, is called mortar in the south and lime in the north. Purins are "pans" in South Lancashire, and "side-pieces" in the West of England. Rafter's are called "spars" in Lancashire, and principal rafters are called "backs." Turning to our international dictionary, we note the modes in which it helps us over this difficulty. The authors give us our choice of clay-mortar, bad mortar, mortar of plaster, mortar of wax, mortar made of lime and sand (*der kalksand-mörtel*), *mortier à chaux et à sable*, air-mortar, hydraulic mortar, poor

mortar, thin mortar, and grout. Then turning to "lime," we have quite as wide a range. We are told the German and French for lime of Vienna, brown lime, caustic lime, quick-lime, dead lime, dead-burnt lime, over-hurmt lime, fat lime, white lime, fibrous lime, hydraulic lime, water-lime, shell lime, slacked lime, lime slacked in the air, wetted lime, and, lastly, hird-lime. Looking to "purlin," we can account for purlins being called pans in some parts of this old Norman-French country, for *panne* is the French for purlin to this day. Next, turning to "rafter," we can see that its Lancashire name, "spar," is but a lingering relic of the old Anglo-Saxon carpenters, for "sparren" is the every-day name for those pieces of construction in modern Germany.

A short time ago the question was discussed in these columns whether we should use the word "rahbet," "rabit," or "rebate," to signify the operation known by all those names in carpentry, and we pointed out that there was more to be said in favour of "rahbet" than some think, for the French word from which we are said to derive it is *rabatre*, not *rabatre*. The international work before us throws no new light on this subject. It is impartial as far as "rahbet," and "rebate" go, and introduces another version, and "rabato." And we have rahbeting (*Die Einfallzung*), Encastrement), rahbet-plane, rabbit-plane, rebate-plane, rahbet-wall, rabbit-beam, rehated door, related joint, related slender shaft, rebated plank, &c.

We should not, however, give a clear idea of the scope of the work without a quotation from it as a sample. We select a portion of the paragraph translating the word "roof" from the volume in which the English is placed first:—

"Roof s. 1) of a building (Build.). Das Dach, Toit m., combis m., Composed r. s., Compass-r. s., Span-r. s., Pent-r. s., Das Dach mit sichtbarem Dachstuhl, T. à ferme visible, ornic. — False r. s., Die obere Hälfte eines Mansardendaches, Faux-comble m., Faise or Half hip-r. s., Das Halbwalnd., Krüppelwalnd., Hammerde, Kiehlende, Toit m., en demi-croupe.—Flat r. s., Platteform s., Die Platteform, das flache D., Plattenform f., c. m. plat., Gable-r. s., Gable-r. s., Das Giebel, T. m., à pignon.—High-r. s., Pointed r. s., Das gotische, altdeutsche, altfranzösische, steile D., T. m., en pointe.—Hipped r. s., Hip-r. s., Das Walmd., Schiefl., T. m. en croupe.—Imperial r. s., Das Kaiserd., wälsche D., die Wälsche Haube, das Zwiebeldach, Comble m., à l'imperiale, impériale f.,—Killessed r. s., Pavillon r. s., Das Zelt, T. m., en c. m., en navillon.—Rigged r. s., Saddle-r. s., Twice hanging r. s., Das zweieckige D., Satteld., T. en battère, à deux égouts, à deux pentes. — Shed-r. s., Lean-to s., Das einseitige D., Schind., Schiepland, Terehd., einseitige D., T. m. en appentis, en potence, à un seul égout.—Square r. s. (Carp.) Das Satteld., mit rechten Winkel, rechteckige D., C. m. en égoutte.—Thatched r. s., Das Strohd., T. m. en chaumière.—Tiled r. s., Tiled-r. s., Das Ziegeld., T. m. convert en tuiles.—Truncated roof s., Flat r. s., Das neugotische D., Mansardend., mit Terrasse, Terraced., Comble m. terminé en terrasse, ou tronqué.—Zink r. s., Zink-covered r. s., Das Zinkd., T. m. convert en zinc.—To Cover s. a. a. r., to Lay v. a. the covering (Tiler.) Das D., eindecken, decken, Poser in couverture.—3) R. s. of a tent (Milit.) R. s. of a tent (Milit.), R. s. of a room (Build.) Die Decke, Plafond m., Comp. Ceiling.—Groined r. s., Inserted r. s. etc. See under Ceiling.—5) R. s. of a fire-box (Cook.) Das Zeltchen, T. m. d'une tente.—6) R. s. of a coach. See Tester.—6) R. s. of the fire-box. Crown s., Fire-box-top s. (Locom.) Die Feuerdecke, Plafond m., ciel m., (de la boîte à feu.—8) R. s. of a beam (Min.) Das Dach, Hangende eines Flötzes, Toit m. d'une couche."

This minute foreign specifications would be made plain by reference to this work, and intricate English directions easily translated. No office,—a word which the translators consider equivalent to pantry, by the bye, though we only apply it so when in the plural number, as offices, and then only in connexion with kitchen arrangements;—no office, we repeat, where international business is transacted, and no library where there are foreign authors on art or mechanics, should be without a copy.

FIRE IN THE CITY FLOUR MILLS.

The destruction by fire of the interior of the City Flour Mills, Upper Thames-street, on Sunday Morning last, has caused considerable excitement, and may lead to fresh consideration as to the best mode of constructing buildings capable of resisting fire. These mills, the property of Messrs. J. & J. Hadley, situated close to the end of Blackfriars Bridge, form an immense brick structure of eight stories, 250 ft. deep and 65 ft. broad. It was built by Mr. Ponsford in 1852; and the floors, with the exception of the lowest, appear to have been formed with cast-iron girders and wrought-iron joists, supported one over another by cast-iron columns, and floored with stone slabs. The lowest three stories are filled with machinery. In the floors above were grinding-mills, including heavy revolving stones, and it is stated, about

200,000 quarters of wheat. The fire appears to have originated in the third story; and although some thirty engines and 200 firemen were soon at work, floor after floor above, as well as the roof, accumulated, and the interior was virtually destroyed. The brick walls are cracked in parts, but all stand. Some shoring has been put up, but the height of the building makes it difficult to do this effectually.

This disastrous occurrence affords another proof of the insufficiency of iron under fire, and the folly of trusting to it when unprotected, as it does also of the necessity of dividing buildings into compartments of moderate extent. When fire gets ahead in a building beyond a certain size it is uncontrollable. It is to be hoped that a careful and technical inquiry will be made as to the circumstances which enabled the fire to spread with such rapidity as it did, and to wreck so utterly a building popularly regarded as fireproof. The scene within the walls is very remarkable.

GREAT FIRE IN BOSTON, U.S.

A FIRE, ranking but too well with that of Chicago, has devastated and destroyed the finest business district of Boston. This city has several times been the scene of destructive fires, but probably has never been visited by one of such magnitude as that which has now occurred. It appears that the fire broke out at half-past seven on Saturday night last, in the store of Tebbets, Baldwin, & Davis, wholesale dry-goods dealers, at the corner of Sumner and Kingstone streets, near the site of Edward Everett's old home. The fire-engines had to be drawn by hand, owing to the lack of horses,—it is said from horse disease, so that pestilence has aided fire in the destruction. The fire made great headway during the delay. The flames swept from story to story, and from block to block, the Mansard roofs first communicating fire, and the efforts of the firemen were unavailable.

The burned district is bounded by Sumner, Federal, Broad, Central Water, Washington, and Bedford streets. The area includes a large part of the Fifth Ward,—probably two or three square miles. The damage is estimated at from twenty to fifty millions sterling. The district, which consists of some of the largest business blocks in Boston, is the centre of the wholesale dry-goods trade.

Among the prominent buildings gutted are the Exchange, the Mercantile Library, the old Post-office building, the new Post-office now constructing, Trinity Church, the Cathedral block near Winthrop-square, the *Transcript* newspaper building, the Hartford and Erie Railroad depot, and many of the ostliest structures in the best business parts of the city. In all, it is said, upwards of nine hundred business premises, the finest in the city, have been burnt down, as well as sixty dwelling-houses and other buildings. The stocks on hand, especially in the case of wool, were particularly heavy. The houses burnt were almost, without exception, of granite, iron, or freestone.

THE PREVENTION OF FIRES.

A SUGGESTION AND INQUIRY.

SIR,—The *Pall Mall Gazette* wisely draws attention to the danger of open "lifts" communicating from floor to floor. Besides this, I would suggest that many fires are both originated and kept going by the escape of gas from broken mains and meters when a large fire occurs.

As regards the one at Boston, a telegram, November 11th, 5 a.m., states "the second fire was caused by explosion of gas." This raises an important question, viz., What means do gas companies provide for shutting off the gas from separate streets in which large fires may break out? If it is answered that, by so doing, total darkness would be felt for a short time in such quarters, it is only a result which must be submitted to for speedy extinction of the fires and for protection of surrounding property.

W. H. ESPENETT.

An Aquarium for Naples. — A great aquarium is being made in Naples by a young German naturalist,—Dr. Dohrn, of Stettin,—at an expense of between 7,000, and 8,000, nearly all of which comes out of his own pocket.

A TRIFLING DIFFERENCE.

AMONGST tenders recorded on another page will be found those sent in last month for some sewer work in Marylebone. Sixteen persons tendered: the highest, Mr. Wall, asked 6,200*l.* for the work; the lowest, Mr. Haynes, 3,020*l.*; the intermediate amounts being in pretty regular progression. Neither the highest nor the lowest was unsupported in his view, for while Mr. Stevens named 5,930*l.* as the fair amount, Mr. Killingsback proposed to carry out precisely the same specification for 3,091*l.* Will some one please explain these mysteries of the deep?

THE LATE MR. JOHN CHUBB.

MANY of our readers must have heard of the painfully sudden death of Mr. John Chubb, the head of the well-known firm of Chubb & Sons, of St. Paul's Churchyard. On the 20th ult. he attended divine worship as usual at Mostyn-road Chapel, presenting his infant child for baptism; and there he was seized with paralysis. He afterwards appeared slightly to improve, but ultimately expired. He was born at Portsea in 1815, and accompanied his parents on their removal to London twelve years afterwards, and on the death of his father succeeded to the management of the business which they have so long carried on in the metropolis, with branches in other provincial centres. His integrity, firmness, and promptitude as a man of business were combined with a kind consideration for those whom he employed, which gave him a strong claim on their regard. This claim they were not slow to acknowledge, and some years ago presented him with an address declaratory of their high esteem. Mr. Chubb's death has led to some strong expressions of admiration from the Wesleyan Methodists, to the interests of which body he had greatly devoted himself. Mr. Chubb was buried at Beckenham, Kent, on the 30th ult. The funeral was largely attended.

FRANKFORT-ON-THE-MAINE INSTITUTION OF ARCHITECTS AND ENGINEERS.

AT the annual general meeting of the Frankfort Institution of Architects and Engineers, consisting of fifty-five members, held in the "Saalhan," on Monday evening, the 4th inst., the report of the council, setting forth the lectures which had been given by members at the monthly meetings, together with the inspections of works which had taken place during the summer months, giving at the same time a general review of the working of the institution was read and approved of.

According to the bye-laws of the Institution, the council, consisting of five members, must be balloted for at each annual general meeting, three of the five members serving during the preceding year being eligible. The following gentlemen have been chosen for the ensuing season:—Mr. Burnitz, architect (president); Mr. Passavant, architect; Professor Sommers; Mr. Vogel, telegraph engineer; and Mr. Gordon, C.E.

The president, in thanking the members of the Institution for the honour they had done him in re-electing him to the presidential chair, took occasion to impress upon the members, especially the younger members, the importance, not only to themselves, but to the Institution, of their contributing papers during the ensuing winter, on works either of structure or of art on which they might severally be engaged, and which present novelties or features of interest to their professional brethren. He had been urged by several members to publicly allude to two subjects, inasmuch as his efforts to prevail upon the gentlemen concerned to give them papers on two such important subjects as he was about to allude to had hitherto been unavailing. Indeed, he found wherever he turned his attention that members were too much engaged, and he knew from experience that there was a great deal of truth in all this, under the presence of the unexampled building progress prevailing in Frankfort and the neighbourhood at the present moment. Still he hoped this public appeal to the patriotism of the two gentlemen in question would not be without its due effect. He was free to admit, with other members, that he watched with great interest, but with a certain amount of anxiety, the progress of the important works for the supply of the town of

Frankfort with water from the springs of the "Vogelsberg," and as they must all shortly make themselves more acquainted with the subject, since the water company had laid down certain regulations with regard to the fittings of the houses, with reference to which there seemed to be a considerable amount of ignorance prevailing, he hoped Mr. Schmidt would favour the Institution with a paper elucidating the subject; and although the question of the house-drainage was much more advanced, many of them no doubt having gone through the mill, yet there were large numbers of them who had kept aloof, and were afraid of this day of burning their fingers in preparing the plans to be laid before the Sewerage Works Office. Hence the establishment of special offices for this class of work. He hoped, therefore, that Mr. Gordon, who had been elected to the council, and had, notwithstanding his apparent reluctance, duly taken his seat at the council-table, would no longer turn a deaf ear to their entreaties, but favour them during the next month with a paper on the important sewerage as well as house-drainage works of this city. He had great hopes that two such interesting papers upon the most important public works ever undertaken by the city of Frankfort could not fail but to be encouraging to other members to make such contributions as their practice afforded them opportunities of doing.

Mr. Albert having proposed that the Institution should identify itself with the Hamburg scale of commission and fees, and that it should be recorded on the books of the Institution, with instructions to the council to give a copy thereof to all persons applying for it, an animated discussion arose, from which it appeared that a case is pending in the Frankfort Courts at the present moment, which would practically be decided by the voting of the Institution, the Court having required proof that the architects' charges in the case in question are customary.

Ultimately the original resolution of Mr. Albert, with some slight modifications, was unanimously adopted, after which the members sat down to a substantial supper.

COMPETITION.

Hull Cemetery.—The Hull Board of Health have resolved to accept the design "Experientia" for chapels, &c., and that the author be employed to carry it out at 5 per cent, less the amount of the premium offered by the Board. The design, Early English in style, is for two chapels, connected by a porch, surmounted by a tower and spire, and for a lodge, &c. The estimated cost of the chapels is 1,850*l.*, and of the lodge, 550*l.* The author is Mr. F. B. Payton, of Bradford.

HEALTHY HOMES.

At a meeting of the National Health Society, held in the rooms of the Social Science Association last week, Mr. R. Rawlinson, C.B., told effectively the "old, old story" of what was necessary at home if people would enjoy health. It has been told so often in these pages, that there ought to be no occasion to repeat it; but there is occasion, and it will have yet to be repeated again and again. We can find room, however, for only a part of it:—The subsoil beneath a house should be naturally dry or be made dry by draining. The ground-floor of a house should not be beneath the level of the land, street, or road outside. A site excavated on the side of a hill was liable to be dangerous, as external ventilation might be defective, and subsoil water from above might soak toward and beneath such houses. Middens, ashpits, and cesspools at the back must faint the basements. The subsoil within every basement should have a layer of concrete placed over it. Cesspools, sink-holes, or drains, should not be formed within house basements. The ground around should be paved, flagged, asphalted, covered with concrete, or prepared and gravelled. Outside channels should be in good order, and be regularly cleaned. House-eaves should be guttered and spouted. Swill-tubs should be near doors or windows. Pigsties should be at a distance, and where pigs were kept rigid cleanliness should be observed. Improperly keeping pigs had resulted, he believed, in more human sickness and loss of life than all the battles in which the country had ever been engaged. Many houses, from the mansion to the cottage, were unwholesome owing to damp basements, to cess-

pools and foul drains within the basement, to rotten timber in floors and skirtings and putrid wall-paper, to kitchen sinks being in improper places and unventilated, to rooms being without adequate means for ventilation, and to water-cisterns and pumps being in improper places and so contaminated. These defects should, he contended, be remedied by the landlord. Houses were also rendered unwholesome by personal dirt and neglect. Rooms were not, for instance, sufficiently cleaned, carpets were left down too long and never swept, windows were seldom opened from the top, closets were left dirty and without ventilation, dirty beds were left unmade and shrouded by dirty hangings, and nooks, corners, and shelves, were never dusted. Such neglect resulted in sickness and squalor, and banished comfort. It was not, then, true charity which gave cake and wine in fever cases, while filth remained unremedied. As to the construction of cottages, he would say let them not be built on heaps of rubbish, manure, chemical waste, or on swampy ground which could not be drained. Thousands of cottages were so placed in the suburbs of our towns, and disease had been the consequence. A bed of concrete would vastly modify objectionable sites, and it should be used in all cases. Back-to-back houses entered by a covered passage, with divisional walls half-brick thick; joists and rafters of $\frac{1}{2}$ in. boards, which a cat walking over would shake; stairs so steep and narrow as to be difficult and dangerous; chamber-windows which would not open; cellars underground, in a hole and without drainage; conveniences crowded against cottage-walls; chambers over middens and ashpits, must be unwholesome. Sewering and draining had, it was true, been vastly improved in England of late years, but they were still far from perfect. London, after the millions which had been expended on it, was defectively house-drained. Most of the houses were drained from the back to the sewer in the street in the front, so that the basement was traversed by drains, and even new earthenware had leaky joints, so that the subsoil was saturated with sewage and became putrid. Then there were cesspools which served no good purpose but to retain sediment. Such foul drains and cesspools should be removed with the tainted subsoil, and new water-tight drains be laid on concrete and fully ventilated externally. There had been a great blunder committed in draining many west-end houses—making no connexion with the sewer, and although the defect had been pointed out over and over again, no remedy had been applied. House-drain ventilation was, too, almost altogether neglected, and many cases of suffering to the weakly from sewage-gas poison were the result. The danger was one, however, which might be very easily prevented by simply making the drain external to the house and ventilating it, as he had done for several friends since the illness of the Prince of Wales.

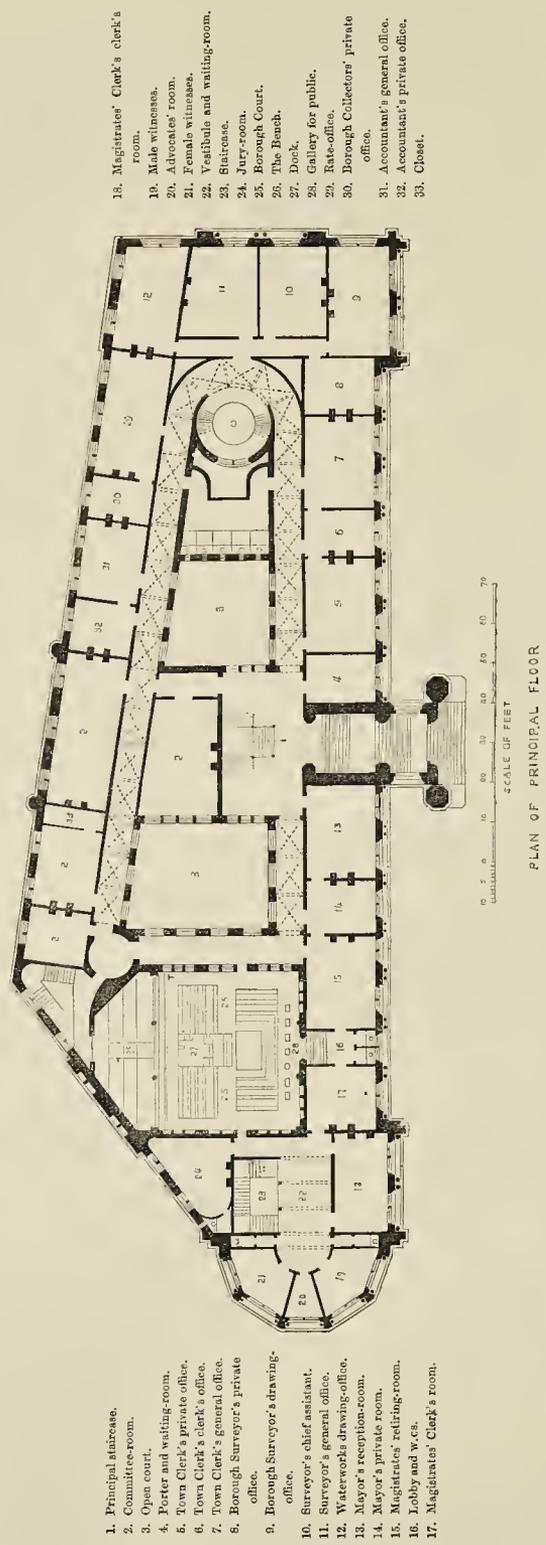
ST. MARGARET'S CHURCH, ROCHESTER.

The particulars given at p. 861, under the heading, "Reopening of Rochester Cathedral," with the exception of four lines towards the end as to the removal of the roof, in reality refer to the reopening of St. Margaret's Church in that city, our informant having been led into error. The restorations at the cathedral are still in progress. The works at St. Margaret's were done under the superintendence of Mr. Gordon M. Hills, architect; and the cost was, as already stated, 1,400l.

ITALY AND THE POST-OFFICE.

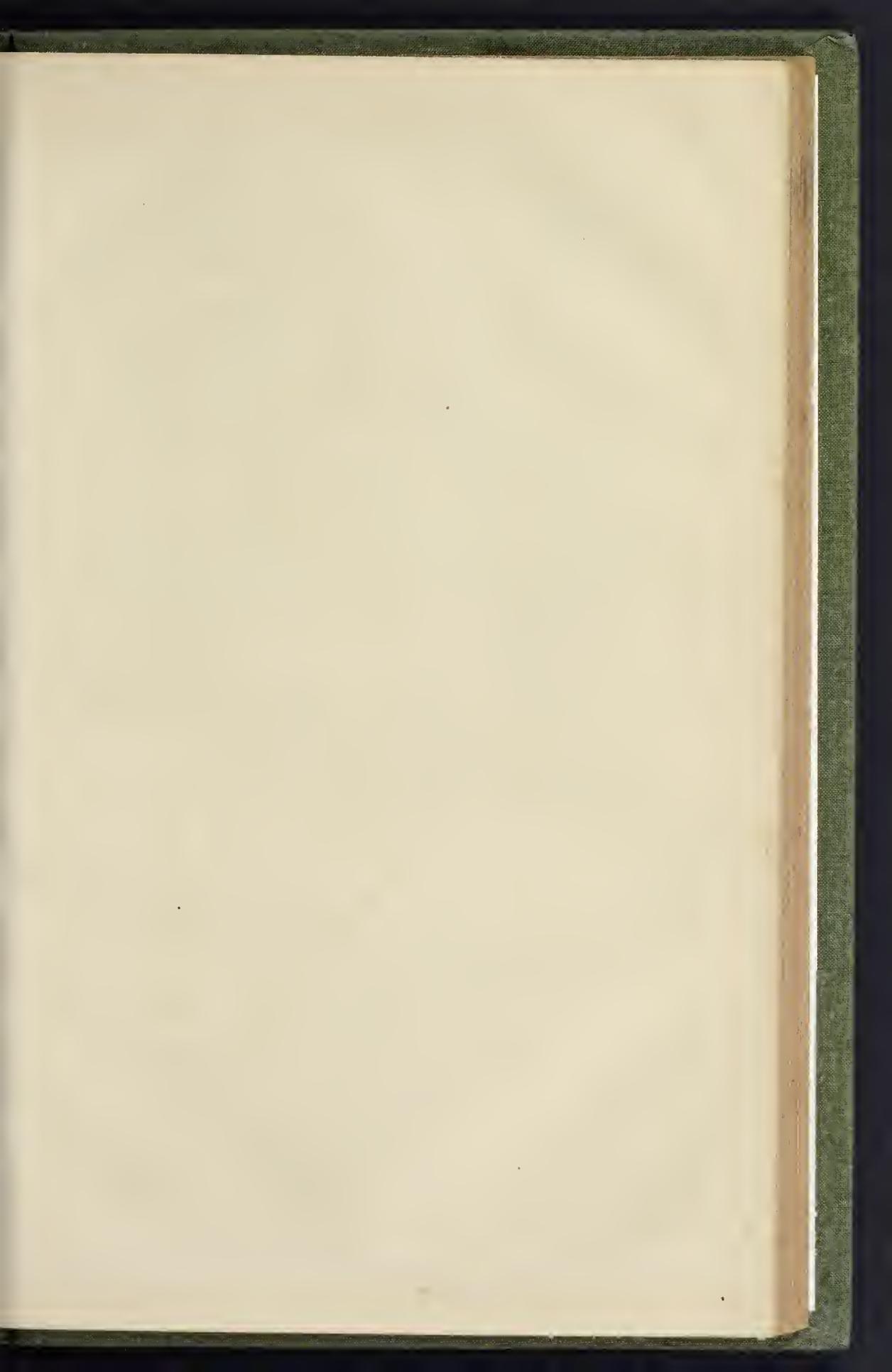
Why is the postage between Italy and England now so exorbitant and so unreasonably irregular in its charges? For example, all the English daily papers cost 3d. from London to Florence; while the same can each be sent from Florence to London for twenty centimes. A correspondent writes,—"The Quarterly Review came this month, postage 1s. 6d.; it was sent to the director of the Florence post to be weighed, and the price ascertained for sending it to England, when the reply was, *one franc*. Another extraordinary fact is, that the postage for books, papers, &c., is considerably *less* between England and Sicily." The effect of this increase is sensibly felt by many residents, and is causing a great diminution in the circulation of English periodicals in Italy. Some explanation is required.

TOWN HALL, BRADFORD, YORKSHIRE.



- 18. Magistrate's Clerk's clerk's room.
- 19. Male witness.
- 20. Advocate's room.
- 21. Female witness.
- 22. Vestibule and waiting-room.
- 23. Staircase.
- 24. Jury-room.
- 25. Borough Court.
- 26. The Bench.
- 27. Dock.
- 28. Gallery for public.
- 29. Rate-office.
- 30. Borough Collectors' private office.
- 31. Accountant's general office.
- 32. Accountant's private office.
- 33. Closet.

- 1. Principal staircase.
- 2. Committee-room.
- 3. Open court.
- 4. Porter and waiting-room.
- 5. Town Clerk's private office.
- 6. Town Clerk's clerk's office.
- 7. Town Clerk's general office.
- 8. Borough Surveyor's private office.
- 9. Borough Surveyor's drawing-office.
- 10. Surveyor's chief assistant.
- 11. Surveyor's general office.
- 12. Waterworks drawing-office.
- 13. Mayor's reception-room.
- 14. Mayor's private room.
- 15. Magistrate's waiting-room.
- 16. Lobby and w.c.s.
- 17. Magistrate's Clerk's room.





WILLIAM I.



RICHARD I.

BRADFORD TOWN HALL, YORKSHIRE.

BRADFORD TOWN HALL.

This building is now rapidly approaching completion, and is intended to be opened about August in next year. It is built of the finest description of Yorkshire freestone, from the quarries of Cliffe Wood, and presents a frontage towards Market-street of nearly 300 ft. in length. Perhaps a more appropriate name for the building would have been "Corporation Offices," as it provides solely for the accommodation of the Borough Court and its requirements, the council chamber and mayor's apartments, and the suites of rooms for the town clerk, borough engineer, and other borough officials.

The grand entrance is in the centre of the main front, and gives access to the principal staircase and to the rooms of the magistrates and members of the council. At each end are entrances, one for the borough court, approached by the court staircase; and one for the offices, by the municipal staircase.

The whole building is devoted exclusively to business purposes, and has no large hall attached to it.

The centre tower rises to a height of 200 ft., and is arranged to contain a clock-chamber on its principal stage, and above, open on all sides, will be placed thirteen bells, the largest weighing four tons. These bells will strike the hours and the Cambridge quarters, and also, by

means of a carillon machine, will play fourteen tunes. In the interior of the building are two open courts, from which the corridors are lighted, and the irregularity of the site, has been thrown into these spaces in such a manner that the whole of the rooms are rectangular.

The second floor of the principal front is divided into an arcade, with niches between the windows; there are also niches in front of the buttresses, and large pinnacles to the centre entrance. These will receive statues of the kings and queens of England since the Conquest, which are now being executed by Messrs. Farmer & Brindley, of London, who have done the stone-carving throughout. We illustrate two of the figures.

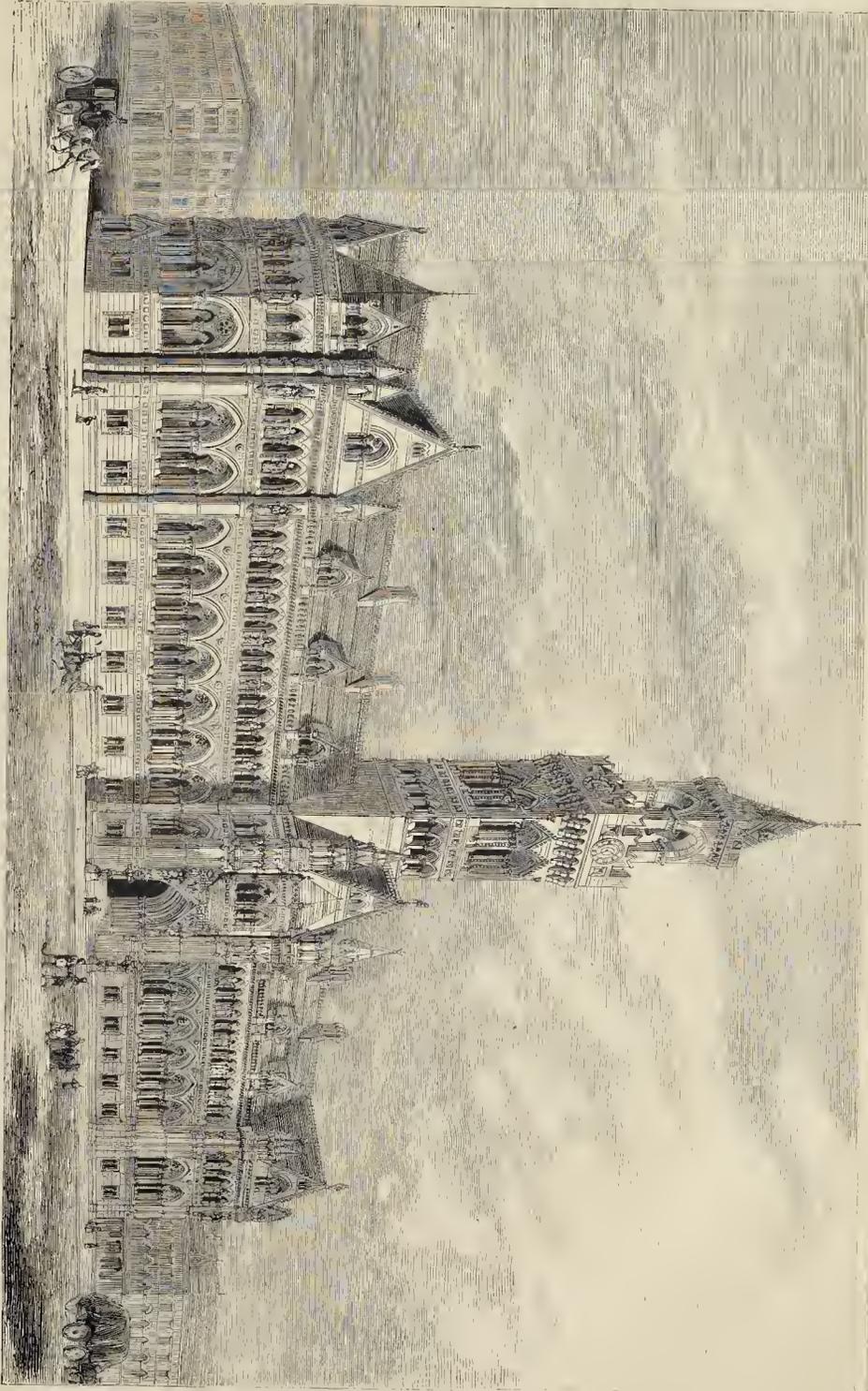
Means have been adopted for the warming and ventilation of the building by shafts leading into the great tower. This work is in the hands of Messrs. Haden, of Trowbridge.

Messrs. Ivcs & Son are the general contractors, and Messrs. Gillett & Bland, of Croydon, are supplying the clock and bells, with their patent carillon machine. It is intended to furnish the building throughout in oak.

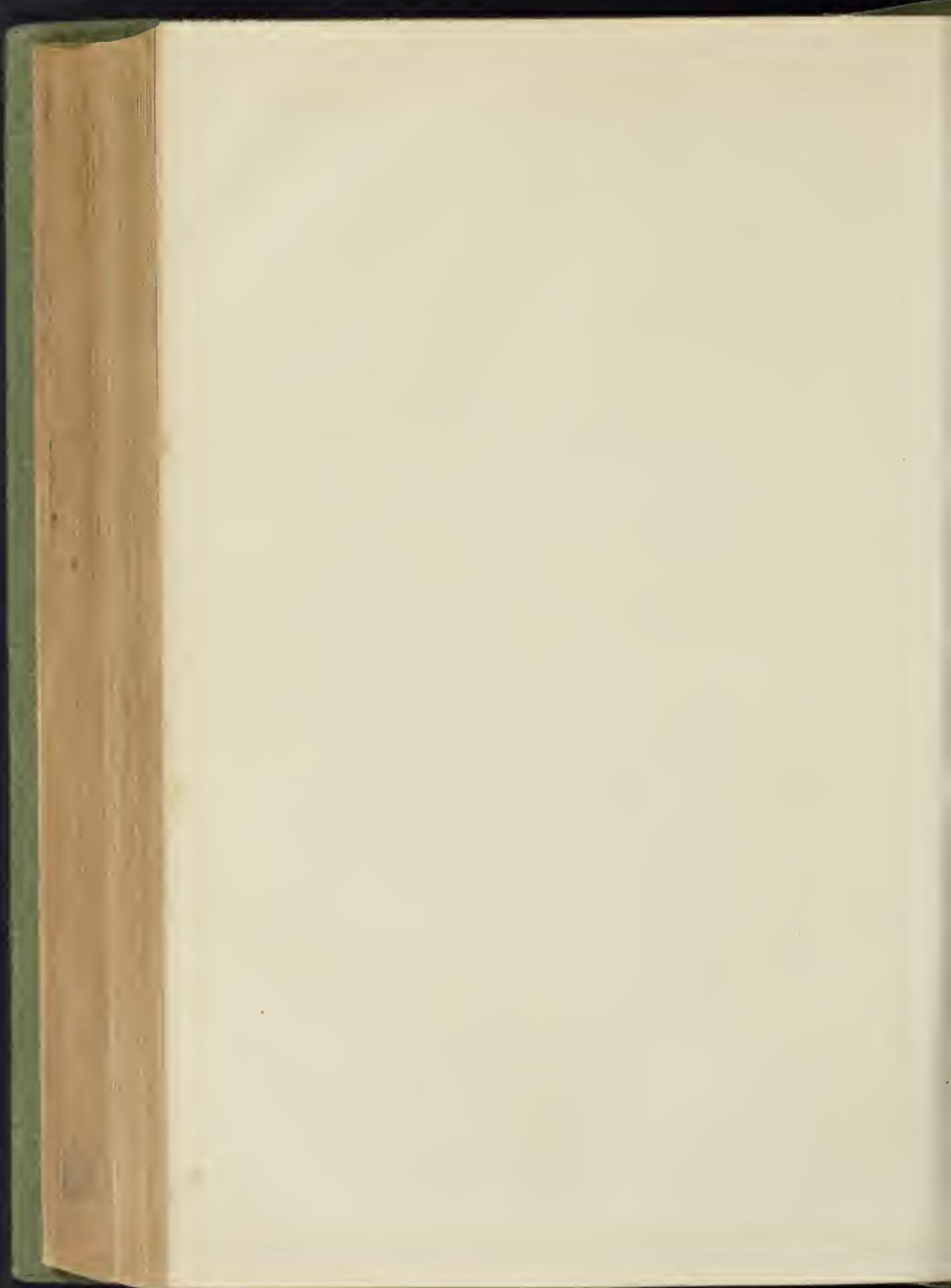
The architects are Messrs. Lockwood & Mawson, of Bradford and London.

We may add as to the clock and bells that the clock will strike the hours upon a bell of 4 tons, and chime the first, second, third, and fourth

quarters on four other bells, which will weigh respectively 52 cwt., 37 cwt., 32 cwt., and 14½ cwt. The time will be shown upon four dials, each 10 ft. 6 in. in diameter. The figures and minutes will be cast iron, all cast in one piece, painted and gilded, and glazed with patent opal glass, illuminated at night with gas. There will also be an automatic self-acting gas apparatus fitted to the clock for the purpose of turning the gas on and down at the exact time, so constructed as to suit all seasons of the year. The weight of the carillon bells will be 16 tons 6 cwt. 3 qrs. One of the bells of about 13 cwt. will be furnished with a clapper and wheel, for the purpose of ringing as a fire or alarm bell, and all the thirteen bells being hung in an open belfry exposed to view, will be heard at a greater distance than large bells generally are. There will be two barrels with seven tunes on each, so that by taking one barrel out at the end of seven days and putting the other in (which can be done in a few seconds by any one), a fresh tune will be played every day for fourteen days. At present it is arranged to play a tune three times over every three hours, day and night, at twelve, three, six, and nine o'clock, but it could be made to play a tune every hour, as at Boston. The whole work, including clock, carillons, machine, bells and their fixings, &c., will cost about 4,500.



BRADFORD TOWN HALL.—Messrs. Lockwood & Mawson, Architects.



quiet way. From those enjoying health and hope, such thought for others—such care for those whom God has seen fit to deprive of the power of working for themselves,—he thought especially fitting. On a somewhat allied subject—the establishment of a provident society among architectural assistants,—something might usefully be said. Many men most fitted to do useful work in that station would much prefer a fixed income to the responsibilities and anxieties of a small general practice, if only their future could be made more sure to them.

In the discussion which followed, some anxiety was manifested with reference to the somewhat relaxed enthusiasm said to be manifested among the younger members, and the want of thorough success in the work of some of the classes last session. Some of the speakers advocated a more regular contemplation of the examination offered by the Institute, as a necessary part of the students' course, and a hope was expressed that at the next examination the number of candidates for the title of graduate would be considerable. The president in his reply, asked members to do well their part in at least one branch of the work of the Association, and having undertaken some stated task, "to go into it with a will."

SCHOOLS OF ART AND OF SCIENCE.

The Nottingham School.—The annual meeting of the donors and subscribers to this School has been held in the Mayor's parlour. Mr. Richard Enfield, presided. The report of the committee congratulates the subscribers and donors on the high position which the institution still maintains amongst the Art Schools of the country; and states that during the past twelve months, the twenty-ninth year of its existence, great success has attended the exertions of the pupils and masters. The last Government examinations of the work of the students had resulted in an award of two silver medals, three bronze medals, and fifteen Free Art Studentships. The Blue Book for 1871, now published, enabled the committee to make a comparison of the numbers gained by a few of the chief Art Schools in the country. Free Studentships:—Nottingham, 20; Birmingham, 16; West London, 9; Lambeth, 7; Stoke-upon-Trent, 7; Glasgow, 6. It will thus be observed that though Nottingham is inferior in size and population to some of the towns just named, yet that from the 186 free studentships granted to the 117 Art Schools of the United Kingdom, Nottingham has gained one-ninth of the whole number. The report of the headmaster, Mr. Rawle, contained the following tabulated statement of the ages of the students who attended the school:—

Under 15 years of age	196 students.
From 15 years to 25 years of age	291 "
From 25 " 35 "	31 "
From 35 " 62 "	16 "

The total number of adult students was 85. There were thus a greater number of students between 15 and 25 than in any former year.

"The school," continued the Report, "obtained in the National Competition, 2 silver and three bronze medals, and 5 Queen's prizes; total, 10 awards (last year, 13). Also 23 Government Art Prizes (last year, 23), 2 season tickets of admission to the Royal Academy (last year, 2), and 15 free studentships (last year, 20). The prize works consist of drawings and paintings from the cast, flower drawing and painting, groups in oil, as compositions in colour, designs for lace, ribbons, and wall decorations, &c."

The Coventry School.—The annual meeting and distribution of prizes in connexion with this institution took place in St. Mary's Hall. There was a large attendance of pupils and their friends, the hall being completely filled. The chair was occupied by Mr. Samuel Carter, and the mayor (Mr. Hill) and other influential gentlemen were present. The chairman in his address said the students have this year obtained more national prizes than they have hitherto won—the list includes one silver medal, four bronze medals, and three Queen's prizes. Well, I think that is as good an account as you can fairly expect of the School of Art in Coventry; it is a most decided advance upon all that has yet been done, and if the institution continues to advance at the same rate, I think it will eventually answer all your expectations. There is one very remarkable circumstance, as it seems to me, in connexion with the school—the students represent almost every occupation that the town of Coventry can afford. I have counted the number, and I find there are nearly fifty different occupations represented. I think that is a

highly gratifying circumstance. In this report it is stated that the number of students in attendance has been 192, against 180 last year. A small number presented themselves this year for the local examinations in free-hand, model, geometrical, and perspective drawing; twenty-six passed, against forty-four last year; and the successful papers were thirty-three, against fifty-eight last year.

The Leeds School.—The report at the distribution of science and art prizes stated that the committee were pleased to record the increased success of the school during the past year. The following were the returns of the Art School for the past year, compared with 1871:—

"Number of pupils under instruction in the school of art for the quarter ending 30th September, 1871, 326; 1872, 358. Number of pupils who submitted works to Art Department, 1871, 356; 1872, 411. Number of works submitted for examination to the Art Department, 1871, 2,592; 1872, 3,196. Number of sets of works which obtained the mark 'satisfactory' from the Art Department, 1871, 41; 1872, 46. Number of third-grade prizes awarded by the Art Department, 1871, 9; 1872, 13. Free studentships, 1871, 1; 1872, 5."

In the School of Science the following subjects are taught:—Practical, plane, and solid geometry; machine construction, building construction, mathematics, inorganic chemistry, organic chemistry, theoretical mechanics, and metallurgy:—

"Number of individual pupils during the session, 1871, 108; 1872, 129. Number of students who obtained certificates, 1871, 58; 1872, 62. Number of works obtained prizes, 1871, 19; 1872, 24. Number of certificates obtained, 1871, 118; 1872, 121. Number of gold medals, 1871, 0; 1872, 1. Number of silver medals, 1871, 1; 1872, 1. Number of bronze medals, 1871, 0; 1872, 1."

The number of visitors to the exhibition of students' works from the opening to the close was 5,161. In all grades of study great progress had been made, even as compared with the works shown at the previous exhibition. The improvement was as marked in the elementary classes as in the more advanced. This year Dr. Packer, the head master, has introduced some new stages of study which cannot fail to have beneficial results. One of these is a costume life class, of whose successful studies there were several examples on the walls. Another is the giving of a subject in words—some dramatic, poetic, or historic incident—by the head master in each half-year, leaving the student, unassisted, to give pictorial expression to it. Of original compositions of this nature, there were examples on the walls, the subject being the finding of Perditia by the shepherd ("Winter's Tale"). The display of mechanical drawings was large, and it embraced several meritorious designs.

THE LEAMINGTON WATER-SUPPLY.

A LARGE and influential gathering of the gentry, medical practitioners, and tradespeople of Leamington was held in the Royal Pump Rooms, in that town, to hear the report of a committee of gentlemen as to the verdict of the London jury in the case of Ellen Hiscocks. The deceased, while on a visit with her mistress at the Arboretum, was taken unwell, and died after she returned to her friends in London. Dr. Young, who was called in, gave it as his opinion that typhoid fever was the cause of death; but Mr. Maberley, of the Arboretum, was confident that it was not a case of fever at all. At the inquest, held before Dr. Hardwicke, the jury found death to have resulted from typhoid fever, and severely censured the Board of Health of Leamington for not providing a better supply of water. This produced strong indignation in the town; and the meeting was specially convened to hear the report of a committee in the matter. Mr. P. Locke, chairman of the Local Board of Health, was called to the chair, and with him on the platform were Dr. Jones, Dr. Hornblow, Dr. Slack, Dr. Bickmore, Dr. Thompson; Mr. S. U. Jones, chemist; Mr. Smith, chemist; Mr. Marriott, surgeon; and others. The water was read, in which he stated that the water contained the usual organic contamination of autumn.

"Taking this into consideration [he adds], I am of opinion that although the Leamington water is, like other river water, a little abnormal in its quality at the present time, yet it is a perfectly wholesome water, and is well suited for the supply of a town where the manufacturing operations do not require soft water. I need not add, in reply, to your question, that there is no ground for assuming that the Leamington water has had anything whatever to do with the causation of typhoid or any other disease."

The following resolution was moved:—
"That this meeting, having heard the report of the analysis, by Dr. Letheby, of the water supplied to the town by the Local Board, compiled with the official returns

published by the Registrar-General for many years past, is of opinion that it is a perfectly wholesome water, and that it is fit to be supplied to any town; and that there is no ground for assuming that the Leamington water has had anything whatever to do with the causation of typhoid fever or any other diseases."

The medical men present seemed to be unanimously of opinion that the water had nothing to do with the death.

Dr. Birt said, "as one of the oldest practitioners in Leamington, I can state that in the whole course of my experience, there have been only about half a dozen of such cases, and not one but I could trace to local contamination."

Dr. Thompson said there was nothing to show that the deceased had drunk of the Leamington water at all, and it was a curious fact that the actual residue of the water was exactly the same then as nineteen years ago, which showed there had been no increase in the pollution.

The resolution was carried, only one voting against it. The following was also carried:—

"That this meeting cannot too strongly condemn the gratuitous statements embodied in the verdict of the coroner's jury, on the body of Ellen Hiscock, that the water supply of Leamington is in a most unsatisfactory state; and they consider that the conduct of those ratepayers who instructed Mr. Edwards Wood was highly reprehensible, and calculated to do serious damage to the welfare and best interest of the town."

The medical men seem to us to have professed a little too much.

BEXLEY HEATH HALL.

THE public hall of Bexley Heath, Kent, has been recently finished and decorated internally. Curved ribs of timber have been introduced under the principals, springing from moulded stone corbels well down the walls between each bay of the roof. The wall in the rear of 8 ft., the framing of which is stop-chamfered, the upper panels being filled with quatrefoils showing the plastering behind, upon which is stencilled in oil colours a pattern of flowers and leaves. The whole of the internal walls have been painted and flatted in a greenish neutral tint. Horizontal strings, foliated in Venetian red and green, run all round above the wall boarding and under the windows, with a diapered pattern upon the space between them. The outline of the windows is marked by a surrounding foliated spray. Upon the wall in the rear of the platform above the boarding is painted in relief an arcade of five arches with troilied crocketed heads, the panels of two outer arches having ribbons, with the names of celebrated musicians and poets, the three centre ones being filled with pot-flowers upon a dark ground; the gable of the wall above is finished with a bold bower of leaves and berries forming a Gothic arch. The opposite end wall is similarly finished with a bower, and below the oriel window is a horizontal ribbon with the motto, from Shakspeare's poem, the "Passionate Pilgrim," "Music and sweet poetry agree."

The buildings, which were erected about two years ago, are of a free Gothic character; the large hall seats about 500 people. The contract was carried out by Mr. Thomas Blake, of Gravesend. The painted decorations have been executed by Mr. Alexander Gibbs. The company's architect is Mr. Joseph Hewitt.

NEW GRANGE AND PRE-HISTORIC MONUMENTS.

In a lecture on "Our Pre-historic Monuments," at Belfast, last week, Mr. J. S. Plenc F.S.A., said, as to the destruction of relics,—found, upon a close inspection of the stones at New Grange, that many of them have been scrupulously worked over, with no other object than I can imagine than erasure. This working done with a studied irregularity, so as to assimilate to a natural roughness of some of the stones, would not be noticed by an ordinary observer, but one used to examine mason's work could not mistake the markings of the tool. Some stones have a species of "tooling" all over, some only partially, always on the face of the stone as a rule, but several angles (which may have had oghams) are clearly worked down. It is remarkable that, where this tooling is on partial, the remainder of such stones is carved but with devices much more recent than the original spirals, such as chevrons, and the like, in case of detection of the erased portions, to give the impression that the erased portions were simply in device to the more modern. There are certain natural irregularities in the stones,

which, of course, I do not refer, and which the mabbings identify. It is stated in a recent work that where the angle stone has fallen forward some of the stones are not to be carved on the reverse side; this is not so—it is a misreading of Sir William Wilde's excellent account. The carving so seen is on the underside of the lowest course, which extends far behind the fallen stone, but which cannot be seen on its reverse side. Nor could these carvings be made from the outside before heaping the tumulus, as also suggested, as they are continued where the tone rests upon its perpendicular support, and could not have been carved after erection. I mention these facts to re-attest the great antiquity of New Grange, and the injury I feel convinced it has already sustained. It is most important that our monuments and every relic should be kept intact, sent to local museums, and drawings taken of them as found, with data of locality, &c. Every peasant should be made to feel an interest in them by popular, untechnical descriptions in his own vernacular, and not in Greek or Latin terms. Let the peasant feel a personal relationship with the great Oriental family that peopled these lands, and know that these relics are so many links in the chain of his own national history, and the desire to know more will prevent concealment or destruction.

PUBLIC HALLS.

Tunstall.—A meeting called by circular has been held in Tunstall, to consider the desirability of having "a public hall in the town, so that meetings of any kind may be held on neutral ground." About sixty persons were present. The meeting was in favour of erecting a temperance hall to seat not fewer than 1,000 persons, and to carry out the plan as far as possible by subscriptions. About 100l. were subscribed for the room, and the meeting was adjourned. A site in Well-street was spoken of as suitable for the erection.

Tonbridge.—A new and commodious town-hall at Tonbridge is projected. Two or three gentlemen in the town have secured property at the top of High-street, and the tenants are under notice to quit. In other directions arrangements have been made for at once raising the necessary amount of funds by means of 5l. shares, of which about 600 are already taken up.

PRECIPITATION OF SEWAGE OVERSIS IRRIGATION.

Str.—Mr. Hawksley's affirmation, in your publication of the 26th October last, raises the question, in the disposal of sewage, of precipitation or irrigation. Notwithstanding his alleged preference and advice for precipitation in what he calls "the particular and peculiar circumstances of the city of Coventry," it would have been well for the corporation, in its deliberations on this subject, to have taken Lord Leigh into account for the use of the sewage over his lands of Stoneleigh, which, in the same valley of a tributary of the Avon, can be commanded by gravitation; a fact, to the ratepayers of Coventry, which means that their sewage matters can, by the cheapest conveyance for them, be taken to a destination to which they, as elements of re-education, point, and for the best account.

With any material as well as town sewage, a maximum return to be expected from it, that which involves the minimum, both of fringe and manufacture. If the manure process which the Coventry people have adopted in present deals with the sewage, together with returning refuse of their sewage, together with other useless, general matters of it, which men in the sewage of a highly-scavenged and over-torn of fashion are to be found, then there must be considerable manufacture to separate matters of fertilisation; otherwise the fringe of them (like that of water in any way to its own logs) is a thankless item in the scale of manure.

A case of more extended distribution of sewage than any which has yet been attained, or ought necessarily, is much wanted, and such extensive landowners as Lord Leigh, who would accept, and carry into practice the wide irrigation of sewage, would earn the thanks of the kingdom for their benevolent efforts.

Sewage accepted for distribution amongst landholders, &c., in place of, and auxiliary to, the manure, fold and artificial,—at present applied to the soil, is, whether at Stoneleigh or any-

where else, a step much to be commended in the history of both the sewage schemes and the agriculture of this country. Possessed of those acres, which in rich land make a subject one of the choicest in "merry old England," no doubt Lord Leigh has that knowledge of the condition and requirements of land, either for a fertiliser, auxiliary, or mesoicider in sewage to it; and in looking to the results of late extensive and judicious improvement of his property, it is no doubt his experience, as it is that of people higher and wetter in the world, that in the good practice of freeing water from the soil, or draining, a fact is discovering itself that we cannot escape adopting its complement, irrigation. As parties to this arrangement, the town of Coventry, in considering itself particularly fortunate in having escaped much lavish and fancy expenditure to several proprietors, in becoming not only filter-farm landlords but tenants as well, should signify its willingness to place a sum (were it only a tithe of the alleged enormous expense that was laid before "its corporation" at the previous meetings), at 3 1/2 per cent. interest on the usual security, in the option of the whole body of likely customers, farmers and gardeners, with which to lay out their land, and thereby encourage and secure the utilisation of its sewage in the best market conceivable. But considering that Coventry has been lucky in getting its sewage off its hands for so long, and at no cost, it remains to be seen whether it, in its dry-disposal belief, is to be the fortunate exception to the many other towns which in sewage projects, wet or dry, are just about their wit's end.

JOHN MARTIN.

STOVES IN ITALY.

A CORRESPONDENT from Florence says, there are many really astonishingly economical stoves here. One I have just seen, to be heated by coal, consisting of two small ovens, quite large enough to admit a good sized pie-dish or joint of meat, a boiler to contain half a gallon of water, and four receptacles for saucepans at top—all heated by one pound of coal or coke, so they say, and will guarantee. The price used to be 102 francs, but on account of the increase of cost of iron, it is now 119 francs. Larger size, with larger ovens, and six holes for saucepans, costs 160 francs. There are others equally economical, cheaper, but perhaps not so durable.

THE INTEREST OF BUILDERS IN LEGAL REFORM.

At a time when the urgent necessity of reforming the administration of the law is occupying much public attention, I have been long thinking that the builders of England should do all they can to urge the good work forward, and it happens very oddly that on two consecutive days the following letters have appeared in the *Times*—

"A Small Legal Reform."

Sir,—The first report of the Judicature Commission, published some three or four years since, contained a strong recommendation that the system of costs in the Common Law Courts should be assimilated to that of the Courts of Equity, viz., that costs should not as a matter of course follow the verdict. The Attorney-General was a party to the report, and I should be glad to be informed why this very simple and reasonable recommendation has not been carried out. The present practice in the Common Law Courts is notoriously a disgrace to the law, as holding out inducements to low-class attorneys to promote and foster litigation. An Act of a few lines would settle the question. Is it beneath Sir J. Colclidge's dignity to pass such an Act?—PRACTICAL REFORM.

"Another Small Legal Reform."

Sir,—The Courts are about to open after the Long Vacation, and, as one of the inferior branch of the profession, I am reminded of an extraordinary state of things to which we have too long submitted in practising in the Common Law Courts. The leading counsel at the Common Law Bar, unlike their brethren of the Equity Bar, attach themselves to no court. They practise in the Queen's Bench, Exchequer, and Common Pleas, the Divorce Court, the Privy Council, and elsewhere, besides accepting briefs in compensation and arbitrator cases, so that you are at a loss what counsel to retain. You deliver your brief in the Queen's Bench, for example, and the chances are 19 to 1 that when the case is called on, your counsel is either in the Exchequer or Common Pleas, or one of the other Courts, and the advantage of the consultation you have had is so much less of time. The case is disposed of somehow, and the result is the unfortunate attorney has to bear the brunt of his client's anger, and, perchance, lose his client as well as his case, although he has taken the utmost pains in getting the case up for trial, and has been advised that he must win.

This is a state of things that no one will deny, but what is the remedy? I submit, etiquette and equity. In short, that, as a matter of etiquette, counsel should select one of the three Common Law Courts, like their brethren of the Equity Bar, where the arrangement works perfectly well, and you are sure to have your case properly and

fairly tried, and it is not a mere question of loss-up dependent on the presence of counsel. I am aware on circuit counsel must practise in all the courts; but this is a comparatively small matter, and even there the counsel would in all probability be selected with reference to the court in which the action was pending. Anyhow, this would be an enormous improvement on the present system, and one in which, when fairly considered, I can help thinking the Bar would gladly acquiesce, as I know many deplore the present system, which they say they are powerless to remedy.

A SOLICITOR OF TWENTY YEARS' STANDING."

These two letters hit points which have been personally brought home to me within the last few months, and it may be interesting to builders in general to state my case shortly.

About four years since I completed a building, and obtained the proper certificate from the architect. There was a dispute as to payment, but payment was made, and the matter had passed out of mind, when a few months ago a writ was served on me without a word of previous warning, in an action at law, the damages being laid at about 2,000l. On particulars being demanded, it was stated that the drains had been badly laid, and that about two years ago they had been taken up and relaid by another builder, and that the proprietor had lost tenants, &c. My defence was, that the drains had been well laid; that my attention had never been called to the drains since we left the job; and that if it had, and the drains found out of order, I should instantly have had them repaired, but it was not possible after such a lapse of time to look into the question. The heavy demand made it impossible for me to endeavour to meet the action, except by defending it. I was advised we had a good defence, but on the trial I lost the action, and damages were given at about 25l. (not 2,000l.). The Judge made some severe remarks on the action having been brought, but he said, "Although any respectable man would have given a builder the opportunity of setting any imperfection to rights, he was not bound to do so." The attorney for the plaintiff sneered visibly at the Judge's remark; he knew that the verdict carried costs, and that was all he cared for. The costs, I need hardly say, were about 300l. No Equity Judge would have given, in such a case, any costs at all.

This brings me to the subject of the second letter to the *Times*.

I had engaged a very able Q.C., gone fully into the question with him, and he said I had a very good defence. On the morning of the trial I found my attorney in a fury. Our able Q.C., Mr. A., was in another court, but had handed his brief to his friend, Mr. B., Q.C. Mr. B. at the last moment was called away, and gave the brief to Mr. C., and Mr. C., gone to another court, also had handed it to a junior, Mr. D., so that I was left in the hands of a gentleman who did his best, catching up the points as he went along, but of course he was not prepared, and hence I lost the verdict.]

In mentioning the matter to legal friends, they only laugh, and say I may thank my stars it was no worse, for such things happen every day. I must say I think the professors of the law, from the Attorney-General downwards, ought to be ashamed of such a state of things.

A VICTIMISED BUILDER.

THE HALL OF THE MERCHANT VENTURERS, BRISTOL.

EXTENSIVE alterations have recently been made at the hall, in King-street and Marsh-street, Bristol, which for many years has been the headquarters of the Merchant Venturers' Society. The improvements are on the Marsh-street side of the premises. The new buildings are from the designs of Mr. J. A. Clark. Some time since, says the local *Times*, the late Mr. Thomas Daniel presented to the society a house which adjoined the treasurer's offices, and this, together with the offices, has been pulled down, and a new structure has been reared on the site. The building is of two stories, the right wing being appropriated as offices, whilst on the left are the apartments of those who take charge of the hall. The frontage is of Bath stone. In the centre is a large arched entrance, flanked on either side by four windows, and surmounted by the arms of the guild. The upper windows are pedimented, and over the halustrated parapet are four large urns. Inside the entrance-door is a vestibule, leading to the offices on the right, and to the domestic apartments on the left. The rooms are all spacious, but circumstances have not permitted of the lower apartments being so lofty as could have been desired. A broad flight of steps immediately opposite the entrance leads into a

tilled corridor, 42 ft. long and 7½ ft. in width, with stuccoed walls and panelled ceiling. This corridor is lighted by day from the roof by means of four small lantern lights. There is access from the corridor to the treasurer's office, and on the opposite side is the entrance to the new committee-room, which is 33 ft. long by 24 ft. wide, and 19 ft. high. The total cost, it is said, is over 2,000. The collection of old and modern paintings in the rooms of the Merchants' Hall has recently been restored.

MR. PETER GRAHAM.

ON Wednesday last, at the Langham Hotel, a dinner, given by manufacturers and artists in the various departments of the cabinet and upholstery trade, took place for the purpose of presenting Mr. Peter Graham, senior partner in the firm of Jackson & Graham, with a magnificent silver-gilt shield in *repoussé* work. This testimonial was offered by the principals of nearly fifty establishments, some of them associated with the house of Jackson & Graham during a period of nearly forty years, and the occasion for its presentation was afforded by the recent return in restored health of Mr. Peter Graham from Germany. The initiatory proceedings took the form of a banquet, over which Mr. John Dyer presided.

Mr. Graham, in responding to the chief toast, expressed his grateful thanks for the compliment conferred upon him. The house of which he was at the present time senior, might have done something towards elevating their particular branch of trade, but it must not be forgotten that they had many coadjutors, without whose aid their own efforts would have been of small avail. He believed, however, that unitedly they had done something towards raising manufacture to an art, for it should not be forgotten that the present age was not like that in which Cellini flourished—himself at once the designer and the worker in art. Now the manufacturer had to embody the ideas of the artist, to modify them, and complete the design. On looking round the table he had the pleasure of seeing the gentleman of whom he purchased the first log of mahogany he ever bought, and another friend had travelled from the marble quarries at the Land's End in order to be present. The testimonial was well deserved.

FALL OF HOUSES, MANCHESTER.

SIR,—I enclose for your perusal a report of a debate in the Salford Town Council, on the recent fall of cottage-houses in Lower Broughton, already mentioned in your pages. The event seems to afford an opportunity to urge upon the authorities of Manchester and Salford the adoption of a code of regulations analogous to the Metropolitan Building Act. Such regulations are badly wanted; and the great influence of the *Builder* might fairly be used in that direction. The contractor and his foreman, in some published letters, attribute the fall of the houses to the subsidence of the *made-up ground*, 10 ft. deep, caused by the rainfall, and to the statement of the foreman, that the local building inspector saw these houses a few days before their fall. From this it is evident that the authorities are quite unaware that such a surface of land, covered with ashes and general *débris*, 10 ft. deep, is quite unfit to build on, for sanitary reasons; and that, even if it were fit, they do not insist upon a broad foundation of concrete being laid under all walls, but allow the foundations to be laid on the surface.*

E. G.

A CHANCE FOR SOUTH LONDON.

SIR,—In the *Builder* for the 9th of this month I observe notice that it is in contemplation to form "a museum for South London," and that at a meeting, held in the Westminster Assembly Room, a "committee was appointed to take steps for carrying out the project." As one of the old, if not the oldest inhabitant of the south side of the Thames, I am most anxious to promote scientific recreation for the neighbourhood, and having formed during my life a very large and valuable miscellaneous collection, I had arranged with Mr. Strange, of the Surrey Zoological Gardens, for its exhibition in my late residence, the old Manor House, close to the

* The provisions of the Metropolitan Building Act are not sufficient to prevent similar doings in London.

Surrey Gardens (the temporary St. Thomas's Hospital). Mr. Strange, as you are aware, is in difficulties, so that I may have to remove all my collection; and had I known that it was in contemplation to form a museum for the South of London, I should have attended the meeting, only too happy to have assisted.

If you can oblige me by giving me the names of the chairman and committee, or to whom I could apply for information, I should be greatly obliged.

R. G. WHITEFIELD.

St. Thomas's Hospital.

** We shall best bring about what our correspondent desires by printing his letter.

ALTERATIONS AT WINDSOR CASTLE.

SIR,—At page 892 we read that at Windsor Castle "additional ventilators, not contemplated in the original plan, have been fixed to the old soil-pipes, and their outlets have been in all cases carried completely up to the battlements of the castle." Now as this is a public or national building, I would respectfully ask, through your columns, what are these "additional ventilators," and how and where are they attached to the soil-pipes? B.

THE ANCIENT CITY GUILDS OF TRADE.

With the past and with the present,
Quaint old manners still are link'd;
Olden customs, grave and pleasant,
Ling'ring still, though nigh extinct.
Earth has changed, 'mid throes volcanic,
Kings have fallen, thrones decay'd;
London holds her great mechanic,—
Ancient City Guilds of Trade.

Through each ill and darksome omen,
Dating from the Norman time,
When our freemen foil'd their fœmen,
Battling in their early prime;
Down through civil war and panic,
And with other ills inlaid,
London held her grand mechanic,—
Ancient City Guilds of Trade.

Blest be all those genial, olden,
Skillful master-workmen, who
Till'd and plow'd, with day-dreams golden,
With the common-weal in view,
Kings and queens have been tyrannic,
And have seized bequests erst made,
By and for the great mechanic,—
Ancient City Guilds of Trade.

Noble craftsmen, merchant-princes,
Ye were great in thought and deed;
And the City still evinces
Love for you, her friends in need.
Zealous, though not Puritanic;
Prompt to punish or to aid,
Were the blunt and once mechanic,—
Ancient City Guilds of Trade.

Alms-house, hospital, and college,
Parish church and grammar school,
Were endow'd, that care and knowledge
Should distinguish civic rule.
These and other goodly gifts,
Of our fathers' worth display'd,
London holds from her mechanic,—
Ancient City Guilds of Trade.

Time has come, and hearts are yearning,
As they yearned once of yore;
Lo! our workmen thirst for learning,—
Yes, they long for something more.
By the sovereign will Britannic,
And the peoples' power array'd,
Let us raise our great mechanic,—
Ancient City Guilds of Trade.

Out from London court and attic,
Workshop, mart, and cellar damp;
Voices call in tones emphatic,—
Light our craftsmen's Safety-lamp,
Art and Science, with galvanic
Power and purpose undimay'd;
Give us back our skill'd mechanic,—
Ancient City Guilds of Trade.

C. H. C.

SOUND.

SIR,—Can one of your readers inform me of any remedy to destroy sound in a new residence? The rooms are 10 ft. high, and the construction of the flooring is as follows:—Joists, 9 in. by 3 in., laid over with 7 in. by 1 in. flooring-boards, and the floor ceiled under. A. SUBSCRIBER.

HEALTHFULNESS OF THE SEWERS.

EVERY now and then, when the dangers of sewer gases are spoken of, we get utterances in reply to the effect that the men who work in them are particularly healthy. Hear what Mr. Bateson, the medical officer of St. George's, Southwark, reports with reference to the health of the men employed in the sewers. Six men were employed by the vestry, whose ages ranged from twenty-four to fifty-five years, and who had been employed in sewer-work from one year to twenty-five. Three had lately died, two from consumption and one

from lock-jaw, resulting from a slight bruise on the finger, incurred while at work in a sewer. The deceased was forty years of age, and had been employed fourteen years. The other two were aged respectively fifty-one and fifty-six years, and had been fourteen and sixteen years engaged in the work. Both were remarkably healthy men when they entered upon their employment. The men work eight hours a day and frequently complain of headaches, giddiness, faintness, and occasionally vomiting. One of them, while opening a drain, some time ago, to let off a stoppage, fell down insensible, and remained so for about twelve hours. His illness continued eight months; and had he returned to the same kind of work, he could not, Dr. Bateson stated, have lived.

Moreover, unhealthy as the breathing of sewer gases thus is, typhoid or gastric fever,—fever of the bowels,—as a speciality, is believed to originate mainly in susceptibility to infection arising from the contamination of water by such gases, or by sewage, and by the internal use of such water, in food or drink, which fevers the stomach and bowels, or produces gastric fever. This special form of illness may thus be escaped by sewer-men, even while breathing the sewer gases, and suffering otherwise from that cause, and not so much in the bowels, or in the form of typhoid fever. The cholera virus in sewage is also believed to depend, for its action, upon water contaminated by it, and swallowed in food and drink, and acting on the bowels, just as in the case of the closely affinitive gastric fever. Thus sewer-men may escape both cholera and gastric fever, just as others may do, unless they drink sewage, or poisoned water, which their business does not necessitate, although they must breathe sewer gases, and must suffer in health otherwise from that cause.

DAMAGES DONE BY STORMS.

IN the North of England, as well as in Scotland and Ireland, there has been very boisterous weather, which has done damage in many places.

At Darlington there was a chimney, about 70 ft. high, blown down in Mr. Middleton's brickyard. A good portion of a new house being built was also blown down in Bondgate. At the North-Eastern station a quantity of glass was blown off the roof.

At Scarborough, roofs and buildings in several places have been much injured. The side wall of a new building on the South Cliff fell on to the footpath.

At Consett ironworks, Mr. Bailey, contractor is erecting a girder bridge across the cinder ovens, and a large travelling crane is employed to lift the stones. A man was on the top working the crane, when it was suddenly seen to rock and fro, and then with a loud crash fell to the ground a distance of 30 ft. The man's death was instantaneous, and two other men who were struck with portions of the falling crane had their bodies dreadfully mangled.

At Shields, a new house, in course of construction in Percy Park, Tynemouth, was blown down. A stack of chimneys at the Tynemouth Union Workhouse was blown down, and did considerable damage to the buildings.

At Jarrow, near South Shields, several of the roofs of new houses in Heworth-place were blown off, besides damage being done to other houses.

The fall of chimneys, chimney-cans, and tiles in this district, as in other places, was frequent. At Stockton, the chimney of a puddling furnace at the Bowsfield Ironworks was blown down, and the falling mass has seriously injured two men. A portion of the roof took fire, and the fire-brigade was called out, but no very serious damage was anticipated. A number of house chimneys were blowing about, and locomotion about the streets was impossible. Part of the South Stockton Railway-station roof was displaced. At Messrs. Jacques & Co.'s Ironworks, adjoining Bowsfield, another chimney fell. One man was killed, and several injured. At the Richmond Ironworks, seven puddling furnaces, with part of the roof, were destroyed. The first stack of chimneys fell upon a large boiler, fracturing some of the plates. Most of the puddlers had just got clear, when two more stacks of chimneys fell through the roof. At the brick-yard of Messrs. Darmand & Co., a large chimney was blown down, but without injuring any of the workmen. At Messrs. Harwood's Norton Pottery, on the north side of Stockton, the roof was displaced and damaged.

A terrific tornado has occurred at Osceola, Arkansas. The storm struck the town, containing perhaps 300 houses, and before the citizens could realise its extent, or before they could even get to their doors, it had burst upon them with unprecedented fury and violence, sweeping down before it houses, trees, cattle, fences, and everything movable. Trees were carried by the winds like straws; cattle, horses, and mules were blown about the streets, and a screaming wild with fright, ran bolter-skoller in all directions, and the air was literally thick with fragments of every imaginable thing. The town, once a beautiful place, was turned into a mass of ruins. Three churches and six school-houses were blown down in a moment, many of the heaviest timbers being carried entirely away, and nearly every dwelling-house in Osceola and its immediate vicinity was either blown down or unroofed. The mills and cotton-gin belonging to Mr. Eddings, near the town, were torn into fragments, and hardly a vestige was left of the buildings to mark the spot where they stood. Eighteen persons were killed or badly wounded.

SCHOOL BOARDS.

London.—The Board have resolved that the tender of Messrs. Merritt & Ashby, of 89 and 90, London-wall, E.C., amounting to 7,193*l.*, for the erection of a school for 1,040 children, on the site in Hunter-street, Old Kent-road, be accepted. Further, that the tender of Mr. John High, of Clarence-yard, Lower Clapton, E., amounting to 8,995*l.*, for the erection of a school for 1,040 children, on the site in Old Castle-street, Whitechapel, be accepted. That the tender of Messrs. L. H. & R. Roberts, of 4, Rheidol-terrace, Islington, amounting to 8,996*l.*, for the erection of a school for 1,040 children, on the site in Harper-street, New Kent-road, be accepted. That the tender of Mr. Thomas Ennor, of 1, Devonshire-place, Commercial-road, E., amounting to 2,450*l.*, for the adaptation of the warehouse on the site in Broad-street, Ratcliff, to the purposes of a school to accommodate 900 children, be accepted. That the tender of Mr. Thomas Ennor, of 1, Devonshire-place, Commercial-road, E., amounting to 3,751*l.*, for the adaptation of the rice-mills in Semer-street, Whitechapel, to the purposes of a school to accommodate 800 children, be accepted.

Coventry.—The Board have unanimously resolved to accept Messrs. Goodmau & Burnmore's tender for building the Spon-street School for the sum of 3,814*l.*, after allowing 200*l.* for the old buildings.

Middlesbrough.—The plans of the Gladstone-street School, prepared by Messrs. Alexander & Kemman, could not be carried out for less than 4,000*l.* Amended plans upon a reduced scale, estimated to cost 5,000*l.*, were submitted to the Board and referred to a sub-committee. Some conversation followed as to Messrs. Alexander & Kemman's remuneration for work already done, and it was arranged that they should be paid 50*l.* in full of all claims.

Driffield.—The following tenders were received for the erection of schools, including fittings, &c.: Messrs. Bretherick, Gage, & Co. (Norton and Driffield), 5,396*l.* 16*s.*; J. F. Shepherson (Driffield), 4,795*l.*; J. Brown (York), 4,695*l.*; Thos. Foster & Son (Driffield), 4,645*l.*; Thomas and Dickinson (Driffield), 4,625*l.* 15*s.* 6*d.*; Jos. Brown (Driffield), 4,580*l.*; Hewson, Brothers (Driffield), 4,567*l.* 6*s.* 6*d.* The tender of Messrs. Hewson, Brothers, was accepted, and it was agreed to make application to the Public Works Loan Commissioners for a loan of 5,800*l.*, for defraying the cost of the building and incidental expenses.

CHURCH-BUILDING NEWS.

Lapworth.—The church here has been reopened by the Bishop of Worcester, after having been closed for some months for restoration. The work which was done twelve years ago was mainly confined to the chancel. That which has now been done extends over all the remainder of the interior. At both times the work has been done under the direction and advice of Mr. G. E. Street, R.A. The fabric of the church, some portions of which are of great age, had suffered very considerably from the lapse of time. To ensure the safety of arches and pillars, the foundations having become insecure, a large amount of underpinning has been necessary. All the columns and their bases have been made

good. The walls have been denuded of their accumulated plaster, thereby revealing in many parts the traces of older work which had been wholly concealed. In the north wall of the nave, above the easternmost arch, a curious and interesting light has thus been exposed, which bears marks of dating from Saxon times, when this was the external wall of a church without aisles. In the south aisle have been opened out two so-called leper windows, and two other windows, remains of a much earlier church, together with a piscina and its credence-table in unusually complete preservation. From the west end of the nave a gallery has been taken away, which has hitherto blocked up two lancet windows of the Early English period. A new chapel has been added, leading to the tower from the north aisle, by which additional accommodation has been provided in lieu of that lost by the removal of the gallery. The stripping away of a lath-and-plaster ceiling from the nave has discovered a fine old oak roof, which is now laid open. The high pews, which still further concealed the proportions of the church, have been removed and replaced by open sittings. The building has been enriched by the addition of four new stained-glass windows. A large one at the east end is the gift of the present rector and his family: the centre light represents the Crucifixion, and the side lights represent the Virgin and St. John, and the holy women at the Cross. Another, in the chancel, is the gift of Mr. John Fetherston, jun., of Packwood House. Another, in the south aisle, is the gift of Mrs. Tyndall. The last, in the north aisle, is the gift of Mr. and Misses Kirshaw. These windows are all by Messrs. Powell & Son, of London, except that given by Mr. Fetherston, which is the work of Messrs. Clayton & Bell. At the west end of the church is a porch, with a chantry over it, dating from the middle of the fourteenth century. This porch was bricked up on the one side and closed by a door on the other, and used as a sort of lumber-room. It has been thrown open, and reveals some groining. The estimated cost of these works is upwards of 1,600*l.*, and the restoration has been effected by the joint contributions of the rector and parishioners, aided by various friends, together with a donation from Merton College, Oxford (patrons of the living), and with a sum of 200*l.* from the trustees of the Lapworth charities. The contractors for the work have been Messrs. Hardwick & Son, of Birmingham.

Brierfield.—The Church of St. Luke, Brierfield, Little Marsden, near Burnley, has been consecrated by the Bishop of Manchester. There has hitherto been no church in Brierfield, but service has been regularly performed in St. Luke's schoolroom. The foundation-stone of the building was laid about twelve months ago, by the late Sir James Yorke Scarlett. The interior of the church has been adorned by many gifts. The architect is Mr. James Green, of Portsmouth. The land for the site of the church is the gift of Colonel Holden. The cost of the building with the gifts is estimated at upwards of 5,000*l.*, nearly the whole of which has been subscribed.

Dover.—The Bishop of Dover has consecrated the portion of the new cemetery at Charlton that is to be used by the Church of England. The total area of the land secured by the Burial Board is ten acres. Four acres of this have been consecrated for the Church of England portion of the parish, two acres are allotted to the Non-conformists, and the other portion remains for future use. The architects of the buildings were Messrs. Brown & Pearce, of Norwich; and the builders, Messrs. Adcock & Rees, of Dover. The following figures show the cost of the cemetery and buildings:—Land, 2,000*l.*; buildings, including entrance, 2,165*l.*; iron fencing (south boundary), 242*l.* 7*s.* 11*d.*; oak fencing, 237*l.* 15*s.* 11*d.*; total, 4,645*l.* 9*s.* 10*d.*

Huddersfield.—Lindley parish church has been re-opened, after being closed for some months, during extensive alterations and additions. A chancel, organ-chamber, and clergy and choir vestries have been added. The flat ceiling has been replaced by an open-timber roof of higher pitch. The church has been partly re-pewed with open pitch-pine stalls, making a considerable addition to the accommodation, under the superintendence of Mr. J. N. Crofts, architect, Liverpool. A painted tile reredos, by Mr. J. W. Knowles, of York, is being placed. The east window has been filled with stained glass, by Messrs. Ward & Hughes, of London, at the expense of Mr. H. B. Taylor, of Huddersfield, in memory of his son. The principal subjects are the Ascension and the Lord's Supper, besides several subsidiary groups. The entire cost, ex-

clusive of the window, will be 1,500*l.*, towards which 1,000*l.* have been already raised.

Newsome (near Huddersfield).—The new church at Newsome has been consecrated. The edifice comprises nave and chancel of the extreme length of 100 ft. outside walls by a width of 27 ft. within, and 40 ft. to ridge. The chancel is separated from the nave by a lofty arch supported upon corbel shafts, with moulded caps and bases. Only one aisle is provided, and that is placed on the north side, together with an organ chapel and vestry adjoining the chancel. The aisle is separated from the nave by an arcade of four bays, supported upon alternate octagonal and circular shafts, with moulded caps and bases. The porch is placed on the south side at the west end, and the west gable is surmounted by a bell-cote, which is carried up in ashlar with stepped and moulded copings, reaching to the height of 64 ft. The windows on the south side are single lancet lights, with cusped heads; and the east window is composed of five lights, with mullions and late Decorated tracery. The floors of the chancel are laid with encaustic tiles, and the passages of nave and aisle are paved with rubbed flags. The roofs are open-timbered, of deal, stained and varnished, with moulded and curved braces, and ribs forming panels for plaster. The seats are open, of deal, also stained and varnished; and the chancel stalls and screens are of pitch pine. The stall ends are finished with carved poppy-heads, and the fronts are open. Messrs. Brunner & Co., of Newsome, were the contractors for the mason's work; Mr. Joseph Sunderland, of Lockwood, for the joiners' work; Messrs. Walsh & Sons, of Halifax, for the plumbers and glaziers' work; Mr. Longbottom for plasterer's work; and Messrs. Goodwin & Sons for slater's work. The church will accommodate 410 people, including special seats for sixty children. The whole of the work has been executed from the designs and under the superintendence of Mr. W. H. Crossland, of London, at a cost of about 3,000*l.*, including boundaries.

VARIORUM.

"Light Railways. By H. S. Ellis. London: Bell & Daldy." This is a paper read at the Exeter Chamber of Commerce, Exeter. The author advocates the extension of light railways, submitting the example of the Duke of Buckingham's railway from Quainton to Brill, in Bucks, in the hope of interesting landowners in the construction of similar lines. The clauses are given of the Act of Parliament which provides for the construction and working of light railways. The paper is dedicated to Sir Stafford Northcote, who filled the office of Secretary of State for India during the consideration of the proposed railway extensions in that country.—"To the Urban Sanitary Authority of the Borough of Leicester. J. & T. Spencer, Printers, Leicester." This is a paper read by Dr. Clarke before the local Sanitary Sub-Committee at Leicester. The purpose is to show that even when drained the midden and privy system is wrong; and that the water-closet and ash-pit system, as a substitute for the other fails greatly in the poorest localities. The author of the paper urges that an auxiliary system should be introduced. The system he proposes is the one tried at Rochdale, that at Salford, or the Gonx system at Halifax and Aldershot. In these cases galvanised iron pails for privies, and ash-tubs, are used, and changed weekly or oftener.

Miscellaneous.

Willenhall.—A new Wesleyan School Chapel, erected at Monmore-lane, has been opened for divine service. The chapel has been built in a plain manner, and is 49 ft. by 24 ft., exclusive of two vestries, each 12 ft. square. The permanent seats are only seven in number, the remainder being movable, so that the room may be conveniently used as a Sunday school. More land has been purchased than necessary for the present purposes, but it is intended that at a future time a chapel shall be built, and the present building used solely as a Sunday school. The whole of the land has been enclosed. The total expense already incurred has been 500*l.*, of which 250*l.* have been raised. The architect is Mr. Baker, town surveyor, and the builders are Messrs. Taylor & Hall. The accommodation provided in the chapel is for 250 persons.

Proposed Tramway between Tenterden and Headcorn.—A public meeting of the inhabitants of the town and district of Tenterden was recently held in the Town-hall, which was filled to overflowing. The Mayor said he had called the meeting to receive from the promoters of the Tramway Company a statement of what they proposed doing, and then to ask those present if they thought a tramway between Tenterden and Headcorn was necessary. Mr. Latter said that in his opinion a tramway between Tenterden and Headcorn was not sufficient; it should go on to Maidstone, as then it would derive a large revenue from the carriage of hops and other produce of the neighbourhood to the Medway. He was quite willing to take the present project as a beginning, and he hoped that the company would also, starting from London Beach, construct a tramway to Ashford. Mr. Cullen, one of the surveyors, said their project was to connect Tenterden with the South-Eastern Railway by means of a tramway starting from West Cross, following the same road as now used by the omnibuses. If the tramway was constructed under an order of the Board of Trade, or by an Act of Parliament, the maximum rate for first-class passengers would be 2½d. per mile. The goods rates would also be fixed, and for heavy goods would be about 6s. per ton. As yet, a company was not formed; a survey had but just been made. If the meeting decided in favour of it, they would then form a company. It was unanimously resolved "that a tramway from Tenterden to Headcorn was desirable." Before December 15th another meeting will be held. As a beginning, such a tramway would no doubt be very useful; but it is obviously desirable that it should go on to the railway at Appledore or Rye. It is much wanted.

Distribution of Prizes of Turners' Company, London.—The ex-Lord Mayor (Sir S. J. Gibbons) presided at the distribution of prizes given by the Turners' Company. The proceedings took a wider scope than the immediate object of the meeting, holding out as they did the promise of a revival of the old influence—long in abeyance—of the civic guilds in promoting the highest degree of skill in the various arts and handicrafts, and also in controlling and adjusting trade disputes from time to time. The ceremony was held in the Egyptian-hall of the Mansion-house. The clerk to the company read the award of the judges, which was as follows:—

First prize, Lewis Donne, silver medal and the freedom of the company, for a chronometer balance, staff, and rollers, perfectly true in practice, turned in a period of extraordinary hardness; second prize, Henry John Mann, a bronze medal, for a chronometer balance, staff, and rollers, indicating workmanship of the highest truth, squareness, and finish; third prize, Thomas Arthur Nelson, an apprentice of 18, for a well-executed chronometer balance, staff, and pinion.

The ex-Lord Mayor distributed the prizes, and addressing Lewis Donne, the first prizeman, who is a young working man, said he would receive, in addition to the freedom of the Turners' Company, that of the City of London itself.

Sanitary Report on Mile-end Old Town. The report on the sanitary condition of Mile-end Old Town for 1871-2, by Dr. Corner, the local medical officer of health, has been printed. The deaths from all causes during the year ending March, 1872, it states, were 2,200 compared with 2,000 for the preceding year, showing an increase of 200, and an increase of 10½ upon the average of five previous years. This excess was almost entirely attributable to the small-pox epidemic. The rate of mortality per 1,000 population was 23·5 in Mile-end, 24 in the metropolis, and 25 in the combined east district, comprising seven registration districts. Dr. Corner points attention to the unwholesomeness of many new houses in the district, both from faulty sanitary construction, and from the nature of the site, on made ground,—ovils which we have too often had special occasion to bring under notice. Stringent sanitary legislation is the only hope of inducing speculating builders to give heed to a subject on which many of them are densely ignorant, or reckless.

Underground Cisterns in North Avenue. The Clerkenwell Vestry have resolved "that the underground cisterns in North-avenue be abolished, and that above-ground cisterns be substituted in their stead;" and "That this matter should be referred to the sanitary committee, with instructions to see that the objectionable underground cisterns were at once removed."

The Manchester Free Libraries.—The twentieth annual report (for 1871-2) to the Manchester City Council on the working of these valuable libraries has been issued in a printed form. The most noteworthy event of the year was the opening of the Cheetham branch. The number of times that persons have availed themselves of the Free Libraries during the year is estimated at 2,264,688, against 2,112,900 the previous year. Of these, 470,549 were loans of books to read at home; 128,844 were consultations of works in the reading-rooms of the Branch Libraries; and 41,934 in the Reference Library; lastly, 1,623,361 were visits to the newsrooms for the perusal of newspapers, magazines, and periodicals. There is thus an increase of 151,788 in the number of persons using the Institution. The unfortunate locality of the Reference Library is alluded to, as well as its increasing want of accommodation, and a hope is expressed that the Chief Library may soon be rescued from its present unsuitable position, and removed to a more central one.

Coal.—Professor Ansted mentions, says the *Cornhill Magazine*, that a quarter of a million of square miles of the earth's surface are covered with sandstones and shales of the carboniferous period, among which coal is buried; and this coal is for the most part accessible. Now, there are upwards of 3,000,000 square yards of surface in a square mile, and assuming an average total thickness of 10 yards for all the distinct seams of each coal-field, we find for the total number of cubic yards of available coal the enormous figure of 7,500,000,000,000. As a cubic yard of coal weighs nearly 1 ton, we may say that there are in round numbers 7,000,000,000,000 of tons of coal available for the use of the human race. If we took the average number of human beings living at each moment during the next 3,500 years to be 2,000,000,000, and the annual consumption for all purposes to be at the average rate of 1 ton per human being, the supply would last for that enormous period.

Instruction in Science and Art for Women.—The winter course of lectures at South Kensington Museum, for the instruction of women in science and art, has been opened by Professor Duncan. The course is to consist of three series: the first by Professor Duncan, on "Cosmogony and the World as a Planet;" the second by Professor Carey Foster, on "Physics;" and the third by Professor Butlerford, on "Physiology." There was a large attendance of ladies. Professor Duncan, in beginning his series of lectures on "Cosmogony and the World as a Planet," said his purpose was to explain the general results of scientific discovery during the last twenty or thirty years as hearing upon the great theory of the universe. He then proceeded to treat of the fixed stars in an interesting manner, and was attentively listened to.

A Sewage Farm.—The sewage of Cheltenham, after passing through tanks, where the solid matter is precipitated, flows by gravitation over a farm of 127 acres, three miles from the town, and which cost the town, with necessary works, some 18,000l. This farm is divided into seven lots, and is yearly let by auction, it being a condition that the sewage shall be applied at the discretion of the surveyor, who has control of the irrigation works. With the exception of a lot of six acres, the farm is ordinary pasture, the excepted field being laid with Italian rye grass. The third annual letting of the farm took place by auction a few days ago. The total of the letting was 8157. 1s. 6d. for the year. In addition to the liquid distributed over the farm, surplus fluid is diverted over the adjoining lands, at a charge of 15s. an acre.

St. Leonard's Tower, Bridgnorth.—The last stone of this tower has been laid by the Rev. M. E. Stanborough. Mr. Wiggall, the foreman of the works, assisted by Mr. Harry Hems, the sculptor, placed the final immediately over the position it was to occupy, and the vicar then fixed it upon its bed. This tower, says a correspondent, will be the finest in the county. The entire height is 122 ft., whilst the extreme width is considerably greater in proportion to the height than is usually the case. Messrs. Slater & Carpenter, of London, are the architects; Mr. Escourt, of Gloucester, is the builder; and Mr. Harry Hems, of Exeter, the carver.

The Worcester Guildhall Competition.—Nothing is yet settled: there is still squabbling going on between the partisans of Mr. Day and Mr. Wray.

Early Closing for Freemasons.—At the Taunton Police-court, Mr. H. C. Trenchard, legal representative of the Licensed Victuallers' Association, applied to the magistrates for a special licence for the proprietor of Clarke's Hotel to keep open until twelve o'clock on the monthly lodge nights of the Freemasons, on November 20th and December 18th, and the annual dinner, or "Feast of St. John," December 30th. The justices refused to grant the application, though it was supported by the master and officers of the lodge, but were willing to grant any single night; which, however, was not accepted. The result, it is said, will be the erection of a Masonic Hall,—a course which other societies in the town intend to adopt.

Improved Dwellings for the Poor.—The Administration Committee of the Charity Organisation Society have recently exchanged communications with gentlemen acquainted with and interested in the question of improved dwellings for the poor, as to the probability of a report from a committee of members of Parliament and others upon the subject being of practical value at the present time. The proposition was most favourably received by those who were consulted upon it, and hence at the last meeting of the Council of the Charity Organisation Society, the Administration Committee recommended that a committee of members of Parliament and others, similar to the special Vagrancy Committee, should be formed to consider what more could be done to improve the dwellings of the poor in London.

The Westow Tumuli.—The Rev. Canon Greenwell, of Durham, the well-known explorer of British barrows, with other archaeologists, has been engaged in the examination of two tumuli, on the estate of Mr. Phillips, of London, at Westow, near Malton. The results have been of considerable archaeological interest, although the burials were poor, being without relics of any kind, except one flint knife. One of the barrows, however, had originally been a "long barrow," and had been added to until it became oval, the added portion containing the secondary burials, burnt and unburnt; while the primary burials, all doubled up, were found in line and burnt *in situ*, having been covered with slabs of oolite, so arranged that a draught would be occasioned, and a thorough roasting of the bodies insured.

The Ruins of Troy.—H. Heinrich Schliemann, a German archaeologist, who possesses a large fortune, acquired in commercial pursuits, is, it appears, at present engaged in making excavations on the site of ancient Troy. He has persevered in this work for about twelve months, and in last September succeeded in reaching what he considers to be the primitive surface of the ground, after digging for about 45 ft. from what is now the surface. At this depth he discovered the ruins of a house evidently scathed by fire, and in it the skeleton of a woman, with her golden ornaments. He also found the bones of a child, and some thousands of specimens of tiles, or pieces of baked clay, which are supposed to appertain to pre-historic times.

The Restoration of Exeter Cathedral.—A meeting has been held in the hall of Exeter College, Oxford, in aid of the restoration of Exeter Cathedral. The Bishop of Exeter presided, and there was a large attendance. Sir Gilbert Scott pointed out the work that was required to be done to the cathedral, and said that to thoroughly restore it would entail a very great outlay. It was resolved,—

"That as the diocese of Exeter has been for many years closely connected with several colleges in this university, the restoration of Exeter Cathedral is an object justly calculated to excite a special interest in Oxford, and has a strong claim for pecuniary support."

And a committee of gentlemen were appointed, for the purpose of diffusing information and collecting subscriptions.

Accidents.—While the Petty Sessions were being held in the upper room at Durres, near Bantry, the flooring gave way, and a crowd of 200 persons fell through to the ground, a distance of 12 ft. Two persons were reported killed, and about forty injured more or less severely. The portion of the floor on which the bench rested did not give way, and the magistrates and their clerk escaped. The frightened crowd did one another great injury in their frantic efforts to escape. —A house in course of erection on the Stanford estate, at the top of the London-road, Brighton, has fallen, burying three men and a boy. The boy, when extricated, was found to be dead. The men were seriously injured.

Roman Catholic Schools, Hatton-garden.—Archbishop Manning opened the new schools attached to the Italian, or St. Peter's Church, Hatton-garden, on Wednesday last, in the presence of a large number of the Catholic clergy and laity. The schools, which are erected in the centre of a neighbourhood largely populated by the very humblest classes of Irish people, have cost 1,500*l.*, and will accommodate some 600 children, including boys, girls, and infants. The foundation-stone of the buildings was laid last March, and the chief cost of the undertaking has been defrayed by an English lady.

Continuation of the Thames Embankment (North).—The Metropolitan Board have unanimously adopted the following motion of Mr. T. J. White, seconded by Mr. Runtz:—"That it be referred to the Works, &c., Committee to consider and report upon the desirability of completing the Thames Embankment (North) by carrying it on to Millbank, with power to confer with the Chief Commissioner of Works with a view to ascertain whether the Government would be willing to co-operate with the Board for the execution of such works."

Society for the Encouragement of the Fine Arts.—At the first meeting of the Council, held on Tuesday last, Capt. J. Britton was elected chairman, and Dr. Temple, deputy chairman, for the new session. It was announced that Mr. George Browning, honorary secretary, has done much, during a tour in Italy and France, to develop a system of foreign correspondence on matters of fine art, proposed by the council of the society.

The Demolition of Houses.—On Monday evening last a public meeting was held at the Workmen's Club in Smithfield, to protest against the demolition of the houses of the poorest classes, and to demand the erection of more suitable dwellings. Sir John Bennett occupied the chair. The object of the gathering met with general concurrence, and it was resolved to send a deputation to the Lord Mayor on the subject.

Fire at the Dublin Post-office.—Flames were observed issuing from the upper story of the General Post-office, Dublin, on Thursday in last week. The fire originated in a store-room adjoining the telegraph instrument-room. All the city fire-engines were at once on the spot, and succeeded in a couple of hours in extinguishing the flames. The damage is believed to be considerable.

Agricultural Hall, Islington.—The directors of this hall have just laid down a plank-floor, covering the whole area between the columns, consisting of 3 in. planks on dovetailed sleepers, laid in 6 in. of cement concrete. Mr. George Trautnit was the architect employed, and Messrs. Longmire & Burge the builders.

Stained Glass in Calcutta.—Some stained-glass windows have been set up in the Cathedral, Calcutta. When the glaziers had finished, and were waiting for public approbation, it was found that the whole of the glass had been fixed inside out. It took them some time to turn it outside out.

The Snow, when it comes.—The First Commissioner of Works and the Thames Conservancy have granted an application of the Westminster District Board of Works for permission to deposit snow in Hyde Park, and throw the same into the River Thames at Millbank, during the coming winter.

Clerk to the Metropolitan Board of Works.—Mr. Wakefield, the senior clerk connected with the Metropolitan Board of Works, has been elected clerk to the Board in the place of Mr. Pollard, deceased, at a salary of 500*l.* per annum. The election was unanimous.

Increase of Wages.—The Westminster District Board of Works have increased the wages of their fishers and gullymen 3*s.* per week, the present prices being 21*s.* per week; while the salaries of the two foremen,—31*s.* and 35*s.* respectively,—have been increased 5*s.* per week each.

Echoes.—An American newspaper mentions that great improvement in a new Court House, wherein a speaker could scarcely be heard, was effected by straining a few small wires across the apartment at a certain height and distance apart.

Sales at International Exhibition.—The sales of works of art and other objects at the recent Exhibition, effected through the agency of the price clerks, amounted to 10,590*l.*,—viz., for British works, 4,410*l.*; Foreign works, 6,180*l.*

Explosion at Ludgate-hill.—A stone slab in the pavement at Ludgate-hill has been blown several feet into the air, from some unexplained cause, probably an explosion of gas. Fortunately no one was injured.

TENDERS

For sewer works in Seymour-road, &c., St. Marylebone. Mr. A. G. Browning, chief surveyor:—

Wall	£6,290 0 0
Stevens	5,930 0 0
Marsh	5,719 0 0
Bridgman, Nutball, & West	5,197 0 0
Pearson	4,759 0 0
Victoria & Crane	4,675 0 0
Hubbard	4,577 0 0
Hoare & Son	4,470 0 0
Wignora	4,350 0 0
J. & S. Williams	4,189 0 0
Crocket	3,985 0 0
Potter	3,790 0 0
Pringle & Son (accepted)	3,495 0 0
Neave & Son	3,488 0 0
Killingback	3,094 0 0
Haynes	3,020 0 0

For stables at Paddington for London General Omnibus Company, under the superintendence of Mr. Toth. Quantities supplied by Mr. A. J. Bolton:—

Blair & Campbell	£1,334 0 0
Mann	1,373 0 0
Wood	1,233 0 0
Pink	1,235 0 0
Allen	1,197 0 0
Heath	1,170 0 0
Mansbridge	1,148 0 0
Gibson, Brothers	1,147 0 0
Carter	1,145 0 0
Bishop	1,135 0 0
Goodman	1,135 0 0
Kepp & Co.	1,030 0 0
Thompson & Smith	1,037 0 0
Mark	1,017 0 0
Waller	1,014 0 0
Holmes	985 0 0
Bleas	983 0 0
Garrud	983 0 0
Atfield & Co.	973 0 0
Atchinson & Walker	956 0 0
Wilson Brothers	898 0 0
Robins & Co.	883 0 0
Mason & Bristol	867 0 0

For garden-wall enclosure and constructing carriage-road to site of proposed residence at Hayes, Kent. Mr. Thomas Davidy, architect. Quantities supplied:—

Nightingale	£599 0 0
Bates	586 0 0
Jerrard	574 0 0

For alterations to Yacht Tavern, Greenwich, for London, Greenwich, and Windsor Hotels Company. Mr. Thomas Davidy, architect:—

Allworth	£261 15 0
Dancy	250 0 0

For proposed schools, Forest-lane, Essex. Mr. Henry Ogg, architect. Quantities supplied by Mr. A. L. Buzzard:—

Palmer	£1,995 0 0
Hobson	1,965 0 0
Morier	1,788 0 0
Rivett	1,687 0 0

For alterations, &c., to premises, Berner-street, White-chapel for new schools for the London School Board. Mr. E. R. Robinson, architect to the Board. Quantities by Mr. W. H. Barber:—

Kirk	£1,594 0 0
Newman & Mann	1,565 0 0
Killy	1,563 0 0
Riddell	1,540 0 0
Jerrard	1,494 0 0
Johnson	1,429 0 0
Perry & Co.	1,384 0 0
Emor	1,375 0 0

For the decoration of state rooms and other works at the Mansion House:—

Morant, Boyd, & Blandford	£5,050 0 0
Trollope & Sons	3,768 0 0
Gillow & Co. (accepted)	3,620 0 0

For Driffield Board Schools. Mr. H. J. Paull, architect. Quantities supplied:—

Britrick, Gage, & Co.	£5,396 0 0
Shaperton	4,795 0 0
Brown	4,695 0 0
Foster & Son	4,645 0 0
Dickinson	4,625 0 0
Berry	4,580 0 0
Hewson, Brothers (accepted)	4,566 0 0

For the erection of vaults and foundations for the Gresham Life Society, Poultry. Mr. J. J. Cole, architect. Quantities by Mr. Barnett:—

Tremp	£4,247 0 0
Brown & Robinson	4,074 0 0
Henshaw	3,655 0 0
King & Son	3,529 0 0
Perry & Co.	3,533 0 0

For the erection of a detached residence, Staines. Mr. Robert J. Wey, architect:—

Wright, Brothers, & Goodchild	£2,500 0 0
Guest	2,490 0 0
Spearing	2,300 0 0
Lynn	2,250 0 0
Turrell	2,160 0 0
Boden	2,010 0 0

For alterations to billiard-rooms, Bird-in-Hand-court, Cheapside, for Mr. Higgins. Mr. Wm. Smith, architect:—

Rooney, Brothers (accepted)..... £220 0 0

For schools, St. Paul's-road, Bow-common, for the School Board for London. Messrs. R. Phené Spiers & Henry Hall, architects. Quantities by Mr. L. C. Riddett:—

Longmire & Burge	£9,989 0 0
Nixon & Son	9,977 0 0
Brass	9,940 0 0
Webster	9,925 0 0
Higgs	9,876 0 0
Pritchard	9,777 0 0
Ferry & Co.	9,438 0 0
Cooke & Green	8,992 0 0
Nightingale	8,999 0 0

For schools, West Ferry-road, Millwall, for the School Board for London. Mr. R. Phené Spiers, architect. Quantities by Mr. L. C. Riddett:—

Sheffield	£7,293 0 0
Cooper	6,750 0 0
Crockett	6,689 0 0
Scrivener & White	6,880 0 0
Brass	6,595 0 0
Higgs	6,560 0 0
Brown & Robinson	6,523 0 0
Cooke & Green	6,389 0 0
Hill & Son	6,349 0 0
Pritchard	6,263 0 0
Killy	6,245 0 0
Mansbridge	6,070 0 0

For longate sewers, for the Metropolitan Board of Works:—

Ritson & Thomas	£13,345 0 0
Bloomfield	12,950 0 0
Webster	12,600 0 0
Nowell & Robson	11,800 0 0
Pearson	11,677 0 0
Wignora	10,400 0 0
Oliver (accepted)	8,600 0 0
Hubbard	8,609 0 0
Neave & Son	8,539 0 0
Bridgman, Nutball, & West	8,199 0 0
Walter	7,450 0 0

Schools, Kender-street, Hatcham.—Add to list printed last week:—

Peto, Brothers	£7,494 0 0
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TO CORRESPONDENTS.

L. M. (the examination of candidates for the office of district surveyor is not voluntary, but compulsory; no person is eligible without the certificate of the Royal Institute of British Architects. There are no published particulars)—G. B. (we decline to recommend)—R. B. & Co.—H. B.—W. S.—H. K.—T. D.—R.—W. G.—L.—J. F.—A. R.—D. R.—R. J.—R.—G. M.—M. B.—E.—R.—C.—T.—J. H.—Quercus.—T. O.—J.—G. R.—F. B.—W. H. R.—H. J. L.—J. F.—H. J. F.—R. Brothers.—R. J. W.—C. B.—W. H. W.—G. & B.—L. C. R.—G. M. (next week)—J. M. C. (next week)—J. K. C. (next week)—A. T. (thanks).

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TO ARCHITECTS AND SURVEYORS. DESIGNS PREPARED FROM ROUGH SKETCHES or otherwise, in an ARTISTIC and EFFICIENT manner. OUTLINE COLOURED in separate style. PERSPECTIVES rapidly and effectively drawn, and etched, or tinted. TERMS MODERATE.—Apply to Mr. MYERS TAYLOR, 15, Tavistock Inn, Holborn.

J. & W. SMEATON, PRACTICAL PLUMBERS TO THE TRADE, PHOENIX-YARD, GAVENDISH-SQUARE, W. WORK TAKEN, by Piece or otherwise, in Town or country. Lead being at 100 cwt. Estimates given for every description of Plumbers' work. Fire-trials in town guaranteed.

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WANTED, an experienced TIMEKEEPER. Apply by letter, enclosing copies of testimonials, &c. to Messrs. CHAMPTON & SONS, East and West Junction Railway, Kington, Warwick. Wages, 30s. to 35s. per week. References given.

CERTAIN WORK THROUGHOUT THE WINTER.—EAST AND WEST JUNCTION RAILWAY.—LABOURERS WANTED, on the Works of the above line of Rail.—Apply, on the Works, immediately after 10 o'clock, Kington, or Bristol-on-Avon.—Wages, 3s. 6d. to 3s. 9d. per day, according to merit. Healthy country, and living cheap.

PUPIL.—A CIVIL ENGINEER, having works of considerable magnitude in operation, had a VACANCY in his Office for a PUPIL. The district in which the works are situated being one of the most important in the Kingdom, offers an unusual opportunity for the acquisition of engineering experience.—Address, A. B. 21, Grosvenor-street, E.C.

ARTICLED PUPILS to the Profession of ORNAMENTIST and DECORATIVE ARTIST will find an Opening in the Studio of DR. C. H. DRESSER, M.A. F.R.S. Architect and Ornamentist. Tower Cressy, Aubrey-road, Notting-hill, W.

AN ARCHITECT, in practice, is willing to take a PUPIL. Premium to be agreed upon.—Address, K. E. M. Office of "The Builder."

MONTGOMERYSHIRE COUNTY SURVEYORSHIP.—The office of COUNTY SURVEYOR being a VACANT, Candidates for the APPOINTMENT are requested to send in their applications and testimonials to the Clerk of the Peace, at his Office, in Welshpool, on or before the 25th day of NOVEMBER next. Candidates are required to have a practical and theoretical knowledge of construction in civil engineering and architecture. The salary of the County Surveyor is 2000, per annum, and he will be required to reside in the county. ROBERT DEVEREUX HARRISON, Deputy Clerk of the Peace. Welshpool, October 17th, 1872.

SURVEYOR, &c.—Notice is hereby given, that the Ulverston Local Board require a Person to perform the duties of SURVEYOR, INSPECTOR OF NUISANCES, and COLLECTOR OF RATES. Salary, 1200, per annum.—Applicants to send particulars of their qualifications, with references, addressed to the Clerk of the Board, on or before the 15th day of NOVEMBER next. Dated the 31st day of October, 1872. JOHN FOGLE, Clerk.

SURVEYOR FOR THE CITY OF DURHAM. WANTED, by the Corporation and Urban Sanitary Authority of the City of DURHAM, INSPECTOR OF NUISANCES, and COLLECTOR OF RATES. Salary, 1500, per annum, with an office provided by the Board, and an allowance of 50, for gas, water, fuel, &c. Applications to be sent to the Town Clerk's Office, No. 10, Market-place, Durham, marked "Applications for the Office of SURVEYOR," on or before FRIDAY, the 26th day of NOVEMBER next. WILLIAM MARSHALL, Town Clerk. Durham, 6th November, 1872.

SURVEYOR'S CLERK.—There is a VACANCY for a CLERK, in the Office of the BOROUGH SURVEYOR, Barrow-in-Furness. The office appointed must be experienced in the routine of such an office, and be a good and expeditious draughtsman. Surveyor and leveler. Salary 1800, per annum. Applications with testimonials to be sent to the Borough Surveyor.

MACHYNLETH UNION RURAL SANITARY AUTHORITY.—The Committee acting under authority of the Public Health Act, 1871, in the first portion of this Union comprising the whole of the Union except the parishes of Tonypandy, require, until the 25th March, 1873, the SERVICES of a Person of ability and competent surveying and sanitary knowledge to go through and INSPECT the District, and to furnish a detailed Report of its Sanitary condition, with such suggestions for improvement in drainage and otherwise as may appear desirable, and to perform such other duties as may be required. Tenders, with testimonials, are to be delivered to me before the 4th day of DECEMBER next. DAVID HOWELL, Clerk to the Committee. Machynlleth, November 6th, 1872.

WANTED, an experienced SURVEYOR, who has a thorough knowledge of Field Work and is a good draughtsman. Apply to BRITON, KNOWLES, & BRITON, Land Agents, Gloucester.

WANTED (Commission), GENTLEMEN with good connection amongst Architects, Ironmongers, and Builders.—Apply, by letter, 225, Office of "The Builder."

WANTED, an OFFICE YOUTH. Good writer, quick at figures, and from a Builder's Office preferred. Address, stating age, salary, last employment, &c. ARCHITECT, care of Messrs. Passmore & Bishop, Stationers' Union-street, Borough.

WANTED, a respectable YOUTH, about 15, who can readily estimate dimensions with accuracy, and write neatly and rapidly, to ASSIST in the office of an experienced Surveyor. No. 24, South Lambeth-road, S.W.

WANTED, a thoroughly experienced MOULDING MACHINE HAND, capable of turning out clean mouldings with dispatch. Wages 8d. per hour.—Apply, with references, to SILVER & DEDLEY, Builders and Joinery Manufacturers, New-street, Kennington Park, S.E.

WANTED, a WORKING FOREMAN, experienced in FIXING IRONWORK in buildings.—Apply, enclosing testimonials and stating salary required, to MEASURES, BROTHERS, & CO. South-west-street and Redcross-street, Borough.

WANTED, a good GENERAL FOREMAN, in a Jobbing Business thirty miles from town. A permanent situation to a good man. Preference will be given to one who can make out estimates.—Address, with references and salary required, to 82, Office of "The Builder."

TO MODEL AND FIGURE MAKERS. WANTED, a first-class Workman in Artistic Modelling, in the office of John Mansel, who has been with the Advertiser two years.—Apply to J. PARKINSON, Artistic Stone Works, Lincoln.

WANTED, a good JOBBING PLUMBER and PLAIN ZINC WORKER, for a permanent. Have to fill in the plain painting and glazing. Reference required.—Address, Mr. HANSON, Southall, Middlesex.

WANTED, a young Man, about 25, under a Surveyor, in a Builder's Office in London. He must be able to draw plans and to have some knowledge of materials and the management of men. The son of a country builder would be preferred. Salary, 150, a year.—Apply, by letter only, to C. A. 10, Eldon-road, Kennington, W.

TO JOINERS AND CARPENTERS. WANTED, an experienced Man, as LEADING HAND in a SHOP, ten or twelve miles from London. He must be a good tradesman, able to set out, and be steady, steady and attentive. Wages about 1s. Also ONE or TWO good BENCH HANDS. Permanency to suitable hands.—Address, No. 808, Office of "The Builder."

WANTED, a thoroughly qualified BUILDERS' FOREMAN, to undertake the entire management of a country branch. He must be competent to prepare plans and estimates, and manage the work of the branch. Good testimonials.—Address, W. WIGMORE, Bricklayer, Horse and Walham Green.

GLASS WRITERS and EMBOSSERS.—TWO good PENCIL HANDS WANTED.—W. GIBBS, Be-yar-arch, Blackfriars-road.

UPHOLSTERERS' CLERK WANTED with experience and ability.—Glate full particulars, age, salary and former occupation, by letter, A. B. C. Odell & Sons, Finsbury-square, London, E.C.

WANTED, EMPLOYMENT, by a steady middle-aged Man. Understands PAINTING and GLAZING. Distance no object. Wages, 15, per week.—Address, A. Z. 2, White-street, New Hampton, Middlesex.

WANTED, an ENGAGEMENT as SHOP or GENERAL FOREMAN.—Address, T. G. Baynes-road, Coldbath-square, W.C.

TO BUILDERS. WANTED, a RE-ENGAGEMENT, of a GENERAL FOREMAN.—Address, A. B. 3, Hope-cottage, Clarendon-road, Hammersmith, W.

TO ARCHITECTS. WANTED, a RE-ENGAGEMENT, by an ASSISTANT. Good references will be given.—Address, No. 3, Post-office, Upper Baker-street, W.

TO BUILDERS AND CONTRACTORS. WANTED, a RE-ENGAGEMENT, of a GENERAL FOREMAN. Twenty years' experience in estimating works. First-class references.—Address, 788, Office of "The Builder."

WANTED, a RE-ENGAGEMENT, of a GENERAL or SHOP FOREMAN. Many years with London firm. First-class references.—Address, H. P. 78, Bird-street, Barnsbury, N.

WANTED, a RE-ENGAGEMENT, of a CLERK of some OUT-DOOR FOREMAN, thoroughly practical Man. Middle age, Joiner by trade. No objection to the country.—Address, A. S. No. 7, Alinger-road, Clapham, S.W.

TO BUILDERS, DECORATORS, &c. WANTED, a RE-ENGAGEMENT, of a FOREMAN or DECORATOR, by a thoroughly practical Man, well up in all the branches of the trade. First-class testimonials.—Address, C. B. 2, Acton-street, Grosvenor, W.C.

TO BUILDERS AND CONTRACTORS. WANTED, a RE-ENGAGEMENT, of a GENERAL FOREMAN. Town or country. CARPENTER and JOINER by trade. Well up in all branches of the Building trade. First-class references.—Address, K. A. Miles-terrace, Blandford-square, S.W.

TO BUILDERS, CONTRACTORS, AND OTHERS. WANTED, a RE-ENGAGEMENT, of a GOOD JOINER, OVER twenty years' experience in London, Sashes and Frames, Boxed Shutters, or any other description of Joiners' Work, by the Piece, or otherwise, at Moderate Price. Can give good references from leading firms as to Ability. Town or country.—Address, F. B. 62, Dagmar-road, West Green, Tottenham, N.

WANTED, a SITUATION, as SHOP FOREMAN or FOREMAN of JOB Carpenter by trade. Good references.—Address, Y. Z. 180, Liverpool-road, N.

WANTED, a SITUATION as PLUMBER. Good reference if required.—Address, C. H. 2, Carlton-mews, Carlton-road, Kilburn.

TO BUILDERS, PLUMBERS, AND OTHERS. WANTED, a SITUATION, by a first-class PLUMBER, GAS-FITTER, HOT-WATER-FITTER. Has no objection to fill up time in painting or glazing.—Address, H. H. No. 6, Fend-terrace, Leader-street, Chelsea, S.W.

TO BUILDERS. WANTED, a SITUATION, by a first-rate CLERK, of many years' experience. Well up in estimating. Age 38. Salary, 3, per week.—Address, A. C. 10, Bruce-road, Devonport, Brixley-by-Sea, E.

TO BUILDERS AND IRONFOUNDERS. WANTED, a SITUATION as CLERK. 7 years' experience in one of the first houses in the iron trade, and 5 years' previous in the black trade. Age 30 years. First-class reference as to ability, &c.—Address, H. 3, 400, Colindale-road, N.

TO PLUMBERS AND BUILDERS. WANTED, a SITUATION or JOB, by an experienced PLUMBER and GAS-FITTER, willing to take placework. Well up in painting and glazing. W. B. 21, Church-leigh-street, Albany-road, Camberwell.

WANTED, a SITUATION, by a thoroughly experienced PLUMBER. Has just finished a large job in the country. Understands both water and bath fitting, plain ironwork, and is required to fill up time painting or glazing.—Address, PLUMBER, No. 26, St. John-street, Midland Park, Kilburn.

TO PLUMBERS, BUILDERS, &c. WANTED, a SITUATION or JOB, by a thorough PLUMBER, a SITUATION or JOB. Take work wherever.—Address, PLUMBER, No. 1, Mallinson-road, Battersea-rise.

TO BUILDERS AND OTHERS. WANTED, by a young Man, aged 23, a SITUATION, as JUNIOR CLERK, in the office of an architect, or as Time or Store Keeper. Six years in last situation.—Apply to ALPHEA, 18, Clayton-street, Kennington Oval, S.E.

WANTED, by a young Man, aged 19, a SITUATION as IMPROVER, as CARPENTER and JOINER. Has had six years' experience.—Address, J. B. 83, Middle-valle, W.

TO ENGINEERS, BUILDERS, &c. WANTED, by a young Man, a SITUATION, as FOREMAN CLERK of WORKS, &c. Has had considerable experience in the management of works and machinery. Address, K. G. 4, Mr. Scripps's Advertising Agent, South Molton-street, W.

WANTED, by a respectable Man, a SITUATION, or a JOB, as a good practical PLUMBER, Painter, and Lead-liner. Thoroughly understands all kinds of pump, cistern, or brass work, every description. Old or new. Good testimonials given. Wages moderate.—Address, J. A. 240, Edgware-road, W.

WANTED, by a practical Man (Carpenter by trade), a SITUATION as OUT-DOOR FOREMAN, who has had the management of some large jobs. Good references.—Address, H. B. 26, Glyn-street, Vauxhall-gardens, Lambeth.

TO BUILDERS, SLATE MERCHANTS, and QUARRY OWNERS. WANTED, by a practical Man, a RE-ENGAGEMENT as QUARRY MANAGER or Foreman of Maons. Has a thorough knowledge of drawings and machinery for working or quarrying stone of all kinds. Good testimonials.—Address, S. care of Mr. Garrett, Higher Belsham, by Birkhead, Cheshire.

The Builder.

VOL. XXX.—No. 1555.

The City of Cities.

VERY one who has visited Rome, or has longed to do so, will find pleasure in M. Wey's handsome work, with its 345 engravings and good map, on that city of cities (the Urbs, the old Romans phrased it), just now published.* Though not written specially for the architect or antiquary, M. Wey's appreciating and discerning admiration for the remains of the ancient world and of the Middle Ages, leads him to give almost every particular that either can desire; while his quick observation of all

things belonging to every-day life and to-day gives his remarks and descriptions a general and living interest. Those who have only studied the works of antiquaries before they visit Rome are notoriously disappointed with the real aspect of the city when they see it for themselves. With their minds full of an anticipation of the surpassing tranquillity of the ruins of the old world they are not prepared for the moan streets, the ill-kept courts, the poor shops, the ragged people, the cooking of brocoli in large cauldrons at the corners of the streets for their consumption, the black mud under foot, the frequent *immondissain*, and the terrible smells in the air. If they think of a beggar, it is of Belisarius. If they think of eating and drinking at all, it is of the old Roman banquets, beginning ceremoniously with eggs, and ending with apples. "*Ab ovo ad mala*," they say to themselves. If they have thought of Roman costumes, and are not artists already bewitched with the dress of the Italian peasantry, they picture to themselves the *toga alba*, chalked to increase the whiteness thereof; the *toga pretesta*, guarded about with purple silk; the *paludamentum*, enriched with scarlet and gold lace; and the *toga picta*, embroidered with needlework. If they have brought themselves to think of Rome otherwise than as the silent site of the successive structural works of the kings, the republic, and the emperors, in fine, their expectations are filled in with the results of classic learning, or of Byronic sentimentalism. M. Wey will change all this.

Advised to leave Florence, on account of the state of his health, he tells us, he arrived, one misty night, at the Roman railway terminus. A friend was awaiting him, who first despatched his luggage to his house, and then conducted him to a dirty *trattoria*, in a mean-looking street, to partake of supper. He concluded from this first hasty introduction to Rome that he was in a small tavern in a remote and deserted suburb, and was astonished when his friend informed him he was in one of the principal quarters, that he had crossed the end of the Piazza di Spagna, and snpped at the renowned *restaurateur's* of the Via de' Condotti. This is the key-note of M. Wey's

hook. To see Rome aright, you must grow to it,—you must rise to it. The first beggar you meet will not be Belisarius; the first banquet of which you partake may have neither egg nor apple in it; the first costume you notice may be that of a snuffy cleric, supplemented by a yellowish umbrella: but, if you stay long enough, there will come to you a realisation of your highest anticipations, your rarest imaginings,—a perception, in a word, of all the majesty, pathos, and poetry of the city.

A distrust of Rome and its ascendancy over thought, opinion, and doctrine, and a fear lest he might lose instead of gain by his visit, were in M. Wey's heart when he sallied forth on the morrow after his arrival. He saw some muddy streets without footways; some mean arched shops, with narrow doorways, which reminded him of La Châtre and Dinan; dilapidated walls; here and there a church among the houses, with a shabby modern façade; and people full of animation and babble,—the women, noticeably, in rags, with their hair elaborately dressed. He came upon an ill-kept court, in which there was a large building, with a tolerably new look about it, and a portico crowded with soldiers. This was the palace of the Barberini. He turned from this to an open, irregular, unpaved space close by, thoroughly disappointed and disenchanted, and seeing a poor alley of squat trees, a seventeenth-century church, and a mission-cross on a pedestal, flanked by four boundary-stones, could scarcely realise that he was not in Vannes or at Brive, where the lamps had creaked as they swang to and fro in precisely the same manner, and the rain had fallen as drearily, in some old experience. He found his way to the Corso. "Another deception!" he exclaimed. For all that he could see, besides the narrow road, with its poor footways, and the number of small shops, where wares of no great value were exposed for sale, he might as well be in Paris, in the Rue Neuvo des Petits Champs. There was a tall shaft of white marble, to be sure, but it made scarcely the smallest impression upon him, though he found afterwards it was the Antonine pillar. However, whilst he was still seeing objects that reminded him only of the smaller French towns, a passer-by uttered a joyful exclamation of recognition. This proved to be a French abbé, whom he had known in Florence, and who had resided in Rome for fifteen years. After they had embraced in the middle of the gutter, they made their way to a *café* to breakfast together.

"I shall take you straight to St. Peter's," said the abbé, whom M. Wey describes as being Pliny, Vitruvius, Ammianus Marcellinus, and Vasari, all resuscitated and incorporated in one genial being. They set out, passing an interminable row of streets of wretched and repulsive aspect; but as they walked the abbé filled the dingy places with bright names. "Where those two lanes divide, is the Albergo del Orso, where Montaigne lodged," he remarked, whilst his companion was absolutely laughing at the ugliness around. "Nothing changes in Rome," he added; "and the market people put up their wagons under that gateway, where the Bordelais gentleman dismounted with his suite." And so on, with a hundred distracting names and a hundred souvenirs, past the bridge of San Angelo, with Hadrian's mausoleum crowning it, to the end of the Borgo Nuovo, where, from the bottom of the Piazza Rusticucci, the façade of St. Peter's was in sight. "This was the great deception of the day," writes M. Wey. He had hoped that his strong expectation of not being surprised would have helped him to some new impressions as he looked upon it, but as he drew nearer and nearer, he only seemed to be gazing at a building that must have been erected after the engravings were made with which he was so familiar. There was a cold grey sky. The pale columns of Borini, as he advanced, seemed to

fold in a cold grey circle behind him, and form, with the portal, a sort of scorpion with a double tail. The immensity of the proportions did not strike him. He noticed that the open space was well paved, and that a carriage drew up at the foot of the great steps which looked curiously small, and that two or three ants got out of it. But all seemed to him commonplace, or, as he phrased it, "an abuse of the permission to pile stone on stone for the amusement of the eye." Nothing stirred him, till the abbé whispered, "that small, low roof on that corner of hure wall yonder, is the roof of the Sixtine Chapel."

He resolved not to enter the church while in this state of mind. His friend drew him close to the portico, and told him to measure with his arms the dimensions of the columns and their flutings. On complying, and realising their enormous size, he hurried out, "Come away,"—overwhelmed and discouraged,—"come away: I have no longer any occasion to seek the origin of our decline of the last two centuries; from Louis XIII. to Thermidor, all is there, down to the endive wreaths of our Pantheon Ste. Geneviève." But his companion would not hedge. He assured him that the more he studied the building the more unforeseen revelations he would find in it; all its faults were on its surface; and once seen, which they were at the first glance, they would oppress him no more; and by degrees a surprise, which would develop into wondrous admiration, would take possession of his soul. "As soon as you can appreciate St. Peter's you will have taken a great step," he added.

However, they turned away without entering the church, to allow the abbé to attend a reception of a cardinal, and, after this little ceremony was over, they made their way to the Pantheon. Then M. Wey's ice began to thaw. The alleys, which were so repulsive and disappointing before, now began to bring before his eyes an ideal of the Latin country. He passed under vaults which rested on ruins of the Lower Empire, and here ruins above them. He perceived that the habits of the people reproduced the past; he called to mind that it was usual to buy victuals cooked at stalls and sauces for them elsewhere in ancient times; he noted that the common brown earthenware vessels were shaped like amphora; that the shops contained wares such as were not sold in any other place within a century; that their owners exhibited a careless indolence, and were as regardless of customers as if they did not require any; that the people began to appear "gay and sympathetic shadows"; that he began to forget chronological exactness. Whilst the past was thus making itself felt, his companion, without warning, took him into the Forum and pointed out spots associated with the memories of Cicero, Pompey and Cæsar, Virginius and Nero, and straightway there resounded in his breast, he tells us, the salvo of great names and great deeds, suddenly fired by all the cannons of history. "I reckon here," he continues, "one of the three most overwhelming commotions that a spectacle ever gave me. The two others are: the first sight of the Alpine glaciers, 4,000 ft. above the Lake of Geneva; and my arrival one evening, by the arcades at the bottom, at the Piazza of St. Mark at Venice." He was entranced with the spectres of temples, the indications of vanished basilicas, the old footways losing themselves in ruins, and, apparently, most of all, as it stood spread out at the back of a white portal on a ground of purple mountain, with the Coliseum. There were blue shadows falling from this, he avers, and the circumference shone with the furnished gold of the sun and of the ages. But the abbé hurried him away to receive one more impression before the close of the day. They crossed the Tiber, came to the Trastevere, saw, in passing, the old bakery where Raffaele's

* Rome. By Francis Wey. London: Chapman & Hall. 1872.

Formarina lived, climbed the Janiculum, and entered the Church of San Pietro in Monte, built near the site of the Apostle's Crucifixion. "We will repose by looking at this church, here, and its little convent, which our soldiers share very fraternally with the good Capucins," said the abbé; "you will see them, snuff-box in hand, performing friendly offices with unwearied profusion for all those military noses." And then, when they had rested and the right time had come for the proper light, he led the way out upon the terrace. We will quote M. Wey:—

"To describe what meets one on this terrace, from which Montaigne three centuries ago threw his eye over a noble winter prospect (26th of January), one would have to introduce into the description the abridgment of Roman history. Rome is only a foreground of the picture; for the view extends towards the north over the plains reaching as far as the Apennines, whence once rushed down Equi, Sabini, Hernici. Towards the south-east, at the foot of the Alban mountains, it embraces those plains of the old Latium which open out by the country of the Rutuli on the swamps of the Volsci. The sun ready to set behind us in the Tyrrhene sea, inflamed with its crimson purple the domes, towers, and pinnacles, the façades of palaces and ruins, as well as the volcanic mounds scattered at the foot of the chains and over the plateaux: a few peaks silvered with early snow crowned the violet Apennines with a pyramid of rose colour, where brighter lines marked here and there a hamlet perched high. Between these two extreme points, the blue-tinted mountains, the city glowing and ruddy in the midst of the bronze zone of its Byzantine walls, lay stretched before us, a mixture of verdure and russet outlines, the country crossed by aqueducts, covered with ancient villas, and pierced by long roads of old renown, marked out and lined with tombs. The yellow Tiber, *Janus*, as Horace called it, winds at your feet like a tract of sand; going up towards the horizon it melts, on one side in the azure of the sky, on the other in the fires of the setting sun."

After gazing at this splendid scene till the light fell, he turned to the abbé and cried in sincere distress, "Do you know, I am undone? Never shall I have the courage to quit Rome and give up the sight of all this." His friend replied, with the modesty proper to a victor, "Come, there are three months gained in a single hour. You will now have to wander at your will, to traverse the whole pell-mell, to acclimatise yourself without fatigue; and after five or six weeks of such a life as that, thanks to so fortunate a preparation, we shall then be in a state to begin to see Rome."

From this point the author falls into the hack-ground. As he describes the famous sites and the grand buildings, he remains comparatively out of sight, not, however, "like a bird singing unseen in a sacred wood," as he puts it, but rather as his own abbé, only stepping before us, occasionally, to show the way. For forty days he went hither and thither, from church to baths, from basilicas to museums, seeing too many new things in succession to retain more than confused memories of them towards night, before he settled to his work and began to make the numerous notes that we feel bound to praise to our readers, as being more suggestive, more sparkling with effects, more satisfying, in a word, than the work of ordinary guides. He returned again and again to the Forum, Coliseum, and Pantheon; but we prefer, for the reason that we are enabled to reproduce his view of it* (thus showing how the book is illustrated), to follow him, now, to the Church of St. Paul, *extra muros*.

This edifice, we need scarcely inform the majority of our readers, is one of the seven major basilicas. It is also one of the five patriarchal basilicas classed apart to represent the bishoprics in all parts of the world over which the Pope has sovereignty. Thus, St. Peter of the Vatican represents the church of Constantinople; St. Lawrence, *extra muros*, is the church of the patriarchate of Jerusalem; St. Maria Maggiore is the church of Antioch; St. John Lateran is the chief seat of the Western church; and St. Paul, *extra muros*, represents the church of Alexandria. St. Paul's has further the especial privilege of possessing one of the four holy doors, kept closed up, to be opened only at certain jubilees at the stroke of a golden hammer by the Sovereign-Pontiff. And over and above, it is built over the last resting-place of St. Paul. Thus it is that though burnt down in 1823, from the carelessness of plumbers, and though situated at a league's distance without the walls, it has been deemed imperative to rebuild the edifice with great richness, at an enormous cost. All the world joined in the task. M. Wey reminds us. "Schismatical Russia offered the gift of an altar of malachite; Mahomet brought as tribute to the sanctuaries of Christ four columns of Oriental alabaster, presented by the Sultan; gold, silver, and jewels flowed in from every side. Hence the porticoes

of veined Greek marble; the pilasters taken from the quartz of the Simplic; the walls, of Carrara, framed with gems of varied hues; the entablature of Paros with its varied frieze; the enormous capitals, so lavish in size, so delicate in execution." The general effect of all this richness is that of a colossal reliquary, he adds, but it does not satisfy the mind, which, after being lost in astonishment for a few minutes, begins to seek out, as consolation for the poverty of design, or "of existing artists," every vestige, however insignificant, of the primitive basilica. The mosaic of the apse, representing Christ with Apostles, is ancient, though retouched. At the arch, named after the daughter of Theodosius, which divides the nave from the transept, there is a sixteenth-century mosaic, showing Jesus and the Twenty-four Old Men of the Apocalypse. There is also a ninth-century white marble candelabrum, 12 ft. high, sculptured with figures representing scenes from the Passion. The thirteenth-century altar was saved, and has been put back again. But the most popular piece of antiquity, perhaps, still preserved, is the famous crucifix that spoke to St. Bridget, wrought by the "most mystic" of the pupils of Giotto, Cavellini. The thirteenth-century cloister was not destroyed; and this is considered a work only equalled by that of St. John Lateran. Only students of Gothic architecture, who find in Roman masterpieces, on their first introduction to them, more wonders that are dispiritingly foreign to their sympathies, can describe the admiration this cloister evokes or the consolation it gives.

When he visits the Church of St. John Lateran, M. Wey brings forward various historical particulars relating to it, so that his readers have no occasion to look elsewhere for the reason that this edifice is called *Mater et caput ecclesiarum urbis et orbis*. He reminds them how Plautius Lateranus was oxiled for being one of Messalina's lovers, and subsequently put to death by Nero for having taken part in a conspiracy, when his domain was confiscated; how Constantine gave a portion of the enclosure of his palace, which included this domain, for a church and residence for the Christian bishops; how this primitive church was so gorgeously enriched that it was called the Golden Basilica; how St. Sylvester consecrated it to the Saviour; Lucius II. dedicated it to the two Saints John; and how it has always retained the name of the original owner of the site, and remained the cathedral of Rome. "At St. Peter's of the Vatican," he explains, "the pope is the spiritual sovereign of the world; at St. John Lateran he is bishop." The first church lasted ten centuries before it was burnt down. After 1308, the date of the fire, it was gradually rebuilt by the successive popes. In the cloisters of this famous building the rich arcades rest on pillars of varied outline, some cylindrical, some fluted, and others twisted, in different combinations, and are surmounted with mosaic work and a double cornice. Within the quadrangle is a well with a circular enclosure of sixth-century workmanship. Two columns, one on either side, support an entablature, from which depends the appliance used for lowering the bucket. We give, as another example of the admirably-executed wood-engravings with which the book is illustrated, a view of this well in the cloister court of St. John Lateran.* Our readers may believe our author when he says "this cloister is one of the most delicious erections in Rome or in the world."

The recent archaeological discoveries, including the traces of the barrack of the Vigiles of the Seventh Cohort, the frescoes of the crypt of St. Clement, the paintings of the house of Livin and others, made by Pietro Rosa, on the Palatine Hill, are carefully described; moreover, M. Wey falls in, now and then, with facts hitherto not noticed, and objects which other writers have not mentioned. Mixed up with all his studies, always, are notes upon the men and manners around. When he is describing the Arch of Titus, he has a word for the angry old Jewess who shouted to a disobedient child dying before her in the direction of it, not to pass under that "accursed arch." When he has paid a late visit to a lonely site, such as the Coliseum, he tells us the current stories of nocturnal amusements and rolhery, and relates his own detention, on his way home, when near the Piazza Barberini, by a man who had been following him for some time, who, after an allusion to his pride, dignity, and clouded fortunes, begged an old pair of trousers. The artists, the scholars, a retired

brigand turned guide, who sends messages of respect to the abbé whom he formerly waylaid; a fisherman on the watch before his grotto; a harber shaving peasants in the street; the market-people; players at bowls, in green arhous in rural taverns, and countless other characters, all figure in his pages as well as accounts of the great festivals and other observances, details of the pictures of the great masters, the mosaics of the early Church, landscapes, and the monuments of ancient and modern times. "Rome is a world," he tells us. "Whatever has possessed greatness in the West,—art, religion, history,—has left its traces in this city." Again, "Rome is the museum of all the ages. Above erudition, above scrupulous accuracy and the best conducted researches, what ought to rule here is the love of what Rome has loved. She has preserved her greatness in the world by the passion she declared for all that is beautiful;" and all that goes to make up Rome, modern and ancient,—all that tends to recall memories of life there, or is likely to help those who are strangers to the great city to imagine its nature,—finds a place upon his page. There is more than usual freshness for English readers from the fact, that when he draws upon literature for a reference, it is upon French literature instead of English. In the department of illustrations he has been so fortunate as to secure very worthy assistance. Henri Regnault, whose heroic death may be fresh in remembrance, furnished the only designs he ever made on wood to this work.

Not till he has touched upon most of the objects we have enumerated does M. Wey approach the Vatican, which he calls an assemblage of palaces belonging to all the ages. On that first day in which the abbé took him to St. Peter's, he saw the Loggia of Raffaele from where he stood with him, and they gave him the impression of a cage, because they were glazed in by the direction of Cardinal Antonelli, to prevent their further decay; and he is never able to get over this innovation, which, he more deliberately declared when he visited them, gave them the appearance of a greenhouse or clock-factory. He declares, too, that the preservation aimed at has not been assisted; for in summer these galleries are turned into a furnace, which is far more perilous to the paintings than the wind; but if he had seen the decorations before they were restored by Mantovani, he would probably have formed a different opinion as to the propriety of this protection. Of course, he does not take us through the 11,000 chambers he was told the Vatican contained, nor up its 208 staircases, nor even into its twenty courts; but he shows the residences of the pope and Cardinal Antonelli in it, and all the leading art wonders of the place, as well as some of the less-visited works. One day he had an opportunity of seeing the Borgia chambers, with their paintings by Pinturicchio, of which no engravings have yet been made. Another day he lagged behind the guardian of the Museum of Benedict XIV., and caught sight, under a glass case, of the ancient bronze medallion showing the profiles of St. Peter and St. Paul. He saw, in the Etruscan Museum, among sarcophagi, geni, urns, and vases, a complete biga, or two-wheeled car, of wood, covered with copper, with the nave of the wheels adorned with Cynocephali. He finds many glowing words to describe the library, which is also shown by an illustration. Not a volume is to be seen in it, although there are more than 25,000. All are under cover of low, shut, and gilded presses or cabinets, illuminated by fresh colouring. Seven pillars divide the hall into two aisles, 220 ft. long, and this perspective is one mass of decorations, illuminations, frescoes, gilding, vases, and various gifts from sovereigns, glittering like a lantern of colours and images. "Have patience," remarks M. Wey; "you will see a line of 794 metres of paintings." You will not, however, see the rare Armenian, Coptic, Hebrew, Persian, Arabian, or other MSS., unless you are armed with very adequate authority, as they are rigorously guarded. The vigilance is so severe and the restrictions are so numerous, that M. Wey came to the conclusion that an exploration of these virgin forests of erudition and curiosities would absorb the lifetime of a Methuselah.

From the sculpture-galleries, our author gives several illustrations. Among others, he pictures the Aridne, formerly supposed to be Cleopatra; the Meander in the Pio-Clementine gallery; a group of an attack upon a stag, in the hall of animals, before which he has seen American

* See p. 925.

* See p. 924.

and Swiss forget the hours; the Persens of Canova; the famous torso of the Belvedere; the Augustus and the Demosthenes in the Braccio Nuovo; a sarcophagus with Bacchantes, among others. He dwells, too, with great satisfaction, upon the superiority of museums built for museums, and not made out of an abandoned monastery or church. Raphael Stern knew what he was about, he points out admiringly, when he constructed the Braccio Nuovo. He knew there were forty-three important statues to be housed. So he divided his gallery into twenty-eight niches, and the apse into fifteen more, thus contriving a niche for each statue; and before each pilaster between the arches he placed a pillar of red granite to hold a bust; consoles at the intersections of the arches to support busts; and between the frieze and the keys of the arches he set bas-reliefs. There is an engraving of this hall.

The Sixtine Chapel also awakened his most vivid enthusiasm. He leaves scarcely a feature of it undescribed by pen and pencil. The altar, with its great altar-piece of the Last Judgment, a portion of the ceiling, several details from the ceiling, the entrance, the Swiss guards, are illustrated by the pencil; and he gives besides a sketch of the grand ceremonial he saw in it, in which the Pope officiated. The gardens, too, of the Vatican are shown by the pencil as well as the pen, and their cypress-shaded solitudes made enjoyable. As every one must do who proposes to see more than a very limited number of the galleries, M. Wey passed several days in the Vatican. The Camera della Signatura, sacred to Raffaele, detains him long, for here he remains at the conclusion of his work, in a rapture of admiration, gratitude, and exhortation, crying,—

"Are not these galleries the most ancient, the most splendid of the public museums of Europe, and are not all bound to gratitude for the examples given by the sovereign possessor in these national collections of which they are now so justly proud? What the Vatican is for the things of the spirit, I will say in a word or two, while leaving its precincts you may remark at the present springs the teaching of divine and human letters; sculpture and painting, arts ancient as well as modern, revealed by the most perfect models."

He has forgotten the muddy streets; the ill-kept courts; the brocoli cauldrons; the little arched shops, that reminded him only of La Châtre and Brian; the stunted trees and poor appearance of the Piazza Barberini, that made him uncertain whether he was at Vannes or Brive; the terrible smells; the dirt-chaps; the babbling people and their rags. You have no concern with Rome, he says, obviously, unless you recognise two sentiments in yourself,—love of the beautiful, and respect for what is great.

But he has produced a beautiful book, which will give pleasure to every one who turns or reads its pages with understanding.

FIRE-PROOF CONSTRUCTION AND THE FIRE IN THAMES-STREET.

AMID the changes which are so perpetually going on in the *fine art* of architecture, and while "style" is ever on the move,—what was fashionable yesterday being out of date to-morrow,—there is always one thing in architecture which remains,—the very foundation of it,—construction. Whatever the "style" may be of the architecture, it must be put together to form a building, no matter for what purpose: it must be constructed. Stonehenge is constructed, and so is that latest of building inventions, the corrugated iron roof, which now does such multifarious duty, from the covering over a mortar-making-and-mixing machine to the huge space occupied by a central railway station. But, without going at present into any general talk on the subject of common architectural construction, we would say a few words on what is called "fire-proof construction," if, indeed, as we have before now remarked, there really be any such thing. Having seen the building in Upper Thames-street, and having known it as well before the burning, a few remarks on this particular building, and on fire-proof construction generally, will be useful to many readers who may not have seen it, and to whom the subject is somewhat new. For this purpose, we can hardly do better than shortly describe, from personal observation, this so-called fire-proof building, and what the fire did with it.

In the first place, we must notice that this structure was remarkable, not only for hugeness, to which, on its erection, we took grave objection, as obstructing and marring the view of

St. Paul's from Blackfriars Bridge, but for plainness. It was of no style of antique architecture, that is certain. It was a simple mass of "construction," and usefulness. In point of position, it stood as well as building ever did stand; and those who are curious in such comparisons may well pause a moment to compare this Thames "ornament" with the delightful architecture which the unimproved old Venetians contrived to ornament the banks of their sea and canals with. Let any reader who feels sure that everything is progressing compare the two things, while the walls of this huge warehouse yet stand. It was made up simply of four tall straight walls, like a great packing-case, 65 ft. broad and 250 ft. deep, with a long creek or draw-dock on one side of it, with some really picturesque surroundings. It was about 80 ft. in height, and contained no less than seven stories or floors, for the storing of grain and flour, and for the necessary grinding and other machinery. It was built in 1852, by Mr. James Ponsford, the builder of many mansions in Tyburnia. Altogether a somewhat remarkable structure,—a mere building, without architectural detail of any kind, and what is, perhaps, more suggestive, without *outline* of any artistic power, so that its huge dimensions simply enlarged its unskillfulness,—a huge, ungainly lump of a building! But it was fireproof,—fireproof until the fire seized it!

It seemed impossible to conceive how such a building as this could have been set fire to, supposing any one had tried to do it. There really seemed—and we knew it well,—nothing in it as a building, or even in its contents, that could burn, or he set fire to. The four walls were of solid brickwork, the floors of slate, and stone supported by iron girders and columns. The window-frames of the 400 windows which the building contained were of iron. The whole of the machinery was iron, and the quantity of wood or timber in the place was so very small as to be altogether unnoticeable. Flour and corn in stout sacks will hardly burn, but only smoulder away at a red heat; and piles of sacks themselves will scarcely ignite into flame. It would be impossible to find in all London a building apparently more unlikely to fire itself, and burn itself clean out. There seemed to be, as we have said, nothing to burn, or that could burn. But nevertheless it did burn, and that most completely, like loose wood in a common grate. It may be interesting to observe here that the late Mr. Braidwood, the clever and brave Superintendent of the Fire Brigade, expressed his opinion that this special building, if but once it did catch fire, would burn itself clean out, and that no part of it would or could be spared. And we now see that he was right. Now, how is this, and what is or can be a "fire-proof" building? Mr. Braidwood's idea was that the entire absence of party walls in the structure left the whole of it open to the action of fire if but once it seized any portion, however small of it. No doubt he was right as far as his idea of it went; for there can be no question that had this building been divided into small square apartments, or boxes, of brickwork and iron, with iron floors and iron roofs, with iron doors, kept shut, from one apartment into another, a fire occurring in one of them, however fierce, could not well have penetrated into the one next to it. And even if the floors and ceilings had been of wood, the fire might have been got under with comparative ease, from the time it must have taken necessarily to spread. It must, therefore, be evident that it is not so much the materials of which a building is composed, or even the contents of it, however combustible, that makes fire so certainly destructive, as the form and disposition of such materials. The plan and arrangement of the building, indeed, it is which makes it fire-proof,—at all events up to a certain point. Thus a structure, as a large warehouse, even if filled with the most combustible of materials and goods, may be made almost, if not quite, fire-proof, as a whole, if it be divided into separate sections or rooms, with partition walls dividing one from another, if of incombustible material, as is brickwork, i.e., good and well put together brickwork. We do not pretend to be able to account with certainty for the origin or progress of this great fire, but knowing something of the building constructionally, and of its contents, we may perhaps be allowed to theorise a little on it. There is really, after all, but little mystery about the completeness of destruction; for any one must have observed the power of heat and flame to spread itself, and to grow more and more intense, as it spreads

and increases in fierceness. It is quite certain that this fire began in one spot, probably at first from a single spark.

But a very slight draught, as through a broken window-pane favourably situated, would soon blow this spark into a small fire, no bigger than that in a common grate. This would spread, and the spreading and gathering fresh and fresh material, although so incombustible as flour and closely-packed corn and piles of flour-sacks, would go on just in the same way as the fire spreads in a brick-kiln. It is only necessary that the draught of air be enough and rightly placed. In this building there were no less than 400 windows or holes for letting in the air-currents; and, as we happen to know, most of those were broken, so that the whole interior of the building was as one vast accumulation of slowly combustible material,—indeed, just the same as cinders in a brick kiln, with the fire-supporting air rushing in from all points. Nothing could be better contrived indeed for the purpose. It was a vast furnace, with the stove-holes just sufficiently open, and no more. This was accidental, of course, but it was complete. This being so, and we can hardly doubt it, the low red heat, as it accumulated and spread and increased in strength, soon intensified itself into a white heat, in which, as all know, almost anything will burn, and even break out into flame.

Corn, flour, sacking,—indeed, everything but slate and bricks,—will burn in such intense heat. There being no dividing walls, the whole mass of matter in the building fell a prey to the vivid heat, just as Mr. Braidwood prophesied it would do. Into the wonderful nature of heat it is vain to go: why it should seize on one substance and not on another, is among the profound mysteries of nature. Advanced chemistry can tell us nothing about it: it can but point to plain facts which everybody can see, but into the causes and essence of the matter no philosopher has as yet got a glimpse! Iron itself, as the chemist knows, will burn as readily as wooden matches if the heat be but strong enough or sufficiently intense, so that but few substances in ordinary use can be said truly to be absolutely incombustible. We have seen even cast-iron girders partially melted in the fire of an ordinary warehouse.

How, therefore, and it is still a question, ought a large building to be planned and constructed, so as to provide in the best possible way against the spread of that powerful force, *fire*,—so good a servant, but so terrible a master? Why simply to confine it. Mere fireproof, or incombustible material ordinarily so called, will not insure against fire, and certainly not against the spread of it. And not only to confine it in separated sections of a building, but to look well to the window openings, and to the broken panes of glass in them. In all human probability it was through a hole in a broken pane of glass that the wind blew this great fire into such vivid power. It was without doubt on a small mass of slowly combustible substance, like tinder, that the air, entering through a broken window-pane, of which there were so many, fanned some accidental spark, or may be heated corn, into a glowing mass of intensely-heated matter. And this could have been done, he observed, only,—it is well worth noting,—by the action of a powerful draught, induced by an opposite open or broken window. We hear so much of ventilation, and how best to ventilate rooms and public places, that it really seems wonderful that the very best and very simplest of means for the ventilating a room should ever be a mystery at all. Open the window of a room as wide as you will, and keep the door shut, and there will be but little ventilation, unless the wind blows right into the room, or the window stands, as the sailors say, right in the wind's eye. But open the door as well as the window, and the whole of the air in the room is totally changed in a few seconds, and if the wind be high, it is accomplished almost instantaneously. No one can stand for long in such a draught, or thorough ventilation. We cannot have everything all at once, and without any inconvenience, so that the providing the means of a thorough ventilation of such a building as this warehouse, provides at the same time for its thorough burning, if not well looked after. The opposite windows, nearly all of them more or less broken, must have ventilated those vast floors completely, but they allowed at the same time of the admission of powerful currents of air at all times, and where they were the least wanted, and were the most dangerous. Had there been shutters to these windows, or had

the broken glass been well looked to, and the windows on three of the open sides of the building closed at night, only opening them occasionally, to clear the air, this fire, perhaps, might never have occurred; or if it had, it might not have got the upper hand as it did. Or had there been a parting-wall running north to south, dividing the building into two parts, and so practically having window-openings on one side only, this disastrous fire might not have occurred. In the rebuilding, may not these thoughts be useful?

But, after all, considering the vast importance of this subject, and the doubts that evidently surround it, even in professional minds, would not a series of experiments, inaugurated, it may be, by one of our architectural societies, do infinite good? The theories as to what is "fireproof construction" are many enough; and nearly all the great fires that have recently occurred may be adduced to support some special remedy for existing evils; but, what certain test is there? What sort of material, for instance, is that, whether natural or artificial, which can protect stone, solid stone, from the action of heat,—white heat? Will plaster, a ½ in. thick, do it? The firemen, experienced men, will tell you, no. What will prevent iron from doubling up, or even melting, as we have seen it do in a great fire? It seems, indeed, almost impossible to hinder the progress and final destructiveness of a great fire when it has once got good hold of a large building. Everything goes before it; but, still we must contend that there would be infinite good done by a few judicious experiments. For our own part, if we may be allowed to express a definite opinion, we would infinitely rather trust ourselves in a house of the Wren build, with all its imperfections, than in one filled and fitted with every "patent" contrivance known to the modern builder. It is wonderful how long wood is in catching fire. There can be no manner of doubt that it is a much safer thing to trust oneself on a good wooden staircase, as every fireman knows, than on one of stone, with one end in the wall some 6 in. or so. In the good old construction there is much yet, if we mistake not, to be learned, even as regards fireproof construction.

POSITION OF ARCHITECTURE AND BUILDING FROM A SCOTTISH POINT OF VIEW.

At the opening meeting of the Edinburgh Architectural Association, the president, Mr. John Paterson, delivered the inaugural address, in commencing which he alluded to the call that had been made upon the profession at large to invent something to lessen the expense of warming domestic buildings, and generally to adapt scientific principles and apparatus to domestic wants; he afterwards continued:—
"The high price of building materials and labour is coming to be a matter of much concern, being the cause of some works being delayed or cut down, and others stopped altogether. How many have failed to reach the architect it is impossible to say. But this we know, that strikes and trade disputes are taking place every day. Contractors are insisting upon a strike clause being added to the conditions of every building contract. They say 'the knowledge of the insertion of such a clause has a tendency to prevent strikes on the part of the workmen, and enables builders to tender with more confidence for any contract.' I have also been told by engineers and bricklayers that some contracts were now taken on what might be termed the 'sliding scale;' that is, the prices of the contract are so adjusted as to rise and fall with the prices of material and labour. Now, the object of the strike clause and of contracts upon sliding principles is to transfer to the proprietors the benefit of any reduction or the burden of any rise in the wages or price of materials, instead of paying a margin upon the contract price sufficient to cover the whole risk of the contractor. In general the proprietors would prefer the price to be fixed, and the whole risk added to the estimates, rather than become partners with the contractor in the manner indicated. Contractors have the same privilege of making their conditions on a contract as the architect or proprietor; they do not need to take one unless they are pleased with it. As times and circumstances change, the same clause cannot apply in all cases, and any strike clause for extending time should be so worded as to limit the time for endurance, &c., and not to take effect in the case of any factitious or

unnecessary dispute. The wages in every class of labour connected with building have risen notably, and the working hours of all at the same time have been shortened. The masons of Edinburgh may be instanced, as they claim the credit of the short-time system of the nine-hours movement. Well, they have reduced their working time 15 per cent., and increased their labour is now 65 per cent. higher than the average rate before the movement began. Although some of the other departments may be more and some less, that may be taken as an average of the whole. As to materials, it may be remarked that those dependent on labour or coal to make or bring them to hand have risen highest in price. Bricks and iron are up 100 per cent.; lime, 35 per cent.; rubble stone, 33 per cent.; cubic stone, 50 per cent.; ashlar, 25 per cent.; and rybats, 12 per cent.; glass, 25 per cent.; joinery work and ironmongery from 10 to 35 per cent. The high price of coals has already seriously affected the coal trade, so much so that the advisers of the miners are getting alarmed at the condition of things. They now see that they have carried matters too far, and wish to abolish strikes and to settle trade disputes by arbitration. It is to be deeply regretted that they have drifted so long on the stormy sea of strikes, before discovering the hopeful channel of arbitration which leadeth to the calm waters of contentment. It is to be feared the present high prices will have a similar effect in destroying the building trade, and driving off investors. But before this is accomplished, to any serious extent, it is to be hoped that the men will learn wisdom, and, instead of striking, take to arbitration. It is to our advantage, as acting for our employers and our own behoof, to do what we can to promote a conciliatory spirit between masters and men; to impress upon them that our advantages are all bound up together; that if building ceases, we are partners in the consequences. The effect of high-priced labour will be, for a time, to separate architecture from building. Necessity may demand the constructive part of buildings at any price, or at any time, independent of the price of labour or materials. But in these urgent cases the necessitous people will be content with the most ordinary and unadorned form into which the rude materials can be converted to form a place of shelter and protection. Expensive labour will tend to retard the growth of architecture, properly so called, and introduce a "utility style," the grand object of which will be to produce buildings weatherproof and water-tight, minus architecture, but with as much rude grandeur as may be compatible with the scanty supply and high price of labour; and which will bring the workmen of the present to mere hewers of wood, and drawers of water in the future. I have considered it expedient to make these remarks in consequence of the unsatisfactory state of the building trade at the present time.

Mr. Paterson then proceeded to consider some matters which have interested the architectural world during the past year, especially noticing points which indicate progress, and mark the present period of architecture as one of progressive excellence and grasp. "Probably no event of interest in this country is more worthy of primary notice than the completion and uncovering to public view of the National Memorial to the late Prince Consort. The fertile imagination of the architect has here produced a design and conceived methods of construction, ornamentation, and decoration, which the country has now, after ten years' labour, seen realized, and which not only cause the Albert Memorial to be regarded as a success, but claim for it a position as the best or one of the best monumental art structures of the kind, produced in any country in modern times. It combines in its construction as singular and beautiful a variety of materials as it does in its architectural features and detail, the whole being gathered together and skilfully grouped into one harmonious and orderly combination."

The new Courts of Justice in London, the Manchester town-hall, and the Fettes College, Edinburgh, were alluded to; and he also took occasion to advert to the architecture of Cockburn-street, Edinburgh, disfigured as it is by "the great bald north wall of our municipal factory" [council chambers], which he contrasted with the splendid hôtels de ville of Belgium. The president went on to speak of the state of architecture on the Continent, which he had made his study during a recent tour. Referring to the cathedral of Cologne, he said,—
"I walked through the workmen's sheds, where

I was told that some 500 men were employed, building the stone towers and stone cutting, under Zwirner, the architect entrusted with the completion of the cathedral. Some of the stones which I saw in progress were large, and of the most complicated description of inter-sectional lines and curves, and adorned with rich and beautiful carving. The work was exceedingly well executed, and the mitreing beautifully done. The men worked hard and cheerfully, and sang at their work in beautiful harmony. The music was taken up from shed to shed in a style which forced one to believe that they were not only good masons, but capital musicians as well. Here was art aiding the art-workman. The fine art of music lending her charms to cheer honest labour."

In Amsterdam and Frankfort extensive restorations are in progress at the cathedrals. At Strasbourg the stonework and the stained-glass windows which were destroyed during the bombardment, are being rapidly restored; but there are two shot-holes through the roof of the north aisle, which, with much propriety, may be left as mementoes of the merciful escape made by the cathedral in comparison with the fate of the museum, the theatre, and other large buildings in the town. The synagogues at Amsterdam, Cologne, and Frankfort, are fair architectural examples, and evince the desire of the Jews to beautify and adorn their places of divine worship. In Amsterdam, the Church of Moses and Aaron has a classic exterior; but the synagogues at Cologne and Frankfort are of elaborate Byzantine architecture. The interiors are evidently designed and intended for elaborate decoration; indeed, at Cologne, the decoration and stained glass are magnificent.

The new synagogue at Frankfort, situated at the south end of the Jews' Quarter, called the "Cradle of the Rothschilds," is an imposing and interesting building, and when the interior decorations are completed, it will be well worth visiting. Indeed, tourists interested in architecture or decorative art should not miss a sight of the interiors of one or other of these buildings.

Here, too, in our native city, the movement begun some years since for the restoration of St. Giles's Cathedral has taken root, and the work has begun, and is being carried on in earnest. Let us wish the architect and the promoters all success in the work that is before them.

At the close of the address, Mr. James Ballantine moved, and Mr. H. Ross seconded a vote of thanks to Mr. Paterson. We understand that at the next meeting the competitive designs for the new cathedral will be discussed by this Association.

PROGRESS OF ARCHITECTURE IN IRELAND.

At the opening meeting of the Royal Institute of the Architects for Ireland, on the 21st instant, the president, Mr. J. H. Owen, in the course of his inaugural address, said a correspondent of one of the London journals, recently visiting Dublin, mentions in his communication that in former times the architecture of Dublin used to be justly commended as exhibited in its public buildings, such as the Bank, Custom-house, Post-office, and Four Courts, &c.; but that now alongside these are springing up on every side new banks, insurance-offices, shops, and other establishments, which are remarkable both for the talent displayed in their design and also as exhibiting a state of things strongly contrasting with the stagnation of trade and decay of prosperity which have been such prominent features in most pictures which have been drawn of the state of Ireland. And what is so truthfully stated of the metropolis may be stated with equal truth, varying only in degree, of nearly every provincial city and town; and the country itself is gradually becoming dotted over with buildings of a new and important character,—in those for religious uses especially is the change most strikingly shown. Perhaps nowhere else in Europe were the ecclesiastical structures erected for the last few preceding generations of so utterly mean and degraded a character,—and this was one point on which all sections of religious belief among us were at one; whatever other differences of opinion, whatever distinction of form of worship, there might be among them, in this one point there was perfect unanimity of both creed and practice. It is much to be feared, however, that improvement in the direction of architecture is receiving a severe check. Without entering into

any discussion as to the merits of the several questions which have disturbed the labour-market, it is sufficient for us here to note that the cost of building has increased by a very large percentage, and that this must, to a great extent, postpone the extension of improvement until matters find their level. I do not see any cause for any feeling of alarm or uneasiness at this state of things; there is nothing really new in it; the same sort of thing has occurred over and over again. The statute book is full of laws for regulating the prices of labour and commodities, which, of course, became a dead letter, in so far as they were opposed to the real progress of the age. In all old chronicles are to be found innumerable notices of such marks of progress, and in almost every case they refer back to some golden age of bygone cheapness, and predict the end of all things as soon to arrive; but the world has waggled on, and there seems no great reason for desponding now. Matters are sure to right themselves, things will find their level; but meanwhile there are grounds for both hopes and fears as to the future prospects and condition of the artisan, based on the uses to which he may apply the increased leisure and pecuniary resources which the march of events has bestowed on him. "What will he do with it?" Will the extra hours and increased wages he spent in the beer-shop and gin-palace, or in any other form of mere animal enjoyment; or will they exhibit their effects in increased comfort and culture of the man himself,—more care in educating his children? It is hard to say; perhaps somewhat of both. The better class of men in each trade will probably be the better for it; the middling and inferior class will probably become worse workmen day by day, until they sink down to the workhouse or the grave; for the after-effect on them must be, that the less the necessity for working, the more the distaste for working will grow. The man who "plays" one or two days in each week will work very reluctantly and unwillingly on the remaining four or five; and when the competition with imported or machine-manufactured goods shall have attained the fuller development which is certain to be brought about when manual labour is at its maximum of high price and irregular and uncertain supply, the weaker man must go to the wall. This, I confess, is the only fear for the future suggested to my mind by the present unsettled state of the labour-market.

The same commentary on our new buildings to which I have already alluded suggested to me another train of thought, to which I think it will not be inappropriate to request your attention for a few moments. In comparing the recent architectural decorations of our streets with those older examples, which have challenged for the city the admiration of most travellers and writers, we perceive a difference between them of a very striking character, which, however, while strongly exemplified here, is not by any means confined to Dublin, but exhibits itself everywhere, and in a greater or less degree, according as the mind of the architect is more or less imbued with the ideas that this generation has reproduced. I say reproduced, for the principle to which I allude is one which always has ruled supreme whenever and wherever there has been true architecture, irrespective of age or country, and without which there may be a good deal of building, but no architecture. This golden rule, this *symbolum stantis vel cadentis architecture*, is "FITNESS,"—adaptation of the design of the building to the uses to which it is to be put. Whether consciously or by mere force of habit and imitation, this is the rule which prevails in modern buildings. There is a very wide range of selection made as to the character. The ornamentation and details may reproduce ideas Classic or Mediæval, and in the latter may range over the whole lapse of time from the earliest revivals of art in the Dark Ages down to the mongrel style of the Renaissance. All countries,—England, Ireland, Scotland, France, Germany, Italy,—are put in requisition to supply ideas of form and character, but the one central, distinctive idea which distinguishes the building of this day is the one of fitness, and the rule deduced from the idea, which eliminates from all good architecture such parts which are not essentially and constructively necessary to the building, in order that it may fulfil the purpose for which it is designed. Let me for a moment call your attention to two of the most beautiful of our older buildings, with reference to this one point. Perhaps no city in Europe can show a more beautiful perspective

view of Classical architecture than what one sees, either by daylight or moonlight, from Grafton-street, by standing at the Provost's gate and looking toward the Bank of Ireland. It is a glorious bit, and as pure in its detail as it is picturesque in outline and grouping; and yet there is not one particle of what meets the eye that might not be removed—cleared away utterly—without interfering for a moment with the business of the bank. What you are admiring is not the building itself, but a screen which hides it. In the same way the façade of the central portion of the Four Courts wants only deeper shadow from somewhat bolder projection of the portico to be perfect; only in looking at it you must take care to stand so as only to see the front of it: a look at either flank will destroy the illusion. It is very beautiful, but, like stage scenery, it is meant to be seen only from the front,—and for the same reason, because it is put there to represent what is not there really, and to hide what is. The whole façade is a mere screen wall,—a picture of a building executed in stone. Now I think it will be admitted that it is not the true aim and object of architecture to erect buildings, and then construct elaborate and costly contrivances for hiding or disguising them, and that a design which treats the exterior in a manner independent of, and bearing little or no relation to, the interior, is radically bad, however beautiful it may be *per se*. No one would think a surgeon entitled to credit who should perform an operation merely to show his own dexterity in handling the knife.

I have sometimes thought, when looking at such buildings as those which I have been considering, that, to most people's minds, the idea of a really noble building must be that of one built regardless of expense, and apparently of no earthly use; but the fact of the matter is, that in these things we are only just beginning to think for ourselves,—to shake off the bonds of old associations, and get rid of an empiricism that had become engendered in all our thoughts, habits, and practices. In architecture, as in every other direction of modern thought, our culture has been built on the revival of Classical modes. In art, as expressed in painting and sculpture, the surviving antique models were themselves perfect, and nature was always present, forcing the artist's mind and hand out of mere slavish imitation and reproduction. In science, Bacon first taught us to throw off the bonds of authority, to test facts and phenomena by analysis, and appeal from the philosophy to Nature herself as our sure guide; and how slow we were to accept the teaching! I can remember myself having in very early days had the maxim impressed on my mind that "Nature abhors a vacuum." Two hundred years after the death of Torricelli. Law, the most conservative of sciences, has in these latter days been cleared of much of the dead branches of previous growth,—is becoming every day less purely technical and arbitrary, and is likely before long to start on a new basis of codified principles as opposed to mere practice. A similar reform in architecture is in progress, but hardly yet acknowledged by the profession, and scarcely at all understood by the non-professional world.

THE GARDNER COLLECTION AT GUILDHALL.

We have already mentioned the admirable display made at the opening of the new City Library and Museum, at Guildhall.

No less famous an historical personage than Lord Mayor Sir Richard Whittington was the founder, in the year 1421, of a library at Grey Friars, at the cost of 400l. of the currency of that date. We are told by Stow that this library was 129 ft. long by 31 ft. broad, and that it was furnished with twenty-eight desks, and eight double settles of wainscot. These desks are enumerated in King Henry's patent. A second sum of 400l. was devoted, by the same hero of civic story, to the erection of a "lybrarye atte Gyldhale," to which Sir Richard also gave many manuscripts of value. To this "Common Library at Guildhall" John Carpenter, the founder of the City of London School, left by his will, proved in 1442, "any good or rare books found among the residue of his goods." In 1444 we find "lyflood, honsing, and casement of the gardyn" granted by the "Maire and Aldermen at their prest and bedeman, John Clipstone, capellanus, et custos Librarie, Gyldhald." But "in the raigue of Edward VI. the

bookes were sent for by Edward Duke of Somerset, Lord Protector, with promise to be restored shortly. Men laded thence three cartes with them; but they were never returned." This was in 1552, and appears to have been the end of the library founded or augmented by Whittington.

Two hundred and seventy-two years had passed since the high-handed robbery by the Duke of Somerset before the City of London bethought herself of the need of a new public library. In 1824, the late Mr. Lannher Jones began to direct attention to the subject, and a committee was appointed to undertake the formation of, not a public, but a corporation, library. Books have since that time been collected, sometimes slowly, sometimes with more spirit. At the present day, the collection is said to be complete, as far as concerns books relating to the City of London, while other departments of literature are also, to some extent, represented. The early manuscript hooks of the corporation commence with the *Liber Custumiarum*, in 1154. The *Liber de Antiquis Legibus*, written in Latin and Norman French, dates in the first year of King Richard I., A.D. 1188. Nine other volumes, the titles of each of which begins with the word *Liber*, bring down the series to the year 1576. Transcripts of the City Charters, written in Saxon, Latin, and Norman French, commence with the charter of the Conqueror, which itself is only a confirmation of the previous charters granted by the Confessor, and by earlier Saxon kings. The last in the series are the charter dated in the fiftieth year of King Edward III., A.D. 1376, and the *Inspecimus* of Charles II., in 1664, two years before the fire. Letter-books, Journals of the proceedings of the Common Council, *Remembrancia*, and Repertories complete this interesting series of civic monuments.

In 1869, Dr. W. Sedgewick Saunders brought the subject of the library before the Common Council. A committee was appointed by that Court to deal with the subject, and the result has been already described in our pages. A reference to earlier volumes of the *Builder*, would show how we, at various times, when the existing library was little known or thought of out of doors, brought it to public notice, and urged the want of better premises.

However, never mind that now. Our present object is to speak of one particular feature of the exhibition only slightly referred to in our account of the opening night.

The whole of the museum proper is lined and filled with a series of drawings in pencil and in water-colour, prints, and woodcuts, illustrative of the topography of London. The number printed in the catalogue as that of these objects is 1,390, but three or four separate views of ten come under the same index number. These exhibits are the contents of only four out of eighty portfolios which have been thus filled by Mr. J. E. Gardner, who has devoted the leisure of his lifetime (and something less readily attainable than leisure) to their collection, arrangement, and illustration. All refer to the topography, the history, the architecture, the antiquities, or the manners and habits of London.

Fortuno has favoured Mr. Gardner in one respect. The period during which he has been collecting the materials for an exhaustive history of London has witnessed the sale of the great collections of the latter part of the eighteenth, and the commencement of the present, century. The Strawberry Hill collection has been brought to the hammer; so has the Stow collection; so has that of Dr. Wellesley. At these, and numerous other sales, Mr. Gardner was a judicious and fearless purchaser. He has thus not only become the possessor of many prints that are unquestionably unique, but he has based the completeness of his own collection on an accurate knowledge of those that preceded it, which have thus furnished him both with ready-collected matter, and with indications of all that was accessible, or known, down to his own period.

While the lover of engravings, and the collector proper, will linger over the stained and gilded sheets that represent some otherwise extinct work of the burin; and while the lover of antiquities, the historian, or the moralist will take most delight in the satirical and comic prints that scoured the follies of the day, we are much disposed to think that the highest service rendered by Mr. Gardner to the history of the metropolis has been the formation of the series of sketches in pencil and pen-and-ink, and water-colour drawings, which have been taken by his direction and at his expense; and

which now form the only records of much of ancient London that is swept from the surface of the earth. These views are of various descriptions, some picturesque, or giving the general effect of ancient streets, alleys, and squares; some architectural, giving details of many Gothic arches, shady cloisters, massive crypts, well-proportioned towers, and hospitable halls, now destroyed; some full of decorative detail, of pargetted ceiling, or quaintly-carved canopies. The cost of this great work (like that of the far less useful hobby of Louis le Grand), the collector has concealed even from himself. But those who know how readily ten, twenty, or a larger number of guineas are obtained for a few square inches of paper, so that it be marked with a rare impression, may form the notion that the collection, and the creation, of some 40,000 illustrations of the history of London, must have demanded a considerable outlay of capital.

The prints and drawings exhibited have been selected as illustrations of well-known portions,—at least of portions that, until now, would have been called well-known,—of the City, of Southwark, and of Westminster. The first group consists of spots that are passed in a walk, starting from East Smithfield, taking the leading thoroughfare to Temple Bar, through Fleet-street to Whitechapel; and thence by Bishopsgate. Starting again from Temple Bar, the course of the illustrator is by the Strand to Millbank and Lambeth, and by the parks to Piccadilly. The Southwark ramble leads by the High-street to St. George's Fields. We commence a notice that must of necessity be disproportionately brief, at the Tower.

From the large group of drawings illustrating the topography of this locality, a portion of which only were sent to the Guildhall, the architectural history of the Tower may be traced in a manner of which written accounts give but little idea. Much that is now swept away is to be found recorded in these prints. There is a view of the Traitor's Gate, as it must have appeared to many an illustrious captive on landing from the Thames, that is worthy of the ominous name. There is a south-east view of what was known as the *Castrum Royale Londinense*, taken A.D. 1560, with a plan of Tower-hill. This is a drawing. It is accompanied by an engraving from the same, denoting the White Tower, as erected for the Conqueror by Bishop Gundulph, in 1078, and strengthened by William Rufus in 1097. There is "a true and exact draught of the Tower Liberties, surveyed in the year 1597 by Gulielmus Harward and J. Gascoyne," and reprinted by the Society of Antiquaries in 1712. There are pencil drawings of the celebrated canteen, called the "Stone Kitchen," and of the "Golden Chain"; both now demolished. There is a ground plan of the fortress, by Lempiere, in 1726. There is a view of the gateway chamber where the young Princes were murdered. There is the room where Anne Bolyn was confined, and a *fac simile* drawing, followed by an engraving, of her autograph. There is an original drawing of the breaking into the strong-room by the notorious Colonel Blood, with an engraving of that ruffian's portrait. There is another view of the breaking into the strong-room on the night of the fire, October 30, 1811, and of the removal of the Regalia, with several engravings of the conflagration on that night, and of the ruins of the long armoury, as they appeared afterwards. As a contrast to these dismal and gloomy scenes, we refer to a quaint view of the Sailors' Cavalcade, conducting to the Tower the thirty-two wagons loaded with treasure taken by Commodore Anson from the Spaniards in 1744; in which ten lines of laden trucks and shouting citizens cross and recross the page from right to left, something after the fashion of the Assyrian processions in the British Museum. These are but a few out of the illustrations named on three pages of the catalogue, which again form but a part of this single chapter of Mr. Gardner's illustrations of London.

In close proximity to the Tower of London nearly four pages of catalogue are filled by the list of various views of the secular, though irregularly returning, Festival of "Frost Fair." This extraordinary jubilee is held on the surface of the Thames whenever an unusually hard winter renders the thing feasible. The first of those illustrated in the Guildhall is that in the winter of 1683-4; the second in that of 1715-16; the third in 1789-10; the fourth in 1814. These most interesting prints partake of the nature of the marvellous; and are the precursors of the

sensational penny literature of to-day. Then we come to the history of St. Katharine's Dock, to the elevation, the plan, the interior, and other views of the church pulled down, and re-erected, in name and in form, in the Regent's Park; a drawing of the excavation—the progress of the works; in short, turn where we may we find the same order, far-reaching, exhaustive illustration. As to London Bridge, the series of views extends from the old, many-arched structure, with more pier-surfaces than water-way, and the ancient chapel and gate-house on its surface, to the opening of the present bridge. Many of these drawings belonged to the great engineer Rennie, and their professional value is hardly less than their topographical importance. The narrow passages between the great boat-shaped staircases of the early bridge must have made the edifice, at low water, the scene of a terrific current. Some of the views represent the first widening of the water-way, by the removal of a pier, and the substitution of one arch for the former two.

We have not space even to glance, on the present occasion, at the remainder of this interesting series. We have mentioned one locality alone. The imagination is actually oppressed by the magnitude and the completeness of the collection. How is it to be secured to posterity? How will the City of London endeavour worthily to honour, and sedulously to preserve, such a memorial of her history, from the time when her sons first learned the art of engraving?

CONCRETE BUILDING.*

I PURPOSELY refrain from attempting any description of the various forms of moulds or machinery for forming concrete walls; each practitioner has his own invention,—most of them patented,—but one and all answering the old description, "The one is as good as the other, and a great deal better too," if we may judge from the puffing advertisements that meet one on all sides in the professional prints; but if it be desired to act without having recourse to any of these patentees, I would recommend the following course to be adopted:—Provide a sufficient number of stakes of squared timber, say 4 in. by 4 in. about 3 ft. long, tapered and sharpened at one end; having excavated the trenches ready for putting in the concrete for the footings: before doing so mark out by lines the thickness of the walls plus twice the thickness of the planking necessary to form the wall moulds, and drive the prepared stakes into the ground hard enough to keep upright during the filling of the trenches, and at such places, at angles, and along the length as will be convenient for the future uprights to support the planking. If necessary, the width of the footing may be increased where the stakes occur, in order to surround them. When the stakes are withdrawn after the footings are set, there will be a set of sockets provided, into which posts of the same scantling may be set; these can be easily plumb and tied together on top by ropes or bands of iron or strips of timber. Then it is only necessary to slide in planks, and the mould for the wall is complete. To keep the planks apart, cross pieces of the required length can be jammed between them, and removed after the intervals between them have been packed with concrete. Such an apparatus can be prepared anywhere, and worked by any one who can use a plumb-line.

We next come to the formation of the openings. If a mere hole in the wall is intended, a core, solid or hollow, will be inserted of the proper size and at the proper level; and, in building with concrete, every hole must be foreseen and provided for beforehand, whether it be for drains, air, water, or gas-piping, or tubing for bells: after-boring must be avoided as far as possible. For openings intended to be filled in with windows, doors, or grates, frames or moulds must be made of the shape and size of the interior of the opening; these need not be of the whole height, as they can be raised from time to time until the proper height is attained, and in this way one mould would suffice for several openings of different heights, so long as the width and form of head were the same: thus, if the windows are segment-headed, and the same width in all the stories, but varying in height,—say 7 ft., 6 ft., and 3 ft. 6 in.,—if the mould be made to fit the upper two first it can be used for all; and in the same way with doors,—no lintels

will be required in concrete building, because it forms its own lintels, and requires no arch over it. And here let me call your attention to an ancient example of concrete lintel given by Viollet le Duc in the *Dictionnaire d'Architecture* under the article "Béton," p. 206, vol. ii.:—"We saw in the castle of the city of Carcassonne windows and doors of the end of the eleventh century, the lintels of which, of considerable bearing, are formed of concrete run in a mould. The lintel is of concrete of extreme hardness, and we have not seen one of them broken by the loading, which, however, is considerable." He adds in a foot-note:—"The shaft which divides this window into two parts is of white marble from the Pyrenees, as also are the base and capital; the jambs and second lintel are of green sandstone. The constructors thereby have admitted that a piece of concrete was less fragile than the natural stones, when supported only at its ends, and loaded in the middle. This lintel is only 9-84 in. thick, with a bearing of 3 ft. 74 in., and a breadth of about 11-8 in." The floor girders rest immediately on it without any intervening wall-plates. This example is of great importance as giving confidence in the right use of the material.

All frames must be made without joggles, because it is evident that if the horns or joggles are left on they must be bedded in the work as it proceeds, and any after repair would be very difficult.

For fireplaces and chimneys, the breasts as far as they will should be constructed in the same manner as the ordinary walls. A simple mould of three planks will enable the opening to be formed up to the arch; this and the guttering should be formed in one mould of sheet iron or zinc on a timber frame somewhat similar to those very admirable articles made of terracotta, and queerly named "oncorns" by the Scotch manufacturers. A timber drum, about 2 ft. long, with a handle for drawing it up, will serve as core to the flues, which cannot by this means of building be left foul or gutted too quickly. Almost any amount of corbelling can be done most easily and economically with concrete, and fireplaces can be put in positions that would be considered impossible in ordinary building; flues can be left for ventilation also with great ease. The only precaution which I would recommend is not to carry ventilation flues up to the top of a chimney-shaft, but to give them outlet just over the roof at the bottom of the shaft, so as to avoid return smoke, the nuisance of which is a very dear price to pay for ventilation. Outside the roof preparation should be made for fixing the flushings by bedding thin laths of deal in the course they are intended to take, which when withdrawn will have a groove into which the lead can be pinned. All offsets and the top of the shafts must be left rough, and afterwards moistened and finished with fine cement mortar, well trowelled and sloped to throw off the wet. I would recommend also to bed on top of each flue a length of fine-lining, projecting about 4 in.,—it will arrest the draught, and save the arrises round the flue from wear and tear.

No wall-plates, tassels, bond-timber, or any such thing must be bedded in concrete walls. The plates for the roof will be bedded on the walls, and all those for carrying floors on corbel courses of concrete, which can be easily formed by attaching a mould of the shape and size required to the face of the wall at the proper height, and can be afterwards covered with plaster so as to form a cornice to the room. For security, the joists should be trimmed to the size required. A strong fillet of deal should be fixed against the inside face of the joists, with rough boarding thereon sufficient to bear the weight of the concrete until it sets. The box thus formed should then be filled in with concrete extending to the back of the fireplace; and by finishing the surface with fine stuff, well trowelled on the face, you will have trimmer-arch, hearth, and back hearth all in one solid block, and perfect security against fire. This operation had better not be done until the floors are laid. From what has been stated, there will be no difficulty in constructing any portion of a building which may not have been described, hearing in mind that any width of opening can be spanned without lintel or iron arch-bar, and that all idea of spreading may be left out of the calculation of the jambs; it is only necessary to give them mass enough to sustain the load pressing vertically upon them. There is no lateral pressure, provided the mould is kept up until the concrete has consolidated. In all building operations

* By Mr. J. H. Owen. See p. 568, ante.

over-haste is the evil of the day, and this is specially dangerous in concrete building.

It may be convenient now, before passing to what is usually out-stone work, to describe the nature of the materials. For the sake of economy, I have recommended a mixture of air-slacked lime with the cement in the foundations, but in the shaft walls cement only should be used. It should weigh not less than 112 lb. to the imperial bushel; if much lighter than this it cannot be depended on, and should be rejected. It will be safest, I think, to adhere, for the body of the work, to the same proportions as given for the concrete in the foundations—1 to 7,—but finer stuff should be used for some purposes: thus for forming the quoins, the angles of jambs and arches, a mixture of 1 to 3 or 4 should be used, rejecting the coarser materials. This fine stuff will take a sharp aris from the mould, and retain it, and save a good deal of time in the after-finishing. All corbeling, and wherever great strength is required, should be done with oven finer stuff, say 1 to 2, as the strength of the mass decreases very rapidly with the increase of the quantity of sand or gravel, and for this reason I would not recommend the common practice of inserting in the heart of a concrete wall lumps of stone; it should never be done where strength and coherence are of importance.

Now, as regards the out stonework. Suppose that a wall is to have a foot not boarded, and steps that would be stone ordinarily, the proper course will be to fill to within 3 in. of the finished level with any dry rubbish, level the surface, fill in with concrete, and float it over to the required level, and finish the surface with fine stuff, placed in a thin coat over the moistened surface of the coarse concrete, and continually trowelled until it is quite smooth and hard. The steps must be formed one by one, by fixing a board of the required height where the face of the riser will come, filling with fine stuff against the face of the board, and beating with coarse stuff. The upper surface would be finished with the floor. If a flight of steps is required, they may be constructed with perfect safety, attached to the wall only on one side, if required, and of any projection, varying the thickness of material in proportion to the work to be done. The steps should be formed simultaneously with the walls, but of the finer material, say 1 to 2. The mould would be constructed of a soffit of timber planking, securely fixed, as it will have great weight to bear; a timber string at the end of the intended projection, and a movable board of the size of the face of the riser. This movable board will be fixed in its place for each step in succession, from the bottom to the top, each in turn being the foundation of and incorporated with its successor, so that the final result is not so much a set of individual steps, but one continuous mass with steps notched out of it. There is no difficulty, except in the case of windows, where the moulds of the soffits will be of some expense and trouble, but, of course, infinitely less than carving out each separate stone. The soffit-mould, in this case, may either be made of heavy boards, bent to the shape, or a rough stage can be erected and a solid core formed by building with half-mortared rubble up to the shape, and grooving over with mortar. By this means great accuracy can be attained, and a surface of paper spread over the plaster will prevent its adhering to the concrete, although it would be no great matter if it did, as the soft mortar could be very easily removed.

As regards window sills, it may be asked,—why have them at all? But as this may be considered an unsatisfactory mode of getting rid of the subject, it may be as well to provide for them. In building the walls, the bottom of the opening left for the window should correspond with the bottom of the sill; and in proceeding to form the sill, a board should be fixed so as to form the rim of the inside face, and a mould should be made in the form of a box with a bottom, and one side and two ends, on the bottom a fillet should be fixed to form the throating. The box, when fixed in its place, would be filled, and the upper surface formed by securing a mould formed to the shape along its length just as an ordinary cornice. All cornices, eave, string, and barge courses would be treated in a similar manner; but it should be matter of consideration whether the finishing of all continuous moulded faces would not be executed more cheaply if run in the ordinary way than by casting in a continuous mould.

In building the walls, projecting corbel courses have been left all round them. On them the tassels will be laid, and the joists on the tassels.

On the upper surface of the joists I would suggest that a fillet should be fixed of the same thickness as the floor, and that then a skirting of cement should be run round each floor. My reason for this is, that it obviates the necessity for inserting plugs for fixing timber sheeting. The inner face of the walls may be either skimmed over with lime-putty or whitewashed; the outer face coated with a very thin coat of fine cement, or tinted with a cement-wash; the ceilings and floors would be treated in the ordinary way.

As regards the mode of roofing, there is no necessity for any variation from the ordinary mode; but if it is desired to have a very cheap form of roof, I would recommend the following, of which I extract the description from a treatise on Portland Cement, by A. Lipowitz:—

"1. The inclination of the framework of the roof (which must have an even surface) should be at the rate of $\frac{1}{4}$ in. or $\frac{3}{8}$ in. per foot. The rafters or joists should not be more than 2 ft. 3 in. apart, so as to give sufficient strength. Boards of 1 in. or $\frac{1}{2}$ in. are fastened on the rafters, and should be rebated. These are then covered with a layer of sand $\frac{1}{4}$ in. or $\frac{3}{8}$ in. thick, to produce an even surface.

2. Strong brown paper, in continuous rolls, and as broad as possible, is then laid upon it so that each length overlaps the other by about 4 in. When the whole or a large part has thus been covered with paper, the mixture is put into a cauldron, in the proportion of 100 lb. of tar to 180 lb. of Portland cement. Care must be taken to heat the tar gently, and to mix the cement with it gradually, in order to prevent its boiling over. This mixture of tar and cement must then be laid as hot as possible on the paper with a tar brush. The next layer of paper is then laid on, and smoothed with a light wooden roller. In this way the whole roof must be covered. In order to break the joints of the paper, begin the second layer with half the breadth, and proceed as before. The third and fourth layers are in like manner laid with alternate layers of the mixed cement and tar and brown paper.

The last layer must be carefully covered with cement, and then strewn with sifted ashes to the thickness of $\frac{1}{2}$ in. Next to the gutter is a board covered with zinc, and projecting about 2 in. It should be laid on after the second layer has been completed, so as to be covered by the third and fourth. If there be any chimneys projecting through the roof, they should be surrounded with zinc, immediately after the first layer has been finished, and before the gravel is strowed upon it. This zinc should rise 6 in. up the sides of the chimneys, and 3 in. upon the roof; the upper edges should be bent, so as to be let into the joints of the brickwork, where they should be carefully fixed with cement.

3. The whole is then finished with a coating of sifted gravel containing about one third of dry loam truly levelled with rakes and scrapers.

This work should not be attempted in rainy or frosty weather.

The workmen should wear very light boots, or better still, none at all; and should always stand on thin boards when working at the roof.

The advantages of this system of roofing are:—

1. A smaller quantity of wood is used.
2. The roof, being flat, gives more room in the upper floors of the house.
3. It is more convenient for constructing garrets.
4. Protection from external fire, and affords easy access to firemen.
5. If properly constructed, these roofs never require repair.

Several roofs at Heischberg, in the Reisinger-gebirge, constructed on this principle, are now twenty-two years old, and have never been repaired.

I have tried this mode of roofing myself, and have every reason to be satisfied with it. It is, of course, much cheaper than the ordinary roof. The imaginary house is now floored and roofed, but it still remains to fit it with doors, windows, grates, and chimney-pieces, shelving, rails for hanging up clothes, and the innumerable sort of things comprehended under the title of fittings. All these must be carefully borne in mind, and provided for beforehand. The walls are like cast iron; they do not admit of the rough-and-ready driving in of plugs wherever a carpenter fancies, for preference into a fine, if it is at all possible to do so. These walls can only be pierced with great difficulty; the place of all those things must be fixed beforehand, and while the walls are in building swallow-tailed plugs of

dry wood must be built in for the purpose of fixing them; and that there may be no mistake, every bit of carpenters' and joiners' work should be delivered on the ground before the walls have got many feet high; and if the plugs are placed in the right position, there will be no difficulty in fixing any of the joiners' work, except the door and window frames. This, I think, can only be properly secured by confining them in their places by jamb-linings and architraves, which are themselves securely fixed to the plugs.

I think there remains nothing more to add as regards the use of concrete in ordinary houses; one built as I have been describing would be cheap, durable, quieter than one built of brick or stone, safer as regards fire, and free from rats and mice and other vermin. I propose to continue this paper by a consideration of the subject of fire-proof building in general, the special advantages attending the use of concrete, the modification of the ordinary mode of using concrete, and the materials of which it is composed which should be adopted in fire-proof buildings.

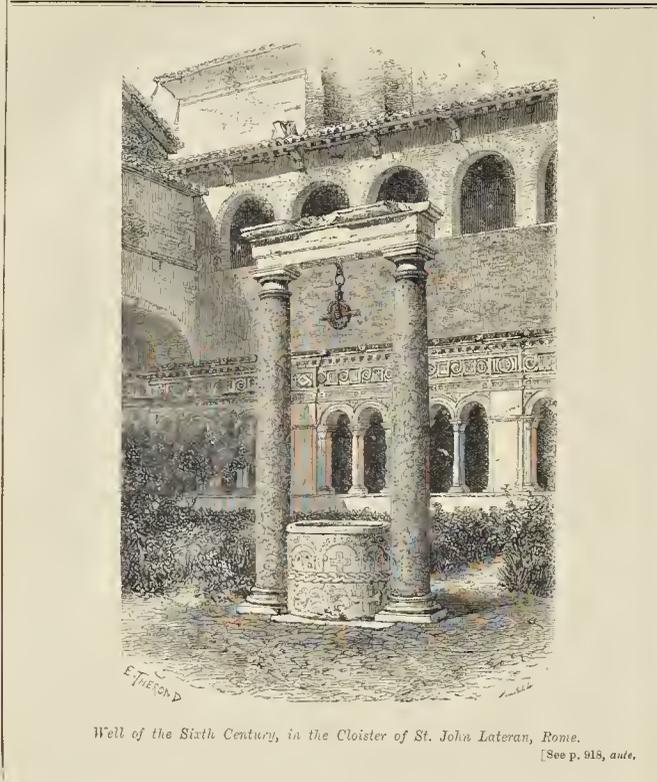
PROFESSIONAL PRACTICE.

At the last meeting of the Architectural Association, on Friday evening, the 15th instant, a lecture was delivered by Mr. T. Roger Smith on "Professional Practice," being the introductory lecture to a course open to members of the Association, to be delivered on certain Monday evenings during this and the two following months.

Mr. Smith began by showing that actual practice of a profession is the end properly looked forward to during all preliminary study, and that a clear vision of the requirements of active life should be had, if possible, from the beginning. Then each step taken may tend more directly to the wished-for goal, when practice and thorough fitness for it have been arrived at together. The profession of architecture, in the form it has now taken, has been the product of what we call the accidental course of events.

Ships and machinery are brought into existence without the intervention of professions distinct from the trades, and it might have been possible that, for buildings also, the design and the execution should have fallen into the same hands. Indeed, a large proportion of the buildings actually erected are carried out without architects,—probably, half of the buildings in the metropolis, for instance; and they do not tumble down. Architects would seem thus to be universally-necessary outcome of human life. Work can generally be done without them, provided that it is common-place enough not to call for the use of special taste, skill, and experience. When these qualities cannot be dispensed with, the architect called in should be able to put them at the service of his employer, and complete his work so as to justify the impression that the buildings thus originated and controlled have been ably and wisely (1) designed, (2) constructed, and (3) conducted. In all, the architect is the representative of his client, doing for him what he is unable, or unwilling, or not anxious to do for himself; and it can only be by the exhibition of the results of special training, showing complete adaptation to the work, that the profession can justify its separate existence as at present, or its professors look forward to a sound and lasting future for their occupation. Though a model architect is, perhaps, as rare as the phoenix, it is quite possible to see what, at the present time, he should be, and to indicate how nearly any one *must* approach this standard in order to avoid entire or partial failure. To make clear to pupils and young men in the profession the nature of this standard in some detail,—affording them an exposition of the matter not hitherto attainable in a definite form, and quite out of reach of many,—will be the purpose of the lectures to which this is to form a general introduction.

1. As to design. The art qualification needs little insisting upon, and is really a great subject by itself. Here as elsewhere, study and pains are all-important. Many men of promise have been ruined at the beginning of their career by premature success and unwise praise. In this section of the architect's work, the temptation to the clever draughtsman to confine himself to the art of pleasing on paper may be too strong for the sober teaching, which points to the building as his real work, and as the true test of his skill. Beyond and before the consideration of this hearty or fitness of decorative form, is the question of fitness for practical



Well of the Sixth Century, in the Cloister of St. John Lateran, Rome.

[See p. 918, ante.]

needs,—the proportioning of each part of a structure to its special use,—the subordination of each part to the general use of the whole building,—the exercise of a fertile contrivance in reconciling with good judgment and good taste at times apparently conflicting directions and demands. For this kind of work effectively performed, an architect must be trained to grasp many details, and, as a simple, necessary preliminary, to hold numbers of such details in his memory. The sizes of doors and windows, room proportions, arrangements of ranges and stoves, spaces in stables, how a carriage will stand in a coachhouse, the position for a grand piano,—these are a few samples of a large number of very elementary facts which the architect must fix in his memory and imagination, in order to recall them without effort in the process of design. Special knowledge of buildings constructed for special uses, is another necessity of the thoroughly competent architect. The principle of the design,—the key of the plan,—should be acquired for most of various classes of buildings. For instance, the shape and position with relation to each other of the wards of a hospital once understood, the details of such buildings group themselves round this key idea in further studies, and radical failure from want of clear perception of the ruling principle becomes impossible. Though an architect may not often run risk of depreciation, because he has not seen out-of-the-way buildings for special uses,—he will contend, if he neglects such guidance from experience, at great disadvantage with others who systematically familiarise themselves with the principles and details of all original structures, demanded by the ever-shifting forms of our social system.

2. As to skill in construction. A young architect cannot, safely and wisely, plead ignorance or inexperience in the case of things going wrong. He must counterbalance his inexperience by taking great pains. Practice is said to make perfect in other things, but in building an architect is supposed to know all about materials and the putting of them together before he begins practice—any want of pains and care may lead to great risks; architects have been tried for manslaughter, and otherwise more or less justly

sought after legally on account of errors of judgment or non-detection of the misdoings of others. Knowledge of structural science,—or, at the least, a good confidence as to being readily able to get at the right sources of information when required,—this must be had, and no little insight and knowledge,—in any case enough to enable a reliable judgment to be come to on the spur of the moment,—as to the fitness or the reverse of most building materials. The building materials of special localities may be the subjects of particular investigation on occasion; but the principles on which judgment of them should be founded, and a fair amount of real experience of their characteristics, should be more frequently obtained by students than has in many cases been the rule heretofore.

3. Business qualities. A good man of business will be honest, systematic, and courteous; and possess some amount of tact. He will be dissatisfied with himself if the builders' tenders far exceed his estimate. He will adjure utterly the detestable practice called "leading a client on." He will be trustworthy,—because he will have the courage to tell unpleasant truths when they must be told. He will have the indispensable habits of steady labour and punctuality, and a knowledge of good precedents for all formal matters; and will rarely dispense with such precedents or any punctilio recognised by custom as serviceable for record or against contingency. These business details form, in fact, the large bulk of the hidden part of "professional practice," transacted in the private rooms of architects or kept to themselves; these reach only very imperfectly even the best trained pupils; and each man has often by painful experience to acquire for himself a method of conducting business. This, the lecturer said, he desired to remedy to some extent, wishing to make a beginning on a subject which the committee has often considered without seeing their way to introducing it as part of the regular training obtainable by and in the Association. Temper and mischance are the real causes of many failures. An architect will, therefore, always show full self-control, though he may not deem it necessary to wholly suppress the manifestation of high temper. Much of the

work of the architect has little connexion with the direct putting up of buildings, and many of the qualities thus suggested as being desirable in him are really quite as necessary in many other occupations.

Mr. Smith then proceeded to notice the system of payment, a system roughly adjusting the pay according to the relative importance of buildings, and regretted its occasional results,—such as correspondence and interviews out of all proportion to the remuneration: the Gs. Sd. of a lawyer actually checks the eagerness for information by letters, and perhaps also adds weight to the words therein. In fact, the profession is not a lucrative one; partly because there are far too many men in it, and partly because the putting up of a new building mostly occurs only once, if so often, in a lifetime. Thus the bulk of the work requiring skilled direction is always limited, and not uniformly diverted towards the profession. This makes every possible extension of legitimate practice desirable. Taking out quantities, managing building estates, valuations, district surveyorships, are examples of such extensions; and for such work, often most valuable to clients or to the general community, special training is a matter of necessity. The moral throughout is that an architect is made,—not born. The highest eminence is to be won by no single step, but by patient, continual climbing. Work,—work,—work,—well directed and persistently carried on,—will train latent powers, and enable a man to take a position well worth working for—a position in which he will be able to use all his attainments and acquirements in turn and to the full; in which matters of vital importance to others are trusted confidently to his care; in which his advice is sought as well worth the having; in which a large part of the work of his life will have a real permanence; and, giving to that work a charm belonging to little of the work of many other professions, he will have the task and the self-training and pleasure of dealing with and directing at one and the same time men and the forces of nature.

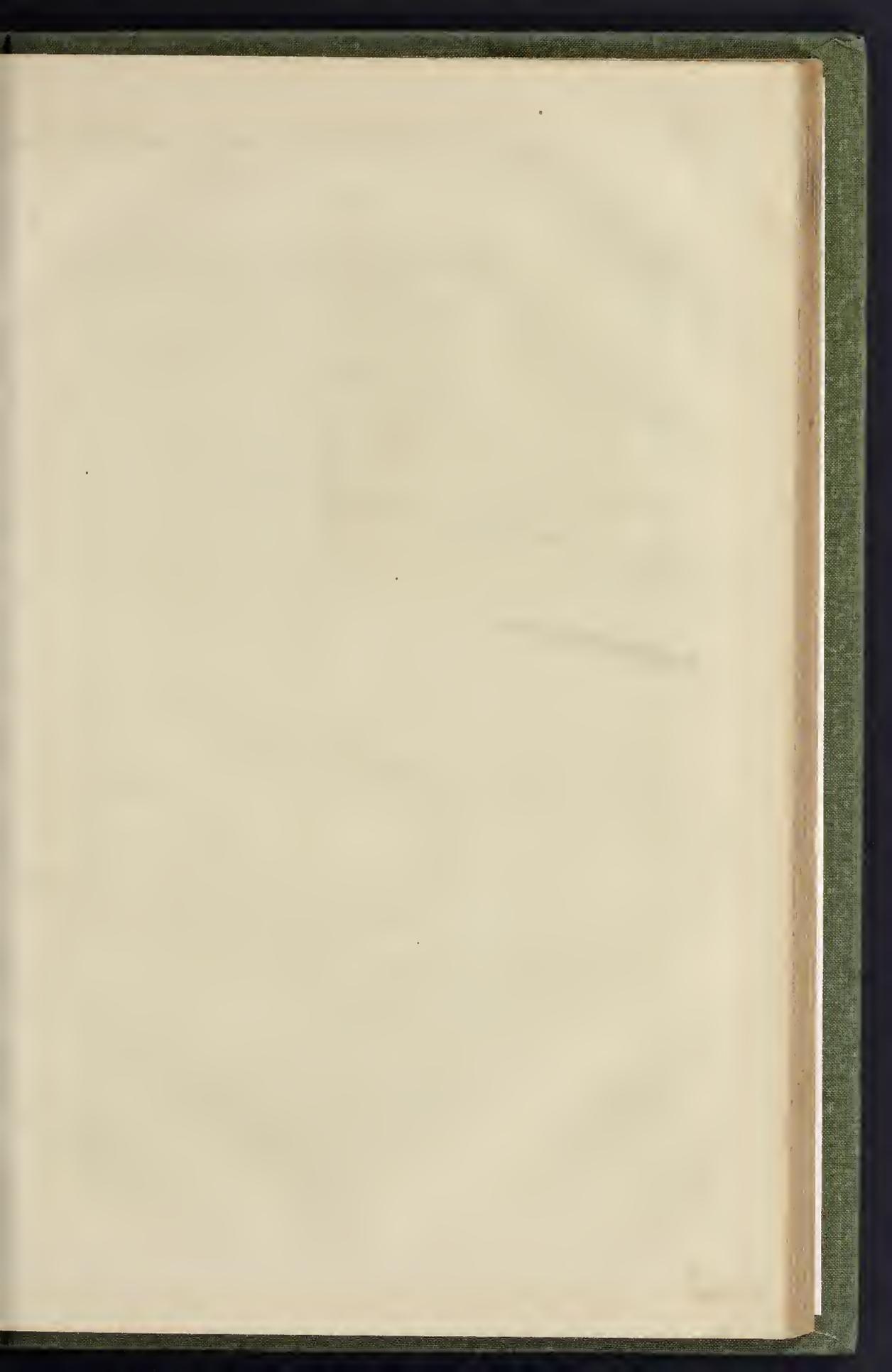
ST. GILES'S CHURCH, DURHAM.

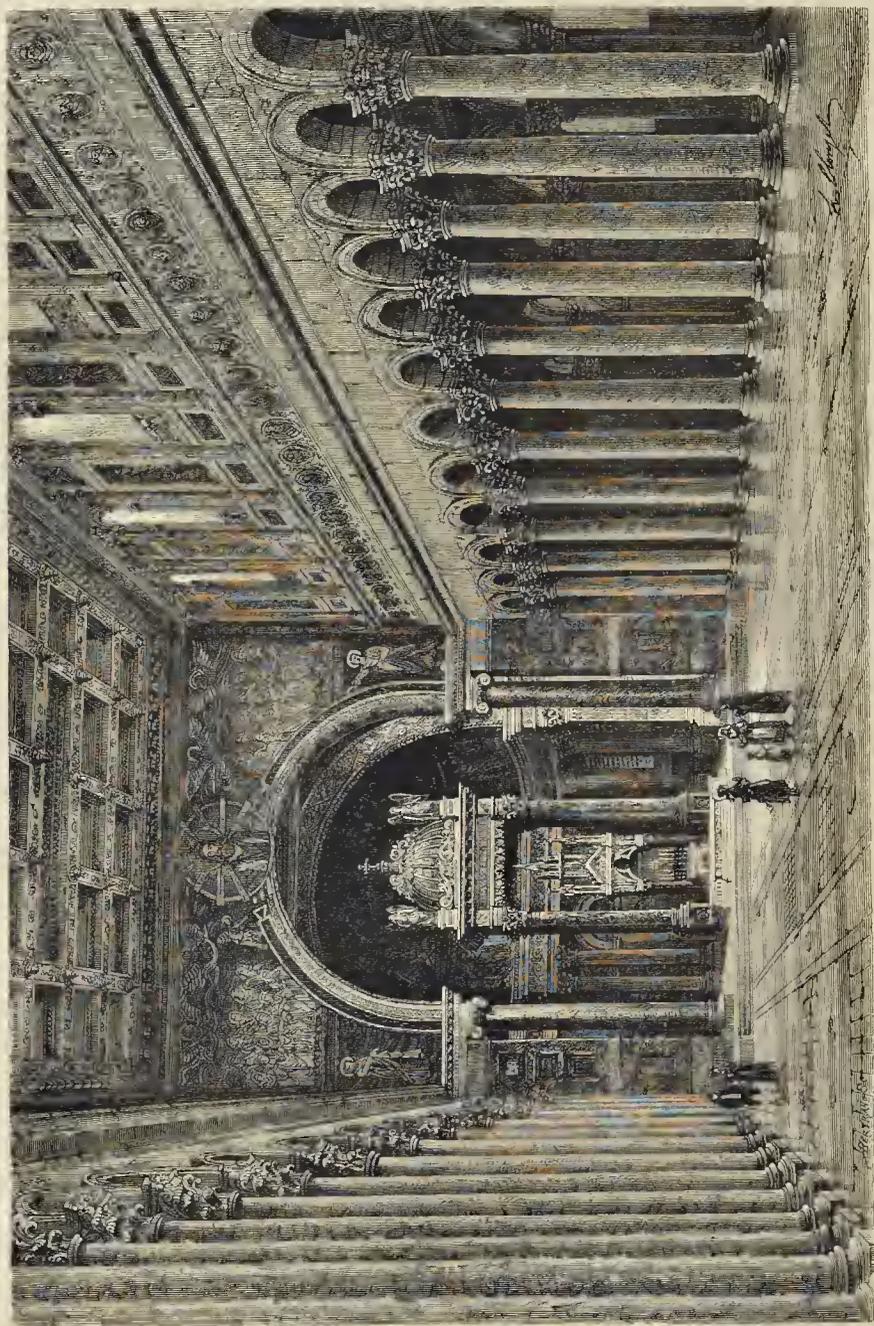
LAST month the Architectural and Archaeological Society of Durham and Northumberland took into consideration a scheme, of which the society had heard, for the partial or entire demolition of St. Giles's Church. The meeting was unanimous in disapproving and deploring the proposed plan, and appointed a select committee, with instructions carefully to examine and report upon the building, historically and architecturally. The committee was further instructed to suggest a plan by which, with the least possible destruction of the existing fabric, the required increase of accommodation could be most effectually provided. The committee so appointed has just now issued their report, the purport of which may be gathered from the concluding paragraph:—

"We cannot, however, take leave of a building so intimately bound up as it is with the ancient history of the Bishopric, and so full of interest, alike to the architect, the antiquary, the historian, and the citizen of Durham, without expressing, most respectfully, but most earnestly, our protest against its contemplated destruction. We trust we have shown that demolition is wholly unnecessary. It would involve a grave and, we believe, needless expense; whilst it would obliterate from the city an ancient building, which is next, after the cathedral (with the history of which its own is curiously and closely parallel), the most conspicuous and venerable in the city. We hope that those who are entrusted with the alteration of the church will give a thoughtful and serious consideration to the statements which we have made, and will hesitate in prosecuting a scheme involving the destruction of a church, which, from its connexion with the history of the old Palatinate, has so strong a claim on the city and county of Durham."

We add our voice in deprecation of the proposed destruction of this ancient and interesting building.

Halifax.—Bursting of a Mill Dam.—On Monday evening last week a dam in connexion with Lily-lane Mill suddenly burst, and the whole of the houses immediately below the mill were inundated. The mill adjoins the Lancashire and Yorkshire Railway, near the Halifax Station, and the line crosses the front of the mill on a viaduct. On the upper side of the mill were two dams, and works were in progress between these dams and the mill for the erection of a shed, and it is supposed that the excavations for the foundation of one of the reservoirs, which was about 12 yards square, and 6 ft. deep,



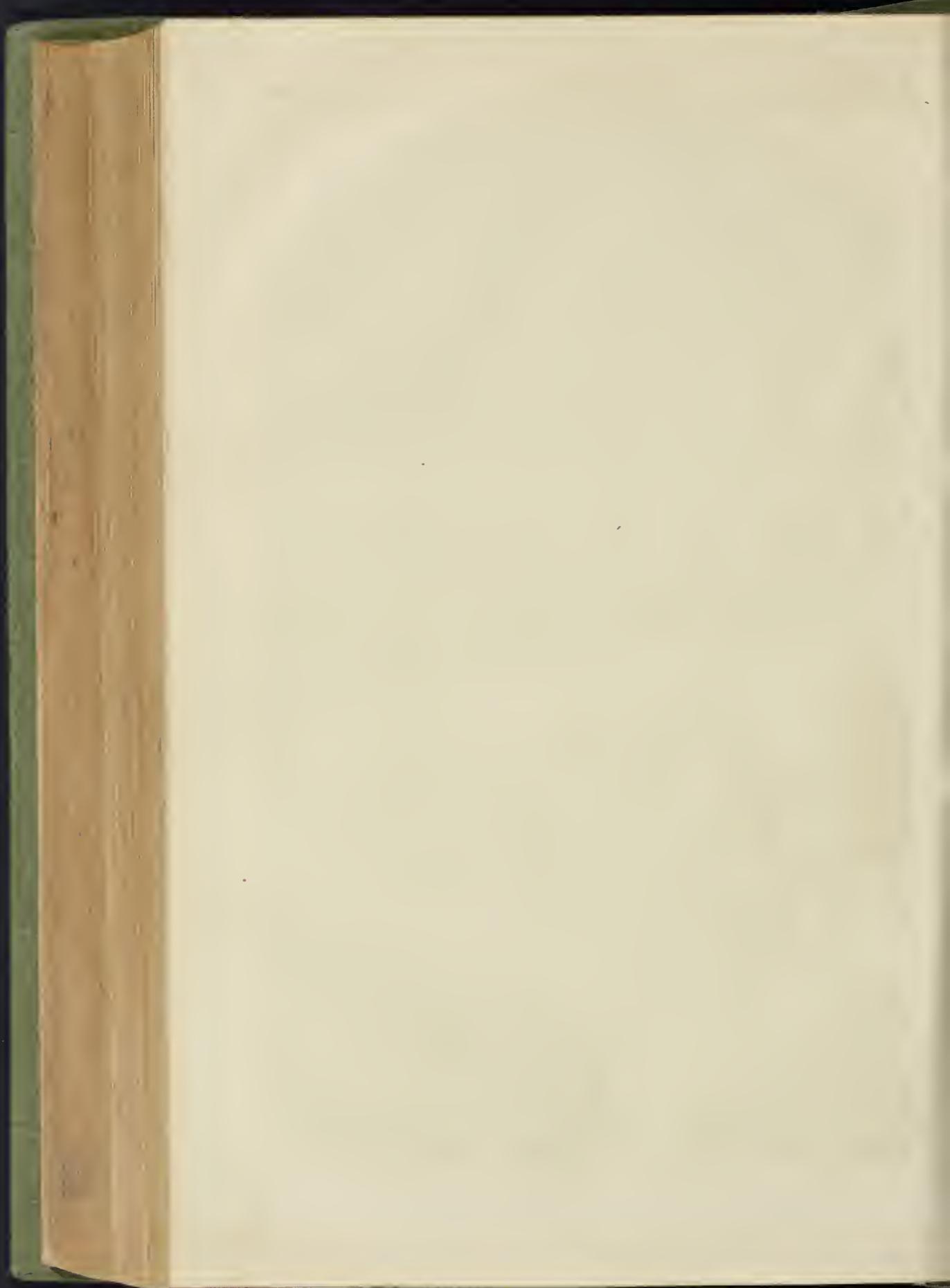


CHURCH OF ST. PAUL, EXTRA MUROS : ROME.

[See p. 913, ante.]



CHURCH OF ST. MARY ABBOTTS, KENSINGTON.—SIR G. G. SCOTT, R.A., ARCHITECT.



KENSINGTON NEW PARISH CHURCH.

In our volume for the year 1870, we published a view and the plan of the new church, then just commenced, for the parish of St. Mary Abbots, Kensington, from the designs of Mr., now Sir, G. G. Scott.* Since then, the nave, aisles, transepts, chancel with its aisle, the lower stage of the tower,—in fact, the whole church, except the upper stages of the tower, fittings in the nave, the reredos, pulpit, and lectern,—have been completed. We now give a view of the interior, looking east, and including the probable reredos. The cost to the present date has been about 23,000*l.* A special fund is being raised to complete the tower and spire, and the aid of all able to assist is urgently invited.

A fine organ has been built by Messrs. Hill & Son, at the cost of 1,500*l.*, provided by a separate subscription.

The church is calculated to afford sittings for 1,600 persons, including children.

THE BUILDING OF THE GLOBE BRIDGE, AT PECKHAM.

WITHIN the last fortnight, the Camberwell Vestry, for whom the Globe Bridge across the Grand Surrey Canal, in Commercial-road, Peckham, is in course of erection, have been engaged in prolonged and excited discussions respecting the delay which has taken place in the completion of the bridge; and during these discussions, some odd disclosures have been elicited as to the causes of the delay. At the meeting of the vestry on Wednesday week, a deputation of tradesmen and others in the Commercial-road was introduced. This was the same deputation that waited upon the vestry a few months ago on the same subject. The spokesman, on behalf of the deputation, explained to the vestry the serious loss to which they had been subjected, endeavoring to show that the business of several shopkeepers had been entirely ruined. He added that on the former occasion when they appeared before the vestry the contractor wrote to the *Builder* stating that he (the speaker) had libelled him, whereas he had no intention of doing anything of the kind, and only desired to show the vestry how he and other shopkeepers had suffered by the delay in finishing the bridge. The discussion on the subject on Wednesday week occupied between two and three hours, and was exceedingly warm, if not absolutely personal, several members of the vestry accusing the committee under whose superintendence the bridge was being built of a neglect of their duty in not having determined the contract, or enforced the penalties in consequence of the terms of the contract not having been complied with, and also expressing sympathy with the shopkeepers who had suffered. Mr. Dresser Rogers, as the chairman of the committee, said they had done all they could with the contractor, whom they had had before them. He added that, although they could not altogether exonerate the contractor from blame, he had had several unexpected difficulties to contend with, one of which was the state of the iron market, and that he had been unable to obtain the girders and other ironwork from the parties at Middlesbrough, with whom he had contracted, although he had given the vestry authority to pay them for the iron as it was delivered. In the discussion which followed, several members contended that they had nothing to do with the iron-masters with whom the contractor might have entered into arrangements, and a motion to take the construction of the bridge into their own hands, and enforce the penalties, was lost. One gentleman (Mr. Denny) contending that the time for the completion of the bridge had not expired, and that, although it might be easy to tear a man to pieces, it was well to know that they had the power to do so. On the surveyor being appealed to, he said he did not think the ironfounders were behaving well to the contractor, and that, in his opinion, there was something which did not appear on the surface. It was ultimately resolved that the surveyor should personally ascertain whether the iron-work was in progress, and report to another meeting that day week, and that, if it was not being executed, the contract should be determined. At the adjourned meeting on Wednesday last, Mr. Reynolds, the surveyor reported that he had been to Stockton-on-Tees, and found that Messrs. Hend & Co., who had taken the contract, had sub-let it,—one portion to Messrs.

Foster, Lloyd, & Co., of Wednesbury, and the other to Messrs. Woodhall, of Dudley. He then went to the last two places, and received a promise that the girders and the other portion of the iron works should be delivered at the works in Peckham this week. Under these circumstances, the vestry declined to proceed farther, but directed the surveyor to report at the next meeting as to the progress made in the construction of the bridge.

PROPAGATION OF DISEASE BY FUNERALS AND WAKES.

How often must the same warning be given before it will be attended to?

At the monthly meeting of the local Board of Health at Leagiate, a district surrounded by collieries, in the county of Durham, Mr. George Renton, the medical officer, acquainted the authorities that scarlet fever had broken out in a malignant form in the district, no fewer than *eighty-two* cases having come under his notice during the month. He had not been able to trace the cause of the growth of this epidemic to any defect in the sanitary condition of his district, but rather to the indiscretion of the people in visiting infected houses and in attending funerals and wakes.

Over and over again we have pointed out the evils of these practices, illustrating them with pen and pencil; but they are still continued, and still do their evil work.

WINTER EXHIBITION AT THE DUDLEY GALLERY.

EXHIBITION succeeds exhibition so rapidly at the Dudley Gallery that it is seldom its walls are not bearing testimony to the activity of artists in these days, when pictures would seem to have become as necessary an adjunct to a civilised existence as at one time it was difficult for pictures to procure for those who produced them a civilised existence at all. Nowhere else is there a fairer opportunity afforded the amateur of modest means to get good change for a moderate check upon a superabundance for more real requirements: many clever and agreeable paintings, of an average degree of merit, are to be found here, with just enough instances of greater worth to emphasise and assist the meaning of what may be expressive or promising of excellence in less convincing speech of it.

A few pictures in this present collection take a superior and helpful position; but there is still cause for regret that the clear-stage-and-no-favour system of an institution like this should not obviously lessen the cause for never-ceasing complaint of "want of room," and, by mitigating a difficulty elsewhere, make it the more easy to improve the character of these exhibitions and others generally. The imaginative, and even the narrative, are elements that scarcely mix with the productions to be found here.

Mr. G. F. Watts, R.A., sends two classical compositions, on a smaller scale than he usually adopts; but Mr. Watts stands nearly alone in the possession of such qualities as make a painter original and painting poetic. The Greek ladies on the rocky shore, "Watching for the Return of Theseus" (70), so unsophisticated, with regard to care for personal appearance,—unless the electric cable is not nearly so late a convenience as many believe it to be, and having learnt something of the impudent persuasiveness of those naughty syrens, they meant to out-argue all argument in adverse favour by statement of the naked truth,—form a very beautiful group, though the arrangement of the lower limbs of the principal figure detract from its gracefulness, and here suggests that "nature, not altered," might be "to advantage dressed": though, so far as a refined sense of beautiful colour and other attributes belonging to the artist go, it is richly clothed already. This, with another admirably-conceived design, showing Eurydice withdrawn from the arms of Orpheus, just as they were free of Pluto's dominion, can only assist an appreciation of Mr. Watts; for he is nearly as imitable, if not quite so singular, as Mr. J. A. McNeill Whistler, whose studies of moonlight effects on the river would divide London's opinion. His "Nocturn," whether performed under the influence of "Grey and Gold" (187) or "Blue and Silver" (237) is nocturnal enough to perplex a Thames waterman as to the time of day, and that such a pretty blue or pale-grey fog could necessitate the lighting up of the moon

and other lamps must perplex him more. He would wonder how the small craft so near should be merged in mist, and yet that a forest of masts should be more visible miles away. Moonshine; moonshine! what a great latitude there is for moonshine! Diorama, panorama, and conjuring tricks are very astonishing in their several ways, and one-half of those who see these performances will wonder how such illusion could have been attained, whilst the other half will wonder—just the same.

Atmospheric phenomenon has been far more rigorously dealt with by Mr. Jerves McEntee, and in an extremely clever way. "October Snow—Squall in an American Forest" (294), makes the spectator shiver, and his thoughts to concentrate on chest-protectors and cough-lozenges. Too long a look at this would make one numb, and dumb, and deaf. The warmest weather is surely preferable to such a deadly-cold state of things, that would seem to defy all general influences. In hot countries it is possible to find a stray breeze occasionally; and Mr. J. E. Hodgson intimates that Eastern law-courts are, even, well ventilated; he has found a very strong breeze in one, and made the most of it; and a very capital picture was in the wind,—at once. As for story, it was supererogatory to add one to the many that are issuing from the wet lips of his clamorous, litigious Arabs, so loudly invoking "An Appeal to the Knit" (17), who deprecates such a waste of energy over a matter he can so easily adjust; let them produce the disputed emulation of Chancery fashion; for half the grandeur of law and equity exists in their universality of appropriation. But Mr. Hodgson perfectly identifies national administration; his Arabs are Arabs, though the knid is not quite so big as a more delinquent apprehensiveness might conceive him to be. "Youth and Age" (51) are illustrated by Mr. Arthur Hughes, in definition of a time's difference,—the span that divides an old woman, that is, from the duck she was: it is very well and delicately done; whether with regard to the duck of the past, the ducklings of the present, or the pleasant spread of English landscape, they alike betoken great imitative skill, and no common taste in their combination. Mr. H. S. Marks, R.A., is represented by a study of "An Elizabethan Rough" (53), who,—with this artist's partiality for a by-gone period,—is not so significant of his social grade, as representatives to be met with nowadays; he is very well drawn and painted, however, and his type not the worst of his belongings.

Mr. E. M. Ward, R.A., sends a "Portrait of Lord Lytton" (244), taken some years ago, and very characteristic of the author of "Zanoni": it is admirably done, and has the advantage of picturesque surroundings. Far simpler and less adorned is Mrs. E. M. Ward's "Summer" (12), a pretty little boy in grey knickerbocker suit: this is both natural and nice in its unaffected treatment and good representation. The sketch for Mr. F. Walker's notorious "Prisoner at the Bar" (33), is very valuable for most of what constituted the worth of the larger version is here, more than indicated. "Barnard's Inn, Holborn, in the Seventeenth Century" (269), has served to good purpose in enabling Mr. H. Wallis to emulate the Dutchmen who, by brilliant colour that they seemed to mix with sunlight, made such use of old buildings and quaint courtyards as ensured a longer existence for the transcriptions than the realities themselves were favoured with. The result of this clever application of Mr. Wallis's precise drawing and clear dexterous painting, if it does not quite equal the perfection aimed at, is very agreeable.

There is no lack of variety amongst the many noticeable works here. Mr. E. Crofts gains an interest for his military heroes, who are so comically disregarding shot and shell, "Artilleur's Bederung" (4); Mr. F. Slocombe's cavalier "At Bay" (27), does not promise quite so much resistance,—he is rather weak; "Mid-day in June" (32), passed by a young girl tending the rose-trees that are burdened with blossoms, Mr. R. W. Machett paints with a vigour that does more than approach coarseness.

Mr. P. I. Calderon, R.A., sends a cleverly-painted picture, a "Lesson of Charity" (135): his straightforward and capital method of depiction would save platitudes from staidness; and such a touch of nature as a mother's direction to her little girl to be kind, whether in France, Italy, or elsewhere, would make "the whole world kin"; and so nicely done as it is, the old lesson is newly impressed, and will last the

* Vol. xviii, pp. 8 and 11.

longer from being so ably handed down. Capital workmanship is, too, displayed in Mr. Calderon's portraits of two brothers of the brush, Messrs. W. F. Yeames, A.R.A., and D. W. Wynfield (169); the latter of whom contributes similar proof of the great value and increase of interest a novel treatment gives to portraiture; if the naturally graceful figure posed in the mild difficulties that such a pretty piece of business as embroidery may involve, and her no less charming conductor, be portrait, the style of work shown in "The New Stitch" (177) may be recommended for imitation. Mr. Val. Prinsep's very brilliant presentation of a beautiful head, "Lily" (126), must add to his reputation for achieving life-likeness.

"The Last Days of the Old Hack" (71), by Mr. Heywood Hardy, must be very weary ones indeed, if such change from honoured recognition of breed and speed to the heavy travel of a four-wheeled cab has been a sudden one: if the poor old horse is as capable of contemplation as the cab is of being the vehicle of sentiment, he has, at least, the consolation of knowing that his very last day will not quite end his usefulness: there are dogs to be fed. Mr. Hardy possesses very clever means of expatiating on such matters so far as manipulation goes and good taste for colour, though this is not so strongly set forth in another specimen, "The Dilemma" (101), which is a bull,—and one would not care to be on the horns of such a one,—encouraged at sight of a fair damoise's red cloak. "After the Run"—this has no reference to the bull, but is the finish of a deer-stalking expedition, by Mr. J. Richardson (87), and shows some very good animal-painting, whether with regard to stag or hounds; "The Fisherman's Pet" (115) is rather a dirty-faced one, by Mr. J. Barr. Mr. James Gow depicts the traditional author, in "A Garrot in Grub-street" (163), when the street was more easily found than the grub; "A Word of Advice," from a hard-looking young woman to an easy, lounging young man, by Mr. R. W. Macheth (222); "Study of a Spanish Bullfighter" (251), by Mr. J. B. Burgess,—we do not believe in Spanish bullfighters, and should like to see one tackle Mr. Hardy's little "dilemma": "Setting Out" (262), by Mr. T. Graham; "A Partial Critic," by Mr. W. D. Sadler (279); "The Post-script,"—remarkable for length even as compared with a lady's P.S. generally,—by Miss M. E. Edwards (308); "Midsummer" (311), by Mr. T. Davidson; "Caleh in his Pantry" (316), by Mr. W. F. Douglas, R.S.A.; "Second Reading," by Mr. A. Ludovic, jun. (329); "The Critic" (336), by Mr. E. Hughes; "Study of a Head," by Mr. J. H. S. Mann (343); "Still Life" (349), by Mr. W. Hughes; "Nemesis Approaching," by Mr. L. C. Henley (358); and "Love Letters" (359), by Mr. J. M. Burfield, are amongst the best of this variety.

There are some beautiful little studies from nature by the late Mr. G. Mason, A.R.A., and amongst other choice items may be reckoned the "Carnations and Corn" (328), and a bit entitled "Our Village" (341), by Mr. G. D. Leslie, A.R.A., and plenty of such pleasure-giving work as is to be found in "Mowers" (38), by Mr. C. J. Lewis; "Gleaners" (39), by Mr. G. W. Sant; "Asters, &c." (63), forcibly and exquisitely touched in by Mr. H. Fantin; "Sunset over St. Mark's, Venice" (102), by Mr. Arthur Severn; "A Spring Morning on the Thames" (103), by Mr. W. J. Hennessy; "A Welsh Hay-field" (109), by Mr. T. Lloyd; "Study at Elche, near Alicante" (127), and "Sketch of Knole" (128), by Mr. A. Ditchfield; "A Pastoral" (139), by M. Fisher; "A Creche" (142), by Mr. F. Walton; "The Lock of the Lowes, Perthshire" (176), by Mr. C. P. Knight; "The Carpet Bazaar, Cairo," by Mr. F. Dillon; "A Garden at Nuremberg" (200), by Mr. C. N. Henry; "Yearsley Lock, near York,—Evening" (203), by Mr. H. Moore; "Waiting" (213), by Mr. W. Small; "Chagford" (231), by Mr. A. Goodwin; "Yew Trees,—Borrowdale" (252), by Mr. C. R. Aston; "The Old Farm House, Sussex" (296), by Mr. E. H. Fahey; and "Off with the Ebb" (353), by Mr. W. L. Wyllie.

"An Orchard" (61), by Mr. E. Gurdon Dalziel, might be an early sketch by Mr. Walker; and "Twilight" (64), by Miss Hannah Hopkins, very successfully imitates Mr. Boyce.

Rock, and sea, and wind, to help shape the sea, have been subjects enough for many a fine picture, and the infinite variation that the sky alone can be an index of, leaves it possible for many more to come that shall yet look new. Mr. A. W. Hunt, paints nearly as well in oil as he does in water-colour. "At the End of the

Reef" (65), shows an angry sea foaming its wrath away in repeated assaults on the firm rock that already holds captive in the hollow of its fortress some of the attacking waves. In sheltered rest spent water sleeps, and waits till higher tide shall bring release, or the wind annihilation. Mr. N. Moore's study of "A Winter Gale in the Channel" (82), bears a remarkable appearance of truthfulness; "On the Test—Low-water" (72), and "Steam Tug leaving a Vessel in the Downs" (54), by Mr. Robert Leslie, convey the same impression, excepting the two-miles-and-a-half-long trail of several tons of coal-smoke, that would prove steam-tugging a very expensive means of locomotion. "Salcombe, South Devon" (18), by Mr. J. G. Naish, with a misty evening effect. "Shadows" (80), by Mr. T. J. Watson; "Better small Fish than None" (120), by Mr. H. Mac-callum; "An Open Shore" (152), by Mr. C. Hunter; "Coast of Artois" (371), by Mr. C. J. Lewis; and "A Stormy Sea" (392), by Mr. T. J. Watson, again, all bear evidence of close observation, with the power of rendering it apparent. It is not all who can write as well as they can read.

SOUND.

It is impossible to prevent sound from passing through such floors as mentioned by "A Subscriber" in the last number of the *Builder*; and the ordinary receipt of "pugging" between the joists is worse than useless, as it only assists the passage of sound. A layer of cockle-shells, laid in on battens between the joists, has been used; and I have myself used brocku crockery, but both remedies are only very partially successful. One thing is certain, that solid materials only conduct sound, and therefore the more open the material, and the more air-cells that can be produced in any filling-in, the better; but unfortunately the sound is carried through mainly by the joists themselves, in a single floor, and therefore the filling-in between is of secondary importance. The only practicable remedy is to prevent the formation of the sound by the use of thick carpets or Kemptulion. The better a house is built, and the more solid the materials used, the more sound passes through it.

This is a subject which wants ventilating, for we know very little about it at present.

J. K. C.

PUBLIC ANALYSTS UNDER THE NEW ADULTERATION ACT.

On the recommendation of the Sanitary Committee of the Vestry of St. George the Martyr, the following have been adopted:—

"That Dr. Muter, M.A., Ph.D., of the South London School of Chemistry, be, pursuant to the provisions of the Act to amend the law for the prevention of adulteration of food and drink and of drugs, and subject to the approval of the Local Government Board, appointed, during the pleasure of the vestry, analyst for this parish, receiving for his remuneration such fees as the Act prescribes."

"That application be made to the Local Government Board for their approval of the appointment of Dr. Muter."

"That Mr. John Edwards, Inspector of Nuisances, be appointed under the 8th section of the Act aforesaid, to perform in this parish the duties of an inspector under the said Act."

The Local Government Board sent a letter to the Lambeth Vestry, asking for the testimonials on which the vestry appointed Dr. Muter as public analyst. The vestry, by a majority of 40, have replied that no testimonials were required, as they knew Dr. Muter as having, close to the vestry-hall, a laboratory in which he had more than fifty pupils under instruction; and that testimonials were of less value than personal knowledge.

It must be greatly to the public advantage that the analysts appointed have abundant resources in the way of assistants or pupils, especially if more than one district have only one analyst. Indeed, our objection to such appointments is thus obviated; and we still hope, therefore, to see a good deal of the laborious work of analysis done under the Act.

Dr. Lankester has been appointed analyst for St. James's Vestry, at a nominal salary of 50l. per annum; all analyses to be made in the Vestry-hall laboratory.

Dr. Barclay has been appointed analyst for the Chelsea Vestry, with a nominal salary of 25l.

Dr. Griffith, the medical officer of health for Clerkenwell, has been offered the office of analyst for the Clerkenwell Vestry. Dr. Griffith had himself suggested 50l. per annum as the analyst's salary.

The Local Government Board are looking sharp after the appointment of analysts. They have just requested of the Wandsworth District Board of Works, and of other district Boards, &c., to inform them what steps they have taken or are about to take to provide an analyst; and it is to be hoped that where nothing is being done the Local Government Board will itself step in and appoint analysts. The very appointment of such officers will have a wholesome influence on tradesmen and manufacturers; and, if speedily followed up by a few analyses, and a few detections and punishments, there will soon be less occasion for public complaint.

The metropolitan dairymen and cowkeepers of their own accord appear to have let go the handle of the pump, and taken the cow by the horns. They have laid their heads together, and have resolved (with closed doors) to appoint a committee to consider the question and draw up a report. The result is expected to be the sale of pure milk to the public at 1d. a quart in advance of the price at present charged.

The Liverpool Health Committee have resolved to authorise the inspectors of weights and measures and the market inspectors to assist the public analyst in the performance of his duties.

THE FIRE AT THE CITY FLOUR MILLS.

With reference to your correspondent's proposition that some means should be provided for shutting off the supply of gas from separate streets in case of fire, I would suggest that the mains to all large premises should be fitted with one of Donkin's valves, placed in some convenient position outside the building, that the individual supply of gas may be entirely shut off. Numerous cases are on record where such a precaution would have saved a building; as, for instance, the large fire some time since in Leicester-square.

If the use of valves were made compulsory, the police and firemen could be instructed in their action. Accidents to meters are not infrequently the cause of fire, and an external valve gives the only means of immediately subduing such an outbreak.

One difficulty in the construction of warehouses and mills arises from the tendency to reduce the area of internal support to the smallest practical extent, and so to indicate the use of iron instead of timber or brick. Timber, no doubt, to resist fire must be in large pieces; but such girders or supports are free from all the dangers to which iron is exposed, viz., bending or snapping, and a sudden rush of water would not only not harm them, but might reduce the fire.

I do not know whether Dennett's floors have ever passed the ordeal of a large fire, but a stont timber-framed floor, filled in with or imbedded in gypsenous concrete (Dennett's patent), using more refractory materials than the brick and Bath stone commonly used by Dennett, would resist fire as well, if not better, than an iron-framed floor, and cost much less in construction.

If staircases and lifts are permitted to be so arranged in the centre of a building that they shall form the most effective means of communicating fire from one story to another, no known construction of floor can long withstand reduction in such a scientific furnace.

THOS. CHAS. SORBY.

MODERN GOTHIC FURNITURE.

MUCH has been said and written about the want of taste and the absence of truth and art displayed in the usual forms of modern domestic furniture, yet far less progress has been made towards amendment than might have been expected, especially when we consider the advance that art has made in other directions. This tardiness of improvement is, no doubt, due in some measure to the history of fashion, the high prices charged for any furniture differing in construction from the prescribed forms, and to the frightful caricatures of Gothic displayed in upholsterers' shops; still, difficulties of a similar kind have been encountered, and are gradually being overcome in other branches of art. The question remains why, furniture, which plays a most important part in domestic architecture, still lags behind. This is sufficiently curious to call for some especial explanation. Possibly the best reason may be found in the fact that the

disciples of the Gothic revival, while preaching against a want of truth, have, in practice,—and more particularly in designs for furniture,—forgotten their precepts, and endeavoured to apply to modern requirements not merely the thoughts of their ancestors, but an actual copy of their works; in other words, they have, in their eagerness to assimilate themselves in thought with Medieval artists, forgotten that they are designing in an age and for a society whose requirements are totally different. The result has been that many designs have been produced which would have done credit to the thirteenth and fourteenth centuries, but which are quite out of place in the nineteenth. This being felt to be the case may be the reason why Gothic as applied to furniture, and, perhaps, to domestic architecture generally, has not received so much support from the public as it has when applied to churches, where the requirements of the present age remain sufficiently the same as those of the Middle Ages, to render what was convenient then tolerably applicable to our present wants. If the principle of design which made the works of the Gothic period so far superior to those of our own age had been adhered to, we should have had designs as totally different from anything actually executed by Medieval architects as is one age from the other, and we should never have heard complaints of the clumsiness or inconvenience of Gothic furniture, nor should we be haunted by those stumbling-blocks to progress in the shape of Medieval cabinets terminating with a sloping top to represent a roof, a falsehood carried further by being carved as though covered with tiles, and even surmounted by dormer windows, the acme of absurdity being reached when the whole is daubed with rude devices in paint in imitation of a combination of circumstances which do not now exist, and on which the greatest care is bestowed to render them as though careless in execution. That there is authority for such forms is worse than no excuse. The moral is, that so long as modern architects affirm that they do not copy, and yet practically do so, we can look for no advance in truth, and therefore none in art.

J. M. C.

FILTRATION OF SEWAGE.

Will any of your readers advise me as to the best and simplest plan for upward filtration of sewage, to intercept the solid matter only?

B.

COMPETITION.

In an invited competition for a new Congregational church in the city of Gloucester, the design by Mr. Tait, of Leicester, has been adopted. It is in the Early English style.

SCHOOLS OF ART AND OF SCIENCE.

The Oxford School of Science and Art.—The distribution of prizes in connexion with this school has taken place in the town-hall, Mr. W. C. Cartwright, M.P., one of the members for the county, in the chair; and among those on the platform were the Regius Professor of Medicine, Dr. Acland; Professor Rawlinson, Canon of Cathedral; Professor Rolleston; the Mayor, Mr. J. R. Carr; and other gentlemen.

The report congratulated the meeting on the success attending the classes from an educational point of view. The following is an abstract:—

Science School.—The statistics of the science school show an increase in the number of students under instruction in the various classes; but a decrease in the number of individuals attending more than one class. In session 1870-71 the number of students was 593, on the class registers, 149; and those attending more than one class were 64. In 1871-2 the numbers were 106, 142, and 38 respectively. Taking the statistics of success and failure in the whole United Kingdom in 1872, and comparing them with those of Oxford in the same year and in the same subjects, we have the following results:—

	Percentage of		Percentage of	
	Failures.	Successes.	U.K.	Oxford.
Mathematics.....	4	5	6	6
Magnesian and Electricity	1	None	8	All
Inorganic Chemistry.....	2	2	8	9
Animal Physiology.....	4	9	9	4

From which we may fairly conclude the standard attained by the students in Oxford to be quite up to the average; above the average in magnesian and electricity; the average in inorganic chemistry and mathematics; and a shade below the average in animal physiology. This statement should be qualified by the fact that between 60 and 70 per cent. of the students presented in the two latter subjects were boys under fifteen years of age.

School of Art.—The condition of the School of Art from an educational point of view is most satisfactory. In the session ending July 31, 1872, the number of persons that have received instruction in the school has been 218, all of whom have attended the School of Art; from these a sum of 97, 10s. 2d. has been received. As the result of the examination in May, 1872, the school received one prize of books at the National Competition; seven third-grade prizes of books on account of students whose works were sent up for inspection; and four second-grade prizes at the Local Examination. Two hundred and thirty works were sent up to the Annual Examination in London by sixty students, of whom twenty-five were successful in passing one or more exercises.

Subsequently to the distribution of the prizes, the Mayor said he was anxious to detain them for a few minutes, for he felt strongly on one of the clauses contained in the report. He collected that the School of Science and the School of Art, although two, and separate and distinct, had been under the management of one committee; and that now it was the intention of Mr. Ruskin not to interfere with the School of Science, but materially interfere with the School of Art. He understood Mr. Ruskin to take over now the united School of Art, the higher classes of the University members and the higher classes of the citizens under his separate and distinct control, and to leave to Mr. Macdonald the working classes. It seemed to him that by this arrangement the working-classes were left in the shade, or rather out in the cold.

THE BRIGITON AQUARIUM.

A WARNING.

SIR.—With a view only to the safety of the public, will you draw attention to the very extensive dimensions of some of the water-tanks in the new Aquarium here.

The tank-space labelled "Smelts, mackerel, turtle, conger-eels, bass, dog-fish," &c., pushes its long length for many yards on the northern side of the building. The water contained in it seems to be from 4 ft. to 5 ft. deep vertically, and occupies a considerable space horizontally. This tank-space contains many thousand gallons of water.

This great tonnage of water is held in its lateral position by glass fronts! Should fracture of this glass take place through sudden unequal-sided temperature; by accident; by a slip of the artificially-placed rock-work, through the struggles of a turtle jammed in the rocks, or otherwise, some persons only, in its vicinity, might survive the destructive collapse.

Any persons who may have witnessed the disastrous effects of a mass of water escaping suddenly from one confined area into another and lower area, would at once advise water-tight subdivisions of such tanks as those mentioned to be formed without delay, not only for the sense of security to the visitors, but for the safety of the light building itself.

A VISITOR.

WATER-TIGHT MAIL-BOXES FOR THE COLONIES.

Why should not the mail-boxes for the colonies be made water-tight before they are shipped? This is a question which may have occurred to many a recipient of pulpy and half-obliterated letters at home and abroad;—letters which, having passed through all the wonderfully well-ordered machinery of the Post-office, have been consigned by some casualty to the bottom of the sea. Surely this might be obviated by the simple expedient suggested.

But I would venture to suggest something more than this, viz., that the mails should be packed, in bulk, in a large iron water-tight compartment, so stowed on deck that it would float, should the mail-steamer founder. This large buoy might be furnished with some distinguishing signal, and have the name of the vessel upon it. It might also prove a life-buoy to many of the wrecked.

W. C. T.

DANGEROUS STRUCTURES.

SIR.—I wish to call your attention to the want which has existed for years past, and which is likely to remain until some decided step is taken, of an official inspectorship of new buildings which are erected in those places to which the power of the Metropolitan Board of Works does not extend, and where, as most of the work is done for speculative purposes, the premises collapse, either during the time of erection or when finished, often with injury to the men employed, and sometimes even with great loss of life.

In this parish (Walthamstow) I have seen a pond of about 50 ft. diameter and 7 ft. deep below the water-mark, filled up with cinder and other rubbish; the footings immediately laid on this unconsolidated mass; and the carcasses completed, and sold at once, for fear they should fall down. In another instance, the ends of the first-floor joists not only rested in the chimney-breast, but actually projected into the flue; and in a third, a 10-ft. opening was left for a bay-window; the brassummer, to carry the brickwork for the first floor, was 6 in. by 3 in.; and, to weaken this still more, the ends of the joists were mortised through it.

There is only one way to remedy this sort of thing, and that is, that an Act of Parliament should be passed making it imperative that in all parishes outside the limits of the Board of Works there should be a local surveyor appointed to inspect all buildings during their erection, such surveyor being selected by the Metropolitan Board of Works or by the parish authorities, and paid by the proprietors.

E. T. B.

STATE OF ORNAMENTAL AND PICTORIAL ART.

At the last annual meeting of the Reading School of Art, Professor Poynter read an address "On the State of Ornamental and Pictorial Art in this Country." In the course of his remarks he said that his object was to show whether a more practical turn might not be given to the study of art. There was scarcely a town in the kingdom which had not its school of art, and in the course of two years more than 60,000 works of art had been submitted for inspection. Next to political matters, there was no subject which was so continually discussed amongst them as the study of art and art manufacture. Still, the condition of the country in this matter was not so satisfactory as could be wished. Unfortunately the aim of manufacturers and designers had not been to produce good works of art, but rather to produce works which should pass muster. He had had the opportunity of examining some of the works of art and design executed by the pupils in the Reading School of Art, and although he should presently dwell on what he must consider as a defect in some of these works (and he should do so with all deference), he could not but commend the industry evinced by the students in that school. It was thought to be a good plan for a student to draw a flower in its simple and natural form, and also dissect it and make drawings of each particular part; also that geometrical patterns should be taken. Here was the idea,—that a design must turn out well because the student had been taught that nature's flowers were "beautiful." This process of reasoning, however, did not lead to the production of works of art. Nature was not necessarily beautiful. Many flowers were not beautiful either in form or colour, and no amount of ideas would be of the least use in the production of artistic designs. Some of the works of the ancients, and of the Oriental nations, were perfect, and nature must be studied entirely with the view to its beauty. When once the student's mind was imbued with a true knowledge of nature, he would be able to use that knowledge as he pleased. After expressing his conviction of the advantage of drawing from the living model, Professor Poynter proceeded to observe that he was glad to find that in the Reading School of Art there were no elaborate backgrounds in the works of the students, and this was, no doubt, due to the good influence of the head-master. He (Professor Poynter) only gave to a student a limited time for drawing a picture, and then the time could not be wasted.

BUILDERS' BENEVOLENT INSTITUTION.

The twenty-fifth anniversary dinner of this Institution took place on Thursday evening, the 7th inst., at Willis's Rooms, St. James's, Mr. Edwin Lawrence (of the firm of Lawrence & Sons) in the chair. The usual loyal toasts having been responded to, The Chairman, in proposing "The Builders' Benevolent Institution," said that the Institution was founded in 1847, by Mr. Cozens, who he was very sorry to see was absent on that occasion, although he (Mr. Cozens) had always been a very regular attendant, and it was only his increasing age and infirmity that precluded his attendance. The Institution now stood in the position,—It was possessed of funds amounting to 13,200*l.*, and a sum of rather more than 3,000*l.* set apart to be devoted to a building fund whenever the Institution thought proper to build. It had now on its books twenty male and twenty-five female pensioners, or rather there would be that number after the next election of pensioners on the 28th, when four candidates would be elected. In some sense it might be

called a fortunate circumstance that they were going to elect four persons next time, but he was sorry to say that that increase of two over the ordinary number of pensioners elected was only occasioned by the decease of two pensioners. He wished that the friends of the charity could increase their subscriptions, and induce their friends to become subscribers. If every one who was a subscriber at present would get an additional subscriber of half a guinea per annum, they would very much increase the usefulness of the Institution. At present, the Institution had paid away in pensions a little over 10,000*l.*, and it was certain that that amount had gone a long way to increase the comforts of the homes of the poor recipients. No one engaged in the building trade could tell how his business would turn out, especially when such elements had to be considered as the late strike. The toast was drunk with enthusiasm.

Mr. Plucknett (Cubitt & Co.), treasurer of the Institution, next proposed the health of "the Chairman." He said that many men waited until the declining years of their lives before they exerted themselves very much in the cause of philanthropy. They then strove to make up for lost opportunities, and did all they could to benefit their fellow-men. But that was not the case with the chairman. He did not wait until declining years, nor indeed until middle age, before he came forward to support such charities as the Builders' Benevolent Institution, which were so numerous, and which sought to provide for the vicissitudes of life and suffering humanity. The chairman and his brothers had been from the very first three of the most liberal benefactors to the Institution. They delighted in doing charity, and were ever ready to do their utmost to encourage and support charitable institutions. Two brothers had already received the highest honours which was in the power of the City of London to bestow on a citizen,—honours which it was hoped might one day fall to the lot of the chairman,—and they represented two of the largest metropolitan constituencies in Parliament.

The Chairman having replied, proposed "the Patrons, Vice-Presidents, and Trustees," to which Mr. Russell Freeman briefly responded. Mr. A. G. Harris, the secretary, read lists of subscriptions amounting in the aggregate to 292*l.*, and the Chairman appealed to the company to make up the sum to 300*l.*. This was more than done for at a later period of the evening it was announced that 315*l.* had been subscribed. The remaining toasts were "the Treasurer," responded to by Mr. Plucknett; "the Architects," responded to by Mr. Henry Strudwick; and "the Directors and Stewards," responded to by Mr. Wilfred Nicholson.

ADVERTISING AND CANVASSING FOR VACANT SURVEYORSHIPS.

In a recent number of the *Builder* there appeared a deserved tribute of respect by the Corporation of Durham towards a rising surveyor in their service, Mr. Collinson. The death of that gentleman necessitated a successor, and a host of applicants beset all having an interest in the valuable appointment. It is well here to state that the Durham Corporation, following the rules of other bodies, advertises for gentlemen to fill posts; and when this appears in the newspapers, aspirants by scores apply, forwarding testimonials, and at great trouble and expense. Many, indeed, travel long distances to try what canvassing will do to carry the election; but it usually happens that the man is already fixed on, and thus the advertising is a downright waste of money.

In the present case, at a meeting of the Durham authorities, the Town Clerk read a memorial urging the Board to appoint Mr. William Ground to the office of borough surveyor. This memorial is signed by many of the influential gentlemen of Durham. Its reception caused considerable discussion, and ultimately it was received; and Mr. Richardson and Alderman Boyd moved that it be referred to the finance and general purposes committee to report upon.

When brought before this committee, a discussion took place, and it was resolved to advertise for a new surveyor. Aspirants for the post, it appears already numbering scores, may gauge their chance by the above.

STAINED GLASS AT EXETER CATHEDRAL.

Sir,—I had anticipated seeing an answer from "Expatriation," to Mr. Moore's letter, in your issue of the 9th inst., in this week's issue, and am disappointed at finding him "shut up."

As an outsider, but as one who to some the proper and careful preservation—restoration if you like—of our cathedrals has always been a topic of the liveliest interest, I would inquire how is it that the existence of this beautiful old glass was not known until it was discovered,—if anything which for years has laid in so conspicuous a place as the Minstrel's Gallery may he said to be discovered,—by Mr. Drake, who is not connected with the cathedral in any way?

Sir Gilbert Scott has had the cathedral in hand some two years, and for that space of time a clerk of works, at a high rate of wage, has been his resident representative upon the spot. Yet he has no intimation about the existence of this old glass; and had it not been for Mr. Drake, it is not unlikely that windows, as unsatisfactory and as unlike the old work, as is the now vulgarly-coloured east window in the Lady Chapel, would have been put in. Mr. Moore says that brilliant colour would be the ruin of Exeter. I would ask, has it not already, in a great measure, been so? Those who knew the cathedral years ago, and have not been in since the "restoration," will be astonished and confounded at the want of height one perceives upon entering the choir now. Always somewhat low, the roof, since the decorative scaffolds have been removed, is brought down infinitely lower by the glaring manner in which the bosses of the roof and the ribs of the groining are painted. The spandrels being plain, the unhappy zebra-like effect obtained from the ribs running down to their springers, one mass of gorgeous colour, has been the means of bringing down the roof in an unfortunate degree.

I saw, the other day, a notice respecting the further restoration of the nave as well as the choir now in hand. I learned thereby that a considerable sum of money would be required for the purpose, especially as there is a deal of debate carrying to be restored.

The bosses in the roof need little doing to them; the

glorious corbels from which the vaulting springs, are in excellent preservation, and at most require the application of a little potash and hot water, to remove the whitewash; and the same may be said of the charming little capitals in the triforium. All of importance that then remains is the Minstrel's Gallery, which is in a fair state of preservation. Every architectural student knows there is little else in the sculptor's art, save these items to be attended to. Exeter is not ornate like Ely, or Lichfield, or Lincoln; why then is such a large sum wanted, more particularly for the restoration of the carved work of the interior of the nave? I must confess to have felt rather puzzled when I read this notice.

AN EXONIAN IN A FAR COUNTY.

WHARF FOR CHELSEA.

THE Chelsea Embankment Committee presented a sixth report, reiterating their recommendation that the vestry accept Mr. Thoron's offer to sell land for a wharf for 13,000*l.*, to be built a stone wall on the river front, &c., at his own expense. The committee said they had considered a plan for the formation of a dock at the bottom of Lindsay-row, but the surveyor reported it would cost 14,000*l.*, and that the cheap shelving proposed was decided in an engineering point of view.

After discussion, the vestry, by 40 to 3, adopted the report, subject to the Metropolitan Board's consent to allow the vestry to borrow the purchase-money.

THE CARRIAGE INDICATOR.

Sir,—In a late impression you notice a "Carriage Indicator," patented by Mr. Streeter, the description of which tallies with one that I made, and unsuccessfully offered to the trade three years ago. Mine, however, by means of a ground-glass face, covering a quantity of phosphoric oil, was luminous in the dark. The principle and means employed are, however, the same. I was advised at Mr. Kesterton's, the carriage-builder, of Long-acre, to take it to Paris, and offer it there, "as such improvements were only done" from abroad. The model is in the possession of Mr. Stubbings, of 72, Wood-street, City. Wm. G. King, the original inventor, if there is any invention about it.

Frankfort.

FIRE-ROOFING.

With reference to certain recent configurations, it has been asked how the term "fireproof" is to be understood. The incidental remark, very confidently made by Professor Barff, in one of his very interesting Cantor lectures, on soluble silicates, given at the Society of Arts (some of which have appeared in the *Builder*), as to a method of rendering wood perfectly unflammable by an easy, simple, and inexpensive process, which he explained, and also illustrated with entire success, observing he was quite sure it was well worth notice, may serve to answer the question.

The use of material so prepared would, perhaps, help somewhat to clear up the means of solving delicately what is thought to be still a question. Another advantage and security of wood thoroughly and efficiently prepared in this manner, would be, that it neither expands nor contracts, nor bursts, cracks, or crumbles, as a state of all kinds does. "Nemo."

SCHOOL BOARDS.

London.—The Board have resolved, "That in accordance with the recommendations of the report of Works Committee of the 21st October, the following he, and they are hereby, appointed additional officers of the architect's department, subject to one month's notice on either side:—

- Senior Draughtsman.—Mr. J. Jefferys, at a salary of 140*l.* per annum. Appointment to date from November 11th, 1872; Mr. Herbert W. Dale, at a salary of 140*l.* per annum. Appointment to date from November 11th, 1872.
- Junior Draughtsman.—Mr. G. L. Wade, at a salary of 80*l.* per annum. Appointment to date from November 6th, 1872; Mr. W. J. Murray, at a salary of 80*l.* per annum. (In place of Mr. Burton, resigned.) Appointment to date from November 6th, 1872.
- Tracer.—Mr. J. Ratcliff, at a salary of 52*l.* per annum. Appointment to date from November 9th, 1872; Mr. A. W. O. Barton, at a salary of 52*l.* per annum. Appointment to date from November 5th, 1872.
- Office Boy.—John Robertson, at a salary of 8*l.* per week. Appointment to date from November 11th, 1872.

Northampton.—The Board considered the propriety of appointing an architect or architects to prepare plans and specifications for the building of the new schools. The chairman said the appointment need not be permanent; and the clerk said the Board might appoint an architect for this particular job. The feeling of the Board was strongly in favour of throwing the plans open to competition, and a discussion ensued as to whether the competition should be confined to the town and county, or be unlimited. Ultimately it was resolved that the Sites Committee be empowered to insert the necessary advertisements in the *Northampton Herald* and *Northampton Mercury*, and in the *Builder*, inviting plans for the proposed new schools. Mr. Phipps suggested whether the Board would not require the services of a professional architect to decide what they wanted. The chairman said, as chairman of the Sites Committee, he should be very happy to draw out an advertisement as to what was necessary, and to render what preliminary assistance was required. It was understood that the commission of 5 per cent. would be expected

to cover all the architect's travelling and other expenses, but that a clerk of the works should be employed.

Driffield.—The Board having considered the tenders, already published in our columns, for the erection of new schools, accepted Messrs. Howson Brothers' tender, being the lowest, if approved of by the Educational Department.

Gateshead.—The committee recommended that the tender of Jacob Atkinson, of Gateshead, for the erection of the Alexandra-road schools be accepted. The tender was for 3,482*l.* There were nineteen tenders, some of which were for the whole contract, and some for portions only, the estimates varying from 3,482*l.* to 5,590*l.* for the entire erection.

Wakefield.—Four school designs were submitted in competition, and the Board have accepted that sent by Mr. William Watson, architect, of Wakefield, who has received instructions to prepare the necessary contract drawings. The buildings are for 350 children.

Hatfield.—The Queen's-road Board Schools, the plans for which have been designed by Messrs. Horsfall, Wardle, & Patchett, are to be proceeded with as soon as the Education Department have passed the plans. They will be erected on the upper side of Queen's-road, and abutting on Gibbet-lane, the front elevation being to Queen's-road, but set back about 60 yards, so as to allow of ample playgrounds in front. The style of architecture will be Italian, and the schools will consist of centre and two projecting wings. The centre building will be the infants' school, and the wings the schools for boys and girls. Over the entrance to the infants' school will be a bell-turret. The windows are coupled together with columns and pilasters of the Corinthian order, being surmounted by pediments, the tympanums of which are to be filled in with carving and open ironwork for ventilation. The girls' school will be 50 ft. by 25 ft., and there are to be three class-rooms attached, the accommodation being for 220 scholars.

The boys' school is of the same size, and has the same number of class-rooms, the accommodation being also for 220. In the infant-school accommodation is required for 250, and the school is 53 ft. by 27 ft., whilst there are four class-rooms. To each school there is a lavatory and cloak-room attached. In the ceilings there are perforated ventilators, and the whole building will be heated by hot-water pipes. In front of the building will be extensive playgrounds for each department of scholars, that for the infants being in the centre, and the boys and girls opposite their respective schools. These will be divided from each other by a low stone wall, surmounted by iron palisades. At the rear of the schools are separate yards for each department, the conveniences being approached from the school by covered ways. The ground upon which the schools are to be erected is bounded on the south by Gibbet-lane, on the north by an intended new street, on the east by Queen's-road, and on the west partially by Arundel-street.

PERSPECTS OF ARCHITECTURE IN ITALY.

Sir,—Many of us would be glad to hear from your correspondent in Florence what are the present prospects of architecture in Italy, now that the country is reviving from its long sleep, and an architectural society has commenced its work in Florence itself. We are all interested in modern, as well as ancient, Italian art, and would gladly hear of a healthy revival of its power, or, at least, that part of it that is really good and noble. We should like to know if there are signs in the air of any real progress. FLORENCE.

IMPROVEMENT IN STREET LAMPS.

This is a subject which has occasionally engaged attention in our columns, and we are glad to think there is now a prospect of improvement, independently of any hope of amendment in the light itself.

One of the most defective points in the construction of street lamps has been that they waste the light where it is not wanted, and do not radiate it along the street from lamp to lamp. A new form of lamp-glass has been invented by Mr. T. A. Skelton, of Essex-street, Strand, architect, and named the Catoptric Lamp-glass. This new form of lamp is being tried in Moorgate-street, London, and also at

Southampton. It intercepts and reflects the whole of the upward and wasted rays of light into the dark intervals between the lamps, and not downwards towards the foot of the lamp, as gas reflectors have done. The effect is to diffuse the light cast in the centre of the interval between two lamps, at about the ordinary distance of 45 yards apart. It is calculated that the lamp gives a net increase in the force of light in the ratio of 36 to 10—i.e., about 3½ times the light at present received.

A perforated zinc case is filled with lime or other absorbent of moisture, and fitted into the lamp, to prevent any dimming condensation of moisture on the inner surface of the glasses.

VARIORUM.

MR. BONONI has printed a "Project for an Instrument for the Identification of Persons," for use in military establishments and police offices, and for physiological and artistic research (Longmans & Co.). In the normal form of a human being, the distance from the extremity of one hand to the extremity of the other is the same as the measure from the top of the head to the sole of the foot.

"From this fact," says Mr. Bononi, "it follows, that every individual of the human family must belong to one or other of three classes: for, either they must belong to that class in which the measure of the extended arm exceeds the height; or, to the class in which the height exceeds the measure of the arms; or, thirdly, to that class in which the measure of the extended arms is exactly equal to that of the height."

The pamphlet before us is devoted to a description of an ingenious arrangement for taking these dimensions with a view to record them for after-identification. — The "Cosmopolitan Masonic Calendar and Pocket Book for 1873," contains lists of lodges in the United Kingdom, France, Germany, and Italy, together with particulars of every Grand Masonic body throughout the globe (198, Fleet-street), — certainly a remarkable array. — The *Belgravia Annual* is more than a good shilling's worth, including some stirring stories, and seven page engravings. — We can honestly give the same praise to *Tom Hood's Comic Annual* for 1873. The cuts are numberless and funny, while amongst the numerous contributors of literary matter are Messrs. W. S. Gilbert, Walter Thornbury, Mark Twain, and the editor, Mr. Tom Hood.

Miscellanea.

The Proposed Demolition of Houses in Clerkenwell.—A deputation waited on the Lord Mayor, at the Mansion House, in respect to the proposed demolition of the homes of the poor in Clerkenwell and neighbourhood of the new street about to be made by the Metropolitan Board of Works. The deputation asked the co-operation of his lordship in obtaining better houses for the poor by inducing the Corporation to build houses on vacant plots of ground. The Lord Mayor said he was quite aware of the great demolition of houses proposed by the new Act; but for the last eighteen months the Corporation had been quietly working in the matter. The improvements committee of the Corporation had considered the question of building on the plot between Ely-place and Farringdon-road, but they found that three of the houses had no tiles, and the present owners could not give a transfer of them. In a Bill before Parliament last session a clause was inserted giving them power to take these houses, and the Bill only received the Royal assent in August last. He had urged on the improvements committee for the last two years the importance of building better houses for the poorer classes, who were now herded together, and he hoped, now that they had got the Act, no delay would take place. The association with which he was connected had provided good and cheap houses for a large class of working people, and they were prepared to build more, but were afraid to do so owing to the strikes in the building trade. There was no want of money.

A Hint to Seamen.—Rockets are not always available: time, place, and distance, alas! too often prevent aid being rendered. The gale that drives a vessel ashore will take a linen kite from the ship: the kite to have a very long tail, string to drag along the ground, with directions printed on linen in various languages to draw the kite down, then haul a rope from the ship, and to make it fast ashore.—R. T.

Metallic Wall Hangings.—A material to supersede paperhangings is spoken of as coming from France. According to the *Medical Press*, tinfoil in sheets, the thickness of ordinary writing-paper, is the material on which this new style of mural decoration, including gilding, is executed. Tinfoil is pliable and supple, sufficiently tough not to be easily torn, and offers a smooth and uniform surface. It forms an excellent base for the work executed upon it. It also possesses the advantage of being waterproof, a property well known to architects and builders, who frequently use it to cover damp walls, on which, without that covering, any decorative work would soon perish. The process of executing the painting on tin offers no difficulty. The sheets are manufactured of a width and in lengths suitable to their application on the surfaces to be covered. The application of the painted metallic hangings to either wood, stone, plaster, or iron surfaces offers no difficulty. The operation is somewhat similar to putting up paperhangings, with this difference, — that with the latter the paper is pasted over at the back before being hung, and with the former the surface to be decorated is covered with a thin coat of adhesive varnish, on which, after it has been left to dry partially, the painted tin is affixed with great ease. The varnish used for fixing the material is of the nature of gold size, but more adhesive.

The Prince Consort's Memorial Chapel at Windsor Castle.—The sarcophagus, which is to bear the recumbent effigy of the Prince Consort, has been set up. It occupies a position in the chapel a few yards in front of the altar. There is an angel at each of the four corners. Those at the head bear each a shield, one representing the arms of the Queen, and the other those of the Prince. The angels at the opposite end are represented as mourning. There are three panels on each side, and one at the head and foot. In the panels on the south side are figures representing Charity and Science, the centre one having an angel bearing a shield with the words—"I have fought a good fight, I have finished my course."—2 Timothy, iv. 7. On the north side the figures represent Truth and Justice, the centre panel containing an angel with a shield, and the same inscription as on the other side. The panel at the foot contains a figure of the Queen in the attitude of prayer; and that at the head contains a figure of Science, weeping. The cenotaph is made of several kinds of marble: the top slab, upon which the recumbent effigy of the Prince is to rest, is of Pyrenee black and white marble. The base is of black and gold Sicilian marble. The angels at the four corners are of Sicilian marble, all the other figures being of statuary marble.

A New Metropolitan Railway.—Among the new schemes to be submitted to Parliament, says the *Railway News*, is one for completing the inner circle by a new line of railway starting from the Metropolitan Station at Brompton, and effecting a junction with the Metropolitan at Farringdon-street. The route of the proposed line would be along the Brompton-road to Knightsbridge, with a station near Tattersall's; then passing along by Piccadilly (partially under a portion of the Green Park to avoid disturbing traffic) to Regent-circus, where will be a large station, with accommodation for the Midland, Great Western, Great Northern, and North-Western Companies, making this in effect a central railway station for the metropolis. From Regent-circus the line would pass north of Leicester-square, through some low-class properties in St. Giles's and Bloomsbury, and along the south side of Holborn to Lincoln's-inn-fields, where would be a station, with wide approaches at Great Turnstile to the New Law Courts. From thence the line would continue to the Metropolitan at Farringdon-street station.

New Congregational Chapel in Cambridge. The first stone of a new Congregational Chapel, to serve in lieu of the existing chapel next Downing-street, was laid a few days ago at Cambridge, by Mr. Samuel Morley, M.P. The site of the building is immediately opposite Pembroke College, in Trumpington-street. The architects are Messrs. Fuller & Cullitt, of Finsbury-place, London; and the building is intended to seat 750 persons. The cost will be 8,000*l.*, exclusive of site.

New Church for St. Giles's, London.—It is proposed to build a place of worship in St. Giles's for the working classes, the Rev. G. W. McCree to be the minister.

Gallery of Illustration.—No one capable of enjoying quaint fun, good acting, and charming music, can fail to enjoy the entertainment provided for him by Mr. and Mrs. Gorman. Read if it be listened to with the right spirit. Mr. W. S. Gilbert's "Happy Arcadia," set by Mr. Clay, is full of droll and original notions, capably presented by Mr. Arthur Cecil, Mr. Corney Grain, Mr. Alfred Reed, Miss Holland, and Mrs. Reed, who likewise all appear in the latest novelty, a fishing piece with the taking title "Very Catching," written by Mr. Burnand, with music by Mr. James Molloy. The scene for this, a retired nook of the Thames, with trees, rushes, stepping-stones, and sedgy banks, gives a remarkable effect of extent, considering the narrow limits of the reality. The well-trained little company play and sing to perfection. Mr. Corney Grain adds his amusing sketch of the doings at a "Five o'Clock Tea," and the result is a thoroughly merry and enjoyable evening in the Gallery of Illustration.

The American Seal Lock.—This is a new lock in which the key-hole is covered by a seal which is a small square piece of glass, held in position by grooves in which it slices. The "seal" covers the hole through which alone the spring catch is accessible, and this cannot be released until the seal is broken. The "seal" itself is a piece of common window glass, marked on the back with a letter and number, and also with various irregular dots and splashes, in a sort of chocolate colour. The lettering and numbering are conducted on the same principle as on the Bank of England notes, so that no duplicate of a seal will ever be made; and the dots and splashes are accidental in shape and position, being sprinkled on at hap-hazard. Before the seals are cut the entire sheet is photographed, and the printed photograph is perforated like a sheet of postage-stamps. The purchaser of the seals is supplied also with photographic *fac-similes*, so that he can send one of these to any person whose business it may be to verify the security of a package.

Fall of a House.—A shocking accident has just occurred at Brighton. For some time past a number of men have been employed at a building in course of completion in Viaduct-terrace. While the men were at work as usual, the building fell to the ground. The plasterers, who were engaged in finishing the interior, had a narrow escape, but three men and a boy, who were at work in the basement, were buried beneath the falling materials. The three men were taken out alive, but the boy was quite dead. At the inquest it was stated that the deceased was digging a trench in the basement of the house at the time of the accident, and that it was caused by his digging too close to the foundation. The jury returned a verdict "That the deceased was accidentally killed by the fall of a house."

Monumental.—In the beginning of the present year, says the *Scotsman*, friends of the late Horatio Macculloch, R.S.A., associated themselves together, under the presidency of Sir George Harvey, P.R.S.A., for the purpose of obtaining a permanent memorial of that distinguished artist. The necessary funds were soon subscribed, and Mr. James Drummond, R.S.A., prepared a design, which was entrusted for execution to Mr. D. W. Stevenson. The monument has just been completed, and may now be seen over the painter's grave near the north-west corner of Warriston Cemetery. The design is that of a Celtic cross, treated in a style of severe simplicity. The memorial also comprises a bust of Macculloch, which is now being executed by Mr. Stevenson from the admirable model by Patric Park, R.S.A., and is intended to be deposited in some public place.

"The Mayo Memorial" for Cocker-mouth.—Messrs. W. & T. Wills, Sculptors, of London, have been commissioned to execute a colossal marble statue of the late Earl Mayo in his costume of Viceroy of India. It is to be erected on a moulded granite pedestal, to be placed in the cross road of the main street of Cocker-mouth.

Manchester and Salford Sanitary Association.—A meeting in connection with this association has been held in the Hulme Town-hall, to inaugurate the series of lectures for 1872-73. The chair was occupied by the Bishop of Manchester, and there was a large attendance. Mr. Thomas Turner, F.R.C.S., delivered an address on the "Use and Abuse of the means of Sustaining Life."

Presentations.—On the 1st inst. a portrait of the Dowager Marchioness of Westminster, painted by the Hon. H. Graves, was presented to Lady Theodora Grosvenor, at Motcombe House, by subscription of the neighbouring tenantry and others, together with a richly-bound volume, in vellum, containing the subscribers' names, and illuminated by Mr. Soppitt, of Shaftesbury, architect.—On the 4th inst., the carpenters and joiners employed by Messrs. Mansbridge, on their works for the Imperial Gas Company, in John-street, Bedford-row, presented their foreman, Mr. S. Pooley, with an ivory rule, a brass level, and a tape measure. On the 11th the bricklayers and plasterers in the same employ presented him with a gold chain. Each of the gifts was accompanied with a kindly address.

The Proposed Improvements at the Lambeth Vestry-hall.—A fortnight ago we noticed in the columns of the *Builder*, certain proposed improvements in the Lambeth Vestry-hall, as recommended by a special committee to whom the subject had been referred, stating that the matter stood deferred for a month, to admit of an examination of the plans by the members of the vestry. In the meantime, an agitation against the proposal has been raised on the part of a portion of the ratepayers, who contend that it is altogether unnecessary; and that, instead of the estimated cost of 3,500*l.*, the proposed improvements will involve an outlay of at least 5,000*l.* It is urged that the present hall having been cleaned, painted, and embellished not more than three months ago, its reconstruction now is unjustifiable.

Society of Arts.—The opening address was delivered on Wednesday evening last by Major-General F. Eardley-Wilmot, chairman of the council. The Prince Consort's prize and the medals awarded during the last session were presented by the chairman. The following arrangements have been made:—November 27:—"On Technical Education, and the Means of Promoting it." By Mr. Thomas Webster, Q.C. December 4:—"On the Manufacture of Horse-nails by Machinery." By Mr. J. A. Huggitt, December 11:—"On Galvanic Batteries." By the Rev. H. Highton, December 18:—"On Russia, her Industries, Commerce, and Means of Communication." By Mr. Leone Levi. The first course of Cantor Lectures for the ensuing session will be on "The Practical Applications of Optics to the Arts, Manufactures, and to Medicine," by Mr. C. Meymott Tidy, M.B.

Charmouth.—Mr. Gale, the waywarden for this parish, having had certain works done in the parish, costing over 60*l.*, without calling a vestry meeting or consulting the surveyor, and also having done the hauling connected therewith himself contrary to law, an adjourned vestry meeting was held, in order that the parishioners might examine the accounts relative to the said work. A resolution was proposed and carried unanimously, that Mr. Gale's bill for hauling, amounting to upwards of 10*l.*, be disallowed, and that he be compelled to take certain pipes which were not used, and have been charged to the parish, and deduct the cost of them from the bill for pipes. The resolution was ordered to be laid before the Highway Board.

A Trade Arbitration.—Mr. Rupert Kettle has given his decision in the matter in dispute between the carpenters and joiners and their employers. He rules that it is quite optional with any employer whether he provides artificial light in the winter months, so that his workmen can commence work before seven o'clock in the morning. If any master does provide artificial light he must pay his out-door workmen the same wages as the in-door men, although they may not be able to work such long hours. In all cases where the master does not choose to provide artificial light the working-day for the period between six weeks before and six weeks after Christmas should commence at seven o'clock in the morning and terminate at five in the afternoon.

Mechanics' Institute, Tunbridge Wells.—The new building in Dudley-road for the Belgrave Mechanics' Institute has been formally opened, with an exhibition of art-treasures in the various rooms.

Columbia Market.—The Court of Common Council have resolved to make a tramway from the Great Eastern Railway to the Columbia Market, at a cost, we hear, of about 9,000*l.*

The New Waverley Bridge and Station, Edinburgh.—In the construction of the new Waverley Bridge station, every section of the new works has had to be proceeded with separately, but it is expected that the entire station will be completed in the course of a few months. The passenger-shed—containing the arrival platform for the North and West trains, and the departure platform for Berwick and Carlisle trains,—is now finished, with the exception of the angle at the west end. Messrs. Hannab, Donald, & Wilson, Paisley, are the contractors for the iron work; and Mr. R. Hutchinson, Edinburgh, for the mason's work.

The Ryde Gas Company and the Corporation.—The Ryde town council having purchased the gas works in opposition to the wishes of the public, nearly the whole of the members have resigned and been replaced. The gas company have now issued a writ against the corporation for payment of 60,000*l.*

"Economical Stove."—A dozen correspondents wish to know where the little cooking-stove illustrated in our Number for November 9th, can be obtained in England. We are not aware that it is to be found anywhere in England. Probably one of our enterprising iron-men will take up the matter.

Fatal Fall from the Clock Tower at the New Town Hall, Manchester.—A stonemason in the employ of Messrs. Smith & Taylor has fallen from the clock tower which is in course of erection at the new town-hall. He fell from a height of 50 ft., and was killed.

Master Builders' Association, Liverpool. The sixth annual dinner in connexion with this association was served on Wednesday night, in last week, at the Adelphi Hotel. Mr. George Rome, the president of the association, occupied the chair.

Cautionary.—Part of the flooring of the entrance to the Odd Fellows' Hall Concert-room, Halifax, gave way on Saturday night (last week), under a sudden rush. About 100 lads were precipitated into a vault below. Eleven were injured.

Camberwell Green-Coat and National Schools.—These schools, recently rebuilt, have been opened by the Bishop of Winchester. The buildings provide accommodation for children of both sexes, and for infants.

Society of Biblical Archaeology.—On Tuesday, December 3rd, a paper will be read "On a Cuneiform Inscription containing the Chaldean Account of the Deluge," by Mr. Geo. Smith.

TENDERS

For five blocks of industrial dwellings, on the Farringdon-road, London, for the Metropolitan Association for Improving the Dwellings of the Industrial Classes. Mr. F. Chancellor, architect. Quantities supplied by Messrs. Curtis & Son:—

Sharrington & Cole	£52,500 0 0
Ashby & Son	51,071 0 0
Conder	51,750 0 0
Brass	50,661 0 0
Hill & Sons	50,167 0 0
Dove, Brothers	45,690 0 0
Perry	43,117 0 0
Adamson	41,380 0 0
Brown (accepted)	39,369 0 0
Tall & Co. (concrete)	36,255 0 0

For Coulsborough Board Schools for 600 children, with Board-room and master's residence. Mr. W. Watson, architect:—

Twibey & Goodlad (accepted)	£23,060 0 0
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For Falsgrave infants' school for 190 children and caretaker's house, for the Scarborough school Board. Mr. W. Watson, architect:—

Estill, Atkinson, & Co. (accepted)	£864 7 0
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For the erection of a residence, Kingsbridge, Devon. Mr. H. Elliott, architect:—

Wells	£1,250 0 0
Chapman	1,099 0 8
Kendall	975 0 0
Stear & Hannaford	800 0 0
Pearse	728 4 9

For alterations and repairs at 17, Bread-street-hill, for Messrs. Adams & Rees:—

Staines & Son (accepted)	£185 0 0
For acid works, jatty, piling, &c., at Scotswood, Newcastle-on-Tyne, for Messrs. Redmayne, Brothers, Mr. G. Kyle, architect. Quantities supplied:—	
Howard & Son	£4,790 12 10
Elliott	4,530 0 0
Scott	4,424 1 0
Lowry	4,345 15 0
Simpson (accepted)	4,348 2 0

For two houses, Wolverhampton-road, Stafford, for Mr. S. Taylor. Mr. J. Ratcliffe, architect:—

Ratcliffe (accepted)	£1,025 0 0
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For two houses, Wolverhampton-road, Stafford, for Mr. Meyer. Mr. J. Ratcliffe, architect:—

Bridgett (accepted)	£215 0 0
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For vagrant wards (cellular system), for Board of Guardians of Stafford Union Workhouse. Mr. J. Ratcliffe, architect:—

Whitton	£1,039 0 0
Adams & Pemberton	969 0 0
Moss	838 10 6
Ratcliffe (accepted)	875 0 0
Bridgett (withdrawn)	620 0 0

For house, Talbot-road, Stafford, for Mr. J. B. Cooper. Mr. J. Ratcliffe, architect:—

Whitton	£215 0 0
Adams & Pemberton	342 0 0
Ratcliffe (accepted)	338 0 0

For three houses, Peel-terrace, Stafford, for Mr. W. Wright. Mr. J. Ratcliffe, architect:—

Trushaw (accepted)	£470 0 0
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For new vestries, Lecture-hall and boundary walls, to the Congregation Chapel, Burnt Ash-lane, Lee, Kent. Messrs. Osborn & Russell, architects. Quantities supplied:—

Perry	£1,618 0 0
Myers	1,589 0 0
Wood	1,583 0 0
Browne & Robinson	1,475 0 0
Dove	1,475 0 0
Fritchard	1,466 0 0
Downs & Co.	1,368 0 0
Tongue	1,156 0 0

For the erection of a new rectory-house, for St. Mary's, Newington, Surrey, including red brick facings. Mr. E. Christian, architect. Quantities by Mr. F. W. Hunt:—

Harlock	£2,315 0 0
Gannon & Son	2,314 0 0
Jackson & Shaw	3,195 0 0
Longmire & Burge	3,175 0 0
Timewell	3,150 0 0
Dove	3,105 0 0
Faulkner	3,095 0 0
Emor	3,028 0 0
Brass	2,911 0 0
Newman & Mann	2,911 0 0
Lalby, Brothers	2,816 0 0
Downs & Co.	2,781 0 0

For the erection of a house, at Pechham-rye Common, for Mr. W. H. Drake. Messrs. H. Jarvis & Son, architects. Quantities supplied:—

Kent	£2,134 0 0
Thompson	1,998 0 0
Thompson	1,940 0 0
King	1,880 0 0
Tarrant	1,850 0 0
Shepherd	1,840 0 0
Marsland & Sons	1,825 0 0
Henshaw & Co.	1,794 0 0
Downs & Co.	1,790 0 0
Thomas	1,790 0 0

For re-building No. 69, Ludgate-hill, for Mr. Treloar. Mr. W. H. Hayward, architect. Quantities supplied:—

Snell	£7,061 0 0
Perry & Co.	6,389 0 0
Baggsley	6,342 0 0
Ashford	6,210 0 0
Axford	6,089 0 0
Perry, Brothers	5,977 0 0
Downs & Co.	5,973 0 0
Browne & Robinson	5,925 0 0
Sharrington & Cole	5,837 0 0
Deards	5,835 0 0
Montar	5,773 0 0
Elkington	5,610 0 0

For extension of shop and repairs to house, No. 438, Edgware-road, for Messrs. Sculling & Sons. Messrs. New & Cumings, architects:—

Bird	£388 7 6
Mark	345 0 0
Thompson & Smith	322 0 0
Harris & Sons	316 0 0

For repairs and painting to the Hercules Tavern, Kensington-road, for Mr. Whiting. Messrs. Bird & Walker, architects. Quantities supplied:—

Brown	£215 0 0
McLellan	177 0 0
Williams & Son	167 0 0
Harris & Sons	148 10 0
Collier	117 15 6

For the erection of enclosing walls and railing to St. Stephen's Church and vicarage, Walworth-common. Messrs. H. Jarvis & Son, architects:—

Henshaw & Co.	£270 0 0
Downs & Co.	512 0 0
Tarrant	527 0 0
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The Builder.

VOL. XXX.—No. 1556.



The Country Houses of the British Labourer.

CERTAIN public speakers, seeking to discredit and oppose the endeavours now being made to improve the condition of our agricultural labourers, have spoken in such positive language of the admirable manner in which they are now lodged; of the dry, airy, well-drained residences provided for them; and the ingratitude of discontent under such circumstances, that we began to hope the unhealthy holes and foul dens we had visited by hundreds, and in numerous cases described, had at length been razed to the ground, or at least so improved that healthy life and decent behaviour were possible within them. It was time then,

to go out again and see with our own eyes the happy change that had been brought about by labours in which we might fairly claim to have helped. We recalled the close, reeking holes, not high enough to allow a man to stand upright in (either in body or mind), with damp walls, broken windows, rotten floors, no trace of comfort,—places which had gradually stamped the of the occupants every rising hope and content feeling,—

“The countenance worn out
As the garment:”—

and gloried in the notion that a better time had come, and that the better part of man would be a chance. It must have come quickly, though, we thought; for it is not long since we saw hundreds of wretched houses utterly unfit for occupation, whole villages in which everything that could be done to defeat the natural advantages of the place was being done persistently and continuously.

We give illustrations, for example, of some miserable houses at Abergavenny sketched in October, last year.* The view shows a set of wretched dilapidated dwellings in what, we suppose, may be justified in terming one of the principal streets in this town, considering it forms the main road from the railway station, past Breckfield, the residence of Dr. McCullough; and that there is a turnpike gate on the road close proximity to these very dwellings. The sketch is taken just beyond the bridge over the small stream, and at the time the drawing was made there was an immense heap of muck and decomposing refuse on the left-hand side, whilst the houses illustrated are on the right. The picture speaks for itself of the utterly miserable state of these structures, few of the roofs being so high but that a man of ordinary height might easily place his hands upon them. Further up the road, on the left, a house existed at year with a large hole in the thatched roof.

This roof, like many others in the street, was profusely covered with wild flowers growing on the rotten thatch,—a dismal mockery of the squalor and wretchedness to be found within. Nearer the High-street were houses of a still worse description than these now portrayed: we content ourselves for the present with giving a plan of one, with a sketch showing how the house would appear if the front wall and part of the roof were removed. It will be seen that this house (one of a series) consists of two stories (1), ground and first floor, the stairs from one floor to the other comprising four steps only, two having very deep risers to two very shallow ones, as shown: the first deep riser forms the coal-cellar and safe. Such luxuries as bandrails are, of course, unknown; and when the bedroom at the top is reached there remains a dangerous “stair-hole” in one corner. We will not describe what we saw in that room: the time has gone by: we should be told things had been altered since then.

Oh, yes; things are so altered, says one writer, that in Wiltshire “there is scarcely room for further improvement.” “Things are so altered,” says a farmer-correspondent of our own, “that in all Somersetshire you could not now find such places as you described a few years ago.” Well, we have been into Somersetshire,—not last year, but last week,—and we will try to give our readers a notion of some of the cottages we saw there. The upper view* represents four human habitations at Wincanton, the property of a considerable land-owner living in the neighbourhood. That there might be no exaggeration, the front was photographed (the sun never lies), and our illustration is a copy of the photograph,—with this difference, that it gives too pleasant an aspect to the wretched huts. Inside the rooms it was unfortunately impossible to catch sufficient of the sun to do similar work;—the wise rays would not enter. The houses may be called Nos. 1, 2, 3, and 4, beginning at the left hand.

No. 1 is occupied by a man, his wife, a grown-up son, and six young children; No. 2 contains an old man and his wife; No. 3, a man, wife, and seven children; and No. 4, two men, one woman, and three children.

The living-rooms are generally without plastering, that on the walls having been knocked off; the ceilings look as if they had never been plastered. The living-rooms of Nos. 1 and 2 are about six feet in height; the others are about 7 ft. The floors were once paved with rough stone in irregular pieces, but at present the stones are split into bits, many less than the size of a hand, and there are some holes in the floor 1 ft. square. The state of dilapidation of the whole is beyond description. The bedrooms appear to have been only partially plastered, and for the most part are now bare to rafters and thatch; there are many holes through the rotten thatch, which let in the rain and show the stars at night to the inmates, who put up umbrellas when it rains. Festoons of cobwebs depend from the rafters in black, thick masses. The side-walls are from 2 ft. to 2 ft. 9 in. in height. The floors and stairs are in such a state that one would hesitate to walk on them, for fear of falling through. The condition of some of the rooms is such that they cannot be occupied, so that the crowding in others must be pretty considerable. The fearful state of ruin, dirt, and squalor that prevails cannot be easily described. These “homes” have no back-doors. As to drainage, we observed some holes in the ground, near the entrance-doors, into which the refuse from the houses appears to be poured. The rains had penetrated No. 2, so that the living-room floor was a pool of water. The drinking-water used by the people is obtained, we believe, from a “pit” dug out of the garden

near No. 4; and this, we were told, is sometimes covered with a green scum. There is one “convenience” for the whole; and for the discouragement of notions of delicacy, it is in a conspicuous situation, right facing the houses, at a distance of some few yards. The door of this place faces the dwellings, and is at the side of the path leading from the road to the houses. It empties into a ditch, and distributes its odours with perfect impartiality.

Has the owner ever visited these dens? We can scarcely believe it, and yet they are in a ring-fence with his other property; within three fields of his own residence. The rent received for these houses, let us add, is 1s. 6d. per week in three cases, and 1s. 8d. in the fourth.

Last week a case of *delirium tremens* was reported to the Wincanton Board of Guardians, and we sent for some particulars of the home of the patient. It is situated in a lane in the town; has a living-room about 12 ft. by 9 ft., and 7 ft. high to the boards of the upper floor; no ceiling; and above there is one room, 12 ft. by 13 ft., and 7 ft. high, containing two beds. In this room generally sleep the man and his wife, three children, the wife's mother, and a young unmarried woman.

Is it much to be wondered at that the husband, a labourer, had fled for comfort too often to the public-house? Sad! but, we assert, not wonderful. At the time of our informant's visit the man was raving mad, occupying one of the beds, and attended on by three other men. The window was closed, the room hot and poisonous; the poor woman looking nearly dead from fatigue. In this house, as in many we had visited, there is no back outlet. In one cottage not far from that last referred to we found a small room in which eight persons usually slept,—rare school for morals; prime shelter for health!

It is really quite wonderful that labourers are still discontented, and do not cultivate amicable relations with their employers.

Postscript.—The sick man is dead. The old woman and the young one have gone out to lodge; the widow and her three children are sleeping in the same room with the corpse.

AN ARCHITECT'S NOTE BOOK IN SPAIN.

WHEN Sir Digby Wyatt went to Spain in 1869 he made a considerable number of sketches, 100 of which have been reproduced in *fac-simile*, and published by the Autotype Fine Art Company.*

The course he took, and which he recommends to those who want to see much in a short space of time, was, as he tells us, from London, *via* Paris, Bordeaux, and Bayonne, to Spain, beginning with Burgos; then successively visiting Valladolid (rail), Venta de Baños (rail), Leon (rail), Zamora and Salamanca (*by diligence* from Leon), Avila (*by diligence* from Salamanca), Escorial (rail), Madrid (rail), Segovia (*by diligence* from Madrid and back), Alcala de Henares (*by rail* from Madrid and back), Toledo (*by rail* from Madrid and back), Cordova (rail), Sevilla (rail), Cadix (*by the Guadalquivir steamer*), Gibraltar (*by steamer*), Malaga (*by steamer*), Granada (rail and *diligence*), Andujar (*diligence*), Madrid (rail), a second time, Guadalajara (rail), Saragossa (rail), Lerida (rail), Barcelona (rail), and Gerona (rail); thence to the frontier *by diligence* and home by rail, *via* Perpignan, Carcassonne, Toulouse, and Paris. Each sketch has a critical notice accompanying it with reference to the salient points of interest in the subject selected. Good reason is given to show the desirability of such records. The ancient monuments are fast disappearing:—

* The beautiful Moorish decorations of the Alcazar at Segovia had been all but entirely destroyed by fire, attributed to the careless cigar-lighting of the cadets, to whom the structure had been abandoned. The finest old mansion in Barcelona, the Casa-de-Gralla, probably the masterpiece of Damián Forment, and dating from the commencement of the fourteenth century, has been pulled down by

* An Architect's Note Book in Spain, principally illustrating the Domestic Architecture of that Country. By M. Digby Wyatt, M.A., Slade Professor of Fine Art in the University of Cambridge, &c. Autotype Fine Art Company, 36, Rathbone place, London.

* See p. 616.

* See p. 946.

the Duke of Medina Celi to form a new street. The beautiful wooden ceiling of the Casa del Infante at Guadalajara, the finest of its kind in Spain, in the absence of its owner, who I was told lives in Russia, is coming down in large pieces; and once fallen, I scarcely think it will be in the power of Spanish workmen to make it good again. The exquisite Moorish Palace of the Generalife at Granada, second only to the Alhambra and the Alcazar at Seville, is never visited by its proprietor, and is now one mass of whitewash, a victim of the zeal for cleanliness of a sanitary "Administrator." In short, to visit a Spanish city now, by the light shed upon its ancient glories by the industrious Ponz, is simply to have forced upon one's attention the most striking evidence of the "vanity of human things," and man's inherent tendency to destroy."

Other interesting buildings are diverted from their original uses. The college at Alcalá de Henares is turned into a young ladies' boarding-school; the Convent of the Knights of Santiago, at Leon, the masterpiece of Juan de Badojoz, and one of the finest buildings in Spain, is now in charge of a policeman and his wife, awaiting its possible conversion into an agricultural college; the Palace of the Dukes of Alva, at Seville, is let out in small tenements, and affluently whitewashed; the Colegiata of San Gregorio at Valladolid, and the old cathedral at Lerida, the richest Byzantine monument in Spain, are now both barracks; the exchanges of Seville and Saragossa are generally shut up; the "Casa de los Abades," at Seville, is converted into a boys' school and lodging-house for poor tenants; the Casa del Infante, at Saragossa, containing the most richly-sculptured Renaissance Patio in Spain, is chiefly occupied as a livery-stable-keeper's establishment; Cardinal Mendoza's famous Hospital of the Holy Cross, at Toledo, is now an infantry college; the great Monastery of the Cartuja, near Seville, with one of the finest Mudejar wooden ceilings in the country, is turned into Pickman's china factory; and the "Taller del Moro," a Moorish house with beautiful decorations, at Toledo, is now a carpenter's workshop.

We shall best show the amount of information which is to be found in the book by skimming through it and condensing a few passages from the author's own words. We just now mentioned a "Patio." The patio is the most striking feature of all important Spanish houses. It is an internal courtyard, perpetuating the atrium of Roman architecture, with its impluvium and compluvium, and corresponding with the ordinary cortile of the Italians. It is usually rectangular in plan, and entirely surrounded upon at least two stories by arading, behind which run passages, and into these open the doors of every principal set of apartments of the house. There are rarely many windows in the walls of the patios, as the rooms generally occupy the whole width intervening between the patio walls and the external walls of the house, from which the light is mainly derived. There are, however, usually more windows on the lower story of the patio than on the upper, since the chief alcoves requiring most light were on the first floor, while much of the lower floor was occupied, as was also usual in Italy, by retainers, servants, poor guests, mendicant friars, and administrators,—to say nothing of mules and horses, with stores and munitions of all sorts. Of several of these patios Sir Digby gives sketches.

With his sketch of part of the Casa del Infante, our author points out that in Spain, as it was in Italy, the architecture of the revival may be divided into at least two great schools, viz.—the early, in which sculpture, and particularly sculptured arabesque, plays a prominent part; and the late, in which regularity in the use of the orders, and a system of rigidly-proportioned plain architectural members form the main constituents of the most highly commended structures. Both merged into the extravagance which follows when architects learn to draw with facility rather than to think with steadfastness and propriety. As Italy had its Borromini, so bad Spain its Churriguera.

The iron pulpits to be found in Spain, of course attracted his attention, and sketches of some of them are given. In the one from Avila Cathedral of the sixteenth century, we no longer meet with a superposition of perforated plates, but the operations of heating and chasing, and indeed cutting the metal with chisels, files, and hammers; working, in fact, as the Italians term it, "a nas-ticio." The basis of the design is no longer Gothic, but strictly of the regular Spanish Plateresque Renaissance, with balustrade columns, figures in niches and arabesques, imitated from the Italians.

The method of working this pulpit is no longer that of the simple smith, but really corresponds much more closely with that of the armourer, which reached its zenith about this

period. There can be no doubt, we agree with our author, that the Spaniards gained much of their well-known skill in the manipulation of iron and steel from the Moors, who had themselves obtained knowledge from Damascus, and perhaps even improved upon the knowledge they had derived from that source. Many fragments of finely-wrought ironwork of the Middle Ages still exist in Spain, but generally in a fragmentary condition.

Spain still possesses much fine bronze-work, in spite of the intrinsic value of the material which has led to the fusion of treasures of art all over the peninsula. Amongst these, Sir Digby points to the magnificent eleven gilt life-size portrait statues of the Spanish Royal Family from Charles V. to Philip II., with which Pompeo Leoni decorated the "Entierros Reales" of the Escorial, and the same sculptor's still finer statues of the celebrated prime minister and favourite, the Duqué de Lerina, and his duqueza, founders of the convent of San Pablo, at Valladolid, whence they have been transferred to the museum of that city. As semi-architectural, semi-sculpturesque works in bronze, occasionally with an admixture of iron upon a large scale, of course, the most important and abundant are the late rejas, or metal screens, of the great Spanish churches and cathedrals. Of these ample notices are given by both Ford and O'Shea,—authorities at once so excellent and so readily accessible as to render unnecessary any more than a passing reference to them. Alluding to the two principal tools by which metal-work was executed, viz. the hammer and the pliers, our author says, in England and in France the first was used in preference, at least, to the last; while in Germany, Burgundy, and the Low Countries the last was specially affected, and by its means foliage, both natural and conventional, was rendered with great skill, facility, and taste. The Spaniards, as is proved by some of the sketches given, were at an early period dexterous in the use of both tools, uniting the massive style engendered by the predominant use of the hammer with the more florid and fanciful manner springing out of the light and convoluted forms created by a more liberal use of the pliers.

The habit of the Moors was almost universally to make their exterior architecture plain, and to reserve richness and elaboration for the interiors of their houses. The fact that what is commonly internal architecture has been used by Moorish workmen on the external façade of one of the houses sketched would be sufficient of itself to prove that it had not been executed for a Moor, even if the Gothic mouldings and ornaments of the buttresses, impostas, cornices, and string-courses failed to assert the Christianity of those for whom the house may have been built. The date of its construction, judging from style, is put at about the middle of the fifteenth century, at which period, in Spain, Renaissance features had in no wise affected the integrity of either Gothic or Moorish architecture. In this case, all the mason's work is Gothic, and all the stucco work is Moorish; and this distinction of style, according to the technical mode of construction, is not an uncommon feature of Mudejar work.

A sketch, representing part of a doorway, illustrates two of the special points of architectural interest, viz. the entirely Moresque character of the stucco-work at a comparatively late date, and the profuse use of "azulejos," or coloured tiles. Some of these may be recognised, although in a sketch, in black and white. It is not easy to make them apparent in the coverings of the lower part of the door-jamb. It is, however, in and about the splendid staircase that this charming tile lining, of the use of which we have here of late date commenced a revival, asserts its value as a beautiful mode of introducing clean and permanent polychromatic decoration.

A sketch of a façade, in the style known in Spain as "Mudejar," that is, neither Gothic nor Moorish, but a compound of both, illustrates two principles constantly followed by the Moors in their treatment of decoration,—viz., to preserve the continuity of all scroll-work from root to fully-developed foliage,—a principle entirely disregarded in all previous ornamentation based upon classical practice,—and to care first for large surfaces to satisfy the eye with harmonious relations of those surfaces to one another, and to the spaces they have to enrich, from a distance, and then to provide minor fillings and intersec-tions, so as to supply adequate elaboration for close inspection. In addition to the decorative effect produced by variations in relief, still

greater refinement was obtained by patterns in colour, painted upon the surfaces of the modelled ornaments. Although almost everywhere the colour has either been rubbed off or rubbed into confusion, the abrasion, Sir Digby says, has, for the most part, only the pigment and its aluminous vehicle, leaving the surface of the stucco bare, and showing the outline of the delicate ornament which has been drawn in by the pencil of the artist.

Speaking of the mosaic decoration of the Alhambra, our author points to the advantages possessed by the Moors over the Greeks in working such mosaics as the one alluded to, and notes that, while a Greek would have required 119 separate pieces to make up what is shown, the Moor wanted only 49. Moreover, instead of having to chip every one of the 119 pieces to a definite size and shape, and then to place them slowly, so as to ensure the truth of his angles of 45° and 22½°, as the Greek or Italian had, the Moor had only to place one of his 49 pieces with precision, and, provided he never took any of the eleven patterns, of which his repeats are composed, out of their right turn, his mosaic would work itself, with scarcely any other attention on his part.

We should not deal fairly by a large body of distant readers, who avowedly regulate their orders for books by what is said of them in our pages, if we did not mention that the sketches are lighter than might be desired, and are addressed rather to those who know than to those who want to know.

The volume is dedicated by the author to his "brother in art," Owen Jones, in affectionate terms, creditable to both.

EXPLORATIONS IN CYPRUS.

The explorations that have been carried on during the last three years in Cyprus have led to discoveries far beyond the expectations of the most sanguine searchers after the buried treasures of antiquity. The very position of the isle made it the receptacle of gems of art, in past ages, from east and west. The offerings to Venus at Golgos and Paphos came from all lands, and furnished, no doubt, a nucleus of the antiquities now brought to light.

The vicissitudes of the island's history contribute also to the variety in date and nationality of the objects found. Held by the Pharaohs, the Persians, the Salamine governor, the art-protecting Evagoras, and the great Alexander successively, it passed subsequently into the hands of the Romans, and thus, east meeting west, were mingled on this isle their respective arts. The altar of the Paphian queen became adorned with gifts from eastern and western potentates. The Cyprian race of the present day must be a compound descent from Greeks and Romans.

Many objects of great interest have been found long since on the island. The "Codex Cyprius," the unchanaged Gospels, was found here in 1673. Pooceke speaks of ruins and some few tombs, but of no works of art. The Duc de Luynes possesses some rare silver bowls found there; and in 1845 some few bas-reliefs, &c., were found. The indefatigable researches of Di Cesnola have produced an almost incredible number of objects. Count Luigi Palma di Cesnola is of an old Italian family,—has fought in the wars of Italian independence, and in the Crimea under General Anselmi. In 1860 he went to America, joined the army of the States as volunteer, and after having greatly distinguished himself in many actions, attained the rank of brigadier-general, became a citizen of America, and was appointed consul to Cyprus. His father before him had fought for Greek independence, and he himself earned the thanks of the Cypriotes in his resistance of Turkish tyranny in 1869. He is about forty years of age, of an intelligent, energetic, persevering character. Having obtained a firmam from the Sultan, and being discontented with all the results of previous excavators, he began in earnest after having studied carefully all native traditions and defined the sites of the twelve celebrated old cities.

We will quote from the able article of an American review some few passages of the result of Di Cesnola's labours. "Upon arriving at his consular residence at Larnaca" (the ancient Citium, the birthplace of Zeno), "Di Cesnola discovered of the massive stone tazza recently discovered at Amathunta, and just contributed by Napoleon III. to the Louvre Museum. It is nearly 11 ft. in diameter, about 7 ft. high, and

weighs 1,000 pounds. It bears inscriptions in Phœnician, Hebrew, Syriac, and Greek, supposed to be of the ninth or tenth century B.C. The inhabitants of Larnica had coins and terra cotta fragments in their possession.

Commencing his subterranean searches among tombs already opened, he found the town was actually constructed on the old necropolis of the Phœnician Citium, or the Kitim of the Old Testament. Opening many adjacent tombs, he found many objects of ancient art, mostly of terra cotta. Among them were many statuettes of the crowned Venus; then came the figure of the water-carrier of the East to light, then the bearded giant of Assyria, the Sphinx of Egypt, the Phœnician woman playing her lute, &c., setting forth the great similarity of all ancient Eastern art.

In 1866, through his attention being drawn, by a peasant, to a stone covered feet below the surface, he discovered the necropolis of the Greek Isathim, at Dalj, a few miles north-west of Larnica, where, Virgil relates, existed the largest temple dedicated to Venus. "A great many tombs were here opened, revealing a grand collection of objects of Greek art;—coins of the age of Phidias, of the Imperial Greek class, of the Alexanders, the Seleucides, and of the series of the kings of Cyprus."

The collection of Greek glass accumulated was very extensive and varied, both in form and colour. Plates, cups, pateræ of lovely forms and varied tints; a red oinoche, or special wine-bottle, used at the Symposium; an unguentary, with yellow spiral lines, iridised. The most finished amphore were of yellow. The collection of glass numbered 1,700 pieces, and is said to be the finest extant.

The collection of jewelry found is very rich, especially in gold rings, engraved with legends, the palm, or the yew.

The objects most numerous are in terra-cotta, consisting of statuettes of Venus and her worshippers. While excavating at Dalj, Di Cesnola came upon the necropolis of the Phœnician Idahim, long buried beneath that of the Greek. The Phœnician tombs he found oven-shaped, with stones at the opening. Some skulls were found. The ancient customary Phœnician gold plate over the mouth of the dead was frequently found. Bronze articles were found also in the tombs;—in stone, Phœnician, Egyptian, and Assyrian heads; statuettes of the Phœnician Jupiter, with a patera in one hand and a cornucopia in the other; heads of the bull, &c.; in terra-cotta, gigantic Assyrian heads with the beard in a bag; fire worshippers and the meriah, or victim of sacrifice to the god of fire, lamps, &c., perfume-holders, a curious procession,—two donkeys carrying baskets, a man on horseback, with two water-jars, a chariot with three musicians, one with a man holding a sabre, one with a female, one with a man and a warrior with casque and shield; little terra-cotta houses, with figures looking out of the windows; hundreds of vases of all kinds, with and without handles, some with Phœnician inscriptions, &c. In pottery are fine red vases, with geometrical designs in black. Much interesting study could be gleaned by the consideration of these Dalj vases. Among the Greek vases are several of an Assyrian character, and on another a design similar to the hunting-scene on the sculptures of Nineveh; whilst, in many of the ancient tombs that have sure Assyrian marks, were alabaster vases, with wedge-shaped ornaments. The Dalj vases may well serve to trace the progress of art. Di Cesnola's labours continued, when the seasons permitted, over a space of three years, and 200 men were employed by him. It is said in that time and with this aid he opened 8,000 tombs. (?)

He next turned his attention to the discovery of the debatable opposition Temple of Golgos, or rather the necropolis was the aim of his search; and he not only found the latter, but the former also. The Golgos Temple is at a distance of fifty miles from that of Paphos,—by many considered identical until now. The temple seems to have been destroyed by fire. The columns having been of wood, no traces of them are left. The vases indicate Doric and Ionic architecture. The temple was quadrangular, 60 ft. by 30 ft., and supposed to have been 50 ft. high, and also, unlike others dedicated to Venus, to have been roofed. It seems to have had no windows, but to have been lighted by stone lamps, each in the form of an Ionic temple, with red pillars,—many of these being found, and stono vases near, probably for oil, all much worn

from use. Several lines of double pedestals ran through the centre of the temple, on which must have stood colossi. A few coins were found,—one of Evagoras I. Votive offerings of stone were found all over the ground, most with holes bored in them for hanging on the walls. The destruction of temples effected by Theodosius was carried out in Golgos; and though, as it is said, the very statues were broken in pieces, and then scattered miles apart, there may yet be hopes that, with such vigorous, untiring search, much may be recovered. It is said, in the ruins of Golgos were found a thousand statues, one-third of them the size of life. Di Cesnola found in the temple statues of Hercules and Apollo; Nana; the Chaldean Venus; Ishtar, the Assyrian; Mylitta, the Babylonian; Astarte, the Phœnician; Aphrodite, the Greek; and Amathanta, the bearded Venus: showing that statues of other divinities were admitted into temples built for particular deities.

The Colossus of Golgos, 28 ft. in height, with its Assyrian cap, is the most prominent of all. Its beard is divided into four parts, encased: there has been an inscription on the neck. It may have been the head of a high priest of Ishtar, date about eighteen centuries B.C. Most have the same grand Eastern characteristics of Assyrian sculpture, with the careful finish of detail.

There exists no specimen of Persian origin, though the island was long under the Persian sway: of Egypt, Greece, and Rome there are many. A beautiful life-size draped statue of the Macedonian period may be placed beside many of the most highly-prized statues of Greece.

Much may be yet learned from the deciphering of the inscriptions, above thirty in number, found, in Cypriote, on the statues. The stone of which the statues are formed is from the island. The workmanship is from the hands of the various nations who held the island in possession.

Di Cesnola had just planned the excavating of Konklia, and had defined and bought Paphos, when an edict from the Sultan put an end to his work. Let us hope, only *pro tem*.

In various parts of the island he had found priceless treasures in gold, silver, bronze, and copper coins, one struck by Ptolemy Philadelphus, bearing the portrait of Arsinoe, vases and other objects similar to those found in the tombs. The collection has formed a matchless museum; that part containing the ancient glass vies in variety and beauty with the celebrated museum at Kertsch. Di Cesnola has visited Turin and explained his researches before the Academy of Science. The archaeological societies of Athens, Rome, Dresden, Berlin, Paris, have received him as honorary member, as well as those of Florence and Turin, and decorations have been bestowed on him by the Kings of Bavaria, Italy, and Greece.

The collection, no doubt, will ultimately become possessed by America.

SOCIETY OF PAINTERS IN WATER COLOURS.

THE Winter Exhibitions of sketches and studies by members of the Society of Painters in Water-Colours vary in little else but denomination from the usual display of summer seasons; and if there be any real pleasure in uncertainty, it is not one that attends a visit to the Gallery, 5, Pall-mall East. Sir John Gilbert, A.R.A., will ever be best appreciated in such performances as leave it most clearly evident how rapidly and powerfully he can paint: further finish would detract from such splendid examples as "The Return of the Victor" (177), or "Prisoners of War" (264), so infinitely preferable to the more studied composition that an assemblage of "The Characters in the Plays of Shakspeare" (108) has occasioned; without show of such advantages as constitute this artist's forte, it is too plainly indicated that the faculty of individualising is not one of them. Mr. Fred. Taylor, likewise, will owe some of his best reputation to the graceful ease and vigour with which he can produce a picture out of slight materials, and in no time; his charming specimen of a mounted sportswoman "Throwing off the Hawk" (347), though described as a sketch, leaves nothing to be desired, and is the best out of three or four similarly agreeable drawings. It would be absurd to apply the term "sketch" to the elaborate representation of "A Fishmonger's Shop" (350), by Mr. F. Walker, A.R.A.; the verisimilitude to the various kinds of the fishy tribe, heaped in groups for choice and sale, glittering with gem-like brilliancy of colour,

betokens a very close application of study, with a successful result, so far as imitativeness is the confined object of such labour. It is a very extraordinary but uninteresting achievement, with very little room in such a subject to evoke the poetic sentiment that commonly invests Mr. Walker's adaptations of ordinary incident; the effect of this drawing is to disappoint as much as to astonish. "Le Plaisir de la Pêche" (374), by R. W. Macbeth, a very agreeable and cleverly rendered little episode, to prove that there may be more to be made of catching fish than serving them up when caught, for sale, and it has a double aptitude for provoking comparison; it needs not have been much better to be mistaken for other emanation than its proper one. And this affinity is as visible, though not so satisfactorily, in a larger drawing by Mr. Macbeth, of a father seated in the garden watching his daughters, designated "My Roses" (184); the garden and the more real roses are by no means the less attractive by reason of papa's partiality. Mr. E. K. Johnson's fair musician at "The Old Organ" (153) is very nice and unaffected: she stands in half-light, with rainbow-hues from a stained-glass window to make her look the more reflective. The same neatness and refinement that characterise this picture are evident in "Caught at Last" (260), the catch being a stiff old Puritan who has given hot work to his Cavalier pursuers. "Un Franceseano" (179) is a capital study of a monk by Mr. Carl Haag, and "A Moselle Peasant Girl" is an admirable sketch by Mr. W. C. T. Dobson, R.A. (205); but the figure-draughtmen would be more than usually outdone by the landscape painters on this occasion if it were not for one member.

Mr. J. D. Watson's contributions are so numerous, and offer such strong testimony to skill as well as industry, that it becomes quite a difficulty to select, out of nineteen instances of it, one special proof of his great ability: he draws so correctly,—wide "Studies for Book Illustration" (244), and is so enamoured with rich, deep tone and forcible tints, *vide* "On the Shore" (204) or "In the Wood" (237), and "Retirement" (344), that from over-assertion of these acquirements he is apt to exaggerate, and so sacrifice natural appearance. A very brilliant representation of a beautiful boy, doing the part of "The Cupbearer" (58), in Medieval costume, is very gay and pure in colour. Mr. G. J. Pinwell's single contribution is a marvel of finish and truthful effect, though the theme of it is only "A Long Conversation" (381) between two very ugly and coarse women; and Mr. J. Boyd Houghton's cleverness and originality are apparent enough in "The Young Musician" (50) and an Eastern mountebank drilling his performing monkey, "A Full-dress Rehearsal" (55), to leave no doubt of his being a great acquisition to the Society.

It would be pleasant labour, though really labour, to examine thoroughly the numerous landscapes that seem to have an equal claim on the attention, and if the purpose were to analyse their qualities severally with a view to account for the impression their general excellence conveys, it would be such a task as would puzzle the most anxious to overcome it. Why should Mr. G. Dodgson obviously give to paper the virtue of a "camera lucida," and with no outline more than may grow from a blot of wet, show nature as he and all others see? "A Yorkshire Beck" (20) and an "Old Quarry in Larpool Woods" (44),—a splendid proof of how force and depth of tone may be got without blackness; whilst Mr. E. Duncan, with a clear definition of bough and weed, acts like a looking-glass, and proves that nature is as he sees it, and everybody else, by a "Study in Lullingstone Park, Kent" (121), and "Study on the Thames, near Stratford" (201)? Mr. Birket Foster's raging sea is wonderful, like a raging sea, in his fine drawing of "St. Andrew's" (30), though stipple and pretty colour, both in that and the sky do away with any feeling of dread one may have of angry elements. Mr. Collingwood Smith; Mr. Paul J. Natfel,—who has nothing better, even whilst all he does is so good, than his delightful little drawing, "On the Arto Beck, near Caton, Lancashire" (383); Mr. H. Gastineau; Mr. C. Davidson; Mr. J. J. Jenkins; Mr. T. M. Richardson; Mr. Arthur H. Marsh,—"On the Conway, North Wales" (113), to witness; Mr. J. W. Whitaker; Mr. W. M. Hale,—"Sunset in Glen Gondi" (148); Mr. Alfred P. Newton; Mr. Francis Powell; Mr. S. P. Jackson; the Messrs. Callow; Mr. D. Cox, jun.; Mr. Arthur Glennie; &c., can all evoke such keys and tones from a japan tin

colour-box as are attuned in chorus to the song of nature's charms.

Mr. Alfred W. Hunt shows some very choice studies on the screens; and Mr. E. A. Goodall is seen to best advantage there, too, in "Arabs returning from the Pastures near the Pyramids of Goezeb" (340) and "The Coptic Church, Old Cairo." Mr. G. P. Boyce's small drawing of "The Tempe, from Ludford" (386) is very beautiful; and Mr. J. W. North's exquisite little epic, "Meadows Sweet" (388) is a treasure that would tempt honesty.

THE PROPOSED GREAT DOCK EXTENSION AT LIVERPOOL.

ENORMOUS INCREASE IN THE STEAM SHIPPING TRADE.

THE proposed extension of the Liverpool Docks, for which the Mersey Docks and Harbour Board have decided to seek powers in the ensuing session of Parliament, may be regarded as one of almost unprecedented magnitude, and will involve in its execution an amount of building and other works, independently of the excavations and masonry required for the new docks and quays proper, which has seldom, if ever, before been attempted by any public body. The proposed works have been resolved upon mainly in compliance with the repeated demands of the steam shipping interest of the port, more especially the trade between Liverpool and America, which within the last few years has developed itself, and expanded at an unexampled rate, as we shall presently endeavour to show, not only as regards the number and tonnage of the ships now in existence, but also as to the vessels at present building for the several steam-ship companies. These different companies have latterly so impromptu the Dock Board for increased water area and quay space, each company alleging that the other was unduly favoured, that, after having in vain endeavoured to meet the demands made upon them, by appropriating to the several companies, interests, and trades, as much dock and quay space as possible in the existing dock area, the Dock Board, literally worried, appear to have had no alternative but that of entering upon the gigantic project for dock extension which is now to be submitted to Parliament. The magnitude of the new undertaking may be conceived, when the existing number of docks, with their water area, and quay, wharfage, and warehouse space, is stated. Those docks, which occupy a river frontage, from north to south, of upwards of six miles in length, are twenty-seven in number, consisting of the Carriers', Canada, Huskisson, Sandon, Wellington, Bramley Moore, Stanley, Colingwood, Salishury, Nelson, Clarence, Trafalgar, Victoria, Waterloo, Prince's, George's, Canning, Salthouse, Albert, Wapping, King's, Queen's, Coburg, Brunswick, Egerton, Union, and Hercules Dock, and contain an aggregate water area of more than 259 acres. The total water area of the existing Liverpool Docks is 259 acres and 587 yards, with a lineal quay space of 18 miles and 916 yards. The water area of the Birkenhead Docks is 165 acres and 3,565 yards, and a lineal quay space of 9 miles and 878 yards; the total area of the docks on both sides of the river being 424 acres and 4,152 yards, and the lineal quay space 28 miles and 34 yards. The proposed new docks, both at the north and south ends of the port, more especially at the north, will almost double this already large area; and as regards the north, it may be stated that the Dock Board have for some years past been in possession of land on the foreshore of the Mersey, to the extent of more than 200 acres. This land the Dock Board made at a very large outlay, having previously purchased the foreshore from the Lord of the Manor, the Earl of Derby. After reclaiming the land from the river they erected a river wall between one and two miles in length. Their intention was at the time to convert a portion of this land into additional docks, but Parliament restrained them from doing so until the Birkenhead Docks, then in progress, were completed. It is this land, along with other land at the south, that it is now proposed to utilise for dock purposes; and when the new works are completed, the present river frontage of the docks will be increased by between one and two miles in length, and extend a considerable distance inland.

The immense expansion of the steam shipping trade of the Mersey, which, as we have already stated, has led to the dock extension above indicated, is worthy of remark. The increase is

chiefly in the trade between Liverpool and America, but the Mediterranean and the Pacific coast have also participated in it. The Cunard line of steamers, now some thirty years ago, was the pioneer of steamships between Liverpool and America, when the company's vessels, four in number, were despatched once a week. The Inman line followed some years afterwards, this company's steamers being again followed some years subsequently by the Liverpool and Montreal Company, now called the Allen line. Other new companies followed in succession, until, at the present time, there are no less than six distinct lines of large steamships trading between Liverpool and the American continent, having a fleet of upwards of 100 ships, with a tonnage of more than 300,000 tons, and instead of one vessel alone leaving the port weekly, considerably more than an average of one per day are now despatched, several of the companies, as in the case of the Cunard, the Inman, and the National companies, despatch their vessels twice, and even thrice, a week. Large, however, as is the combined fleet, both in numbers and tonnage, it is not equal to the demands and requirements of the trade, and at the present moment there are eleven new vessels in course of building for the several companies, representing upwards of 30,000 tons.

It is to meet the requirements of this fast-expanding steam shipping, together with the large timber trade of the port, that the proposed extensive augmentation of the existing dock area has been resolved upon. It is true that in addition to the present dock space on the Liverpool side of the Mersey there are on the opposite shore at Birkenhead some of the largest and most magnificent docks in the world, which have been constructed at an outlay of several millions. These docks, which form part of the Mersey Dock Estate, are in themselves amply sufficient, whether as regards water area, or quay space, to supply all the additional accommodation required; but although the Dock Board have offered every facility to shipowners to make use of them, neither the steam trade nor the shipowners generally can be induced to resort to them, except to a very small extent, the result unfortunately being that this fine portion of the Dock Estate, upon which such an enormous amount has been expended, is comparatively avoided, and unremunerative, and without using a figure of speech, may be designated "a splendid ruin."

There can be little doubt that the comprehensive project about to be submitted to Parliament will be sanctioned, and we may in a short time expect to see on the banks of the Mersey works of almost unexampled magnitude actively in progress, which for some years to come will give employment to many thousands of skilled artisans and others.

The total number of new docks which the Board propose to construct is twelve, six of which will be at the north end of the port. These docks will be much larger than any of the existing docks, their average water-area being from eighteen to twenty acres each, and their estimated cost, including quay-space, sheds, roads, and approaches, 3,549,867*l.* The six new docks which the Board propose to erect at the south end of the port, will not be on so large a scale as those above-named, but they will nevertheless cover a large area, the water-area of one of them being eight acres, and another between eleven and twelve acres. Their estimated cost is 1,284,18*l.*, making the entire outlay for the whole of the new docks which it is proposed to construct, 4,834,051*l.*

ON PROFESSIONAL ESPRIT DE CORPS.*

We have all discovered, I hope, that we cannot afford to confine our attention exclusively to positive matters, whether technical, artistic, or professional. It occasionally becomes necessary, if we desire to understand our position and our prospects aright, to give attention to the motive forces by which our collective action is shaped and impelled, and to attempt to gauge the depth of the intangible moral agencies at work in the great world, and in that professional microcosm the welfare of which is of so much importance to us all.

We fully recognise the importance of mastering all the material and artistic elements with which our art and our practice have to deal, and of regulating and considering all those steps of

* By Mr. T. Roger Smith; read at the Institute of Architects on the 15th inst.

professional conduct upon which the success of our undertakings so largely depends. But there exists a something of greater moment to us than rules of practice and scales of fees, or than any individual detail of study; an actuating principle so intangible and so unobtrusive that we run some risk of forgetting its importance and of neglecting or underrating its claims upon our notice and our care.

If we set a justly high value on reliable rules and maxims of procedure, at what rate should we prize an animating spirit, such as shall substitute for a formal conformity to strict rules a voluntary and hearty adherence to a line of action? The spirit is better than the letter. The living soul is worth more than the dead trunk and limbs; and if we combine all the architects of England into one organised and compact professional body, the task will prove fruitless unless that body be animated by an active and a healthy spirit,—in fact, a professional *esprit de corps*.

That wonderful similitude under which men intimately associated together, and inspired by a common enthusiasm or a common affection, are likened to a human body, has grown, like many other Scriptural ideas, so familiar to us that it has almost lost its force. When we say a body of men, we almost forget what we mean. The military services have appropriated the phrase with the intention to carry out, as far as discipline and careful forethought can do, all that the emblem implies. The corps of engineers, a corps of artillery, and so forth, each means an organised body of men linked together by strong ties, and into whom it has been sought to breathe a spirit of devotedness to their duty and comradeship towards one another. I need not tell you how successfully the perfect organisation of military service has in many instances been made vital, so to speak, by the glow of a fervent soldier's spirit. An intensely strong bond of union has grown up in the different branches of the army, manifesting itself in a jealous loyalty to the traditions of the service, an enthusiastic devotion to it, a high sense of honour as growing out of it, and a generous good-will towards every member of it. This is what is meant by *esprit de corps*. The greatest commanders have been those who have roused and cherished such a spirit the most. The most successful armies have been those in which it has been the ruling passion.

And now I am to invite you to consider with me for a few moments the importance to ourselves of our possessing so much of this temper of mind as is appropriate to the circumstances of our professional life, in the hope that we may come to recognise *esprit de corps* as one of the things needful to us, and its cultivation as one of the most important objects which this Institute and the kindred societies throughout Great Britain can keep in view. It is, indeed, almost the sole object of the present paper to direct attention to the subject. It will, of course, be expedient to say something as to the conditions essential to the growth of *esprit de corps*, the existence of it in other professions, the means by which its increase can be stimulated, and the good which we may hope to gain from it; but none of these considerations is, in my view, at all so important as the mere recognition of the subject. If professional *esprit de corps* can only become to some slight additional extent admitted as one of our stock ideas, to be from time to time considered, discussed, and kept in view, the object proposed will be fully answered. It is not, let me add, a feeling that professional *esprit de corps* is altogether wanting in our body which has prompted me to raise the subject; I admit, with pride and pleasure, that a wide, a healthy, and, I hope, a growing spirit of brotherly friendliness and helpfulness exists in the profession, and that a large amount of zeal for the craft and honest pride in our work is to be found among us, and especially among those frequenting this room; but the promotion of this temper of mind seems not to be sufficiently recognised as an object to be kept in view; we shut our eyes to its great importance; we fail to provide for and encourage it as we ought and might; and, as a consequence, it languishes where it might flourish, and is imperfect when it could easily be complete.

Two things seem to be necessary to originate *esprit de corps*, though, once originated, there are a thousand which may promote or retard its healthy development. Men must be bound together in some way. The tie that binds them must be one which they can honour or love.

You, of course, get no *esprit de corps* among

men who are in no way bound together by any tie. It is absent from among the passengers of a ship, though it may exist in the crew. There is none of it among the travellers by a train, but it may be very strong in its hold on the guards and porters of the railway or the engineering staff. There is no *esprit de corps* in the inhabitants of a village: organise the villagers into a regiment, give them a colonel of whom they can be proud, drill them, and march them to the wars, and you will soon begin to find *esprit de corps* at work.

Again, not only must there be a tie, but the tie must be one in which men can take a pride, or towards which they can feel an affection. No man who hates or despises the tie which binds him to his comrades has a spark of *esprit de corps*. It is quite dead in the soldier or the sailor who has no heart for his calling, and it can be crushed out, even when it exists, by making the service unbearably irksome or disgraceful to the men. It does not need that I should go back many years in the history of recent wars to illustrate this. We have only to contrast the intense devotion of the soldiers of the first Napoleon to their military duties with the bearing of, let us say, those of the same race and nation under Bazaine at Metz, to understand what a difference a commander who is admired and loved can make in the temper of mind of his army.

Illustrations could be multiplied to any extent; but probably it will not be felt necessary that more should be brought forward in order to establish my contention that when *esprit de corps* is developed, there must previously exist, first, the tie to bind men together, and, secondly, some noble or lovable quality in that tie to rouse their enthusiasm.

This temper of mind, as you see it in a high-spirited soldier or sailor, is a very noble thing. The ruling passion of such a man is zeal for the service,—one of his most marked characteristics is a frank cordiality towards his comrades. No sacrifice is too great, no exertion too arduous for him to make, if duty or the good of the regiment calls for it; and every fellow soldier or sailor is felt to have a certain claim to good-will on account of his being in the same service,—a good-will which exists notwithstanding a vast amount of professional jealousy and a most keen rivalry in the race for promotion. A man may have no personal liking for a brother officer,—may, may resent bitterly his having been promoted over his head; but he would be none the less sensitive to any attack upon his comrade's honour as a soldier, and ready to resent it; while the greatest outrage which either could endure would be some stigma unjustly cast upon the regiment or the corps.

It is now necessary to inquire how far, as a matter of fact, professional life in other walks than our own has given rise to an *esprit de corps* at all resembling that by which the soldier and the sailor are so fully animated. It is hardly necessary to say much as to the advantage which the members of any profession derive from the existence of such a temper of mind; but whatever need be said on such a subject will, perhaps, be most appropriately introduced as we glance rapidly at one or two different departments of professional life.

Putting aside exceptional professions, such as diplomacy, Parliamentary and political life, and the civil service of the Crown, let us come at once to the case of those which somewhat resemble our own,—law, medicine, church, art, literature, and engineering. Each of these can contribute something of use to our inquiry; and commercial life if we had the time and opportunity to examine it, might yield some amusing contrasts by way of practical commentaries on the negative side of the question.

Taken all in all, the Bar is the foremost profession in England. The highest official position which a subject can hold is its great prize, and the lesser prizes, with all the fame, fortune, and social status belonging to them, are numerous and brilliant. There is much, too, in the intellectual nature of a large part of the work which has to be done to induce a barrister, who has any success, to take an interest and a pleasure in his work. Barristers form a very definite body, strongly detached from other professions. They do the most conspicuous part of their work in one another's presence, and as the bulk of them are university men, and many of them public school men, they have the advantage of early association to a considerable extent. Here then the two conditions supposed by us to be favourable to the growth of *esprit de corps* seem

fulfilled to a remarkable degree; and supplemented by favourable circumstances. As a fact, we find professional feeling at the bar to be conspicuously energetic and healthy, perhaps more so than in any other calling.

There is no barrister who does not feel that his profession is an honour to him, and there is hardly one who could be induced by any temptation to do an unprofessional thing; while any man guilty of a dereliction from his duty as a member of the bar, would be immediately and unsparingly expelled from it. I do not believe that barristers are much different in their nature from other men; but, thanks to *esprit de corps*, they act much better than most others, for it is notorious that among them when a thing is recognised as one which ought not to be done, it is not done. I quite admit that the discipline exercised by the Inns of Court is the primary agent in maintaining this high standard of professional propriety, but nothing except a vigorous *esprit de corps*, and a highly-pitched enthusiasm for the profession itself, could possibly cause that discipline to be endured.

Among men who are constantly engaged in keen conflict, who feel that the road to wealth and distinction lies open for him who can oftentimes snatch a victory from his opponent, it is indeed remarkable that a higher tone of professional etiquette should exist than anywhere else; and this, in spite of certain temptations which the profession of advocacy may be fairly assumed to present towards a more or less lax tone of morals. The man who as a matter of business will do his best for an atrocious swindler or forger, and will save him, if he can, from the condign punishment which he knows him to deserve, may yet be safely trusted to refrain from misleading a formidable rival, or attempting to interfere with his legal connexion. A strict code of professional honour, to a large extent an unwritten code, governs each member of the bar. He well knows that against unfairness of a certain sort he is perfectly safe, and that he is bound in honour to be himself equally fair to his brethren. How great the advantages are which this high professional tone procures for the bar of England, and indirectly for all their clients, we can each one of us appreciate, and we need hardly seek any better illustration of the nature and value of professional *esprit de corps*.

The practice of various branches of the fine arts has developed some amount of the kind of spirit I am referring to. Actors and musicians are very much thrown together; they form a distinct body of men, who constantly work in concert, and who have a great enthusiasm for their professions; and they possess as a rule plenty of *esprit de corps*, marred sometimes by strong personal rivalry. Painters are little thrown together in the pursuit of their profession, though they are all fond and proud of it, and there is, I think, less of professional spirit among them. Sculptors seem to be very deficient in *esprit de corps*, and this may perhaps be traced to the facts that they happen to work in a very isolated way, and that however eminent individuals may be, the position of their art, as a whole, in public esteem at the present day, can hardly be regarded by them as a thing to be proud of.

Letters are, as a rule, pursued by isolated men working in their own studies, and though literature is an acknowledged profession, or rather group of professions, it is not easy to define the extent to which *esprit de corps* prevails among literary men. They have not so much an enthusiasm for literary work as for the various subjects and aims towards the study of which their writings are a means; and though they are many of them thrown much together, that occurs chiefly in connexion with their special studies. Journalists occupy a rather different position; but as a whole the literary world in this country is too ill compacted, too little homogeneous for *esprit de corps* to flourish among its members. In France, where the profession of literature is more definitely recognised, and where it enjoys higher social distinction, there is a strong *esprit de corps* among men of letters.

Civil engineering is an occupation in more than one respect closely akin to our own. In the case of this profession, though the individual has much to be proud of in his calling, and has a good deal to throw him into contact with his fellow engineers, there exists the drawback that everything is extremely new, the organisation, as we see it, having sprung into existence within a lifetime. Here also the interests of individuals are often very conflicting, and their stakes very

large; while anything like professional usage has hardly had time to grow up, and has had some special obstacles to contend with. Taking these things into account, the amount of *esprit de corps* among civil engineers may be fairly admitted to be considerable, and very usefully manifested, and will, I believe, be felt to be decidedly in advance of what exists among ourselves. Several circumstances contribute obviously to this result. Civil engineers are more thrown together, and better organised than we; their profession has reached a high social status, and the public and other works entrusted to it are of imperial importance and magnitude, and consequently a civil engineer has great cause to take a pride in it. The circumstances of a large work, such as a railway, require not merely large staffs of clerks in the lead engineer's office, but the engagement of a considerable number of younger men as resident engineers and sub-engineers, and in this way the members of the profession are thrown together into groups. They have one immense accidental advantage over us, in being nine-tenths of them fixed within a stone's throw of Great George-street when they are in London, a circumstance in itself sufficient to promote the *esprit de corps* to no small extent, and one which has led to the organisation of an Institution which forms a more central rallying-point than our Institute has been or can easily become. In several respects their central society is more powerful in its authority over them than ours: the leading men devote time to its management, and attend its discussions with a zeal remarkable, when we consider the money-value of their time; and if I am not misinformed, its control over the proprieties of professional life is vigorously exercised. All these things tend very much towards the compact organisation of the engineers into a definite body, animated with high professional feeling.

In connexion with this mention of the Institution of Civil Engineers, it may be of some interest to note how widely these different callings, to which we have made allusion, vary in the mode in which they are governed or brought together. The engineers and solicitors each have a powerful central society. The barristers have their different Inns of Court, and are also very much directed by expressions of opinion from the Bench. The medical profession have their College of Physicians and of Surgeons. In the church Convocation has little real influence, the government of matters being really personal and in the hands of the bishops. Artists have the Royal Academy, but are not cordial towards it. In the civil and military services of the country, the direction of the affairs is personal, and in the hands of the head of each department, or the commanding officer, as the case may be. There does not, therefore, seem to be any rule as to what form of organisation best promotes *esprit de corps*, only it is to be noted that the professions where public spirit is most manifest, seem on the whole to have the most vigorous central ruling power, whether personal or a society, and to possess the most strongly-marked and most strictly-kept boundaries.

In each case that has come before us, there exist for the members of the profession alluded to definite professional publications, and it may perhaps be pardoned to one who was for some time responsibly identified with the architectural professional press, if I dwell for a moment on this as a conspicuous element in the diffusion and formation of any professional public opinion. It is very difficult to say how much or how little any individual letter or article, published by the press, has to do with the formation of the general opinion of the mass of readers; but one thing at least may be advanced, without doubt, namely, that whatever of weight or of reason there may be in the thing said, the newspaper at least secures it a fair hearing; while certainly, when anything of real importance has to be brought before the members of any profession, there are no other means of doing it so extensively or so readily. Were any token of the influence of the professional press required, it might, I think, be found in the ostentatious way in which people, who set up for taking an independent course, from time to time declare that they are not influenced by it, and even go to the extent of writing in one journal to inform the public that they rarely, if ever, read another. Now, I believe that this influence is too powerful and too important to be safely neglected, and I am convinced that the men who are entitled to be listened to, would do well to occupy this field more frequently than they do. A letter or a

signed article from the pen of one of those members of any profession who has made his name known, is read with attention by the whole of that profession, and may produce a permanent and sensible change in public feeling on a disputed point. Such a communication, if directed to obtain a definite and attainable reform, would be the most powerful agency possible towards securing such a reform.

We have hitherto examined *esprit de corps*, so to speak, from the outside; we have named a very few of the advantages which it procures to the individual members of the professions where it prevails, and if I do not refer to those advantages more in detail, it is because they are obvious and well known to you all. There are, however, corresponding advantages to the public, and here, I think, comes in the leading distinction between genuine *esprit de corps* and its spurious counterfeit, trades-unionism; the one is honourable to those who possess it, and advantageous to their clients and themselves alike; the other seems to consider notions of honour superfluous, and only aims at being of advantage to one side.

The professional man has been described as a tradesman selling his own time and skill; but the comparison is not just, because his relation to his client is not that of selling some ware to him, but of doing some act for him: he represents his client. We, for example, do not simply sell a building to a client; if he wants to buy he goes to the auction mart. He comes to us to take charge of such ideas as he has, and such requirements as must be met under our charge, to mature them, work them out, carry them into execution, and represent him by doing for him what he cannot do for himself for lack of the required architectural knowledge and skill. It is the same, *mutatis mutandis*, with solicitors and counsel, or with medical men. Now it is of infinite importance to the individual that the person who represents him,—his vicarious self, so to speak,—should represent him in the best possible way, and the man who pays a high fee to a distinguished barrister does it with the desire that he may make his temporary appearance before the court in the character of a person of complete knowledge of the law and high intelligence. It is also of importance that to this should be added a character for high honour; and professional *esprit de corps* secures that the client shall be temporarily clothed with such a reputation. The parties to a suit may bear, each of them, a very indifferent character; but it smooths the transaction of the business to an untold extent, if the judge knows that each is represented by counsel who will not overstep the bounds of legal propriety. So in our own profession, a client employing one of ourselves has in professional *esprit de corps* a safeguard, on the one hand, that his interests will be attended to, and his work well done and fairly charged for; and, on the other hand, that he will have the advantage in negotiations, such, for example, as arise about party-walls, rights of light, &c., that, however indifferent his own personal character may be among his neighbours, the matter will be argued as one in which right will be done, because it is in the hands of a respectable professional man. The employment of men having a high standard of professional honour prevents many base things being done, and *esprit de corps* so becomes a public advantage. Were our judges corruptible, our counsel base, what untold injustice would be perpetrated which is now left unattempted, or utterly defeated? Were there no high tone of feeling among our medical men, how much of cruel neglect, of infanticide, and of other sorts of murder would be quietly accomplished; and were there no professional honour among architects, many a bad brick and rotten stick would find its way into works where, if professional superintendence was paid for, on the one hand, professional hindness would be handsomely fed, on the other.

Trades-unionism has been mentioned, and it is in this direction that the danger of all combinations of persons engaged in business lies. I should not like to say that every organisation which has profit for its sole aim must be wholly bad, or that every one which professes to secure honourable ends is entirely good, but in each case the presumption lies in that direction. This subject, however, I will not pursue, or it would take us over too much ground; but it would unquestionably be instructive, did time permit, to devote a little attention to what professional *esprit de corps* is not, as well as to what it is. We are, however, at least agreed that it is not a

combination for the purpose of securing unfair remuneration for the members of the profession, or for hampering any one in his legitimate competition in the race of life, for screening any member from the effects of his own willful misconduct, or in any other way for exalting selfishness above honour and justice,—in one word, it is not a trade-union.*

POPULAR EDUCATION IN SCOTLAND.

THE EDINBURGH HOSPITALS.

When the school boards of England and Wales have got well through with their preliminary labours, which it is most desirable they may everywhere accomplish speedily, and have entered with zeal and assiduity upon their real mission, it is to be hoped that they may be successful, within a reasonable time, in doing much to wipe out the discredit that attaches to the largest, wealthiest, and most important section of the United Kingdom, in the matter of popular education. England has a long leeway to make up before the mass of the rising generation are abreast in educational advantages with the children of Scotland, which has enjoyed the advantages of a system of national education for nearly two centuries, whereas England has had no system worthy of the name. Before the Reformation the parochial system was adopted in Scotland for educational as well as ecclesiastical purposes, and numerous schools,—good, considering the mental light and culture of the time,—were in existence, and accessible to the children of the poor. It was not, however, until after the Reformation that the parochial system was fully adopted. In 1616 the Privy Council enacted that "in every parish in this kingdom where convenient means may be had for entertaining a school, a school shall be established, and a fit person appointed to teach the same, upon the expense of the parishioners, according to the quality and quantity of the parish." From the unsettled condition of public affairs, it was seventeen years before the enactment was ratified by Parliament. The Act still remained in abeyance, and it was not until the celebrated statute of William and Mary, 1695, was passed that the Scottish parochial school system came fully into action. It provides "that there be a school founded, and a schoolmaster appointed, in every parish (not already provided), by the advice of the presbyteries; and, to this purpose, that the heritors do in every congregation meet among themselves, and provide a commodious house for a school, and modify a stipend to the schoolmaster, which shall not be under 100 merks (5*l.* 11*s.* 3*d.*), nor above 200 merks (11*l.* 2*s.* 2*d.*), to be paid half-yearly at two terms." In 1803 the minimum salary of the parish schoolmasters was raised to 300 merks Scots, and the maximum to 400 merks; the heritors, or landowners, being required to provide also a dwelling-house for the schoolmaster, with at least two apartments, and a fourth of an acre, Scots, of ground for a garden. There was provision made for further increase of salary, and in 1828 the salaries had reached from 25*l.* 13*s.* 3*d.* to 34*l.* 4*s.* 4*d.*, with the small fees often as low as 1*s.* and 6*d.* per quarter; nominated poor children being taught free. There was thus an important educational work prosecuted in Scotland as early as the seventeenth century, at a time when England and Ireland were left in comparative darkness. The prevalent use in the educational action of those days of the dead languages, of Latin in particular, engendered in Scotland respect for the classical element, and raised, so to speak, the educational tone of the people, and enabled them to appreciate, probably, the value of a higher kind of education than that given in the common parish schools, such as is now spoken of, and looked for, as given in the "middle-class schools" of London and other places. To this cause it seems natural to attribute, in part at least, the numerous endowed schools and burgh schools of Scotland,—the one class founded by benevolent donors leaving funds or property in trust for educational and other benevolent objects, the other by corporate bodies devoting corporate funds and property to the provision and maintenance of good and cheap schools. Burgh schools, under the control of corporations, existed prior to the introduction of the parochial system, and many of them have flourished simultaneously with the parish schools, with constantly augmenting vigour. Dr. William Chambers tells us, in his

charming memoir of his brother Robert; how, after he had passed his first stage of schooling under the care of the widow, Kirsty Craunton, in the small town of Peebles, he was entered at the burgh school, the master of which was James Gray, author of an arithmetical class-book popular in Scotland for generations. Thence he was able to advance to a still higher stage,—to the grammar-school (also of Peebles) in which the classics were taught for marvellously low fees. Dr. Robert Chambers says:—

"My first two years of schooling were spent amidst the crowd of children attending Mr. Gray's seminary. On the easy terms of 2*s.* 2*d.* per quarter, I was well grounded by the master and his helper in English. The entire expense must have been only about eighteen shillings—a fact sufficient to explain how Scotch people of the middle class appear to be so well educated in comparison with their southern compatriots." "For a small fee (in the Peebles Grammar School it was only 6*s.* a quarter), a youth gets a good grounding in Latin and Greek, fitting him for the university; and it is mainly, I believe, through this superior education, so easily attained, that so many of the youth of our northern region are inspired with the ambition which leads them upwards to professional life in their own country, or else sends them abroad in quest of the fortune hard to find at home." "The good education that has enabled me to address so much literature, of whatever value, to the public during the last forty-five years, never cost my parents so much as ten pounds."

The school education of Dr. William Chambers was "finished" when he was thirteen years of age, and had cost, books included, somewhere about 6*l.* It can scarcely need to be said, in view of his distinguished and useful after-career, that his real education commenced after he left school.

The influence and teaching of the great Scottish Reformer, John Knox, did much to lead up to the adoption of the parochial school system, although he did not live to witness its establishment or beneficial results. It is evidence of the existence in Scotland of efficient schools in the early part of the sixteenth century, that Knox received such a grounding in classical education as fitted him for the university in the burgh school of Haddington, a venerable institution that remains to this day, and at which several living men that could be named have been educated, who have achieved in various departments of usefulness, even more than national reputation. The school is in three divisions,—English, or elementary; the mathematical, or commercial; and the grammar, or classical schools, each conducted in a separate, although contiguous, building. Two of the divisions are conducted in comparatively modern buildings; but the English school, which is adorned with a panel in a central pediment, containing a goat, the arms of the "guid auld toom," in alto relievo, has sufficient evidence of antiquity to induce the belief that it is the identical building, in so far as the carcass goes, in which Knox learned to read Sallust and Virgil. The Haddington Burgh School is not, however, an evidence of the perfection of the system, or of the efficiency of the control exercised, under all circumstances, by the magistrates and council. It has unfortunately occurred in its history that a stiff-necked, wrong-headed rector has been able persistently to defy the governor, and render the school all but worthless; but such misfortunes are happily rare among the burgh schools of Scotland, nearly 100 in number, some of them flourishing in "county towns" of 3,000 and 4,000 inhabitants.

The Grammar-school era commenced in England also about the time of the Reformation, when so many schools were founded that it became evident that their regulation, rather than an increase in their number, was the chief educational desideratum. Many of these schools were free at first, as designed by their founders, but abuses crept in; funds were misapplied, and not a few of these schools sank to decay through egregious mismanagement, and ceased to be of any advantage to the children of either rich or poor. The parochial charity-school era may be placed as from 1700 to 1800. This system is only partial in operation, and the cost involved in clothing as well as educating the comparatively small number of children it embraced restrained its extension. The free charity-schools for "Grinders" (*vide* Dickeus), and the grotesque dresses of the hoy old men, and girl old women, admitted to them, are peculiar to England, and are more numerous and notable in London than in any other city or town.

The administration of the funds of some of the most wealthy educational foundations of London has long been a favourite topic, of seldom favourable criticism, and the provision of efficient middle-class schools for London is a vitally important subject that has of late years de-

* To be continued.

servely received much attention. The present aspect of educational affairs in Edinburgh bears upon both points. A brief notice of the educational and scientific institutions and agencies for which Edinburgh is renowned would occupy more space than can be spared to the subject. It has its celebrated High School, dating from the beginning of the twelfth century; its Academy, incorporated by royal charter; Pettes College, housed in one of the most ornate and superb educational buildings in the United Kingdom; its training colleges and normal schools, and others too numerous and various to mention.*

FROM EDINBURGH.

MISS WALKER'S trustees, after some difficulty as between the designs for the new cathedral of "Fidelitas" and "Auld Lang Syne," have fixed upon the latter, which are found to be by Sir Gilbert Scott. The services of an architect eminently qualified for such a work have thus been secured; but neither the accepted design nor any of the others (fine as some of them are) are upon such a scale as to possess the dignity which may naturally be looked for in the cathedral of a city like Edinburgh. Two courses still remain open to the trustees. The funds at their disposal are large, amounting, we understand, to upwards of 200,000. The main object contemplated by the testatrix was the foundation of a cathedral, and a much larger sum than the 65,000, voted for the purpose may, we think, with propriety be set aside for the building, and a design upon an extended scale be procured from Sir G. Scott. If, however, it may not be thought judicious to exceed the sum already voted, there remains the alternative of building a portion only of the extended design, leaving the remainder to be dealt with in the future. Such was the usual practice in Medieval times; but, now-a-days, we are in too great haste to accomplish every object, and it would be of advantage to art were the practice of our ancestors sometimes followed.

Operations have commenced for the erection of an Oldfellows' Hall in Forrest-road, from the designs of Mr. J. C. Hay, architect. The building is to be in keeping with the adjoining buildings, which are designed in the old Scottish style of street architecture. The front elevation only will be seen from the street. It will be of three stories, finished by a gable having a figure of Charity at the apex. On the ground-floor the entrance is flanked by shops, which are divided from the first floor by a cornice, terminated by brackets at each end, and in the centre is the insignia of the order, under a hood. The first floor is lighted by three circular-headed windows, and is ornamented by an alto-relief, emblematic of Faith, Hope, and Charity. The third story rises from a corbelled course, and on each side are turrets of different design.

A large hall in the rear is approached by a passage 8 ft. wide; it will be 61 ft. long, 47 ft. broad, and 30 ft. in height. A gallery is carried round three sides of the hall, on light iron columns, which run up to the roof in the manner of an arcade. In the front over the shops will be another hall, capable of accommodating 300 persons, and the remainder is occupied by committee-rooms, and a house for the keeper. The total cost is estimated at about 5,000.

Sunday, the 24th of November, was the tricentenary of the death of John Knox, and in most of the Presbyterian churches throughout the city special reference was made to the life and character of the great Scottish Reformer, and of his influence upon the religious and civil institutions of the country.

No memorial of Knox has been erected in Edinburgh, with the exception of a paltry church adjoining the house which he occupied—which quaint building is still carefully preserved. This church has a somewhat ornate Gothic front, but the body of the building is of a nondescript style, and unworthy of the name it bears.

A meeting has been held with the view of raising funds for the erection of a suitable memorial as to the nature of which numerous suggestions were made, and much difference of opinion seemed to exist. A memorial window in St. Giles's church, in which the Reformer ministered, was generally considered of too limited a nature, and even a simple statue was not thought of sufficient importance.

A lofty column, with a statue on its summit, was likewise proposed, an idea which can hardly

be entertained by any man of taste,—such a monument already existing in the city, and one such being quite enough. Another suggestion, which appears to meet with some support, is the erection of a memorial hall. Ample funds will be required to give such a structure a monumental character, to secure which the useful must be subordinated to the grand or ornamental.

We understand that the trustees of the Royal Infirmary have resolved to delay the erection of new surgical wards, and to proceed only with the medical portion of the building. As we stated in a former notice, the basements of all the pavilions have been constructed, a course which seemed to us to be unwise in the circumstances.

ENLARGEMENT OF THE CHELSEA WATERWORKS.

THE Chelsea Waterworks Company contemplate a considerable enlargement of their existing premises and works, and for this purpose the company have given the necessary Parliamentary notices for powers which they intend to seek in the next session. The proposed works include the construction of three new reservoirs, one of which will be in East Moulsey and Thames Ditton, being 485 yards in length, and occupying an area of 20 acres. A second will be wholly in Thames Ditton, and will be 480 yards in length, and 19 acres in extent; while the third reservoir will be situated on the company's land at Putney, close to the aqueduct, where the existing mains are carried across the river, near Putney Bridge.

SOCIETY OF ARTS' REPORT.

We abstract from the report read at the recent opening meeting a few items of special interest.

National Training School for Music.—The Council have reason to hope that the actual establishment of national scholarships for music, to be competed for in many of the counties of the United Kingdom, will take place in the course of the ensuing year. From the list of upwards of eighty subscribers may be named the following:—Sir Titus Salt, bart., has promised to devote 1,000l. to the foundation of a scholarship, when the National Training School for Music is established, to be called the Saltire Scholarship. Mr. F. Morrison will subscribe 500l., for five years, for an Invernesshire Scholarship. Mr. C. Minton Campbell will give 500l., for five years, for a Staffordshire Scholarship. Mr. Hawksbarrow, C.E., promises 250l., for five years, for a Sussex Scholarship. Mr. H. A. Hunt promises a donation of 1000l. The Marquis and Marchioness of Westminster will subscribe 150l. annually. The Marquis and Marchioness of Lansdowne, 50l. 5s. annually. The Musical Committee will be requested to advise in reference to the necessary details for regulating the holding of these scholarships, and the Council have special satisfaction in announcing that H.R.H. the Duke of Edinburgh is personally interesting himself in the plan.

Improved Stoves and Grates.—Through Sir William Bodkin, from a gentleman who does not wish his name to appear, the Council has received the very liberal offer of 5000l. [as already mentioned in our pages], to be used in such a way as they may consider best, for some means of economising the use of coal for ordinary domestic purposes, without diminishing its efficiency. The great rise in the price of coal has again brought this question more prominently before the public, and the Council cannot but express their admiration of the practical philanthropy which has urged a private individual to contribute so handsomely towards an attempt at its solution. It is not intended to entertain any proposals which are suitable only for the mansions of the rich, or have relation to cooking for large numbers, but rather, taking a room as the place of experiment, to offer prizes for grates suitable for existing chimneys, which shall fulfil the conditions of warming and ventilating, or of cooking in combination with these. But though thus inviting the manufacturers of grates, among others, to compete, it is obvious that any widely-spread and real improvement depends mainly on the designers and builders of houses. Year after year we hear of the same result, owing to the extravagance and waste of valuable material, in producing a miserable substitute for warmth and comfort in ordinary dwellings; and year after year we see the same type of enormous fireplaces and chimneys, in many cases constructed without

even the application of the form which experience shows to be the best, rising up on every side. However much we may hope that builders will, some day or other, have the courage to strike out a new line altogether, we can only at present advise, with regard to the money entrusted to us, that it be awarded in connexion with the arrangement of houses already built, and that the improvements should be of such a character that the dwellings of the many shall be able to profit by them.

Incombustible Paper.—The Gold Medal, in furtherance of the terms of Dr. Pöbergill's will, is this year offered for the production of an incombustible paper, so as to render the ledgers of commercial men, bankers, &c., ordinarily indestructible by fire.

Cameo-cutting by Females.—On several occasions the conductor of this journal has sought to lead the attention of female art-students in this direction. It is satisfactory to find that the Silver Medal, in furtherance of the will of Mr. John Stock, is this year offered by the Society of Arts to female artists, for the best cameos designed and executed on any of the shells ordinarily used for that purpose.

PROPOSED NEW BRIDGE ACROSS THE THAMES.

AMONGST the Parliamentary Bills seeking powers to execute new works, which will be investigated in the course of the ensuing Session, a project is included for the construction of a new bridge across the Thames. The proposed undertaking, which is described as the "Tower Bridge," is intended to commence near Fair-street, Horselydown, on the Surrey side of the river, crossing the Thames in the direction of the Tower, and having its terminus on Little Tower Hill. In connexion with the bridge, it is proposed to construct four tunnels or subways along the line of the bridge, these tunnels to be on or under the bed of the river, and it is further proposed to connect these tunnels with a footway on the side of the bridge by means of shafts to be constructed in the piers of the bridge. The tunnels are to be 150 ft. in length, and to be 200 ft. from the centre of the Thames. It is not stated in the Parliamentary notice what the height of the bridge above high-water mark is to be; but, inasmuch as vessels of large burthen come up to the wharfs close to London Bridge, the probability is that the Admiralty authorities will insist upon a height of more than usual altitude before giving their sanction to the project. It is reasonable to suppose that if the proposed bridge can be erected without unduly interfering with the navigation of the river or the shipping of the port, it will be a great convenience to the residents on both sides of the Thames east of London Bridge.

NEW SCHOOL BUILDINGS FOR THE LONDON SCHOOL BOARD.

THE School Board for London have just given notice of their intention, under the provisions of the Elementary Education Act, to take compulsory possession of plots of land in different portions of the metropolis for the purpose of erecting new schools on each site. The total number of schools which the Board propose to build is 56, on a corresponding number of sites, and the aggregate area of the land to be purchased is 112,452 square yards, or upwards of 23 acres, 64,281 square yards of which are for schools to be erected in Middlesex, 41,665 square yards for schools in Surrey, and 6,556 square yards for schools in Kent (Greenwich). The schools to be erected in Middlesex are 35 in number, 10 of which are in the Finsbury division, viz., 3 in St. Luke's, 2 in Islington, 2 in Clerkenwell, 1 in St. Giles's-in-the-Fields, and 1 in St. George-the-Martyr's; 8 in the Hackney division, of which 3 are in the parish of St. Leonard, Shoreditch, 3 in St. Matthew's, Bethnal-green, 1 in Hackney, and 1 in Bethnal-green; 7 in the Marylebone division, all in the parish of St. Pancras; and 10 in the Tower Hamlets division, of which 3 are in St. George's-in-the-East, 1 in Stepney, 1 in Shadwell, 1 in Ratcliff, 1 in Limehouse, 2 in Poplar, and 1 in Mile-end Old Town. In Surrey the number of schools to be erected is 18, of which 12 are in the Lambeth division, viz., 4 in Camberwell parish, 4 in St. Mary's, Lambeth, 3 in St. Mary's, Newington, and 1 in Clapham. In

* To be continued.

the Southwark division the number of schools to be erected is 6, of which 2 are in the parish of St. George-the-Martyr, and 4 in Bermondsey. In Kent 3 schools are to be built, all of which are in Greenwich.

SCHOOL BOARDS.

London.—The report of the works committee was brought up at last week's meeting. The committee recommended the acceptance of the revised tender of Mr. W. Shepherd, for the erection of a school for 837 children in Kender-street, Hatcham, at a cost of 6,471*l.*, which was agreed to. The committee also recommended the acceptance of the tender of Messrs. W. H. & J. Mansbridge for the erection of schools for 825 children, in West Ferry-road, Millwall, at a cost of 6,070*l.*, which was agreed to. The tenders have already been given in our lists of November 9th and 16th. At this week's meeting, the Works Committee reported that they had invited tenders from builders for the erection of a school providing accommodation for 1,213 children on the site in New Winchester-street, Islington. The committee recommended that the tender of Messrs. Down & Co., offering to do the work for 9,328*l.* be accepted. The recommendation was agreed to. The committee had also had tenders before them for the building of a school on the site in Gloucester-street, Stepney, capable of accommodating 1,038. They recommended that the tender of Messrs. Roberts, amounting to 8,371*l.*, be accepted. This was also carried. The tender of Messrs. Cooke & Green, for the erection of a school for 788 children in Creek-road, Deptford, was in accordance with the recommendation of the Works Committee, and was agreed to. The amount was 5,758*l.*

Okehampton.—The Okehampton School Board have chosen Mr. Charles Pinn's design for the new schools. There were eight competitors. The schools are to contain 250 children, with master's house, and are Geometrical in style. The cost will be about 1,000*l.*

Wraybury Schools Competition.—The design of Mr. Fred. W. Albury, of Reading, architect, has been selected by the local School Board. Twenty-seven designs were sent in.

"THE CHISEL."

At the Birmingham Royal Society of Artists, Mr. J. H. Chamberlain has delivered the third of a series of lectures entitled "Means and Results," the application of the subject being devoted on this occasion to "The Chisel." The lecture consisted of a review of the progress of chisel-work from the Middle Ages to our own time, showing the various influences that have existed, locally and otherwise, to affect the operations of architects and workers in stone. Thus it was that in earlier times men built walls thickly and roughly because of the abundant supply of stone at their command, presenting strange contrasts to the brick walls of the present day, which may be built up evenly and strongly, and presenting as much solidity, with half the thickness of the old stone walls. Mr. Chamberlain treated of his subject in three sections,—masonry, carving, and sculpture. Birmingham, with all its wealth,—with respect to which ancient cities were not to be compared,—possessed not a tenth of the number of statues which an ancient city only a quarter its size had been known to contain. The statues of Sturge and Attwood were pointedly alluded to as furnishing instances of the application of modern sculpture built up in pieces instead of worked out of the solid block. The reason why there was no national school of sculpture was principally because we would have no common art; everything in the way of art, as far as it could be, should be great and noble. Greek sculpture was composed of the representations of life, consisting perhaps of the wars of the people, their fames and legends; and if they came to Mediaeval times, they met with even representations of their trades. There was nothing ideal in any of their sculpture. Having noticed how difficult, or rather *outré*, it would be for sculptors to deal with such subjects in modern times,—say, for instance, the portrayal of a Foresters' or Odd Fellows' procession, after the manner of the ancient Greek sculpture, the lecturer passed on to notice that there was nothing about the public buildings of this town in the way of sculpture to indicate the purposes for which they were erected. Especially was this the case with

the Market Hall,—supposed to be a copy of the Grecian Doric order of architecture,—the Fish Market, which does not even possess a carving of a lively fish; whilst the athletes of Birmingham met for the practice of their feats of strength, &c., in Bingley Hall, a damp, monidly, and nasty piece of architecture. The remaining portion of the lecture was devoted to the technicalities of the subject.

ANALYSTS UNDER THE ADULTERATION ACT.

The first prosecutions we have heard of under the Adulteration Act have occurred at the Borough Police-court, Liverpool. Two cow-keepers were charged with selling adulterated milk; the adulteration in one case was to the extent of 30 per cent., in the other 10 per cent. The magistrate inflicted a fine of 40*s.* and costs in one case, and 20*s.* and costs in the other. The adulterant, we suppose, was water. The analysts, however, have higher game to aim at than mere water, or merely diluted milk.

The Camberwell Vestry have appointed Dr. Bernays, the professor of St. Thomas's Hospital, as their analyst. He is appointed for one year, and payment for that period is to be by fees.

A committee of the St. Martin's-in-the-Fields Vestry have suggested that one analyst should be nominated for the whole of Westminster.

A letter from the Local Government Board to the St. Saviour's District Board of Works, referring to the recent appointment of Dr. Bianchi as analyst, requests to be informed of Dr. Bianchi's qualifications for the office, and that testimonials on the subject should be referred to the Local Government Board. Mr. Thorne stated that Dr. Bianchi would furnish the necessary testimonials: he had been their medical officer for over sixteen years.

ARCHITECTS IN THE ANTIQUE TIMES.

SIR,—With reference to the articles which the *Quarterly* has recently allowed to appear in its pages, permit me to say, whatever may be thought of the value of the writer's special criticisms on things as they are,—and it is not to be denied that in many points they are trenchant and just,—it is with his one *pet theory* that architects are most concerned, *viz.*, that it has been left to modern days to develop an architectural profession, upon which, though an architect himself, he pours all the vitals of his contempt as "spurious," &c., and the fruitful source of what he considers the present deplorable condition of things. To support this view, he is very great in Greek quotations, with the pretence of showing that anything like an architectural profession was unknown to the Greeks, and that apparently their buildings must have grown up under their hands, and been evolved stage by stage out of the inner consciousness of the "workman." The absurdity of this is so apparent to any one who will consider what a Greek temple is as a *perfect whole* (a repetition of parts constructed on identically the same mathematical principles, adjusted to each other by the nicest discrimination of optical relationships, all needing to be grasped and combined as a whole before the work could proceed), that it needs little refutation; but as the flourishing of these Greek quotations, in which the word "architectones" is made to play so prominent a part, might deceive some minds, it may be worth while to offer just one other Greek quotation which is directly fatal and destructive to his whole view and theory. I am indebted to another source,—an article in a contemporary dealing with the architectural controversy in an able manner, and in part devoting itself to the views propounded in the *Quarterly*,—for this quotation, which is as follows:—

"The pay of a common builder was five or six mims, but that an architect would require more than ten thousand drachms."—*Plat. Epistola*, ed. Serraw, t. i, p. 135.

This quotation from Plato will probably be enough to settle the question for most minds as to the validity of the writer's great point about the absence of an architectural profession in the past, and resolves all that he otherwise says into the easy task of fault-finding and ultra-criticism, without practically showing that "more excellent way" for a truer and nobler art than we now possess, which is the desideratum of all earnest minds equally with his own.

ALPHA.

THE OLD MASTER OF WORK.

SIR,—In connexion with the great controversy which has been going on of late regarding the portion which the old workmen had in either designing or carrying on the work, the following extract from the old Burgh Records of Aberdeen may be interesting. The duties of the master of work as here recorded may have been more in accordance with German, than with either English or French custom; but your readers can judge of that for themselves:—

4th May, 1384.

"The 3ij day of May, anno lxxxiiiij, Maistre John Gray, mason, was resault be the alderman, bailies, counsail, and communitie of the burgh of Aberdeen, in maistre of work, to the bigging of Sanct Nicolace Wark (or church), quhilk has taken upon him to be continuall labourand diligent for the springing of the said wark, and to do all ear concerning the said wark, that accordis til a maister of wark, bairn in labouring of his awyn person, deuying, he seyng and ourseyng of thairis masons and workmen that sal be under him, for all the dais of his lif, to the finale completing and ending of the said wark, at al his possible and power, the best wyse that he can. For ye quhilkis thingis to be done he has, in the presence of the bailies, counsail, and communitie forsaids, gevin the gret bodily aith, to be leld and trew to the said wark for all the dais of his life, vnto the completing and ending of the same. And the said maister of wark sal labour himself, and get thairis masons and workmen under him labour daily and continually, efter the Act of Parliament made thairupon. For the quhilkis labouris and services to be done he the said maister of wark, the saidis alderman, bailies, counsail, and communitie has promissit to gif yerly to the said maister of wark, for his fil (or fee), twenty pundis and fyre merkis, til a propyne in al costage andur and al the dais that he has to lif quhilk the said wark be complete. And the day of his entra to the said wark the day of this present writte. And this said some of scill lib. xvi. s. vi. he yerly, to be paid til him at four termes in the yere, proportionally, as thal and he sal accord best thairupon."

The chief point of interest in the foregoing extract appears to me to be in the word "deuying." How much does this word "deuying," or designing, comprehend, and to what does it refer? W. P. B.

BRITISH ARCHÆOLOGICAL ASSOCIATION.

On Wednesday, Nov. 27, Mr. II. Syer Cuming, V.P., in the chair, twenty-three members were announced as having been elected by the council, and thanks for numerous presents were returned.

Mr. J. W. Baily exhibited many specimens of articles recovered from Victoria-street, London, including two skulls of the *Bos longifrons*, which were exhumed from a depth below the Roman stratum, and were found amongst piles,—several examples of Samian and British ware, one of the latter of the fourth century,—a time when it now becomes difficult to determine whether they are Roman or purely British; but this specimen, from its large mouth, must unquestionably be British;—a spotted vessel, somewhat later, but still British;—a chafing-dish of the sixteenth century, pertaining to a barber's shop.

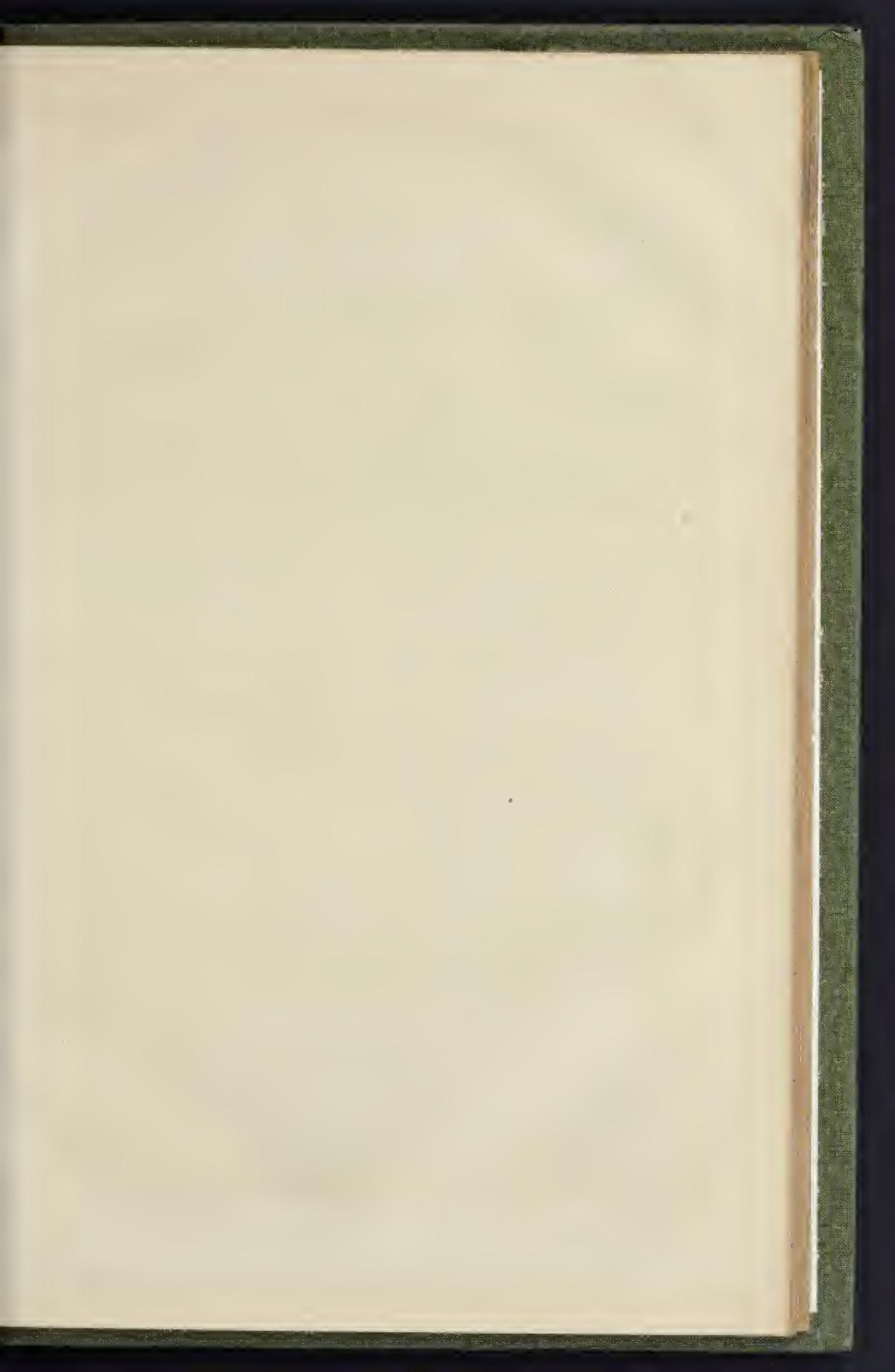
The Rev. Mr. Home exhibited a cambric collar of Charles I., given by Charles II., to a member of the Byron family, in 1660, and marked, "A Gift from King Charles." Dr. Kendrick exhibited a piece of embroidery (embossed appliqué), showing the story of Hero and Leander, circa 1670, for the panel of a casket.

Mr. Roberts exhibited a series of curious knives found in Thames deposits. The Rev. Mr. Hodgson sent an account of discoveries at Monkwearmouth Church, and especially of a monument of a priest, Eberic, formed out of a previous Saxon tomb, and the name erased, and probably contemporary with Bede. Mr. Crickmay, of Weymouth, exhibited drawings of a Roman pavement at Preston Weymouth, not previously illustrated.

Mr. Stainbank exhibited two volumes of drawings, showing inscriptions on bells, taken from rubbings,—the earliest dated bell being 1296, at Cloughton, Lancashire.

Mr. J. W. Grover read an account of a Roman villa recently discovered at Teston, Kent, and compared it with that at Chidworth, in Gloucestershire.

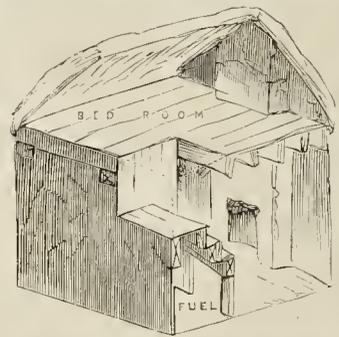
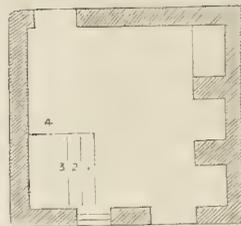
Mortuaries.—A committee has been appointed by the Vestry of St. Martin's-in-the-Fields for the purpose of considering the desirability of erecting a mortuary for the parish in Drury-lane burial-ground. Such accommodation is greatly needed in the district, and it is not creditable to the parochial authorities that they should have deferred taking action in the matter until the present time.



THE HOUSING OF THE BRITISH LABOURER.

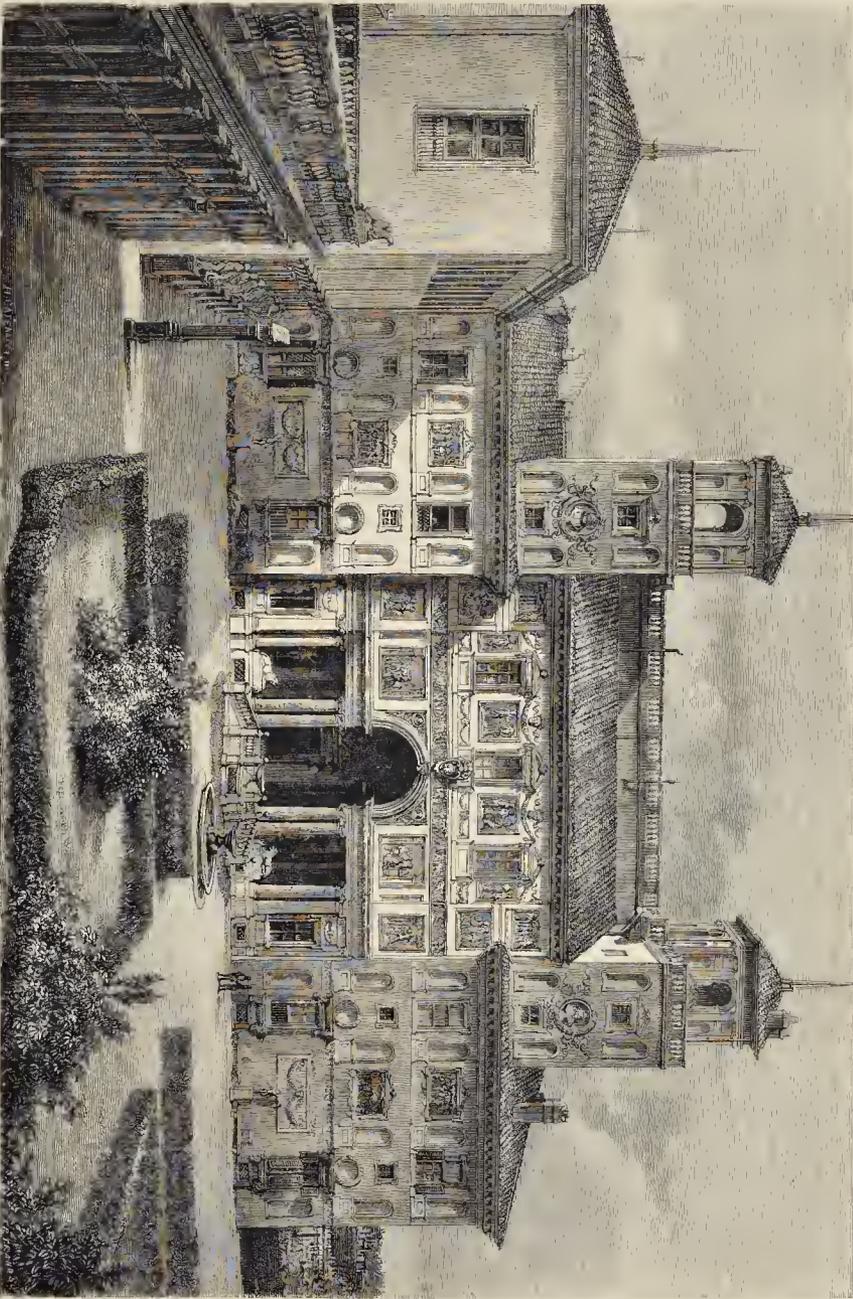


The Home of Twenty-six Christian Souls.

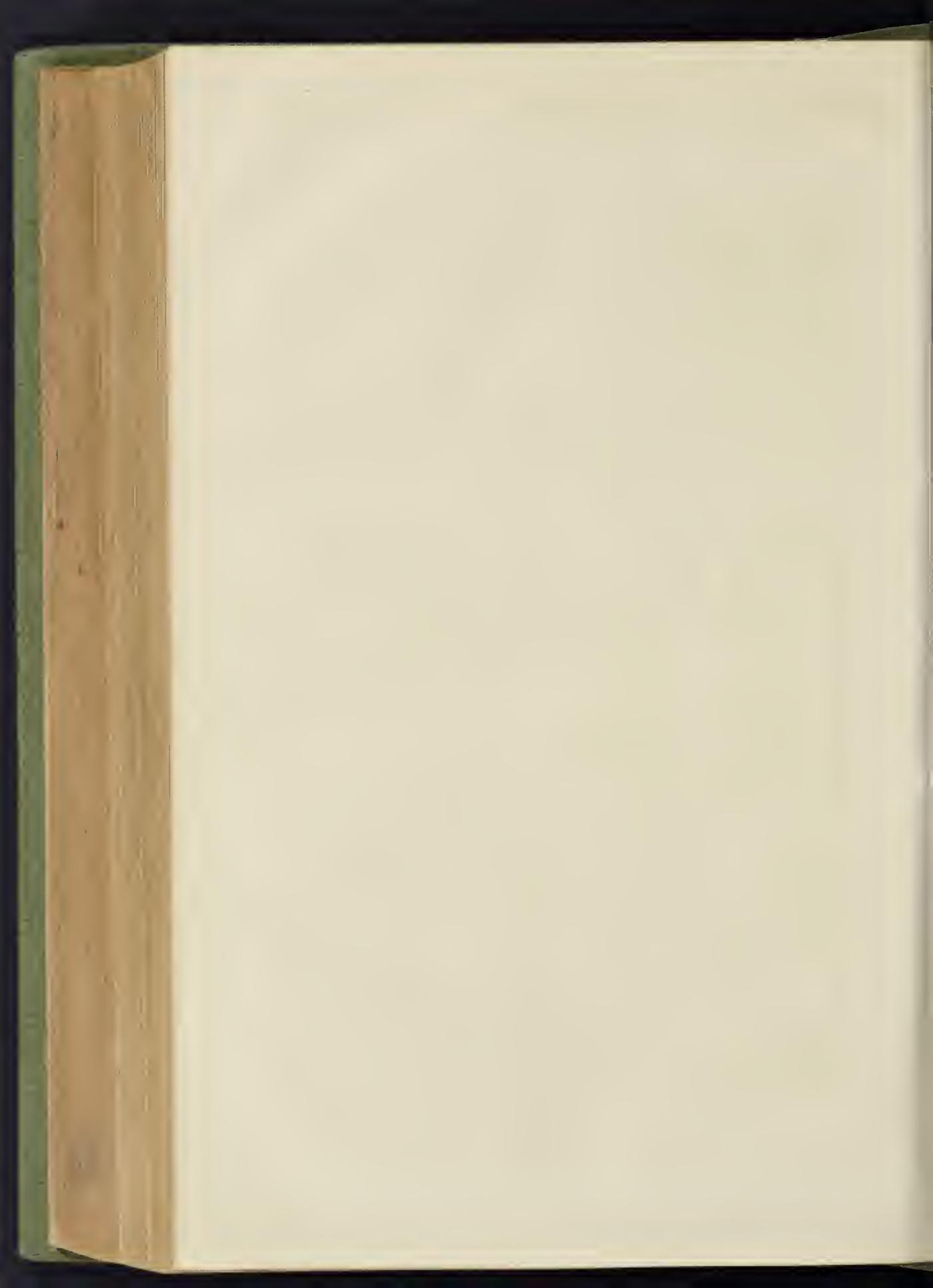


A Pretty Prospect in Abergavenny.

[See p. 937, ante.



THE VILLA MEDICI, ROME: GARDEN FRONT.



THE VILLA MEDICI, ROME.

We complete our illustration of Rome, noticed in our last,* by reproducing, with consent, the view given in it of the Villa Medici, the residence of artists sent from Paris; and some of the particulars he has given. It is elevated on the hill of the gardens whence it dominates city and fields, and is masked by the two pavilions rising out above the trees, over the facade. From the exterior side which faces towards Rome, the building has a cold look; windows of tolerable simplicity and very spacious; a very high doorway crowned by a balcony,—such is the most noteworthy arrangement adopted in 1540, by Annibale Lippi, when he erected the palace for the Cardinal Montepulciano. It was intended to make of the opposite side a gem of architecture enriched by a collection of bas-reliefs, the precious fragments of antique sculpture. This facade, with its portico sustained on columns, and watched by lions, is in strong contrast with the other, of which the design has, without the slightest proof, been attributed to Michelangelo.

It is probable, for the rest, according to M. Wey, that the plan was modified when Cardinal Alessandro de Medici acquired possession of it, and gave it a name. He amused himself by decorating it in the few periods of leisure which he was allowed under Clement VIII. from the negotiations with which he was charged at the courts of various sovereigns, and among others at the court of the Béarnais, Henry IV. On the death of Aldobrandini, the Cardinal having been chosen Pope on the 1st of April, 1605, he took the name of Leo XI., and died only twenty-seven days after, leaving as many regrets as he had inspired hopes. The Cardinal de Medici commenced collections which, under the Florentine sovereigns, continued to enrich the villa on the Pincian. On the vase placed in front of the steps was once seen the Mercury of John de Bologna.

It was Benedict Suvée, appointed director of the French Academy in Rome, who, in 1603, obtained the transferance of the Villa Medici as the home of French artists. The most remarkable of the domestic apartments is the dining-room, adjoining a kitchen, whence issues that disturbing and too familiar odour of such offices in lycæums and boarding-houses. This fine refectory is vaulted, and the arch has been divided into compartments, in which since 1811 the portraits of those crowned by the French Academy have been placed by their comrades.

The building is scarcely so well kept as it should be, and has the consequent aspect of neglect.

BEHAVIOUR OF GRANITE AND BRICK UNDER FIRE.

The Boston correspondent of the *New York World* sends some notes on this subject, which will interest our readers:—

The Post-office is of granite; the columns at two corners have been burnt out of shape, and one or two of them almost out of existence, by the fervent heat so near it. But here it stands now as on Saturday, with all its openings uncovered, and with a network of light wooden scaffolding, which these openings exposed to fire over the whole interior of it. The fireman kept it so drenched that the flames which burnt away the woodwork within; but in this very praise there lies a reproach. If this building, which thus invited destruction by fire, not only stands unconsumed, but is the bulwark which held back the fire from eating up the whole of Boston, why is it that a stand was not made on one of the many burnt buildings, which were not only by structure, but by equipment and preparation, intended to be fireproof? From here, for a stretch of almost half a mile southward, were solid squares or polygons of granite, with here and there a building of marble or of brick. Of these granite buildings, it may be said, with almost literal exactness, that there is not left one stone upon another that is not torn down; and not only so, but the massive stones thus disjointed are disintegrated. I picked up and pocketed a piece of marble and of granite, of equal size, which lay alongside each other. They had been subjected to the same tremendous test. The granite crumbled under my fingers like baked rice; the marble was as firm as when it was quarried.

* See p. 917, ante.

All over this tract you may see what must amount to millions of bushels of grains of granite, the size of blasting-powder, reduced to this state,—not by concussion, mark you; for granite splits, and does not disintegrate, when it is struck, however hard,—but by mere heat. It looks as if there had been a hailstorm of adamant. Meantime, in this wreck of granite, the marble building at what was, as near as I could make out, the corner of Lindall and Congress streets, stands erect and in structure uninjured. The facade has not a fissure in it. These warehouses were all superbly built of vast blocks. There is scarcely anything left by which we may judge how goodly they were. Most of these great stones have gone to powder, as I said; but some of them remain to show Cyclopian buildings. They are all seamed. Pick one of these seams with your fingers, and off come whole laminae, 4 ft. or 5 ft. long. A boy can kick one of them to pieces. And here are brick piers standing unscathed to the height of 15 ft. or 20 ft. in this waste of granite. The spacious granite fronts have dissolved and disappeared; the brick partition-walls and piers stand often uninjured,—always uninjured when good mortar has been used to join them. From a brick vault I saw a man, precariously perched upon a ladder, extracting his books in perfect order, while of the granite which had hidden the brick, barely enough was left upon the ground to show what it had been. In one place a brick wall, four stories high, and in extent the whole side of a warehouse, stands above and perfect. Of course, the next high wind will blow it down; but while it stands it is an eloquent witness to the excellence of the material of which it is made.

BUILDERS' BENEVOLENT INSTITUTION.

An election of four pensioners on the funds of this institution (two male and two female) took place yesterday (Thursday) at Willis's Rooms, King-street, St. James's; the president, Mr. Edwin Lawrence (Lawrence & Sons), in the chair. There were five male and eight female candidates. The poll opened at 12 o'clock noon, and closed at 3 p.m., when the scrutineers (Messrs. T. Stirling, Matthew Hall, and R. K. Burstall) announced that the successful candidates were:—Males, J. W. Annis and Matthew Satch; females, Ann Budd and Frances Sears. The chairman having formally declared the results of the election, votes of thanks to the scrutineers (proposed by Mr. Thorn and seconded by Mr. Richardson), and to the chairman (on the motion of Mr. Burstall), brought the proceedings to a close. The Institution has now forty-five pensioners on its funds—twenty males and twenty-five females; the males receiving 25s. per annum, and the females 20s. per annum, each.

SEWAGE UTILISATION, BORROWING POWERS, AND GOVERNMENT INSPECTION.

Sir,—About twelve months ago, the Corporation of Weymouth engaged the services of Sir John Coode, of Portland Breakwater fame, to devise a scheme for more effectually draining the town and disposing of its sewage, which has hitherto been discharged into the tidal backwater or estuary. In the course of the spring Sir John accordingly produced elaborate plans, which embraced, among other things, an enormously expensive dam and drain across the said backwater, in order to concentrate the sewage in one pumping-station, from whence it was proposed to be carried a mile and a half, and disposed of by irrigation on clayey land. This mode of disposal has subsequently been set aside pending the experimental trial of one of Austin's strainers at the mouth of a main drain; yet notwithstanding this fact, the contractor has been pushed on to commence the dam, which will be altogether unnecessary should the strainer or any other new method of treating sewage in the meantime be found successful.

The estimated cost of Sir John Coode's scheme, which avowedly leaves the drainage of the town incomplete, is 25,000*l.*, and that sum has recently been borrowed at the rate of 4*l.* 7s. 6d. interest per cent. per annum, repayable in thirty years. Now we have not been favoured with the visit of a single Government inspector to go into details and check the plans on the spot, and it is generally understood, on the authority of statements made in the town council, that Sir John Coode

has obtained the required Government sanction to his plans through the influence of his former official connexion with the Admiralty.

What a large number of ratepayers are anxious to know is:—

1. Whether the sum referred to could be legally borrowed by the Corporation, in the absence of a proper Government inspection?

2. If the rates can be lawfully charged with the money borrowed of an insurance company at the rate named, after the passing of the Act of last session enabling any Local Board of Health to obtain money from Government for repayment being spread over sixty years?

If we are in error in respect of that Act you will doubtless set us right.

TWELVE RATEPAYERS OF WEYMOUTH.*

THE TOWER OF THE CHURCH AT SIXHILLS, LINCOLN.

The tower of the church at Sixhills has been, and is, matter of serious dispute between the patron, Mr. Henage, and the vicar, the Rev. C. A. Wilkinson. The patron, upon the plea of want of funds, pulled down the old tower (said to have been built by the Gilbertine monks, in the time of Stephen),—very massive, and quite susceptible of restoration, without faculty, as we are informed, and without communication with ecclesiastical authorities. He spurned the vicar's remonstrance, broke up tons of the old stones for the walks of his own grounds and to mend the highway, and threatened to sell the fine peal of ancient bells. The vicar has been energetically engaged for the last fourteen months in getting subscriptions, and has collected 450*l.* The Architectural Society have taken the matter in hand, have made a grant of 5*l.*, and have approved the design of Mr. Fowler for rebuilding it.

The patron has caused his tenants-at-will to pass and record in vestry, "that no alteration whatever be made in the church; and he himself has, by his order, caused upwards of 100 tons of the stones of the demolished tower, that would have been used immediately for the new building, to be buried and jodded down in the field of one of his tenants.

So stands this matter at present. The vicar has entered his solemn protest to the authorities against this act of his patron. We do not express any strong opinion on the subject, our information being *ex parte*; but certainly, judging from the printed documents, the proceedings of the patron seem extraordinary, to say the least.

It appears likely that the vicar's efforts will be crowned with success, and that the tower will be raised again on that hill, which is one of the finest sites in the county, to stand for ages to the glory of God.

The vicar sends us a full statement, too long for publication, and begs us to add that the same will be sent to any address upon application by post-card.

THE TRADES MOVEMENT.

Birmingham.—A partial lock-out has occurred in the building trade. The Builders' Association issued notices to the effect that the working hours for all branches, both in workshops and out of doors, would be from seven a.m. to five p.m. on and after Monday, November 11, till February 18, 1873. This, the men say, is contrary to the rules as decided by Mr. Rupert Kettle, and they accordingly issued a counter notice that the short time would not commence till Wednesday. A large number of men were thrown out of employment.

Blackburn.—The operative bricklayers having given notice to their employers that they are not going to have their wages lowered this winter, the masters have met, and resolved that the old rule be adhered to, and that bricklayers should be lowered to 30s., and labourers to 20s. during the winter months.

West Hartlepool.—Fully 120 bricklayers and their labourers (chiefly employed on the new buildings at or near the West Hartlepool Rolling Mills), have refused to continue at their employment, because their employers declined to allow them to adopt the scale of wages which the master bricklayers of Middlesbrough recently conceded to their men.

* The signatures are forwarded.

TOKENHOUSE-YARD, CITY.

Slums and squalor vile,
Check by jowl with stately pile.
Some of the courts hereabout,—and these are many,—are only 4 ft. wide! In the event of infection or conflagration, it must spread. A fire would certainly do what the authorities should—make a fine opening from the Bank of England to Finsbury-circus. There can be no question about the ground being speedily occupied by commercial palaces. I hope our new Lord Mayor will Baron Hansmann these rookeries and slums, where the sun never shines. His business premises adjoin this remnant of bygone London; but would either of the above eventualities break or make him? A step in time may save nine, and be sure to gain renown,—equal to an Embankment, Bridge, or Viaduct. R. T.

DEFECTIVE SCHOOL BUILDINGS IN SOUTHWARK.

It has just transpired that the several school buildings in Southwark are in a very unsatisfactory condition, so far as regards their construction and arrangements. Canon Gregory, a few weeks ago, on the occasion of laying the foundation-stone of a school in Bermondsey, referred to the great disproportion between the increase of population and that of the schools in the district, adding that whilst the schools were deficient in number, several of them were also very defective in construction. Mr. Stokes, the Government Inspector of Schools, in a report just issued, confirms this opinion.

THE NEW GAIEITY BUILDINGS.

The enlargement of the buildings in connexion with the Gaiety Theatre, in Catherine-street, which have been in progress for the last two or three months, and which we have already noticed, are now almost completed, so far as regards the external architectural elevation. During the present week the scaffolding in front of the enlarged Catherine-street frontage has been removed, revealing a prominent architectural façade. The building now forms one continuous block from the Strand frontage to the rear of the theatre in Catherine-street. The added portion is uniform in its architectural features with that part of the restaurant and hotel at the corner of Catherine-street and the Strand, with the exception of the first story windows, which are square-headed, and the elevation has been rendered additionally effective by balconies in the centre of the building. The objection to be taken is, that the theatre is swamped in the restaurant; in fact, but for the illumination at night the presence of a theatre could scarcely be guessed.

BURLINGTON HOUSE, PICCADILLY.

A lofty story has been added to the old part of Burlington House, in accordance with the design of Mr. Sydney Smirke, as exhibited some time ago, Messrs. Jackson & Shaw being the contractors. Shrouded by the buildings next immediately intended for the Learned Societies, the addition has been made so quietly that it will take many by surprise. It includes three galleries for the purposes of the Royal Academy, one of which, we believe, is destined to receive the statues, casts, and other works of art left to the Academy by the late John Gibson, and concerning the neglect of which we have recently received more than one complaining letter from Rome.

ROMSEY.

At Porter's Bridge there stood until a few months ago some old premises and a brewery; these have all been removed, and the site converted into a garden inclosed within a wall. A public convenience has been effected by the road near Messrs. Stead, Tylee, & Potter's offices being widened. The architect for this work is Mr. James Jenvey, of the Abbey; and the contractor, Mr. John Crook, of Southampton. At the Abbey, adjoining the new hall, a building of a substantial character, intended for schools, class-rooms, &c., with a residence for a superintendent, has been erected on the site of some old dilapidated buildings. The works are in a forward state, and will be completed shortly after Christmas. The architect is Mr. H. J. Paul, of Manchester. Mr. Crook is the contractor here also.

PROPOSED SCHOOL BUILDINGS FOR BELFAST.

In reply to advertisement by the Belfast Board of Guardians, a number of designs for school buildings were sent in, and from these a set by Messrs. Young & Mackenzie was selected. On the 19th instant a deputation of architects who had submitted plans for the buildings, consisting of Mr. Thomas Jackson, Mr. F. Shirral, Mr. McKinnon, Mr. Hevey, and Mr. Whittington, and accompanied by Mr. J. McLean, solicitor, waited on the Board in reference to the selection made by the guardians. The complaint set forth was that the plans had not been properly examined, and that better designs had been passed over. The competitors, therefore, urged that all the designs should be referred to the Institute of Architects of Ireland, or to the commissioners' architect, for a fresh decision. After a discussion, the matter dropped; it being understood that Messrs. Young & Mackenzie would furnish an estimate of the cost of carrying out the work from their designs.

THE HARTLEPOOLS EXCHANGE AND CLUB-HOUSE COMPETITION.

In May last, about a dozen architects of South Durham were invited, by the directors of the Hartlepoons Exchange Company, Limited, to prepare designs in competition for the above buildings. Only eight responded to the call, and from these, three sets of designs, bearing the mottoes, "Compact," "Veritas," and "On Change," were selected for the premiums offered.

The Directors submitted them to Mr. Ridley, of the Lock Works, Middlesbrough, that he might prepare estimates of cost, and it was found that none of them could be erected for the sum stipulated in the conditions of competition.

As this was the case, the directors requested the three premitted architects to obtain substantial builders' estimates for the erection of the buildings according to their several designs.

The author of the design bearing the motto "Veritas," Mr. G. G. Hoskins, of Darlington, obtained an estimate from Messrs. Robson, of the same town, to erect the Exchange buildings for about 8,000*l.*, which was the stipulated sum, although Mr. Ridley's estimated cost for this design was above 10,000*l.*, and higher than that for either of the others.

After sundry alterations, Messrs. Robson's estimate has been finally accepted, and the other two premiums awarded.

In consequence of the lack of funds, the directors considered themselves compelled to give the work to Mr. Hoskins, because he obtained the lowest actual estimate, although the plan for the Exchange buildings was thought to be inferior to that submitted by one of the other premitted architects.

Having thus far adopted this principle of action, they felt bound on the same basis to award two other premiums to Messrs. Thompson & Garry, of West Hartlepool, and Messrs. Alexander & Henman, of Stockton and Middlesbrough.

All your readers who have perused the General Regulations for the conduct of architectural competitions, lately issued by the Royal Institute of British Architects, will be able to judge for themselves as to the fitness of this decision.

LOOKER-ON.

OBSTRUCTING LIGHTS.

The case of Young v. Shaper, before Vice-Chancellor Malins, was an application by Mr. Robert Young, spirit merchant, Old Haymarket, Sheffield, who asked for an injunction to restrain Mr. Shaper, eating-house keeper, Westbar, Sheffield, from proceeding with a building, which is being erected at the top of Water-lane, in such a way as to injure Mr. Young's property on the other side of the lane.

Mr. Glasse, for the plaintiff, said the buildings were two hotels, and they were separated from each other by a narrow lane known as Water-lane, and the fronts of each faced Castle-street.

The plaintiff's longer frontage was in Water-lane. There were twelve windows looking towards the east, all but one being ancient lights. Water-lane varied in width from 13 ft. to 14 ft., and the defendant was raising the wall complained of, a height of 22 ft., above what it was originally.

After an address by Mr. Cotton, Q.C., for defendant, the Vice-Chancellor said his experience of all such cases taught him that the plaintiff, in a case where ancient lights were interfered with, was apt to magnify the value of these lights; and on the other hand, there were always witnesses to be found, skilled and unskilled, ready to prove not only that there would be no damage, but that the plaintiff would derive great benefit from the proposed work being carried on. It had been urged in this case

that because the lights were not used for a very important purpose the defendant had a right to darken them; but he had to consider the purposes to which the light might be put hereafter, and that would involve a much more serious loss than at present would be experienced. The new building could not fall to prove a very serious injury by materially obstructing the light. The plaintiff had a right to those lights for any purpose he might choose, therefore the defendant had no right to erect any building which would materially obstruct light and air, which would overwhelm the plaintiff, and instead of light coming from the east, he would be completely blocked out. The plaintiff was entitled to the injunction. The plaintiff ought to be satisfied with compensation in damages, but he could not enforce his opinion. The injunction would be granted in the terms prayed for, to restrain the defendant from continuing the erection of the building above ancient level. Costs follow as a matter of course.

IMPROVEMENT IN STREET LAMPS.

Sir,—Having had my attention called, through the medium of your paper, to the new patent lamps on one side of Moorgate-street, I went to see them, and certainly hope they will contribute to general use. In one thing, however, I think an improvement could be effected; on the proposal offered to use wire gauze and chalk (which would constantly require renovation) to absorb the moisture, by doubling the lamp double-glass, in the common square lamp to have four panes of glass fitted inside, and about 2 in. or less from the outer four panes. When in cold weather the gas is alight, the heat, by transmission through the inner glasses, would warm the air between the two, and consequently the inner glass being kept warm on both sides, would evaporate any moisture on the inside; and as no steam could get between the two glasses, the outer one would also be kept clear and bright. CARLO F. JOHNSON.

WHITEHAVEN BATHS COMPETITION.

Sir,—You remember the caution I gave in your pages a fortnight or three weeks ago respecting the above competition. The enclosed post card now issued to competitors, who it may be presumed have nearly finished their drawings, forcibly bears out the views I then expressed respecting the character of the competition. May I ask you to print it? It is, no one will be so foolish as to try to do you sympathy for mispent labour. If one has been weak and erring, let him sorrowfully hide the sad fact. FORBES.

"Whitehaven, Nov. 26, 1872.
BATHS.

The ground indicated on plan sent, not being available, the project is for the present in abeyance.—Yours respectfully,
PRO JOHN JACKSON,—G. E."

ENLARGEMENT OF THE CONSUMPTION HOSPITAL.

As the Chelsea Vestry a letter was read from the Metropolitan Board stating that application had been made from the authorities of the Hospital for Consumption in the Fulham-road for permission to tunnel under the road, they having purchased some property opposite the road, and asking the views of the vestry on the subject. Mr. Symons moved that the vestry offer no objection. The Board be asked to amend that the Metropolitan Board be asked under what Act of Parliament they propose to grant the application. Supposing the authorities wished to light the tunnel with gas, who would be the authority to interfere? Mr. Dutton asked whether the Kensington Vestry had expressed any views on the question, as one half of the road was in that parish. After some further discussion, the vestry clerk (Mr. Lohel) said there was just this point, that one did not know under what statute the permission to construct a tunnel would be given. The point was novel. In the end the vestry adopted the amendment.

THE LIGHTING OF BLACKFRIARS BRIDGE.

Sir,—I believe several suggestions have been made connected with this subject, and I shall feel obliged if you will allow me space to submit another, which may, I think, be considered worthy of notice. I propose that the lamp standards supporting the lamps, which are constantly being broken (I presume by passing vehicles), be removed from their present very unsuitable position, and placed at the side of the bridge, close to the parapet, in the same way as on Westminster and other bridges; or, what would be still better perhaps, to have the lamps placed on the top of iron framings, fixed at different points over the footway (having a sufficient number of them to light both the footway and the carriage-way). By carrying out my plan, the present difficulty would be overcome. Blackfriars Bridge has a very cheering appearance at night, especially when the gas is lighted with the broken lamps, and the wind is blowing; the bridge has then a spectral look. N. WATERBALL.

SUGGESTION AGAINST FIRES IN MANUFACTORIES.

Sir,—After reading the deplorable accounts of the fire at Boston, in America, it discloses certain facts worth bearing in mind, viz.—That granite when exposed to intense heat crumbles like dust; and that steel and iron are equally subject to much destruction. Now, in the serious fire at the Corn Mills, Blackfriars, we still find a great destruction of materials, but that the brick walls still stood a great deal from the raging fire, although the walls cracked; but this might in some measure have proceeded, perhaps, from the immense iron beams giving way, which would act as a lever on the walls. Under these circumstances, one feels disposed to suggest such remedial measures as might in some measure counteract the sad destruction of property from fires. For this purpose would you allow me to suggest the following, viz.—That the great accumulation of refuse coal at the mouths of coal-pits,

which hitherto has been of little available use, might it not be applied with a portion of clay and ground flint, or even a small portion of sand, in making a fireproof material, either in the form of bricks and tiles, or even to apply this material to other purposes, such as steps for staircases, for floors, &c.? For staircases, could not steps and risers be formed in one, as the stone staircases; also to form floors of tiles made about 1 ft. 6 in. square about 3 in. thick, laid in mortar, and grooved over to fill all the joints, and laid on brick arches, also made of a fireproof material.

Again, why should not warehouse doors be faced with thin fireproof tiles in a similar manner as those to the outside of buildings? In fact, if a fireproof material of such as I have endeavoured to describe, it might prove a boon, either in this country or elsewhere, as I believe it has now been sufficiently decided that a material in the form of brick is the most secure of any. All shafts to warehouses ought to be rendered fireproof, as also all accidents from gas-pipes being used in brick drains, &c.

If a company were formed for such a purpose it might be a safe speculation. W. B. W.

THE SHAMELESS ADVERTISEMENT FROM CROWLE.

STR.—This reply has been sent to the kind invitation of the above Board, published in the *Builder* last Saturday:—

"To the Clerk to the Crowle School Board. Having noticed your Board's advertisement in the *Builder*, we think it must have escaped the memory of its members that architects are obliged to live as gentlemen? Would it not be well for your Board and other Boards and institutions whose ideas of fairness are defective, to purchase general instructions for the conducting of architectural competitions issued by the Royal Institute of British Architects, cost 3d. Is the 5s. in the advertisement a misprint? Should it not have been 50s.? If it is not the case, how can you expect honourable architects to accept your invitation?—We are, &c."

Would not the Institute be doing a charity to such consciences corporations as the above by sending each of them a copy of their general regulations for conducting competitions lately issued? And would not this be a legitimate and most useful way of expending a small portion of their revenue? The labours of the Institute in drawing up these regulations will be lost if they do not find some means of placing them in the hands of those who have to organise competitions.

ONCE BITTEN TWICE SHY.

FIRE AT THE CITY FLOUR MILLS.

STR.—At page 930 of last week's *Builder*, a modification of "Dennett's" floors is suggested for fireproof purposes. In the gypsum districts, the coarse rock, in which sand predominates, is roasted, roughly pulverized, and used for bed-room floors. It has this quality, that after being in use it can be broken up, burnt again, mixed with a little new, and re-used.

The "Dennett's" arch is composed of concrete, in which the above floor plaster is the binding material, and from its cohesiveness and cheapness, it is well adapted for many of the purposes for which it is used; but in the event of fire it would calcine with the heat, and burst on the application of water.

It is probable that slag, if cast in proper shapes, would make a fireproof material for steps and landings. Y.

DESTRUCTION OF MILLS BY FIRE.

The great fires in Boston, and Thames-street, London, have been of such magnitude that they have overshadowed those of lesser extent in the public prints. It may, however, not be amiss to chronicle in the columns of the *Builder* some of these minor events, all of which, with one exception, have taken place in Lancashire and Yorkshire during the past four weeks ending November 23rd, 1872, and all of them cotton or woollen mills.

October 26th, Waterloo Cotton Mills, Bolton; 30,000. Higson & Sharple's Cotton Mills, Blackburn; 6,000. November 14th, Dean's Cotton Mills, Swinton, near Manchester; 10,000. November 15th, Parker's Cotton Mills, Preston; 16,000. November 18th, Whatley's Cotton Mill, Huddersfield; 7,000. November 19th, Hadden & Sons' Woollen Mill, Aberdeen, 18,000. November 22nd, Bury & Heap's Cotton Mill; 10,000. November 23rd, Gomerall, Brothers', Woollen Mills, Dewsbury; 15,000.

Now, here we have an aggregate of eight mills burnt down within four weeks, and a total loss of property equal to 112,000*l.* and thousands of workpeople rendered idle, all of which, or nearly all, I boldly assert, might have been prevented by a proper construction of buildings; for in large and lofty mills, costing many thousands of pounds each, we have, as in cottage-houses, a vast deal of "jerry" work. The plan of nearly every cotton-mill is a rectangle, the length of which is some multiple of 10 ft. 6 in., that being the width required to run a pair of mules, and is called in reports, "a window." The width is various, but generally a multiple of 20 ft. or 21 ft. The walls are of brick or stone. The floors are invariably supported on cast-iron

hollow pillars, resting one on another, with sockets at their junction half an inch deep only, so that a single height of column, complete, resembles a huge fishing-rod. At the height of the several floors, from these project brackets to carry pine beams 16 in. by 8 in., into which are notched 7-in. by 2½-in. joists of spruce, and the floor is laid on these in two thicknesses, ¾ in. and ¾ in., overlapping so as to break joints. These are celled between the beams underneath. The heat at which the rooms in these mills is kept ranges from 80° to 100° Fahr., so that in a very short time after the mill is started running the wood becomes as dry as tinder. Add to this the continual droppings of oil from the machinery, so that in a year or two the floors are saturated, and as these are covered with light cotton at all times, it is evident you only want the lightest spark to inflame them, and when once alight, it is impossible to extinguish the flames by any known means. The roofs are mostly compounded, 7 in. by 2 in. or 6 in. by 1½ in., 20 ft. span, celled on joists underneath, and covered with slates; the windows, 2-in. or 2½-in. wooden sashes, or "sheets," framed, and with a ventilator; the staircase, usually in a tower outside; the steps, of stone, on cast-iron risers; the hoist, or lift, sometimes on stairs, sometimes in the building itself, forming an admirable chimney for the flames from one room to another.

Now, sir, I beg to submit that this construction ought not to be permitted; that the Legislature should compel mill-owners,—who have so many lives cooped up between four walls,—to use the very best materials and construction possible to prevent disaster. The difference in the rate of insurance ought to be enough to induce them to adopt such solid construction as brick or cement-concrete, instead of the wood for flooring, the said difference being nearly one-half. But the extra capital required in the first instance mostly determines the adoption of the lowest-priced construction, and nothing short of legislative power will, I believe, ever alter it.

E. G.

SLATED ROOFS ON PUBLIC BUILDINGS.

Your correspondents "N." and "J. S." have expressed opinions upon the use of slate with reference to its employment at Worcester Cathedral, but have gone into no detail upon the subject of the colour of slate, or of different kinds of slate. May I be permitted space for a remark or two on this subject?

Firstly, I would submit to the common sense of your readers, that the following is a fair description of much of the slate, of excellent quality as material, that is now to be found freshly prepared for use, namely;—hue, dark as a thunder-cloud; surface, as monotonous as a painted door that is waiting to be grained.

A slated roof need not necessarily be obnoxious to this description. I have especially in my mind's eye, in contrast to it, the roof of the old British Museum (Montague House). The hue in that case might be described as the soft grey of a sheet of Academy paper, on which, as with black chalk, the outlines of hips, ridges, and domes, were marked by the lead flashings. The monotony of surface seemed less, too, than in a modern roof; possibly through the edges of the slates being weather-worn.

Respecting lead roof-coverings: the soft pearly hue that we prize in an old country mansion or cathedral seems so much due to time and weather, that it could not be matched by giving an order to a painter for a new lead roof. Even the dome of St. Paul's Cathedral has not thoroughly acquired it; probably the hindrances may be London smoke as well as insufficient age.

G. M.

CHURCH-BUILDING NEWS.

Willesden.—The parish church of St. Mary, Willesden, Middlesex, was reopened on October 20th, after being enlarged so as to contain 287 additional sittings on the ground floor. A western children's gallery has been removed. The church, as it existed previously to the enlargement, consisted of a chancel, a nave, and a south aisle, terminating in a chancel-aisle at its east end, and in a tower at its west end, a south porch, and a modern vestry. The recent works, executed by Mr. W. Shearburn, of Dorking, consist of a north aisle, with an entrance and porch at its east end; a transept, containing the children's seats and an organ-loft; and a vestry, with stoker's room beneath it. The tower has, by the removal of the organ to the transept, been ren-

dered available as a baptistery, thus rescuing from concealment the ancient font. In taking down the north wall of the nave, the bases of three columns were found *in situ*, and stones of the shafts and capitals mixed up with what proved to be modern masonry and brickwork. These columns correspond exactly in detail with the Early English arcade opposite. The extension of the nave has necessitated an arcade of five arches opening into the new north aisle, but the recent works produce rather a restoration than an alteration of the old church. A sufficient number of sound stones was found to rebuild one column as a memorial of the original fabric, but, beyond this, care has been taken to make the detail of the new work quite distinct from the old. The other discoveries in the north wall include two heads of narrow Norman windows, the capital of a Norman nook-shaft, the remains of doors and windows of the Decorated and Perpendicular periods, and a piscina, with a very narrow shelf above it. This has been rebuilt in the south chancel wall, and sedilia have been formed in the adjoining window-sill. A reredos, with open tracery, through which the east window is seen, and a sacarium pavement of tiles and mosaic, have been recently given; and the whole has been carried out from the designs and under the superintendence of Mr. Edward J. Tarver, architect.

East Hardwick.—The foundation stone of St. Stephen's Church, East Hardwick, has been laid with full Masonic honours by the Marquis of Ripon, K.G., Grand Master of all England, and Provincial Grand Master of West Yorkshire, assisted by the Deputy Provincial G.M. of West Yorkshire, Brother Bentley Shaw, J.P., D.L., P.G.D. of England, and officers and brethren of the Provincial Grand Lodge. The old church, which is being superseded by the building at present in course of erection, was founded in 1653 by Stephen Cawood, yeoman, and, besides being somewhat decayed, is now found to be too small. The new edifice, which is being built according to plans furnished by Mr. Davis, architect, Leeds, will accommodate 230 persons. It is cruciform in plan, and the style of architecture is Early English. The chancel is to be 28 ft. in length and 18 ft. wide; the nave, 52 ft. in length and 21 ft. wide; and the cross transept, 58 ft. in length and 13 ft. wide. The estimated cost of erection is 2,100*l.*, of which 1,700*l.* are already subscribed.

Thornby.—The old church here has been taken down, and a new structure erected on the site. All the architectural features of the old building have been retained. A new chancel has been added in the place of the one destroyed in the last century. The tower has been rebuilt, principally with the stone used in the former one, and has within it a peal of bells. The new roofs are of oak, and covered with lead. The work has been carried out by Mr. Firm, of Leicester, under the direction of Messrs. Slator & Carpenter, the architects.

Matson.—The church at Matson has been reopened for divine service. The old pews have been cleared away; new benches, and a new pulpit and reading-desk of pitch pine, and a new font, have been provided; a warming apparatus, supplied by Messrs. J. M. Butt & Co., has been placed in the church, and a new floor of ornamental tiles laid. The renovation has been carried out, under the direction of Mr. J. E. Jones, architect, by Mr. W. Fream, jun., of Gloucester, builder.

Malvern.—It has been decided to enlarge Trinity Church by pulling down the north and south aisles, and reconstructing them so as to give additional accommodation of 104 sittings in the north, and 96 in the south aisles. In connexion with the north aisle a new vestry will be constructed, and the organ-chamber enlarged. The present north doorway will be removed and inserted in the west end. The alterations will be carried out in accordance with drawings prepared by Mr. Henry Haddon, of Malvern, architect.

Ratley.—The parish church of Ratley having for some time been undergoing restoration, and the work being now all but completed, it has been re-opened by the Bishop of Worcester. The church had long been in a very dilapidated state, and restoration having been resolved upon, the Earl of Jersey, who is an extensive landowner in the parish, gave 100*l.* towards it, and the Rev. A. Benefield, the vicar of Ratley, and family another 100*l.* The chancel was restored by Mr. Jones, farmer, at a cost of 220*l.* The total cost of the restoration was 600*l.* The restoration

consists of a new east window, which has taken the place of one in the Perpendicular style. The nave, aisle, and chancel, have been re-seated with open benches of pitch pine and yellow deal. The whole of the works have been carried out by Mr. Charles Claridge, of Banbury, builder.

Liverpool.—St. John's parochial church, Old Haymarket, which was erected in 1761, has been closed for alterations and improvements. The whole of the old high-backed seats have been swept out of the body of the church, and new pitch-pine open benches substituted. The three-decker has been dismantled, and a simple oak pulpit stands in the centre of the new chancel platform. The organ has been removed to the south-east gallery, and the old organ-loft removed from over the chancel, whereby the east window is quite exposed and the church made lighter. The chancel has been extended by the introduction of a platform, on which choir-seats and a reading-desk and lectern find places. This platform has been laid with encaustic tiles. The lighting of the church has been considerably improved.—The corner-stone of a new church in the district of St. Thomas, Toxteth Park, has been laid. The new edifice will be dedicated to St. Philemon. The site is in Windsor-street, near Northumberland-street and Dorrit-street, and is in the midst of a rapidly-increasing neighbourhood. The plans for the new building have been prepared by Messrs. Culsaw & Sumners, of Liverpool, architects. The church will consist of a nave, chancel, transept, and one side-aisle, which will be separated from the nave by five arches, supported by red stone columns, with carved caps and moulded bases. Adjoining the chancel on the west side will be a spacious organ-chamber, and on the opposite side a convenient vestry, having a private entrance from Dorrit-street. There will be a small gallery constructed to seat about 150 persons, and access to the gallery will be gained by a special staircase, leading from the main porch in Northumberland-street. In the basement occupying the whole area beneath the church floor sufficient provision will be made for a school-room, so that at any future time such an addition, if required, can be made at comparatively little expense. The architectural features of the church will be plain Geometrical Gothic, the architects having been obliged to turn their principal attention to internal accommodation. The walls are to be of brick, relieved by stone dressings and window tracery. In the gable of the principal elevation, which will face Northumberland-street, there will be a tracery window, and over that a bell gable. The church, when completed, will be capable of accommodating 800 persons comfortably, exclusive of the choir; and the total cost of the building, including the provision for a school-room, will be about 5,000l. Mr. John Corkhill, of Liverpool, is the sole contractor.

Kildermister.—The old parish church of St. Mary, Kildermister, has been re-opened, after undergoing some alterations and improvements. Formerly the organ was placed in a modern organ-loft under the tower, and two huge galleries encumbered the north and south arches, extending the whole length of the nave. Owing to bad construction they pressed against the outwalls, affecting their stability, and disturbing the equilibrium of the nave pillars. These galleries also prevented the decorated windows from being seen, and obstructed the light. All these encumbrances have now been removed; a spacious organ-chamber has been erected; all the galleries have been taken down; a new arrangement of the choir-seats has been effected; and the church has been adorned by a new stone pulpit and font. The work was directed by Mr. W. J. Hopkins, diocesan architect, of Worcester. The new organ-chamber is erected at the east end of the north aisle, and harmonises in style with the existing buildings, most of the details being precisely similar in character. The chamber opens into the chancel by means of a lofty arch, extending, one way, eastward from the chancel arch, and another arch is introduced at the east end of the north aisle, extending its whole width; an arched oak-boarded wagon-roof with moulded ribs forming the ceiling of the chamber. The lofty tower arches are now exposed to view, the spaciousness of the church is rendered apparent, and the traceried windows of the side aisles once more light up the interior of the church. The builders employed were Messrs. Binman & Son. The work of restoring different parts of the church has been going on for the last quarter of a century, and there still remains more to be done. A new organ is in the hands of Messrs. Hill & Smith, of London.

The exterior of the tower is in a sad state of decay, and this and other parts of the edifice still require to be seen to. The cost of the present restoration, including the purchase of new organ, is about 2,000l., of which a considerable portion has yet to be raised.

Burrington.—The parish church has been re-opened after a restoration. The work has been superintended by Mr. F. R. Kempson, architect. The chancel floor has been raised 1 ft. above that of the nave, and laid with Godwin's encaustic tiles; the reredos being covered with similar tiles, only of superior pattern. Much of the stonework and ancient carving, thickly coated with plaster, has been laid bare and well pointed. The lab and plaster ceiling of the nave and chancel has been replaced by a vaulted panel roof in pitch pine, intersected throughout by bold ribs in red deal. High-backed and closed pews have been converted into low, open seats; the choir-stalls in the chancel being entirely new. A light altar-rail in oak, with ornamental iron standards, decorated in blue and gold, spanning the entire width of the chancel, replaces an old balustrade. In progress of the works it was found necessary to rebuild the south wall, in which three new windows, presented by friends, have been erected in place of the large round-headed, modern windows in iron frames. A new chancel arch has been erected. Over this are the new gable, coping stones, and final cross, where none existed before. The slates which covered the roof have given way to Breckley tiles. The stonework of the west window is entirely new, and that of the east window nearly so, being in each case reproductions of the old designs. A screen, in oak, spans the lower portion of the tower arch, and does not interfere with a full and open view from east to west. The last window in the chancel is filled with stained glass, by Messrs. Ward & Hughes, as a memorial gift. The remnants of ancient glass found in the tracery of the east window have been inserted, with modern glass to match, in a small window on the south side. The two Norman windows on the north side of the chancel have been filled with stained-glass figures, of St. Philip and James, to whom the church is dedicated. These windows have been executed by Messrs. Ward & Hughes. An old Norman tomb, with recumbent effigy, has been carefully restored at the cost of the contractors, who have also fitted the west window with Powell's coloured quarry glass. The pulpit, of carved Bath stone, is a memorial gift. The entire cost somewhat exceeds 1,000l. The contractors were Messrs. Collins & Tullis, of Tewkesbury.

DISSENTING CHURCH-BUILDING NEWS.

Chapel-on-the-Frith.—The memorial stones, four in number, of a new Wesleyan Methodist Chapel, have been laid at Chapel-on-the-Frith, near Stockport. The building, which will be of the Gothic character, will be erected upon the site of the old chapel, which was erected in 1780. The estimated cost, exclusive of material from the old building, will be about 1,800l. or 2,000l., of which sum about 1,023l. have already been realised by subscriptions, &c. The new chapel will accommodate about 500 persons.

Northampton.—The memorial stones of the new Wesleyan Reform Chapel, Wellingborough-road, have been laid. The site of the new edifice is the same as the old one which it replaces, and faces the road. The new chapel will be set back about 10 ft. from the road, and will then occupy an area about double the size of the old one. The school-room will be underground, and will be reached by a flight of steps, the descent being 7 ft. 6 in. Two class-rooms are to be attached to the school-room. The chapel, the front elevation of which is 26 ft., will be entered by a flight of steps, the ascent being 1 ft. 6 in. The entrance is to be by two folding-doors, and the two folding-doors will communicate with a small porch, and the porch with two small aisles, right and left. There are to be three series of seats, and these will be open and of plain deal. Over the entrance-porch there will be a small gallery, six seats deep. There will be accommodation for about 350 persons. The chapel will be lighted with windows back and front, as it will be impossible to get light from the sides of the building, it being erected close to houses on either side. To relieve the monotony of the side walls, pilasters, with ornamental capitals, will run up either side. The ceiling will be in panels. At night the place is to be lighted by a gas star suspended from the ceiling, and also

with gas brackets on the side walls. The windows, the framework of which will be of iron, are circular-headed, with stone dressings. The pulpit is to have a sort of canopy, and beneath it a platform will be constructed, intended to be used for the baritone and choir. Over the pulpit, between the two south windows, will be a small circular window for the purposes of light and ventilation. The architect is Mr. Ingman, of this town; and the builder is Mr. Richard Smith. The cost is estimated at about 700l. The chapel is to have iron palisades in front. It is proposed to warm the edifice by means of a gas apparatus.

Newbury.—The Congregational Chapel here has been re-opened, after having been altered and improved, on plans by Mr. W. H. Woodman, of Reading, architect. The first attention of the architect was given to strengthening the walls, and, as far as possible, securing the defective foundations. The next step was totally to alter the shape and proportion of the interior of the building by throwing into it the old lobbies, erecting new ones outside the east end, and a large and deeply-recessed apse terminating in a semicircle at the west end; replacing the floor at a lower level, and reconstructing the galleries much nearer the floor, and of about half the original size. The entrance to the chapel is now through three lobbies, the gallery staircases being approached from the two end ones; folding-doors across the lobbies are arranged to separate the congregation from the body and staircases during egress, though both use the same lobbies for ingress; glass doors communicate with the ground-floor, which inclines about 18 in. from the entrance to the pulpit. The seating is arranged in three blocks and two aisles; the seats are all open, are low with sloping backs, have book-boards, and are to have hassocks. The communion-pew is arranged at the junction of the apse with the west end; is segmental in form, raised above the floor; and is inclosed with a cast-iron railing. The apse is the principal architectural feature of the interior. It has a domed roof, divided into panels by deeply-moulded ribs, which spring from carved trusses at a considerable elevation from the floor. The opening to the apse from the chapel is spanned by a moulded and panelled arch, supported on six carved and gilt brackets. The walls are also panelled, and in four of the panels there are circular windows, filled in with deep stained glass in simple geometrical patterns, and in the apex of the dome there is a circular lantern-light, glazed with ground and ruby-tinted glass. The organ is an entirely new instrument, built by Speechly & Ingram, of London. The system of ventilation which, upon the recommendation of the architect, has been adopted, is the same he has applied to many buildings in the north, and known as "Watson's syphon ventilator," made by Hill & Hey, of Halifax. Two have been considered necessary. Each has a long square shaft from the top of the roof to the ceiling inside, divided diagonally by a partition into two parts; fresh air descends one part, foul air ascends the other. Flaps to regulate the currents are attached just above the ceiling, and are opened or closed from the galleries. The heating apparatus, which has hitherto proved satisfactory, has not been altered. The artificial lighting is by two coronas, pendant from the main ceiling, and one from the junction of dome of apse with west wall. There are eight side brackets for the galleries, and ten on the ground-floor for the side aisles. They are all made of wrought iron and brass. The ceiling, which is very large, and was devoid of all ornament, is now filled with eight ornamental centre flowers, and two east-iron ornamental centre flowers, and the two east-iron ornamental gratings under the ventilators. The central flowers are all grouped together and formed into one large central panel by broad bands of colour: the central and important feature being a reproduction of the key-pattern in blue and white colour, the marginal tints being mauve and pink. From the centre panel, advantage has been taken of the segmental form of the ceiling to continue the bands of colour to the side and end walls—dividing the whole ceiling into eleven panels; the cornice which runs round the building has been distempered and tinted. The walls of the chapel are divided into panels, the colour being green, the border between, buff. Strong lines of crimson, and finer of mauve colour, are run round each panel, and an ornamental corner introduced at each angle. The panels of the dome of the apse are tinted pale blue, with gilt stars interspersed, the mouldings of the ribs being relieved with lines of pink

colour. The panels below the dome are pale green, the stiles between them, huff; the mouldings of the panels are French white, the prominent member being gilt, and the inner next the panel, pale pink. The organ-pipes are painted grey and gilt; similar colours are used in the gallery front and pulpit, pink being sparingly introduced in the mouldings. The iron columns and iron railings are all painted charret colour to harmonise with the metal gas-fittings, and they are relieved with ornaments of blue and white, and a few of the mouldings are gilt. All the pewing is painted light leather colour and varnished. Round the walls above the pewing there is a flat board to protect the walls, with an ornamental pattern painted on it. The contracts for plastering, plumbing, painting, glazing, gas-fitting, and smith's work, were taken by Mr. Joseph Hopson, of Newbury. The gas-fittings are of Medival style, and were supplied by Mr. E. Tuck, of Bath. The contract for bricklaying and carpentering was taken by Mr. Salter, of London. The probable total expenditure is not yet known.

Holbeach.—The new Nonconformist Chapel has been opened. The building is in the Romanesque style of architecture, and is divided internally into nave and aisles by two rows of iron columns, supporting semicircular arches. Over the arches is a clearstory, lighted by semi-headed windowing, arranged in couplets. The material for the walling is white Whiteleas brick and Bath stone. The front of the chapel has a gabled centre, containing in its upper stage a three-light semi-headed window, with detached shafts and moulded arches, and in the lower stage five semi-headed windows. The chapel, when the end gallery is added, will seat about 350 persons; and attached to it is a school-room, vestry, and out-buildings. The contract for the building has been executed by Mr. Chappell, of Holbeach. The architect is Mr. Tait, of Leicester.

SCHOOL-BUILDING NEWS.

Bexley (Kent).—The school accommodation in this parish has been increased by voluntary contributions, to obviate the necessity of a School Board. A piece of freehold land has been purchased in Station-road, Bexley Heath, and a new school erected there, for the accommodation of 150 children. In the hamlet of Welling (in Bexley parish) a new school, to accommodate 100 children, has been erected, at the expense of Mr. A. W. Bean, of Welling. The contract for the Bexley Heath Schools was carried out by Messrs. R. & J. Butler, of Bexley Heath; that for school at Welling, by Mr. Ashdown, also of Bexley Heath. The architect in each case is Mr. Joseph Hewitt, of London.

Wakefield.—The new school-rooms which have just been completed by the Wesleyans, at West Parade, have been formally opened. The building is of a plain character, of red brick, with stone dressings, and has been designed to harmonise with the adjoining chapel. The principal entrance, on the ground-floor, faces South Parade, and in entering, on the right, is the large school-room, or lecture-hall, 72 ft. long, 33 ft. wide, and 19 ft. 6 in. high, attached to which is a class or retiring room, 15 ft. by 13 ft. At the south end is fixed the platform, and from the south-west corner a staircase to the basement is placed, by which is reached a room fitted with boiler and other apparatus for tea-making or other purposes. By stairs from the entrance five classrooms are reached, about 14 ft. by 12 ft. average size, and a room 33 ft. by 30 ft. The latter is intended for the ladies' sewing-room and for other meetings. All the rooms are warmed with hot air, supplied by apparatus in the basement, by Blake & Co., of Coventry. The whole of the works have been carried out from the designs and under the supervision of Mr. William Watson, of this town, architect; and the following persons have been the contractors for the various works:—Messrs. George Fawcett, bricklayers and masons; C. F. Pywell, slater; Charles Driven, plasterer; Craven & Lloyd, joiners; William Woodhead, plumber, glazier, and gasfitter; Samuel Kirk, ironworker; and Charles Turner, painter. The cost has been £1,950.

Carleton.—The foundation-stone of a new school at Carleton has been laid by Mrs. Hetherington, of Burlington-place, Carlisle, who gives half an acre of land on which the school is being built, and also defrays the entire expense of the erection. Mr. Joseph Hetherington, of Carlisle, son of Mrs. Hetherington, is the architect; and

Messrs. Baty & Son, of Upperhy, are contractors for the mason work. It is intended also to hold religious services in the new school.

Stratham.—New schools, long needed in this parish, have been opened by the Bishop of Ely. We understand that the cost of the new buildings (including site) is between 1,300*l.* and 1,400*l.*, of which the rector makes up a deficiency of nearly 400*l.*

Rattlesden.—A new school, built by Mr. H. Luff, from plans by Mr. F. Barnes, architect, both of Ipswich, has just been opened at Rattlesden. The contract was 878*l.*, and accommodation is provided for 180 children. In addition to the school there is a residence for a master and mistress.

Great Yarmouth.—The new schools of St. James's, on the Queen's-road, and also the additions to the Priory schools, are now nearly completed. The St. James's schools (including the portion previously built), will accommodate about 500 children; and the total cost, exclusive of the value of the site, will not exceed 1,600*l.* The buildings are plain. They are of Gothic character, having open-timbered roofs, and comprise three large school-rooms, with class-rooms, lobbies, and offices. The additions to the Priory schools comprise new school-room, with lobbies, &c. Accommodation is provided for about 200 children, and the cost will be about 600*l.* These buildings have been carried out at the outlay of about 3*l.* per head. The architect is Mr. J. T. Bottle, of Yarmouth. The contractors for St. James's schools are Messrs. Leggett & Want, and for the Priory, Messrs. Jackson & Want.

VARIANTORUM.

"OUR Mother Church: being Simple Talk on High Topics," by Mrs. Jerome Mercier (Rivingtons), is addressed to girls, and contains much that is good to know, provided it be acquired in the right spirit. The priggish, over-clever young ladies whom such distillations have a tendency to create are the most disagreeable objects in creation. The following definitions will show the tone of the book, and help its sale with the party for whom it is written:—"Gallery, a modern wooden erection for the execution of Tate & Brady, or for increasing the accommodation for 'hearing' without reference to 'worship.'" "Tense—High pews were introduced by the Puritans, after the Reformation, to hide their disobedience to the command to kneel, and to show their disregard of all ideas of 'worship.'" It is right to say that the estimable authoress declines, in a foot-note, the responsibility of the first of these.—A second edition has been published by Messrs. Lockwood of Mr. Warrington Smyth's "Rudimentary Treatise on Coal and Coal-mining,"—an interesting and useful little book.

Miscellaneous.

Archaeological Discovery in Coventry.—In a field at Jeffrey Wood's Cross, workmen employed in digging clay have come upon remains of ancient masonry, about a yard below the surface, which, on being laid bare, were found to consist of a series of twelve arches, built of tile, arranged in pairs, and enclosed within rubble walls of stone, having two thicker arches at the western extremity. The west wall contained openings to a flue. The floor is of concrete, and the arches parabolic, somewhat resembling in elevation half an egg, with the smaller end upwards. They are constructed of tiles, tapering inwards. The thickness of each pair of arches is 7 in. The height of each arch from the floor (interior measurement) is about 2 ft. The height of the exterior wall, measured on the inside is 9 ft. There are no traces of cement having been used, the whole of the joints in the masonry being of clay. The inner surface of the walls and arches has been covered with a thin coating of clay, and it is considered probable that the tiles may have been placed in position in a semi-dried state, and all burnt together. Several archaeologists have no doubt of its having been used as a furnace for some purpose, or part of a warming apparatus for some building formerly existing here. At first sight it bears some resemblance to a Roman hypocaust or sweating-bath.

Institution of Civil Engineers.—On November 26, the paper read was "On the Ah-el-Walk Sugar Factory in Upper Egypt," by Mr. W. Anderson.

Sanitary Report on Salford.—The annual report of the General Health Committee of the borough of Salford to the local Council, for 1872, has been issued in a printed form. It states that the death-ratio for the first nine months of 1872 "has been much lower than it was for the corresponding period in 1871." And from an accompanying table this appears to be so; the weekly average to the end of October, in 1872, being 25.7 per thousand, while in 1871 it was 30.3. The averages for the quarter ending 28th September were very heavy in both years, according to this table; but those of the 1872 quarter ending 28th September do not accord with the Registrar-General's quarterly return of deaths for July, August, and September, 1872. According to this last return, the average death-rate for that quarter was 33.7; whereas, the very highest given in any one week on the local table for the same quarter was 33.7, in the week ending 14th September; and the lowest was 15.8, in the weeks ending 6th and 20th July.

Bad Building in Manchester.—Mr. E. Salomons, as President of the Manchester Society of Architects, points out that during the last five years the Society of which he is the president has made several attempts to induce the Corporation of Manchester to codify the various sections of their Acts of Parliament relating to the regulation of buildings as well as their building-by-laws, and to extend them either by framing additional by-laws or by procuring a satisfactory Building Act. He says,—"Communications have again recently been opened with a view to this end, and we are not without hope that ultimately a set of building regulations may be adopted and enforced by the Corporation which will have the effect of raising the character of the construction adopted in the large run of dwelling-houses, that will impose obstacles to the spread of fire from one property to another, and that will insure a greater amount of safety and facility of egress from places of public entertainment than exists at the present moment."

Manufacture of Oxygen Gas.—The manufacture of oxygen gas on a large scale by the Motay process is an established fact. The process, as we have before described it, consists in heating the manganese of soda in steam; oxygen is discharged, and water absorbed; caustic soda and oxide of manganese being the result. Upon heating this in a current of air, oxygen is taken up, and a manganese of soda reformed, which admits of a repetition of the process. The oxygen is thus being constantly extracted from the atmosphere. In Brussels a manufactory of this oxygen has commenced operations, and is now furnishing a supply of the gas, to aid in increasing the illuminating power of ordinary gas in the Galeric St. Hubert. The gas is compressed into iron cylinders, and thus rendered very portable. It may be used as a remedial agent, by supplying any additional quantity of vital air to the atmosphere of a sick room.

New Fountain at Patna, in Ayrshire.—A new fountain has been opened in Patna, a village about nineteen miles from Ayr, in Scotland. It has been provided by Major Walker, of Liverpool and Warrington. The Duke of Portland permitted the donor to bring a stream of pure water from Patna village to supply it. The fountain consists of a basement of polished grey Aberdeen granite, with two basins, into which the water flows through two metal spouts issuing from lions' heads. Above is a moulded plinth of Yorkshire stone supporting the shaft of the fountain, which is of polished Aberdeen granite. Above the shaft is a carved Gothic capital, with splayed angles surmounted by an open corona in Yorkshire stone, carrying a carved conventional fleur-de-lis. The total height of the fountain is 12 ft. from the basement to the top of the finial. The design was furnished by Mr. Henry H. Vale, of Liverpool, architect.

The Social Science Congress Visit to Norwich.—A meeting of gentlemen of the city of Norwich and county of Norfolk has been held at the Guildhall, under the presidency of the mayor (Sir Samuel Bigwood), to make arrangements for giving a proper reception to the Social Science Congress upon its visit to Norwich in the middle of September, 1873. The Bishop of the Diocese, the sheriff of Norwich, several M.P.s, and other influential gentlemen were present; and a subscription-list was opened, and 260*l.* at once subscribed. Four secretaries, two treasurers, and six committees to form a general committee, were appointed.

Mr. Ruskin.—In a letter to the *Full Mall Gazette* on "gratitude" as between employers and employed, Mr. Ruskin says:—"In all right relations between the employer and employed, each respects the other, because both deserve respect. But the feeling of deference is greater on the part of the person employed, because the person who directs him is (always supposing their relations right) the wiser of the two. Many invaluable facts relating to this matter under existing conditions of large employment may be found in Mr. Helps's 'Life of Mr. Brassy.' By the way, Mr. Editor, is that letter from 'Mater-familias' in the same number really written by a lady, or did you do it yourself? You will not tell, I suppose? All I can say is, if you did it yourself, write a little worse next time; if it is really by a Materfamilias, I wonder whether she has a daughter who would have any sympathy with the follies and amusements of an old gentleman of fifty-three?"

New Gas Company for Buenos Ayres.—According to the *River Plate News*, new gasworks are in progress at Buenos Ayres for the "Mutual Gas Consumers' Company." The excavations were out, the front and left side walls completed, and bricklayers and navvies pushing on as fast as possible. The site for the works is 90 varas front by 200 in depth, and situated in Calle Defensa, exactly opposite Genl. Brown Station, on the Boca line, and will be connected with the river by a tramway for five squares. The coal-store is 300 ft. long, and the gasholders will contain 500,000 cubic feet of gas when full, besides space for another to hold 400,000. The capital of the company is 200,000*l.*, in shares of 10*l.* each, the whole to be raised in Buenos Ayres. A London contractor undertakes the gas manufacture: Mr. C. H. Smith is his engineer.

Death of Mr. Jordan, of Electrotypes Fame.—Mr. C. J. Jordan died on October 5th. His name, like those of Mr. Thomas Spencer, of Liverpool (now of London), and of Professor Jacobi, of St. Petersburg, will be familiar to many in connexion with the invention of electro-metallurgy. Mr. Jordan was buried in Finchley Cemetery. He was from early life a journeyman printer, being last engaged in a large establishment in Red Lion-court, Fleet-street. He was of unambitious and simple habits, and died in poverty, leaving behind him, without the least provision for their support, a wife and three children, while the rent of the house he occupied for thirty years is being raised, and arrears of rent demanded.

Cooking.—A meeting of the Committee of Advice for the class of Cooking to be represented next year in the London International Exhibition, has been held, and it was resolved that cooking for agricultural labourers, artisans, upper and lower middle classes, as well as that most suitable for the army and navy, for paupers and for prisoners, should be represented as far as possible. It was also resolved to communicate with some of the principal makers of kitchen ranges, stoves, and apparatus, with a view of ascertaining whether they will exhibit apparatus in action. Arrangements ought to be made for a series of experiments on the subject.

Covered Sheds or Ventilating Barns.—These buildings save trouble in the field (by the crop being carted earlier than if it were to be placed in the old-fashioned closed barn); they allow corn to dry better than if packed in a stack; and especially they save cost of thatch and thatching. The cost of some such buildings is, it appears, from 8*l.* to 1*l.*, according to material used, for each cubic yard of contents. Thus, says a correspondent of the *Berford Times*, if 30 cubic yards were taken as the bulk from one acre, a shed to accommodate the produce of 100 acres would cost between 100*l.* and 150*l.*

Constant Water Supply in the East of London.—The East London Water Company have informed the Metropolitan Board of Works that, on and after the 25th of March next, they will give consumers, in certain parts of Bethnal-green and Shoreditch, a constant supply of water. Proper fittings, however, must be provided.

The late Mr. Morris, A.R.A.—The Burlington Fine Art Club proposes to form an exhibition of such works of the late Mr. Morris as they may be able to obtain. Owners willing to contribute, should communicate at once with the secretary of the club.

Cassars's Camp at Wimbledon.—The Court of Common Council have resolved, *nem. dis.*, "that it be referred to the joint Coal and Corn and Finance Committee and Board of Commissioners in trust to consider the desirability of preserving Cassars's Camp at Wimbledon as an open space for the recreation and enjoyment of the people, and with directions to place themselves in communication with the proper authorities to ascertain upon what terms and conditions this may be accomplished, reporting to this court from time to time."

Drainage of Oxford.—Men are excavating for sewers in different parts of the city, and an advertisement has been issued announcing that the Oxford Local Board propose to apply to Parliament next session for power to purchase lands for the construction of the main drainage works and the purchase of lands below the village of Ilfley for the purpose of a pumping-station and sewage irrigation in accordance with the recommendations contained in the published report of Mr. Bailey Denton.

Meeting on Behalf of Agricultural Labourers.—A meeting is to be held on the 10th of December, at Exeter Hall, under the chairmanship of the Right Hon. the Lord Mayor, at which several influential persons will attend for the purpose of considering the present deplorable condition of the agricultural labourers in the counties of Somerset and Dorset, having special reference to their wages, the overcrowding of their homes, and their social position generally.

The Vienna Exhibition and French Art. It is said that a project is now under the consideration of some eminent French artists in connexion with the great International Exhibition, to be held next year at Vienna, to attempt an exhibition—separate from the great one,—of all the most remarkable works that have been produced by the French school during the past ten years, in order to set French art before Eastern Europe with all possible *clat*.

Royal Architectural Museum.—It should be noted that the first session of art-workmen's drawing and modelling classes will be opened at this Museum on Monday evening, December 2nd. The payment is but nominal. The second session will commence after Christmas, when a course of practical descriptions of the figure sculpture in the Museum will be given by Mr. J. F. Redfern. Some practical lectures on metal-work will be delivered by Mr. Joseph Peard.

Mr. Rogers, the Carver.—We are glad to hear that her Majesty the Queen has been pleased to approve the *Primo Minister's* recommendation that a grant of 50*l.* per annum be made to Mr. Rogers on the Civil list, in consideration of the influence he has had in reviving the art of wood-carving in this country.

Housing the Pastor.—The *Rock* says that the congregation of Christ Church, Cloughton, have just presented a novel testimonial to the Rev. Dr. Blakey—viz., a parsonage-house, and a sum of 200*l.* to defray the expenses of removal thereto. The house cost 2,090*l.*, the total amount raised being 2,320*l.*

Schools for Paris.—The capital of France is to spend next year 18,000,000 francs on the building of thirty-five elementary schools. "This is the way," says a French paper, "to take a brilliant revenge on an empire that paid its schoolmasters so badly that thousands of schools are actually deprived of masters."

Library for Derby.—Mr. Bass, the senior member for Derby, has made a donation of 5,000*l.* towards the erection of a free library in Derby. Mr. Bass has already given a recreation ground, value upwards of 4,000*l.*, and public swimming-baths to the town within the past year.

Warning.—We are told that Messrs. Shilleto & Shorland, of Manchester, have completed an apparatus capable of being fixed to any grate, by which hot air can be circulated from one fire to a number of rooms; or to those constant sources of draught—the passages and staircases.

The Manchester Abattoirs.—The public abattoirs in Water-street, in this city, erected by the corporation, have been so far completed as to allow the butchers to occupy them. The first beast was slaughtered last week.

TENDERS

For one section of the Weymouth drainage:—	
Stephens.....	£1,895 0 0
Weakley.....	731 0 0
Brown.....	797 0 0

New schools, Deptford Creek-road, for the London School Board, Mr. E. R. Robson, architect:—	
Merritt & Ashby.....	£5,980 0 0
Higgs.....	5,950 0 0
Jerrard.....	5,800 0 0
Cooper.....	5,874 0 0
J. & P. Coleman.....	5,870 0 0
Perry & Co.....	5,850 0 0
Coolie & Green.....	5,775 0 0
	5,768 0 0

New school, Powis-street, Woolwich, for the London School Board, Mr. E. R. Robson, architect:—	
Gorram.....	£3,923 0 0
Ennor.....	3,650 0 0
Newman & Mann.....	3,635 0 0
Perry & Co.....	3,583 0 0
Riddall.....	3,250 0 0
Kilby.....	3,182 0 0
Johnson.....	3,069 0 0
Jerrard.....	3,083 0 0
Kirk.....	3,050 0 0

For the erection of a warehouse in Bride-street, Ludgate-circus, for Messrs. Colbenson & Lock, Messrs. Woodzell & Colcutt, architects. Quantities supplied:—	
Bath Stone, Tisbury Stone,	
Dove, Brothers.....	£2,955 £3,055
Cooke & Green.....	2,934 2,974
Simpson & Son.....	2,883 2,923
Scriveners & White.....	2,741 2,809
Perry & Co.....	2,697 2,767
Ennor (accepted).....	2,703 2,739

For rebuilding premises in Tottenham-place, for Messrs. Maple & Co. Messrs. Woodzell & Colcutt, architects. Quantities supplied:—	
Scriveners & White (accepted).....	£1,100 0 0

For stabling, &c., at Berkeley House, Nightingale-jane, Clapham, Mr. A. G. Hennell, architect:—	
Candler.....	£650 0 0
Amer.....	630 0 0
Mason.....	518 0 0

For stabling, &c., at Woodside, Shorelands, Kent, Mr. A. G. Hennell, architect:—	
Pritchard.....	£967 0 0
Emmett.....	598 0 0

For erecting new workshops, &c., at Industrial Schools, North Hyde, Mr. C. J. Wray, architect:—	
Perkins.....	£615 0 0
Richards.....	615 0 0
Wicks, Bangs, & Co.....	490 0 0
Robins.....	490 0 0

For schools, New Winchester-street, Pentonville, for the London School Board, Finsbury division, Mr. C. Barry, architect. Quantities supplied by Mr. J. H. Strudwick:—	
Downs & Co. (accepted).....	£9,323 0 0

TO CORRESPONDENTS.

Ch. L. (many thanks for report. The Great Hall at Hampton Court is probably meant; not the "church." Illustrations of the roof and other parts will be found in Pugin's "Specimens of Gothic Architecture," vol. II.)—H. C. (we have nothing to do with the error of our contemporary)—N Nottingham (it appears to us that A. has no ground of complaint since he declined both propositions)—J. C. (each list of prices as that alluded to is simply a delusion and a snare).—E. R.—E. T.—P. W.—A.—J. M.—C. H. R. H.—C. & Sons.—E. C.—S.—A.—M. J. L.—T. R. S.—R. Y.—C. P.—J. W.—A.—6, R.—C.—S.—L.—B.—E. T.—P. B.—T. H.—A. D.—E. P.—R. R.—B.—T. W.—J. B. C.—T. W.—J. P.—J.—C. E. J.—G. & Co.—E. F.—C. A. W. (description did not reach us).—Queens (in type).

We are compelled to decline pointing out books and giving addresses. All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication. Note.—The responsibility of signed articles, and papers read at public meetings, rests of course with the authors.

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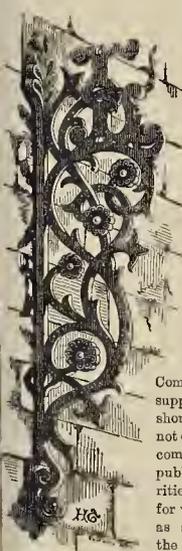
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The Builder.

VOL. XXX.—No. 1557.

The Water Supply Question: Manchester and other Corporate Towns.



ATELY we gave an instance,—Sheffield,—in which the water-supply is in the hands of a private company. We add now some cases in which the supply is in the hands of the town authorities. In his report to the Home Office, Dr. Pole says that the Corporation of Manchester were the first to carry out the recommendations of the Health of Towns

Commission,—that the supply of water to towns should be in the hands, not of private commercial companies, but of the public municipal authorities, and that the charge for water should be made as a public rate. At the time the Commission made that recommendation the water-supply to Manchester and Salford was afforded by an old private company, on the intermittent system; but the service being very deficient, and the company being unable to entertain any large scheme of improvement, the corporation bought up the company, and took the matter into their own hands. The works were designed for the corporation by Mr. Bateman. The water is obtained from the head of the river Eiberow, one of the tributaries of the Mersey, and is collected in seven large reservoirs, which have a drainage area of 19,300 acres. The water is brought by gravitation to service-reservoirs near Manchester, from which the town is supplied. The whole of the reservoirs taken together cover an area of 600 acres.

The town mains are not tapped for any purpose other than for hydrants to supply water in case of fire, and the water is always on in them under a pressure sufficient to throw water over any building without the aid of fire-engines. The service-reservoirs are elevated 250 ft., 223 ft., and 145 ft., respectively, above the lowest part of the town, and the whole district supplied is divided into three zones or levels, each of which is served by the reservoir corresponding to its altitude. The house-service pipes are connected with subsidiary or "service-mains," branching out from the arterial mains of the town, and connected with them by sluice-cocks, so that they can be shut off in small separate areas whenever desired, for repairs, or for laying on a new tenement, without interfering with the general supply. These service-mains vary from 4 in. to 3 in. diameter, and are also always charged under pressure.

The water was first introduced from the new works in 1851, and after a short time occupied in adapting the general arrangements to the change, the constant-service system was applied throughout the town. It has ever since remained in operation, except in portions of two

very drouthy years,—1868 and 1870,—when, in consequence of two new reservoirs then in course of construction not being completed, and in order to guard against the possibility of being unable to supply water for domestic consumption, it was determined, during a short period, to restrict the supply, and to shut the water off for some hours in each day.

The Corporation supplied in the year 1870 an average of 14,315,877 gallons per day to 123,371 houses, the estimated population of which was 685,334. These numbers give an average consumption of about 21 gallons per head per day. The trade supplies are large, being estimated at 7 gallons per head per day, leaving 14 gallons for domestic use.

The arrangements for extinguishing fires are very perfect in Manchester, and much saving has been effected in this respect since an ample supply of water has been available. Mr. Pole says that there is a very general impression that where water is constantly laid on under a tolerably high pressure, fire-engines are unnecessary; but this requires considerable qualification. In cases where small quantities only are wanted it is so; but at large fires quantity is the most important thing, and a large quantity can rarely be obtained without so much reducing the pressure in the mains as to leave but comparatively small force available. A single jet may be easily thrown up some 80 ft. or 100 ft., but a single jet would be of little use in a large fire, and when several hose-pipes are put on, the power of projection to any large extent is gone. The fire brigade at Manchester keep engines, both hand and steam, always in readiness. As soon as a fire is heard of a two-horse light cart is despatched, with all possible speed, with hose, jets, and all apparatus for attaching to the hydrants in the streets, and in nearly all cases,—that is, in about 97 out of 100,—this preparation is sufficient to extinguish the fire; but engines are always sent after the hose-carts, to be in readiness in case the fire should prove to be so large that the jet thrown directly from the pipes would be insufficient in quantity to extinguish the fire.

Seeing how largely the population of Manchester had increased, and what had house-fittings were in existence, which were the cause of great waste of water, and over which the Corporation had no sufficient control, they obtained an Act of Parliament in 1860 to enable them to prevent waste, misuser, or undue consumption of water, by themselves prescribing the size, nature, strength, materials, mode of arrangement, and repair of the pipes, valves, cocks, cisterns, water-closets, and other apparatus to be used; and these regulations seem to have been effectual, for, notwithstanding the growing population, it will be seen from the following statement that for five years after they came into force the quantity supplied was not much greater at the end of the five years than at the beginning. The daily average quantity of water supplied,—

In 1855 was	8,078,152 gallons.
In 1860 was	10,907,183 "
In 1865 was	11,156,433 "
In 1870 was	14,315,877 "

Mr. Pole says, "The relations between the authorities supplying water to any town and the plumbers trading in it have a most important influence on the efficiency of any arrangements which it is attempted to carry out for controlling the distribution. The co-operation of these traders will much facilitate such arrangements, while their hostility will render them difficult in an equal degree. It is notorious that, when left without regulation, the water-fittings supplied to the consumers in a town are very indifferent,—often lamentably bad. This arises partly from ignorance or carelessness on the part of the plumbers as to what are the best modes of con-

struction, partly from working too cheaply (to satisfy speculating builders and others who wish to limit the outlay), and partly from a disgraceful desire to make further work by repairs."

The respectable plumbers in Manchester are invited to sign an agreement, binding themselves to conform to the regulations of the corporation, and to execute all work, both as to material and workmanship, in such a manner as the corporation should approve, in consideration of which they should be formally appointed "authorised plumbers." No one is compelled to employ one of these authorised plumbers, but the advantage of doing so is that they, and not the consumers, are the persons held responsible by the corporation for compliance with the regulations.

Taps and stop-cocks are the chief articles to be attended to, water-closets in Manchester not being common in the lower class of houses. Out of 123,000 houses in the district, only about 10,000 contain them. Nevertheless, all valves and fittings to water-closets and baths are included in the regulations. The corporation require all water-fittings to be approved and stamped at their own warehouse before use; and these regulations are really in the interest of the consumer,—or, at least, of the owner of the house,—as well as of the corporation, inasmuch as they compel him to have good work, which will not only ensure the efficiency of his water-supply, but save him from the expense of frequent repairs.

The charges for domestic water-supply in Manchester are made on the principle that was recommended by the Health of Towns Commission, and are as follow:—1. A "public water-rate," to be levied on all property, payable by the owner. 2. A "domestic water-rate," to be levied on all dwelling-houses, payable by the occupier. The amounts levied can be varied by the corporation from time to time. At present the public rate is 3d. in the pound, and the domestic rate 9d. in the pound, estimated on the poor-rate assessment. No extra charge is made for one water-closet in a house; nor for private baths; nor for horses and carriages, unless used for business purposes.

From a "Memorandum on the distribution of water to the town of Leeds," furnished to Mr. Pole for the purposes of his report by the resident engineer and by the superintendent of the works belonging to the corporation, it seems that the average daily supply at Leeds to 260,000 inhabitants is about 6,000,000 gallons, being 23 gallons per head, of which from 4 gallons to 5 gallons are for trade and public purposes, leaving from 18 gallons to 19 gallons for domestic consumption.

All waste-pipes are authorised to be made to discharge either on to the nearest sink or such other suitable place as the officer of the corporation may approve, so that any waste may be visible. The weights of lead service-pipes to be used are to be as follow:—2-in. pipe, 38 lb. per yard; 1½-in., 26 lb.; 1¼-in., 21 lb.; 1-in., 13 lb.; ¾-in., 11 lb.; ½-in., 9 lb.; ¼-in., 7 lb.; and 3/8-in., 6 lb. per yard. No pipe less than ¾ in. diameter is to be used. The taps are to be of the same pattern and quality as those manufactured by Messrs. Guest & Chirnes, and numbered 27 in their list.

The kind of water-closet known in some places as the "pull-down" closet, which consists of a simple pan and trap, and a pipe (commonly made too small) leading down to it from a cistern overhead, is, in Leeds and elsewhere, called a "sanitary" water-closet. Every closet of this kind, and every closet of whatever kind, in houses not exceeding 10l. rental, is to be provided with a double-valve water-waste preventer, having a boot, or division, and having the valves so connected that both cannot be open at the same time.

The charges for water for domestic use are made on the gross rental, and the bulk of the

houses,—that is, those from 4l. to 20l. a year,—are charged at the rate of 5 per cent. on that rental. If the rental does not exceed 4l. a year the charge is 4s. per annum. Above 20l. the rate decreases until a 35l. house is charged 30s.; a 50l. house, 40s.; a 70l. house, 50s.; a 100l. house, 70s.; and above that, 4 per cent. on the rental, up to 250l. a year; above that, 10l., irrespective of rent. One water-closet is charged 5s. 4d. a year extra, and each additional one, 2s. 8d., except that where the rent is not more than 10l. a year the charge for one is 2s. 8d. each house. Horses are charged 5s. each per annum; washing carriages, 5s. for two wheels, and 7s. 6d. for four wheels; cows, 2s. 6d. each per annum. The rates are payable quarterly in advance.

The supply of water to Liverpool in the year 1870, according to Mr. Pole's report to the Home Office in 1871, amounted to 16,334,105 gallons per day, of which about 62 per cent. was derived from the Rivington reservoirs, near Chorley, twenty-five miles from Liverpool, and the remainder was pumped from deep wells sunk into the new red sandstone beneath the town. The population supplied with water in that year was about 625,000, and the above-named quantity gives an average daily supply of 26.1 gallons per head of that population, being divided thus:—

	Per head per diem.
For trade purposes.....	2.6 gallons.
For public purposes.....	2.0 "
For domestic supply.....	21.5 "
	26.1

From these wells was derived the old water-supply before the Rivington works were made, from which source water was brought into the town in 1858. These works consist of seven large reservoirs, which impound water gathered from 10,000 acres of moor and mountain land. The reservoirs contain together about 3,200 millions of gallons, and the top water-level in the lowest of the series is 428 feet above the Old Dock sill at Liverpool. The Act which authorised the Rivington works to be made directed that the corporation should afford from these reservoirs certain quantities of water, amounting on the whole to about 8,000,000 gallons per day, as compensation to mill-owners and others along the line of the impounded streams.

For several reasons, which we cannot now stay to notice, the supply of water from these works was in danger of falling short in 1865, and the old wells were again resorted to, and new ones sunk. In the following year the water-engineer of Liverpool, the late Mr. Thomas Duncan, reported to the corporation on various schemes that had been proposed, and in favour of one that had been proposed many years before by Mr. Robert Rawlinson, the River Dee, below Bala Lake; but having spent so much money on the Rivington works and otherwise, the corporation decided to improve and extend these as far as possible before going elsewhere. This they were doing at the date of Mr. Pole's report.

Previously to the year 1862, the mode of charging for the domestic use of water had been that ordinarily adopted by waterworks companies, that is to say, a per-centage on the rental of those houses to which water was supplied; but in that year the corporation obtained an Act of Parliament authorising them to alter the former mode of charging, and to adopt a different principle.

The following are the charges now in force:— 1. A public rate, called the "water rate," of 6d. in the pound, is levied on all property rated to the poor. 2. Water supplied to shipping is charged at the rate of 7s. 6d. per 1,000 gallons. 3. Water supplied to manufacturers is charged at 9d. per 1,000 gallons. 4. A "domestic water rent" is payable in cases where water is actually supplied. It includes baths and waterclosets, and is variable in amount, being fixed from time to time by the corporation. 5. Water for horses, gardens, &c., is charged for at rates fixed by the corporation. In fixing the amounts of 4 and 5, the corporation adopt such a rate as will make good the deficiency between the annual expenditure and the income derived from the first three sources. The "rent" usually varies from 5d. to 6d. in the pound.

The supply is not constant, being on in the service mains, from which the houses were supplied, only during the daytime, *i.e.*, for about twelve hours, and is shut off from them during the night; the chief mains, however, being always charged.

THE GRAMMAR OF ARCHITECTURE.

BY W. PETTIT GRIFFITH, F.S.A.

"To be rich without profusion, simple without barrenness, is the great aim of an architect."—*Ferrier.*

"The world is still deceived with ornament."

"Thus ornament is but the gilded shore
To a dangerous sea."

"—Plainness moves me more than eloquence."
Merchant of Venice.

It is an important inquiry as to the extent architects are justified in consulting their architectural classics, leaving a new style out of the question, without being denounced as copyists or plagiarists.

Sir W. Chambers accuses our greatest architects with having too much neglected the detail, it being the duty of an architect to attend to the minutest object, as well as to the most considerable. By so doing, he says, a practitioner may distinguish himself from the common herd of those who assume the title of architects. The most masterly disposition, incorrectly executed, can only be considered as a sketch in painting, or as an excellent piece of music performed by country fiddlers.

The study of architecture requires to be carefully and nicely handled, and it must not be overlooked that the mouldings form the very grammar of the art; without them all buildings would be senseless masses.

It is of more importance just now than at any other period, that the proper use of good mouldings should be encouraged, as powerful temptations are offered to force the employment of colour, in lieu of form, upon the architecture of the day. The folly of using soft red bricks is now deplored, and mosaics for external work are now proposed to be thrust upon the public attention.

During the Middle Ages, when people could neither read nor write, the religious teachings conveyed to the people through the medium of painted and stained glass windows, fresco, mural, or other paintings, encaustic tiles, &c., were most instructive; but, at the present day, the more light we receive in our churches the better. By all means preserve the mind-products of former times, but do not reproduce them. They have done their duty well, and deserve respect.

Sacred writ was not always truthfully exhibited, either on canvas, glass, stone or embroidery; it is a question, therefore, in these enlightened days as to the desirability of exactly imitating the old school. How often have the vices, particularly from Venice, been pointed out, of representing Scripture histories, after the most immodest and scandalous manner, without any sanction or authority of truth.

In the Middle Ages the mind was influenced through the eye. In the reformed church the mind is reached by the ear: hence the absurdity of over-decorating our churches.

The streets of London are filled with palaces, crowded into narrow thoroughfares, and not to be viewed without risk of dislocation of neck or loss of hat. The money wasted upon these edifices is to be deplored; as, in most instances, neat elevations, carefully proportioned, with moderate cornices, and suitable sculptures, would be more tasteful and answer all purposes. In many buildings, the mouldings are either clumsy and too large, or insignificantly small, spaces badly distributed, sculptures indifferent, columns ill-proportioned, and tasteless sensational ornaments everywhere.

Many architects exhibit a great desire for over-decoration, forgetting,—

"Beauty, truth, and rarity,
Grace in all simplicity,"
Shakespeare.

A well-distributed ornamentation produces a far better effect than a profusion crammed into confined spaces; and however the multitude may admire the rich confusion, it requires a well-regulated mind, as Horace says, to "prune all ambitious ornaments away," and to appreciate a duly proportioned and decorated production.

The relative surface proportions in which the primary, secondary, and tertiary lines harmonise with each other, have been clearly shown in a "Manna of Colour"; and there would be no difficulty in proving that relative surface proportions, plain and decorative, may be likewise harmoniously distributed, and thereby avoid that over profusion of ornamentation which destroys the appearance of many of our principal buildings. An ordinary intelligent eye can, without difficulty, discern between a good and had façade, for,—

"Beauty itself doth of itself persuade,
The eyes of men without an orator."

Real architecture does not consist of over-decoration, as practised by our Continental neighbours, but of a duly-proportioned edifice having its mouldings well adjusted, and its sculptures well balanced. To an uneducated eye clumsy mouldings appear bold and sensational; to the cultivated mind they are unbearable. Much may be learnt upon this subject by an observant walk through our principal thoroughfares, and the discerning architect will be astonished at the great absence of careful proportion: the projection of the cornices is either too great, so as to half conceal the superincumbent attic, or else too poverty-stricken; the pediments and the trusses to windows and doors too large and over ornamented; columns too tall or stunted, with a ridiculous entasis; and so throughout the compositions.

Errors of this kind are naturally common among civil engineers; their education, requiring a higher and more scientific development than that expected from architects, prevents them from paying attention to the formation of mouldings. This defect on the part of the engineers can be easily remedied by their seeking the services of an architectural tyro, who, though not perfect, still would create more reasonable details than they themselves are capable of producing. We are not bound to servilely copy former mouldings and forms,—

"A just and ample licence, which, if used
With fair discretion, never is relaxed."
Horace.

Every architect is acquainted with the exquisite purity of the architecture of ancient Greece; consequently whenever this style is consulted for future development, the grand point to be observed is to continue the spirit of its authors by following in their footsteps. Roman architecture, on the contrary, was nothing more than a garbled edition of the Greek style, and although the Romans have handed down to us some choice specimens, still it was left for the Palladian school to proportion, arrange, and to adapt their crude works for practical use. The grammar of architecture has been much advanced by the works of Palladio, the latter should be well studied, and not forgotten.

Judges in competition cases ought to demand an inspection of the detailed drawings, as well as the pictorial views, because, however well a building may be planned or designed, if the cornices, mouldings, &c., have not their correct projection and contour, the absence of these properties in them will mar the best proportioned building in the world.

It would be only reasonable, I think, that, when money is voted by Government from the public purse for public buildings, all competitions should be open to the profession. How is talent to be recognised, or architecture advanced, if competitions be limited to a handful of architects, selected without reference to their brethren's opinions of their merits, but merely because they have friends at court, or practise a fashionable style of architecture, generally possessing no other recommendation than eccentricity?

Upwards of thirty years ago, I stated, in *London's Architectural Magazine*,* that "it is well known that, by the officiousness of parties who sometimes have the management of erecting public buildings, the original intentions of the architect are often nearly, and sometimes, quite destroyed, to please the whims and fancies of these directors. Now, if these interferences were made by persons who had acquired some taste for the art, let that taste be ever so small, professional men might benefit by their suggestions. The importance of possessing a knowledge of architecture is, by many persons, never perceived until they are called upon to exercise an opinion on the subject; and yet there is scarcely any one who may not be solicited to join a committee to decide upon the merits of architectural designs for schools or other buildings connected with the parish in which he resides. The deficiency of persons often met upon these committees is pretty well known, and more especially by those architects whose drawings have unfortunately happened to fall into their clutches."

Since the above was penned, a great improvement has been effected: drawings are often publicly exhibited prior to a decision being pronounced, and in the *interim* the press is permitted to give an opinion,—consequently, if an ignorant decision be made, the best competitor may lose the premium, but not the merited honour. So far

* Vol. iii., p. 98.

an improvement in one direction. Curiously enough, as regards the committees, and the public in general, their knowledge of architecture was not advanced one jot. Ask them the difference between a Greek and a Roman capital, or between Early English and Decorated English, and you may be certain of the answer; plans and sections are enigmas to them.

It has been the fashion of recent times to denounce and ridicule precedent,—to repudiate those rules and architectural maxims which have occupied a thousand and more years to perfect. This retrograde movement was aided by men, professors of our art, who, having young men under their educational care, ought to have been more careful in giving vent to their opinions.

It would be well if architects guided the public taste, instead of rendering themselves slaves to it. Sensational architects are selfish persons, satisfied with a little temporary notoriety, and of whom posterity will know nothing. If Palladio, Inigo Jones, Wren, Chambers, and others had belonged to the above class, their well-proportioned and decorated productions, that are so justly admired, would not have afforded us that instruction and educational delight which they now do.

The common sort of builders in this country, observes Sir W. Chambers, are extremely fond of variety in the ornaments of windows, and, indeed, in every part of a building; imagining, probably, that it betrays a harnerness of invention to repeat the same object frequently. These inventive gentlemen would do well to give their attention to some professors of the mechanical arts, who, through exercising their talents on meaner objects, are nevertheless worthy of their imitation. No tailor thinks of employing seven or eight kinds of buttons on the same coat; a cutter will not make ten different sorts of knives for the same set; and if a cabinet-maker be trusted to furnish a room, he seldom introduces more than one sort of chairs. We do not discover, either in the works of antiquity or in those of the great modern architects, any traces of this foolish hankering after variety. The same object is frequently by them repeated a hundred times over; and this is one of the causes of that amazing greatness and that noble simplicity so much to be admired in their productions.

The public taste is easily formed and led,—architects have great power over it. The architecture of a city remarkably indicates the civilisation of its inhabitants: when buildings are seen composed of streaky red brickwork, twisted, ill-proportioned columns, adorned with cabbage-leaves and other trifles, you naturally find the same frivolous taste in all other matters of art. Turn to the musicals, which might, under proper direction, exercise a great influence over the general taste, by providing good, standard music, instead of such miserable episodes as "The Life of a Cadger, or he wants no Work to do"; "Petticoat-lane"; and many other popular songs.

There are certain maxims or canons enunciated for the guidance of correct taste in architecture: if these are founded upon truth, and admitted, then all departures therefrom are bad, and, of course ought to be avoided.

The present Gothic mode of roofing buildings may be compared to the extravagant style of head-dress in the fourteenth century, when it was built up in a couple of cones or spires, which stood so excessively high on each side of the head, that a woman who was but a pigmy without her head-dress, appeared like a colossus upon putting it on. Nature, says Addison, seems to have designed the head as a cupola to the most glorious of her works; and when we load it with such a pile of supernumerary ornaments, we destroy the symmetry of the human figure, and foolishly contrive to call off the eye from great and real beauties, to childish gawgaws, ribbons, and bone-lace.

Our architectural classics are valuable; but I think that more direct practical information is to be obtained from buildings themselves: for instance, take students, and personally point out to them, not the beauties, but the shortcomings, of city architecture, and those in the suburbs,—they will never forget them. I do not mean to say that all the absurdities are the fault of architects. Some people act for themselves. Builders, also, not for them,—engineers, if they can get a chance,—and so forth; nevertheless, the extraordinary blunders committed are such as to cause even a tyro in art to shudder. They occur in even the more important buildings. All these errors might have been avoided simply

by a knowledge of the grammar of architecture. We should not forget that,—

"The master-piece of knowledge is to know
But what is good, from what is good to show."

Reynolds says, that in our inquiry after simplicity, as in many other inquiries of this nature, we can best explain what is right by showing what is wrong; and, indeed, in this case it seems to be absolutely necessary. Simplicity, being only a negative virtue, cannot be described or defined. We must therefore explain its nature, and show the advantage and beauty which is derived from it, by showing the deformity which proceeds from its neglect.

New views are occasionally ventured. Recently "Symmetry from a Gothic Point of View" has been announced. The writer, an architect, speaks of the palace of the Archduke Michael, at St. Petersburg. "It was a purely Classic building, and one of the best modern erections in that style he was aware of. The two wings of the building were, externally, exactly alike; but, on consulting the plan, one wing consisted of a spacious apartment copying nearly the whole of it, while the other comprised a number of small rooms. This was certainly not true symmetry."

When the eye takes in at a glance an external view of a building, if the latter be symmetrical, it pleases the eye,—a building may, however, be unsymmetrical, yet agreeable to the eye, through having its parts picturesquely grouped. But to render the internal arrangements of a plan symmetrical, as suggested above, would be of no value, or even pleasing to the eye, because the eye could not discern all the rooms at one glance. Perhaps the writer proposes that a plan of the building should be hung in the hall, as the eye could not discern the plan at one glance of the building.

Quatremère de Quincy, quoted by Loudon,* says there exists in many plans a sort of mechanical correspondence, which consists in chalking out the arrangement of one side exactly by the other; a merit more imaginary than real, and which is a total loss to the spectator, as it can contribute but little to the effect of the whole.

An architect who copies existing styles is denounced as a mechanical fellow: this is correct, but seriously enough, how few there are who can copy,—the majority produce simply caricatures.

Asserted original attempts are often merely cloaks for ignorance,—there is much to be learnt from the former phases of art, and an architect who has studied the various styles of each country has an excellent opportunity of extending and working in the spirit of the style he selects. In the Greek architecture, the materials for design contrast wonderfully. There are the Parthenon and the Temple at Corinth,—who is to become the Greek Palladio, to reduce the architectural dissimulations to proportion and propriety? Of what value would the Roman remains have been to the profession if they had not been collected, compared, adjusted, and reproduced for practical purposes?

It is surprising how varied the matter which is set forth in a large volume of literature, the result of combination of the twenty-six letters of the alphabet, and the wonderful calculations produced by a few numerals. The same with architecture. The few mouldings of the different styles can be appropriately employed for further development in each style, and produce wonderful variety.

As practice makes perfect, this may hold good in some cases; but, as a rule, to ensure success in producing well-proportioned and harmonious mouldings, I would recommend a careful study and comparison of similar mouldings in the various styles, and then the adoption of forms suitable for the decoration of the building in contemplation.

Regular architecture is not guided by such arbitrary rules as people imagine; the contour of mouldings varies very much. Some architects deem themselves so gifted that, without reference to ancient authors, by taking a blackboard and a piece of chalk they can mark the mouldings off-hand as the works proceed.

There has been much unmeaning and idle talk concerning fine-art architecture, which has been in importance unfairly contrasted with the knowledge required for building, the latter being looked upon as a mere mechanical production, whilst the former has been upheld with a Royal Academic castle-building-in-the-air significance.

The truth is, that building is a science requiring more real headwork than is at the present time devoted to fine-art productions. Drest a cathedral of all its decorations, and you would still possess a scientific giant. I am not an advocate for deteriorating the value of fine-art productions, my object being to direct the attention of young architects to the intrinsic importance of devoting more attention to the science of building. The exterior of nature is lovely; how far more wonderful and scientific is the interior: in the production of the latter a real headwork has been exercised. And how much dependent is the beauty of the exterior upon the interior: ill-proportion your human frame, or a cathedral, or a church, and all the fine-art pleasures in the world will fail to render them beautiful.

Robert Morris, 1734, justly observes in his lectures, that a plain regular front, without dress or ornament, if justly proportioned, will better satisfy the taste of the judicious, and more immediately strike the eye, than all the gray dress and decoration of an ill-proportioned design: this has been confirmed by Cress, who says a building, though entirely devoid of ornament, may be rendered beautiful by the justness of its proportion, and the richest edifice wanting in this never can excite admiration.

We cannot be too anxious in designing our buildings, and in constructing them with the most durable materials. Of course, the air is the menstrum that consumes all materials whatever, till the earth shall be no more, and time itself shall end! But still, if the temples of Greece had been of Bath stone and red bricks, their remains would not have been spared for our contemplation and instruction; if therefore behoves us to create good architecture, and to execute it with the most suitable and lasting materials. Preliminary sketches, rough and vigorous, such as those by Prout, the Rev. L. Petit, and others, are excellent for conveying to the mind the general effect of buildings; but without neat and mechanical precision in drawing, little real architecture can be produced.

Much to the credit of the present age, we are seldom treated with philosophical inquiries into the nature of taste,—papers in which the writers "are continually discoursing of effects instead of developing causes; and after many pretinences, in very pretty language, do fairly set you down just where they first took you up."

The architect has to deal with material substances, to be fashioned into intelligence by his experienced mind. Let any one test his head against a stone column or a brick wall, and he will find the truth of this remark. Let the philosophical man place the hands of a builder or mason a specification of works proposed to be done, and it will be returned with a smile. We all of us know that, when young, if we are called upon to build a church, that without experience, when the cross is put on, or in a classic building a vase, it appears ridiculously small; and we take care afterwards, until we have had experience, to raise in wood the cross or vase to test the proper size for a given height. It will be found that philosophical inquiries generally treat of subjects of which the writers know but little, and their readers nothing.

The painter's ignorance of proportion is well known, particularly when buildings form a prominent feature. This is not to be wondered at when he is taught to be jolly and lively, and to ignore such dry studies. Ruskin says that "proportion was dull, to say the least of it; and he would ask men of genius on the proportionate system upon what achievement of the past would they in their old age look back with satisfaction?" "He thought they might abandon the theory of architecture being in proportionate lines, and find something better upon which to feast their fancy." "If architectural designing led to no pleasant journeys, if it did not excite life and emotion, and passion, it sank into a condition in which those who practised it were neither numerators nor denominators, but mere common fractions."

The principal causes of the differences of opinion among those who criticise in architecture, are owing to their different degrees of knowledge of the principles of the art; for critical taste does not depend upon a superior principle in men, but upon superior knowledge; it is the offspring of learning and a just education, and is always more or less within our power.

In 1734, Morris published lectures on architecture, founded upon harmonic and arithmetical proportion, designed "as an agreeable entertainment for gentlemen;" this sounds anything but dull!

* *Architectural Magazine*, vol. iii., p. 2.

A knowledge of geometry has, before now, led to profitable results. "Aristippus, the Socratic philosopher, shipwrecked on the coast of Rhodes, perceiving some geometrical diagrams thereon, is reported to have exclaimed to his companions, 'Be of good courage; I see marks of civilisation!' and straightway making for the city of Rhodes, he arrived at the Gymnasium, where, disputing on philosophical subjects, he obtained such honours, that he not only provided for himself, but furnished clothing and food to his companions."

There is no doubt that architecture is an art less understood, and worse practised, than any other. An architect is dependent upon an educated eye, perfected by long, laborious study; and does not rely upon sensations, feelings, affections, emotions, and romantic dreams. These we leave to the painter, while the architect rests satisfied to leave his works to the admirers of the beautiful, the grand, and the magnificent. Proportion being based upon, and sanctioned by, Nature's works, will endure for ever; while Venetian Gothic, red brick, Bath stone, and twisted, stunted columns, will decay in their author's lifetime, and form picturesque ruins for Ruskin and his satellites to muse upon, until the public have common sense to reject such unprofitable visions.

Some years ago an architect was ill-esteemed had he not travelled abroad; but bear in mind that at the present time there is more to be learned from the valuable measured works of Stuart and Revett, Taylor and Cressy, Bowman and Crowther, and others, than from any sketches to be obtained; besides which, recollect that your own tailor can visit the Continent with a camera, and vie with you in perspective views.

It will be well for architects to study, and to pay more attention to historical sculptures. Sculptors may occasionally realise living forms somewhat satisfactorily, but whenever they meddle with material form, either in designing pedestals, or other architectural features, they invariably raise a smile; and this is the result of their want of knowledge of proportion, mouldings, and other details.

In our ancient sculptures, historical and floral, the geometrical key-note exercised a great influence over the direction given to the living forms, foliage, and so on.

To those who desire to create beautiful buildings I would suggest that more time be devoted to the Grammar of Architecture: much expression depends upon the nice manipulation of the mouldings; and as in music, so in architecture, rhythm, uniformity, and simplicity are needed for a perfect development.

THE HITCH IN SANITARY REFORM.

It is a matter for serious regret that in the reports of a recent deputation to wait on Mr. Stansfeld on the subject of sanitary reform, the impression should have been given that a professional, rather than a comprehensive, standpoint was selected by the speakers. We are convinced that such was not the intention of the deputation. No intelligent person can either doubt or undervalue the primary importance of medical inspection in sanitary matters. It would be as ignorant to do this as it is to disregard the equal importance of engineering experience. The physicians and medical practitioners of this country would consider themselves extremely affronted if they were called upon by the Administration to inspect, to take up, and to re-lay drains! They would not consider that their knowledge of climatic influence, and of the character of that local climate which, as far as health is concerned, is a question, not of degrees, but of yards, was such as to fit them for dealing with the great question of watershed. They know, far better than it is for us to point out, the true limits of their own beneficent practice and special education. We wish to put the question to them whether, in their natural and proper anxiety that imperfectly-educated men should not be allowed to exercise strictly medical duties, they may not have given to the minister at once a false impression of the real object they have at heart, and an excuse for that persistence in doing nothing into which the Government has unfortunately drifted. When men are hard-pressed with work, or when they are enjoying a temporary rest from such pressure, it is not in human nature to resist taking advantage of any excuse for continued inaction. While the country is watching the Local Government Office

for signs which it does not give; while place after place is asking for inspectors who are not forthcoming; when the terrible typhoid is again selecting the noblest victims, and entering on a winter campaign which the mere passing of the stump end of one Act of Parliament, followed by no definite action, is not likely to check—it is a thousand pities that the minister should have an excuse put into his mouth which is that most fatal of all falsehoods, a half-truth.

If we could reconcile it to our sense of propriety to become the advocates of a class interest, in opposition, or even in priority, to that which is the true interest of the whole community,—if we were to consider it our first duty to "make work" for the architect, the engineer, and the builder,—we could not wish for anything better than the committal of the needed sanitary re-organisation of the country to the care of the medical profession, unaided by the proper skill of constructive science. But such a position would be like that of a physician who should advocate the unchecked sale of drugs of all kinds, poisonous or otherwise, or the free practice of the self-taught practitioner, on the ground that it would increase the activity of disease, and so, ultimately, make more work for the actual man of art. We know, and all practical men know, what comes of the work of the amateur, or of the non-building man, who meddles with bricks and mortar, with drains and pipes. To those whose object it is to "make work," and to draw the largest possible sum, in the long run, from the pocket of the customer, nothing is so welcome as to see him begin to save money (as he expects) by dispensing with specially-trained skill. And if we are to have this all over the country, if sanitary engineering is to be treated as an inferior branch of the art of the apothecary, we know both who ultimately will lose and who will gain, at least in a pecuniary sense.

If, again, instead of taking this purely selfish money-grubbing view, we were to regard the subject under the influence of *esprit de corps*, we might have a lance to break with medical men in an encounter in which numbers would be on their side, and reason and right on our own; for, after all, if the care of sanitary provision is to be single and not double, it is the proper province of the architect and engineer in preference to that of the physician. This statement is proved by one consideration. It is no reflection on the ablest physician to suppose that he is entirely ignorant of the skill and art of the builder. Indeed, if his time has been entirely taken up, as is the case with the most eminent of the profession, with study and with practice, such an ignorance is a necessity. It is in favour of, rather than against, the eminent character of the man. He may pronounce that a certain locality is unhealthy, that ventilation is requisite, or that drainage is requisite; but how this requisite should be supplied he knows no more than the architect knows what drugs to prescribe for a sick man. The physician can indicate the fact that the services of the builder are requisite. In the case of the most eminent physician, he neither can nor will do more.

On the other hand, it is a disgrace to an architect to build an unhealthy house, or not to know how to remove a nuisance. The knowledge of the medical man is in no way superior to his own, if he be fit for his own profession, as to the fact of certain arrangements being unhealthy; but as to the mode of removal of the cause, it is the architect alone who can be the judge. Thus, in the first instance, that of the observation of the evil, the two men are about on a par. In the second part of the story,—the remedy,—it is the latter alone who has anything to say. If only one man is needed, the engineer is that one man.

How is it, then, that men are fond to imagine or to admit a claim on behalf of the medical profession, to take charge of the physical sanitary arrangements of the country? There are two reasons for this error; and, as is often the case with a pair of reasons, one is good and the other bad.

It is the medical man to whom appeal is naturally made, in the first instance, on the outbreak of disease. It is his function to stem that outbreak,—a function often discharged with consummate skill and with great self-devotion. And what is almost the first question put by the skilful physician, when consulted, in nine cases out of ten? It is,—Where does the patient live? Is his disorder the result of poisoned water or of poisoned air? Is it arising from a damp house, or from a damp or ill-drained soil?

Often and thus will it occur that the able medical man then at once touches with a needle the very nucleus of the evil. "You must leave your house. You must quit that alluvial soil. You must seek or you must shun the sea air." Thus, as man naturally clings to him who has superior knowledge (when he wants the fruit of that knowledge), the patient will naturally say,—"Doctor, what must I do? Will a new roof keep my house healthily dry? Do you think that my drains can possibly be pestiferous?" Thus, in spite of himself, is the physician made into a sanitary inspector; and thus, if the proper man be not at hand, for the physician to call in, may be led to attempt special functions which are not his own, and which he knows that he can very ill discharge (or if he does not know it, so much the worse for all parties), as a mere forlorn hope in the rescue of suffering humanity.

This, then, is a good reason why the medical profession should have sensibly drifted into a position that is not their own, and which they can only occupy to their own detriment and to that of the public, with reference to the duties of the sanitary engineer. But we said that there is also a bad reason for the position which this question now assumes to the vulgar eye. It is this. The medical men are much more numerous than the members of the professions connected with building. Their voices are more audible,—the accumulated sound is incalculably louder. We blush to admit that, in the full blaze of the nineteenth century, the ministers of a country like this should base their conduct rather on the loudness and persistence with which a claim is made than on the right and reason of the claim. And yet! we eschew politics,—but can any one doubt that it is this very power of voice and power of numbers that in the press, in society, in Parliamentary debate, has led nine persons out of ten to believe that a doctor is a man naturally learned in water supply and in sewerage?

Let us take an instance as to which the present week, for the first time, has seen the collection of the statistics. What does London pay for her water supply? It is a simple, non-medical, engineering question. The reply is, London pays annual water-rent to the gross amount of more than a million sterling (the actual figures are 1,041,132*l.*). This rent is collected by eight companies, who have actually expended on their works, mains, and other appliances the gross sum of ten millions and an eighth (10,137,710*l.*). To maintain and to manage the system carried out at so large an expense, these eight companies pay more than four hundred thousand pounds per annum (411,965*l.*), being about 40 per cent. of their charges for the water supply. That leaves a return on the capital spent of about 6 per cent., which, considering the precarious nature of the property, and the depreciation and danger to which it is exposed, cannot be considered exorbitant. It is not such as should induce any very prudent man to seek to enter into competition with existing companies. The respective rates of profits of these companies differ among themselves, the Kent Company, for example, spending 22,000*l.* out of an income of 62,000*l.*, a little more than 30 per cent.; and the West Middlesex, spending 66,000*l.* out of an income of 116,000*l.*, or a little over 50 per cent.; but the average returns are the safest guide for our present purpose.

Now, the quality, the quantity, the frequency, and the level of this supply are subjects of extreme sanitary importance. Analysis of the water, which is now regularly conducted, is a matter, not of medicine, but of chemistry. It is the special duty of specially-educated men, the most eminent of whom have no connexion with therapeutics. Out of the four points requiring attention, then, there is only one into which the medical man is likely to be specially qualified to enter; and even this is out of his proper province. He may be an analytical chemist, as an engineer may be, or he may not. He will be none the worse fitted for his proper curative duties in the latter case; and, whatever be his chemical knowledge and skill, he will have recourse to an expert for analysis, if he have any patients worth mentioning on his hands. The other three questions are simple matters of engineering, controlled (as the first is also) by financial considerations. No one who remembers the great complaint made not long ago by a large district as to the extreme deficiency of the water-supply can doubt that this great engineering question will have to be resolutely tackled before very long. London is paying six shillings a head for water. The quantity demanded is daily

increasing. The quantity supplied is, in some instances, such as to be unfavourable to health. A good deal has to be done in the matter, and that by some authority, whether administrative or Parliamentary, that can grasp all the facts, and deal with all the interests concerned. It is a question eminently concerning the wise administration of sanitary law, but it is an engineering question, and one on which medical,—as distinguished from chemical,—science has nothing to say beyond truisms with which we are all familiar.

If sanitary improvement is to depend, as Mr. Stansfeld implied, on the gradual "rising of the local boards to the height of their new functions," the theory may be admissible; but, mean time, fever and pestilence will have their own way. Nor can we foresee that any real reform will be effected till some scathing misfortune wakens the country to declare that what it demands is, not gradual political self-education, but physical purity: not a policy, but a fact.

We see that the medical profession are alive to the great difficulty, to which we called early attention, of the inability of the country practitioners to hold their own against the parsimony of the local boards without the aid of proper organisation. Mr. Stansfeld recommends courage; but that is but cold comfort. What is required is, that degree of associated authority that organisation alone can give; and, in the absence of which, the best efforts of the best men are but too likely to be hopelessly frittered away.

In a word, the issue which we join with the minister is this. We are agreed as to the presence of a terrible foe, and the necessity of taking measures of resistance. We propose that such resistance should be organised according to our best resources, and that the Minister of Health should dispose of the two arms proper for the encounter. Of these, the medical profession may be regarded as the cavalry,—its first function being that of obtaining intelligence; the engineering profession forms the infantry and artillery, who are to attack and to occupy position after position. But Mr. Stansfeld proposes to make the attack by a cloud of volunteer skirmishers, to whom he refuses uniforms and officers. This is not a mere illustration, but a fair description of the difference between the two systems. Or again, we may say: we look to result; and we propose the best means of attaining that result; not for the sake of those means, but for that of the object. Mr. Stansfeld looks at the means for its own sake, and thinks more of how a reform is to be arranged, so as to educate the people in its progress, than at the end to be effected. In this he counts on one ally who is, in point of fact, his most fatal opponent: we mean Time. Allow decades or centuries to elapse, and country boards may "rise to their functions;" isolated medical men may find courage, and water-shod districts may shape themselves.

We see how the action of Time has already taken place. We can measure the progress made in the Sanitary Reform since the Royal Assent was given to the Bill of last session, but we must take the smallest unit known to English long measure for the purpose. Time, we repeat, is enlisted on the wrong side. The sanitary urgency is one thing, the political outcome another. We hold that sanitary measures should be primarily regulated by sanitary principles. If this one point be admitted, there can be no doubt as to what is requisite. The double organisation of the medical and the engineering staff, each in its own province, and each upon its proper principle of action, is essential to the scientific, which is also the truly practical, treatment of the case. As to the political aspect of the question, there is room for differences of opinion, into which we forbear to enter. We think it ought to be reserved, not on political, but on sanitary grounds. If this is the verdict of the country, there can be no question as to the general form of the organisation which is needed for giving fair play to the public health. We have no doubt that the ultimate course will be, but we should rejoice to see it adopted without further waste of time, of money, and of life, that is more precious than silver.

Borough Surveyorship of Burnley.

There were sixty-five candidates for this appointment, from which the committee invited three gentlemen for further consideration; and, after an interview, Mr. Edward R. S. Escott, of Halifax, was unanimously selected.

SOCIETY OF BRITISH ARTISTS.

The collection of pictures and drawings forming the present winter exhibition, at the Gallery in Suffolk-street, is of just such relative unimportance when compared with the chief annual display of the year, as custom and consent have settled for a proper distinctiveness, and that is as little as possible; even this difference will become more accidental and less incidental presently, and summer's ripeness will bring with it very slight improvements on the fruit of winter's growth so far as picture production is concerned. This may really be advantageous in some cases where maturity and full strength mean but stronger evidence of immaturity and weakness. A very off-hand sweep would skim the cream of what may be found here, not enough to churn into the butter of flattery, and give a thin layer of it to a tibia of the numerous contributors to this collection. Mr. Baxter sends two of his pretty female heads, that serve to recall how very pretty his fancy portraits need to be; his "Bride" (93), and her charming sister, of a yet untried fate, taking "The Stroll" (123), bear some evidence that these agreeable features of a long time's notoriety are not to become wholly things of the past; and, though no present portentous meaning is to be ascribed to "The Wreck" (83) of Mr. A. J. Woolmer, this subtly gorgeous combination of bright hues, rich shadows, sea-nymphs, and other mythic marvels, refreshes a long memory of similar remarkable effects conclusive in establishing Mr. Woolmer an old master beyond the reach of a new man. There was glamour in his art at a period when elaborate copyism was not considered the only food, and food enough for wonder. Now, Mr. W. Bromley's peasant children happily circumscribed in home-scenery, "Blackberry Picking" (6); "Watching the Bird-trap" (92), or "Angling" (186), though no high degree of finish is attained in their representation, are far more likely to secure admiration than anything that appeals to the imagination rather than conviction. This popular taste for simple, natural incidents is, as usual, well provided for, by Mr. T. Roberts's, "Is Baby asleep?" (70); Mr. J. Morgan's "Kiss! Baby" (76); Mr. A. E. Patten's "Hide and Seek" (108); Mr. W. Hensley's "Models criticising" (127), and many another cognate episode. Lovers and love-making are more powerfully than pleasantly illustrated in Mr. V. W. Bromley's reading of "Sir Lancelot and Guinevere" (152); by Mr. E. Radford's kneeling devotee making a rather ambiguous request, from "Waller's Girdle Song" (300),—

"Give me but what this ribbon bound,
Take all the rest the sun goes round;"

and by Mr. E. G. Girardot's "Lover's Gift" (331), amongst other instances; and a little more pleasantly, if not so powerfully, by Mr. J. C. Waite's comely damsel helped in the cogitation of a sweet address by her dicky-bird, "What shall we say?" (27); by Mr. W. Gush's similarly perplexed young woman, "What shall I say?" (57) with no such assistance to the tune of her answer; and Mr. Haynes King gives some insight to the difficulties attending such a matter by the careful study and neat performance shown to be necessary in the production of "Katie's Love-letter" (94). Mr. C. Banerle's child in rapt admiration of some "Flowers" (105) will be thought by many to be the gem of the collection, it is so thoroughly free from pretentiousness, so agreeable in colour, and so solidly painted. A brother and sister "Coming over the Heath" (220) do not fully share the best qualities that characterise the single figure. Mr. J. D. Watson works as easily with oil-colour as he does in any other medium: a weather-worn veteran lighting up for "A Quiet Pipe" (122) is a small but telling proof of how conspicuous real worth may be sometimes. He has also helped Mr. M. Fisher to very good purpose, for the "Jassie" paying "A Friendly Visit," with a laudible of vegetable offerings, to Mr. Fisher's capitially-painted sheep, adds very much to the completeness of one of the best pictures of its kind here; though Mr. T. F. Wainwright's cattle, "By the River-side" (41), is a very admirable work; and Mr. J. S. Noble, jun., may rank amongst the better depicitors of animal life, if his painters grouped during "A Rest at Luncheon-time" (188), and keeping watch over the dead game, be only an ordinary example of his skill. Talking of dogs, Mr. C. S. Lidderdale introduces such a beautifully ngly "pug" to do duty in his version of "Beauty and the Beast" (165), that the fact being a patent one, putting beyond all doubt of a pug's hideousness consti-

tuting its most-precious charm, it is only by the absurdity of the supposition that a suspicion of some confusion for a lady as to which was the best and which was the beauty could exist, is saved; however, the improbability is so monstrous, for the fair sex, as a body, are too ready to acknowledge superiority in any member of it, so long as the delicacy of self-consciousness does not stand in the way, and Mr. Lidderdale's Beauty has claim enough to the denomination by the steps he has taken to elevate her, so that identity, after all, must be easily settled. In any view taken of the subject, it is a very cleverly executed picture.

It is rather difficult to understand whether or not the one reclining lady of the two wooing the invigorating influences of "Sea Breezes" is an invalid, or if she who is upright stands in just as much need of restorative assistance. The wind is blowing its best, and the principal aspiration of the artist, Mr. G. E. Hicks, would appear to be literally involved in illustrating the definition of difference between hair and air. The ladies are handsome and ladylike, allowing for the effects of such rough treatment by the rude element, and the wish that they may be benefited by such a gale as they are facing is "father to the thought" of what a deal of fatigue the labour of combing and brushing will cost them presently!

"Presents from Japan" (13), by Mr. R. J. Gordon, of technical merit; "A Royalist" (102), and "A Puritan" (142), both female figures, by Mr. W. H. Weatherhead; "Happy Recollections" (168), by Mr. S. B. Clarke; "A Fair Critic" (179), very boldly and forcibly painted by Mr. J. Gow; "A Daughter of Italy" (196), by Miss M. Backhouse; "The Glass of Wine" (261), dismissed by an Elizabethan cavalier, very clearly and closely finished by Mr. J. W. Chapman; "Little Miss Prim" (282), by F. H. Potter; and "The Lotus Gatherer" (501), by Mr. J. Bouvier, are some of the most noticeable items selected from scores. The landscapes do not contain amongst them so many attractive works as so numerous an assortment would reasonably promise. Mr. J. Danby's "Boulogne Sands," under a gorgeous sunset sky (3); Mr. G. Cole's "Evening—the Timber-drag" (101), a favourable specimen; "In Chancery" (52), by Mr. C. A. Calthrop; "Port Newydd, on the Usk, South Wales" (58), by Mr. J. Peel; "Twilight" (110), and "On the Thames near Marlow" (235), by Mr. W. Gosling; "A Calm Sunset on the Coast" (143), very pure in colour and truthful in appearance, and "A Study of Moonlight" (254), both remarkable performances by Mr. H. Moore; and "Near Devonport" (150), by Mr. H. T. Dawson, jun.; "A Valley in the Gower Country" (176), by Mr. G. Sant; "Near Hampstead" (272), by Mr. A. Maclean; and "Peatmoor,—Loch Awe in the Distance" (303), by Mr. D. Cameron, deserve exceptional notice.

The water-colour drawings by Mr. E. M. Wimperis of "Welsh River" (430), "A Welsh Moorland" (461), and "An Autumn Afternoon" (577); "Carrying Corn in Kent" (375), by Mr. J. Price; "Porth, Towan, Cornwall" (382), by Mr. L. P. Wood; "Worcester" (383), by Mr. W. H. Jobbins; "Slipper-making near Rosen" (396), by Mr. J. B. Surgery; "On the Trees at Rokeby" (437), by Mr. A. Powell; "Cornfield,—Evening" (464), by Miss M. I. Grant; and "On the Torridge, North Devon" (465), by Mr. H. Sandcock; "Moonrise on the Thames" (589), by Mr. G. S. Walters; "St. Urban, Troyes" (608), by Mr. Wyke Bayliss; "Fittleworth Common" (646), by Mr. T. J. Soper; and "Old Houses at Whitty" (663), by Mr. C. Earle, give a very fair taste of the quality that does not predominate in this department.

ON PROFESSIONAL ESPRIT DE CORPS.*

AND now we come to the most interesting point of the whole inquiry. Turning to our own profession, we are now to inquire how we stand in relation to this very important subject. Let me ask (and in putting the question I am happy to admit that in not a few instances the answer would be what we should wish) does *esprit de corps* do for us anything like what it does for the soldier, the lawyer, and the doctor? And if so fine a profession as ours fails in some respects to command the social position which is generally accorded to the members of some others which I have named, is not our own deficiency in *esprit de corps* at the root of much of that failure? For, after all, we are somewhat

* By Mr. T. Roger Smith. See p. 940, ante.

deficient in this temper of mind, and we do need to cultivate it. Whenever we meet an architect is it a matter of course that he is a man with the interests of our profession at heart, and bearing goodwill to all its members, our respectable selves included? In any case of difference, disagreement, or dispute are we quite certain that no member of our own body can ever be found to uphold against us that which he knows in his heart is unprofessional and unfair? In any emergency or difficulty should we be wise, would it be safe for us, to call in, without a thought about anything beyond his practical experience, any architect who could be named as skilful? Should we be quite secure that our professional brother could not in the nature of things make an attempt to dislodge us, or would not listen to overtures which have for their object to substitute him for ourselves? Do we all expect that in a competition of architects all the perspectives will be fair, and all the estimates honest; that no one will divulge his own motto, or tout for influence, or disparage the drawings of his rivals? Nay, let me come nearer the root of the matter, and ask whether we ourselves feel that beyond our duty to our clients, there is a wider duty which loyalty to our profession and our brethren imposes on us? Are we even more anxious for the sake of the profession than for that of the individual employer that every step in our professional career shall be above suspicion and beyond reproach?

I have already indicated by implication what I should suppose your reply to these questions would be if you made one. I fear we should all of us admit that if things are as bad as they might be, they are yet far enough from being all that they ought to be among us. When a true and noble *esprit de corps* has taken full possession of our whole body; when each practitioner has a proper professional temper and a fitting professional pride, rules for the regulation of practice and the guidance of competitors will almost make themselves. A successful competitor will then receive the congratulations and support of those professional brethren, who in less happy days would, perhaps, have written damaging letters to the *Times*. When that time has fully come, we shall cease to hear complaints such as from time to time reach this Institute; we shall then also probably lose the edifying spectacle of a battle of styles and views, and an advocacy of the architect-working man, such as fill the journals with articles which have for the general public little interest beyond that which household strife always arouses in the bystander.

We meet, if we have any object beyond that of spending a pleasant evening and enjoying an interchange of opinion, to strive to raise the general standard of our profession, and to secure that the conduct of each member of it towards the others shall be equitable and fair. This can be better done by fostering a proper spirit than by attempting to lay down hard and fast lines, and guides within which we are all expected to run. Not that our rules may be superfluous or arbitrary, but they will only work well when men observe them spontaneously and cordially. Let us then see how we are off for professional *esprit de corps*.

Architects are, in the nature of things, so circumstanced as to be deprived of several of the accidental advantages which have been noted as tending to promote professional feelings in other callings. We are, unhappily, but few of us university men; if any of us have come from the same public school, it is a mere chance; we have no Haileybury, or Woolwich, or Sandhurst; we walk no hospitals, we draw in no *atelier*, and we pass no examination to admit us to practice; nor are we trained in colleges; with the exception of those who attend the lectures at King's College or London University, or the classes at the Architectural Association, there are few chances of studying together for us while we are learning our duties. We are generally brought up in offices where one or two, or some other small number of pupils associate with a somewhat larger number of clerks. This method has some great advantages; but the promotion of a large-minded *esprit de corps* is not one of them. We are not much better off when we begin to practise; there is little to throw us together, much to keep us apart. A brother architect in the same neighbourhood, or with the same connexion, especially in a country town, may be a dangerous rival; at any rate, there is a strong temptation to wish him out of the way, and dislike him accordingly, with no circumstances to lead us to overcome it. Then come the jostling

in the race of life, competitions where all but one must be disappointed, and where the successful man will have to run the gauntlet of all those who have failed. Nor do we, like the medical men, often consult one another, or work together: the association of a local architect with a leading one (like the resident and the engineer in chief of a railway) is a thing never so much as thought of. We do not even so uniformly admire the same things or work in the same taste as to be quite free from the temptation to disparage one another's performances. These are some of the unfavourable circumstances in our case, and they result in its being impossible for us to be considered a compact well-defined body of men, a misfortune which is very considerably aggravated by the fact that there is no kind of fence round our practice: any builder, decorator, or auctioneer may call himself architect, if so it pleases him, and though the nucleus of the profession may be very clearly seen, and indeed may be considered as present in this room, its edges are extraordinarily ragged and indefinite.

Notwithstanding such drawbacks as these, there are, however, many circumstances which would render it not unreasonable to expect some *esprit de corps* among us. First and foremost is the fact that although the boundaries of the profession are ill defined, the actual practice of an architect competent to carry on his business with success is a very definite and distinct matter, requires considerable technical knowledge, long experience, and a peculiar association of artistic, mechanical, and business powers, not easily broken in to run in harness together; and thus it comes to pass that an average architect is really very much educated by his work into a member of a special class, having a wide space between him and any other people with whom he mixes. We are, I believe, more closely assimilated than we seem, and, like elements which have a chemical affinity for one another, we only require to be properly brought together, and we unite readily enough. If, as it appears, the link which connects us together, though not very apparent, is very real, there is no doubt that in its nature it is one calculated to stimulate *esprit de corps*. Our profession is interesting enough to rouse a real liking in the minds of most men,—in some a passionate attachment. It is one of which any man may be justly proud. There is something to kindle enthusiasm in the thought of being, in however modest a degree, made one of the community to which belonged those illustrious men who from the east to the west have covered the earth's surface with the only tangible landmarks that a nation's progress can leave behind it. If the great designers, known or unknown, of the noble buildings of the past form a distinguished ancestry of artists with whom it is an honour to be connected, there is in addition much that is delightful both in the study and the exercise of the art. In no profession is there employment for a larger range of powers and faculties, in none is there so enduring a record of faithful, well-executed work; and no profession has so little to do with the griefs and miseries of men's lives. I am not, of course, blind to many drawbacks which exist, nor insensible to the want of fortune to which the architect must submit, or to the annoyances and vexations that beset his practice; but I think, even when difficulties are at their worst, very few of us would be willing to change places with a lawyer, or a doctor, or a statesman, if he could. There is, then, in the nature of the profession itself a strong basis for *esprit de corps* to rest upon. As a matter of fact, there is also a very great tendency in architects to fraternise with one another, when circumstances bring them together. No doubt it is more or less so with men of other professions; but of our own it is easier to speak from experience, and my own experience has always been that whenever I found an architect I found a man who was very ready to become a friend the moment we had established the existence of the professional tie between us.

Much as we decay them, we might have a means of strengthening this friendly feeling, instead of weakening it, in our competitions. These, rightly managed, would do something to draw us together, paradoxical though it may appear to say so. Men who, like harriers, are constantly in the habit of measuring their strength against each other in open fight are much more likely, if the fighting be only fair, to conceive a respect for each other than men who never meet in any way. Once made competitors fair, and you would render competitors friendly,

Perhaps, however, the main source of a healthy *esprit de corps* has lain (as certainly the only chance of giving to it the stimulus and the direction which it requires will be) in the existence of organisations like this Institute, the Architectural Association, and the various local societies. And among other chief reasons for this being the case is the fact that these societies afford a channel for the exercise of that personal influence which seems to have more power than anything else to rouse enthusiasm. Since we have had a professional friend here we have gained immensely in *esprit de corps*; and I firmly believe that what has been gained in this way has been secured, not by the influence of an impersonal entity, consisting of a council and a charter, a subscription-list and a library, but by the personal leadership exercised by a Cockerell, a Tite, a Donaldson, or a Wyatt. Long may the traditions thus happily inaugurated continue to act with constantly-accumulating power on the body at large.

We meet in this room, as the students meet in the room downstairs, on a common footing, and for common objects; and what we do here renders us more jealous of the honour of the profession, more determined to support one another, and more ready to co-operate for common purposes than we could possibly be otherwise.

A most important and gratifying proof of the genuineness of our *esprit de corps* is encountered by every one of us who is engaged in practice in London, as often as he comes into contact with a brother practitioner belonging to this Institute, in matters which involve personal negotiation. You meet, perhaps, on a matter in which the interests you represent and those which your colleague represents are at variance; yet the result will be (at least, my experience has been so, without one exception) that you are met in a spirit of friendly fairness which renders the dispassionate discussion of the business easy and possible. If a solution can be arrived at, it is found; and whether it be or no, the negotiation is conducted as between men who understand each other's circumstances, can enter into each other's difficulties, and are honestly disinterested, so far as may be possible without sacrificing a client's interests, to be of assistance to a professional brother. But though so much has been accomplished among the members of this Institute, there remains, even here, more to be attained; while among those members of our widely-scattered body who do not belong to us, or who seldom mix with us, there is great need of the promotion of *esprit de corps*. It is, of course, impossible to say that this or that definite thing ought to be done; but it is easy to see that an increase in that spirit will follow every accession of dignity, honour, or importance to the profession, however, or the diminution of any drawback or defect in consequence of which it may be disparaged; and notably will correspond to every extension of the link which binds practising architects together. One or two speculations as to what may be practicable in these directions may, perhaps, appropriately close our inquiries.

Every accession of dignity or of importance in public estimation to our profession will, as I have said, increase *esprit de corps*, and on this account, as on many others, it behoves us jealously to watch how we stand with the public, and to secure for the profession all the honour and credit which are its due. Now, without entering at any length upon this subject, I am inclined to doubt whether there is as much harmony between public feeling, as regards matters architectural, and our own as there ought to be. I cannot help the notion that we and the public are somehow a little out of tune. Could we establish a better concord, it would help us. I think, as one simple instance of what I mean, that, building, as we mostly do, for business men, we are habitually too lax in the business part of our undertakings. We look upon extras for example, as an inevitable attendant upon building contracts. We are sufficient forethought liberal preliminary estimates to be passed, and sufficiently large money provisions to be introduced, extras might disappear almost entirely from our practice. It would require a certain amount of energy and determined will, but the result, if it became general, would be to raise the value of architects a hundredfold in the eyes of the commercial world.

Again, men run about with sketches and designs, making themselves and their work cheap, not to mention the mass of competition labour

foolishly thrown away. All this discredits the value of an architect's services. Can we do nothing to stop this? Mr. Briefless does not go round Bedford-row touting for briefs. He might very likely get some if he did, but it would be unprofessional. Can we do nothing on our parts to keep up the public sense that our work is the work of educated, intellectual men, and is not to be had cheap, or for nothing, by enlisting professional *esprit de corps* on our side? Again, there can be no doubt that we do our professional standing a great deal of harm by disparaging one another. There can be no objection to strong things being now and then said in friendly ears; but to blurt them out before the public, when they really only represent half-truths, and the speakers do not mean them to be taken for what they will be supposed to mean by the hearers, is suicidal, and very different from that healthy, discerning criticism which is useful to art. Lastly, might we not really, as a profession, take some opportunity of expressing appreciation of great and difficult works when they have been successfully accomplished? We show a good many tokens of respect to the men whose careers and executed works demand our recognition; could we not, now and then, in some way, show our appreciation of an individual great building, even if it was only by hanging up the drawings of it in this room, and so showing that we take an interest in the undertakings of our colleagues. No civil engineer in charge of an undertaking of importance is willing to give an account of it to the press until he has done so at his Institution. How far this unfortunately is from being the custom among us is abundantly proved by your having to listen to a discussion of an abstract subject at the very beginning of the session, instead of papers on the important public buildings, cathedrals, restorations, and other large undertakings of last year, of which, most unfortunately, no particulars have been, or probably will be, furnished to this Institute. Let it be a matter of course to bring forth every really good building in this room, and you will create a kind of honourable distinction for good architecture, which will help in no small degree to advance what we desire to promote.

There are, however, some abuses which must be done away with, and some defects which must be remedied, ere *esprit de corps* becomes pure and powerful, even where it exists.

To begin at the beginning of all practitioners; the man who has a proper enthusiasm for his profession will be very careful what pupils he takes. There is some probability in the case of each pupil that he may become a practising architect; in every such case there is the intention that he shall be so. Every man who is asked to take a pupil ought to put this question to himself,—“Is this boy, with the education, and the capacity and the surroundings that I find him now to have, likely to prove, after a certain number of years, a cultivated, upright gentleman, with a sound knowledge of his profession, and fit to do it credit by his practice and his character?” In very many cases, an inquiry of this kind, honestly conducted, ought to lead a man to decline an offered pupil; and till we are every one of us prepared to do this and let the premiums go, whenever it is clear to us that the youth is not likely to do well, we cannot be said to have a healthy *esprit de corps*. A further step will be gained when it is a matter of honour with those who are really courted, who have, to use a homely figure, the key of the professional front-door in their keeping, to permit only the entrance of men of good general cultivation. There is no reason why architecture should not have a very large proportion of university men among its practitioners. As a matter of fact you may count the B.A.s and M.A.s on your fingers. And I do not think it too much to ask of those who can obtain high premiums, and are able to pick and choose, that they should stand out for a university education in their intending pupils.

Again, when the pupil is accepted, it is sometimes forgotten that he is a future colleague, and is to be fitted honourably to pursue our profession; and that it is not enough, with this aim in view, to make him trace and copy the specifications. A healthy *esprit de corps* will lead a man to feel that he has a duty to perform to the profession, as well as to the pupil, in this matter. It would also tend to raise the tone of scholarship were the present unfairly short term of pupillage lengthened. When men were apprenticed for seven years there was more useful knowledge communicated to them than now, when they go for three, or even two. I would

suggest that four years ought to be the shortest term of pupillage, and that five years would be a more suitable time; and were this reform carried out we should in five or six years see a marked improvement in the young men advancing towards the threshold of responsible practice.

Again, it seems pretty obvious that we shall not be quite as we ought to be till we have put some sort of fence round ourselves, and made a gate which no one can pass who has not a competent amount of elementary knowledge; and till we have established a tribunal with power to turn out any one who disgracefully misconducts his professional practice. This I find a peculiarity of all the professions where the *esprit de corps* is strong; and nothing is more natural than that it should be so. If the title “architect” is to become a kind of passport to a man from one end of England to the other, as that of barrister now is, there ought at least to be the certainty that an architect's attainments and his character are known not to disgrace that title,—a matter quite distinct from placing any limit to originality, or even eccentricity, of design, or from interfering with the student's licence to restrict himself to one style if he desires to do so.

Lastly, when *esprit de corps* has sufficient power to be real force in our profession, those things which it is understood men ought not to do, will not be done, and such a body as this Institute will not for a moment permit them to be attempted. I hope I am not using too much plainness of speech when I say that this is not so now. It is generally believed, for example, that persons practising as architects, some of whom might possibly be found to be beyond the reach of this Institute, are in the habit of receiving payments in respect of works from the persons towards whom they ought to hold a perfectly independent position; yet probably it would be thought rather unfortunate if a well-authenticated case of this kind were brought forward to be adjudicated upon here. If *esprit de corps* were strong among us, such a malversation would be very rare, and when it was heard of would be hunted down and traced out, and the offenders exposed with zeal, every man feeling that till this were effectually done, he, and the profession he belongs to, were sustaining damage and disgrace. In short, the feeling of its being necessary to keep up the honour of the profession whenever this or any other misconduct tended to tarnish it, would be keener than it now is. Men would, I think, even carry such a feeling into their artistic work, and would make it an additional motive for abstaining from the use of base materials and bad construction, and perhaps even from a style of architecture which they were pledged to oppose, doing these things for the honour of the profession as well as for their own credit. We should then be spared some at least of the sweeping condemnatory remarks which architects of one school have been known to permit themselves to make upon the works of another; and we should possibly even have in some rare instances the phenomenon of an architect admitting that there might be some merit in an architectural work which he did not quite understand, and which he felt unable himself personally to admire.

Here, where, thanks to the wise provision of those who founded this Institute, we are to a large extent sure that each member is a worthy brother practitioner, there exists, as I have tried to show, a very fair amount of *esprit de corps*, and as a result remarkable good-will prevails between the members. Why, then, cannot the whole profession be like one large Institute? Nay, why could not the scheme of the Institute be so enlarged that it should be to our profession what the Colleges of Surgeons and Physicians are to the medical, or the Inns of Court to the legal? If any actual step is to be taken, any one thing to be done in order to bring about an increase in *esprit de corps*, it is here, I believe, that the work must be performed; and it would be a lasting honour to this Institute, and an incalculable benefit to us all, if the recent Conference were to prove the germ of some simple but comprehensive scheme for affiliating every architect who is competent and carries on his practice respectably to this body, giving him a title and a position worth holding, and which it should be for him a misfortune and a disgrace to lose. The time may be distant when this shall be realised, or it may be nearer than we think. One thing is, however, certain: every step which can be taken to promote the general advance of the profession if it be well judged, will benefit each individual member; and every proposal

tending in that direction deserves to receive the best help which each of us can afford. It was not, however, I beg to repeat, in order to suggest any one or other definite act that this subject was brought forward. It was with the simple view of bespeaking for professional *esprit de corps* a place, such as the importance of its claims seems to demand, among the subjects which shall be here cherished and kept constantly in view. Let us be alive to the nature of the spirit animating us, as well as to the shape of our acts. It is well to stimulate research; it is well to originate combinations; it is well to concert action; in short, it is well to do the best we can to build ourselves up into a homogeneous, a shapely, a well-organised body. But let us remember that a body needs to live. An organised body without a spirit has nothing before it but speedy decay. Whatever else, therefore, is forgotten or remembered, let us not forget, I beseech you, *l'esprit du corps*.

SIR WILLIAM TITE.

ON Tuesday last, at a meeting of the Bath Town Council, a number of the admirers of Sir William Tite, who is the senior member for Bath, and who has now represented the city for seventeen years with great satisfaction to all the citizens, presented the corporation with a life-size bust of that gentleman, as a mark of respect for him and admiration of the manner in which he has represented the city. The bust is of statuary marble, and was executed by Mr. Theed, R.A.

The presentation was made by Mr. Alderman Murch on behalf of the subscribers, and he, in doing so, dwelt in eulogistic terms on the public life and munificence of Sir William Tite, and said it was thought by the subscribers to the presentation that the city would like to have some permanent memorial of its senior member. The respect for Sir William throughout the city was so great that persons of all parties were struck with a life which was so generous, valuable, and eminently useful, and had, therefore, freely subscribed for the bust. To appreciate a work of this kind it was necessary to have two things,—a favourite subject and a high-class artist. In each of these points they had been very fortunate.

Our esteemed friend and colleague is certainly earning “golden opinions” from all sorts of men. May his shadow never be less!

NEW BUILDING FOR THE BRITISH MUTUAL INVESTMENT COMPANY.

A PROMINENT block of buildings has just been erected in Farringdon-street, for the British Mutual Investment Company. The structure has two main elevations, one in Farringdon-street and the other in St. Bride-street, with another narrow elevation at the angle of the two last-named streets, which contains the chief entrance to the company's offices, and facing Ludgate-circus. The materials used in the construction of the building, which is in the Italian style of architecture, are the Farnham red brick, with stone facings. The Farringdon-street and St. Bride-street frontages are each 60 ft. in length, the building being also 60 ft. in height, to the ground level. There is a basement and also a sub-basement, and, including these, the building altogether consists of six stories. The ground-floor windows are segment-headed, the first and second stories having circular-headed windows, whilst the third story windows form a continuous arcade, and are mainly of stone. Above the third story is a cornice and stone balustrade, behind which are attics. The house-keeper's apartments are at the top of the building, the roof being a flat one, formed of asphalt on Pilkington's patent. The main ground-floor entrance facing Ludgate-circus is pedimented, and in the Farringdon-street and St. Bride-street frontages there are niches for statues. The ground-floor portion of the building will consist of the Board-room and general offices of the company, and will be exclusively devoted to the company's business, the several stories above being let for offices, as well as the sub-basement, the basement consisting of vaults, which will be occupied by a wine-merchant for storage purposes, and the entrance to which, as well as the entrance to the several offices, will be in St. Bride-street. The estimated cost of the building, exclusive of the land, which is held on lease from the corporation, is 6,000. Mr. Henry Currey is the architect, and Messrs. Brown & Robinson are the contractors.

THE HOUSES OF THE LABOURER IN
SOMERSETSHIRE.

CARRYING on our observations,* we have been inquiring as to the homes of the agricultural labourers in Chincock, Chiselborough, Montacute, and Stoke-sub-Hamdon, and we will now endeavour to describe something of what we have seen or learnt in these places. We give views of a couple of cottages by the roadside in Chincock. The only portion of these cottages now uninhabited consists of two rooms, a kitchen below, and a small bedroom above, whose windows are in the gable-end, with entrance-door up a passage. The height of the kitchen is about 6 ft. 3 in.; breadth, a little over 9 ft.; and length, 13 ft. The bedroom has a ceiling broken through in three or four places, through which the rain from the thatch above trickles down the walls. It is only in the central part of the bedroom a person of ordinary height can stand upright. There is hardly 3s. worth of property in the sleeping apartment in the shape of bedding. An old tick, with scarcely any stuffing, and a few rags, composed a bed, spread upon the floor in one angle of the room, and a wretched frame,—the caricature of a bedstead,—occupies another corner of the apartment. A few winding steps, scarcely sufficient in breadth for one person to pass up, lead from the kitchen to the bedroom, the sole sleeping-apartment of an aged mother of eighty-four years, an unmarried daughter of forty, two children, and a grown girl, who acts as a help in gloving and other work. The aged mother is an imbecile, and is otherwise afflicted. The average earnings of the household throughout the year could not easily be determined. Sometimes 5s. a week, sometimes 7s., at other times 2s. 6d., and, at times nothing. For these two rooms, the last corner of the two cottages which now affords a refuge for miserable creatures, 3l. have lately been obtained for the year's rent. We must be just to the landlord, who is a noble lord to boot: he allows the use of another small room on the opposite side of the entrance-passage, which is used as a workshop when glove-making is brisk; but we are in doubt whether the additional accommodation is wholly free or not. Our informant here was interrupted in his survey of these and the adjoining cottages by the owner's bailiff, who challenged his authority, not only to look within, but to sketch without; so the pursuit of knowledge was one under difficulties. Rags and semi-starvation mark the chronic condition of the people here and in the adjoining cottages along the roadside in the village of Chincock. In many of the dwellings there is only one sleeping-apartment, where the labourer and his wife, with families varying from five to eleven, the infant and the marriageable daughters or sons are all huddled together, even admitting there is no lodger. The rents vary from 1s. 3d. to 1s. 6d. per week, or more, but in the latter case there are, besides the kitchen below, two rooms above. The kitchens are flagged with rough slabs of Hambill stone, as they are all round the localities we traversed; but though we entered several of the homes we failed to find one in decent order; sunken here and raised there, and fractured into numerous fragments, showing hollows capable of holding no small quantity of water. In times of heavy rain and flood, many of the kitchens present the picture of a number of miniature lakes or pools. As to "conveniences," we found instances where one place of accommodation had to meet the wants of a whole row of cottages.

In the village of Chincock, the farm labourer's wife and daughters add a little at times to the income of the household, by glove-making; but it is a hard-earned and miserable pittance, one individual often spending from nine to twelve, and often fifteen, hours in earning 9d., and at times even as little as 6d.

Passing along from West Chincock, we soon enter the ill-fated village of Chiselborough. No external sketch of the habitations in this place could give a complete idea of the state and condition of the interior, or the deplorable life of the labouring inhabitants. This village is the home of an unhappy race of human beings whose frightful afflictions are unquestionably attributable to the place and circumstances. Several of the inhabitants are negro-like in aspect, save as to colour, misshapen not only in head, but in body, thick lips and flattened noses, heavy, and bloated,—in a word, altogether twisted and deformed in person. The worst cases are grinning, paralytic idiots. The maladies that these un-

fortunate creatures suffer from are goitre and cretinism. The existence of such a place as this is a disgrace to our boasted civilisation. Chiselborough is situated at the bottom of a rather narrow valley, and it is encompassed on three of its sides by towering hills. Being enclosed thus, it is roiled somewhat of thorough ventilation, and the temperature of the village is possibly milder than that of other Somersetshire villages. This, in itself, would not create the maladies; but coupled with the immemorial state, housing, and surroundings of the inhabitants, it may go a great way in perpetuating them. The houses, cottages, and other dwellings constituting the village form lines of irregular terraces, one over another, along the sides of the hill. The eaves of the roofs at the back of many of the dwellings are nearly on a level with the sloping hill-side, consequently it may easily be imagined how they stand in regard to the drainage of the hillside above them. A few inches below the surface of each floor must exist an eternal dampness, and not only dampness, but pent water. Where attempts have been made to build cottages with their fronts to the hillside and their backs towards the public road, a sort of fosse had to be sunk, a few feet wide, to give liberty of entry through the doors, otherwise there could be none, except through openings contrived in the roof. In times of heavy and continued rain the natural outfall of the drainage of the hillside is the floors of such cottages. Further, year after year, the contents of cesspools have been allowed to sink into and saturate the soil; the foul drainage in connexion with one set of houses percolating through the soil down under the walls of houses below them. The wells and other means of water-supply for the inhabitants in the lower portions of the village suffer necessarily from the foul filtration we have been describing.

The appearance of the cottages in Chiselborough, as well as in West Chincock, externally, is respectable, compared with their construction and accommodation within. Blackened, naked joists form the ceiling in the kitchen; a transverse beam, in many instances, supports these joists in the centre, thereby lowering the height of the room, which, independently of this obstruction, is dangerously low. The plan and sketch of bed-room given in our last issue are applicable, in many cases, to the cottages in Chiselborough, Montacute, and Stoke, with this difference, that the creaking stairs or ladders are more upright, and there are a greater number of risers. Hand-rail or protection there is none, and the edges of some of the beds above are within a foot or two of the well-hole or opening, so that a child creeping out of its bed upon the floor may have at any moment its brains dashed out on the stairs or the flagging in the kitchen underneath. The fireplaces in not a few of the cottages we entered are as primitive in form as any the fourteenth century could produce. A few loose bricks, two or three in height, form the three sides of the improvised grate upon the hearth. A pot or kettle is seen suspended from a chain and hook, and a few rotten kumblies, gathered in the roadside ditch, constitute the fuel. Only a few days ago a poor creature was marched off two or three miles to the residence of the local justice of the peace by the village constable, who charged her with picking up a few rotten windfalls from the trees. Had she not committed this grievous offence, she and her children might have had to eat a raw swede for dinner. In this the first week in December we find many hearths in which the fire has gone out, for fuel in the shape of wood is scarce, and coal can only be had in a sixpence-worth at a time, and then only when all the family are employed. The family is very well off indeed when it can afford to purchase a hundred-weight of coal; and when the cooking is done, a piece of stick supplies the place of the coal, which has to be economised for Sunday's use particularly. The ordinary farm-labourer gets from 9s. to 10s. a week; the ploughman and carter from 10s. to 12s. Not long since the wages of the labourer were from 8s. to 9s.; but last June, in consequence of a revolt, the wages were raised a shilling; but the two pints of cider previously allowed were stopped. No London labourer or beggar would drink this wretched stuff, which is especially brewed for the field-labourers, and which is nothing more than the final pressing of the apple-pulp flooded with water, with the addition of the skimming or fermentation from the first brewing. The lees of the exhausted casks used by the farmers are sometimes added. We tried to drink a wine-glassful of this liquid to test the

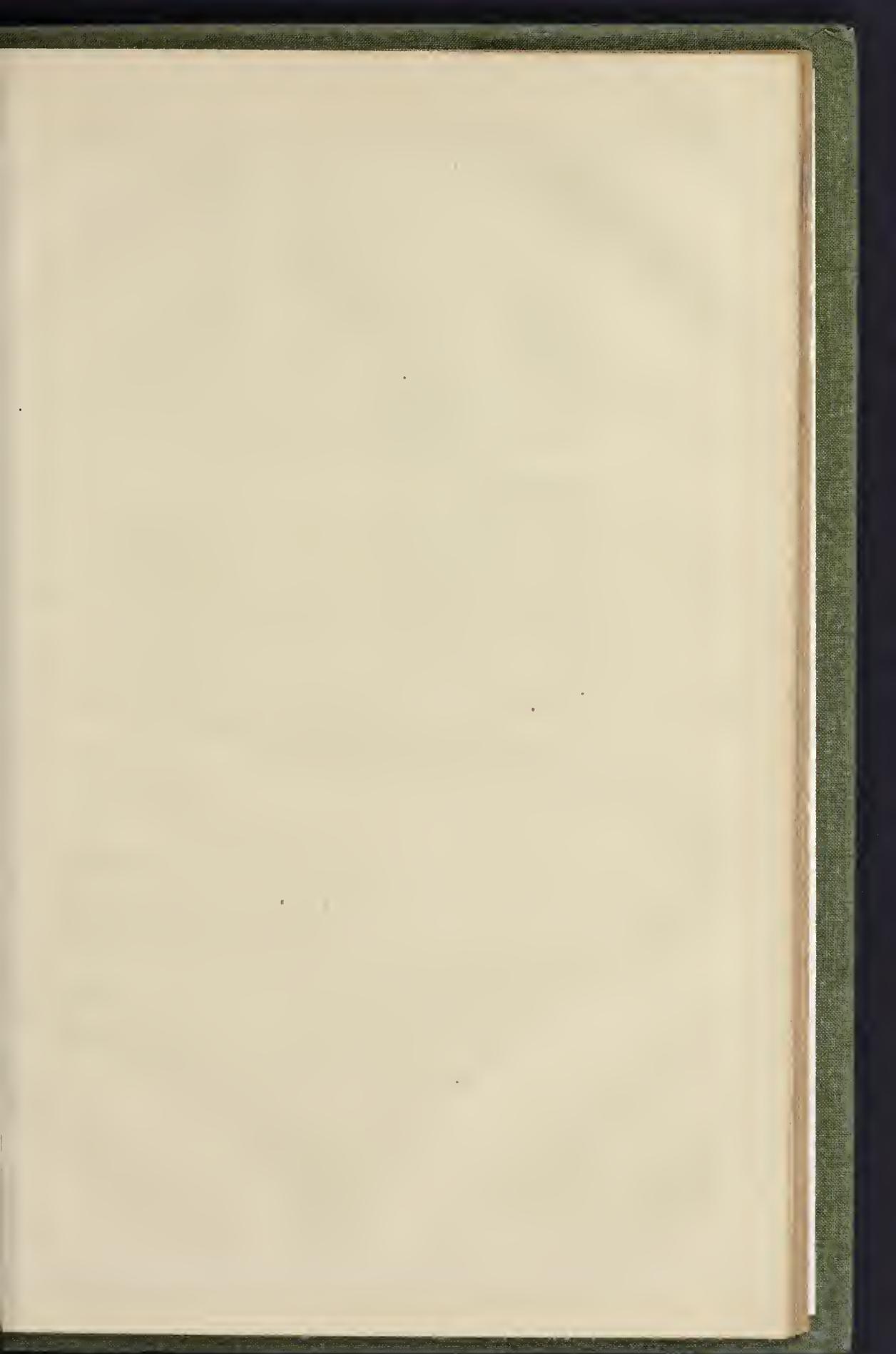
truth of what has been said in its favour; but we found it impossible to swallow the second mouthful. No vinegar that we have tasted was more sour. It is matter of wonder how agricultural labourers can get intoxicated on such abominable stuff. Yet this cider allowance is one of the boasted perquisites of the Somerset hind, and the farmers never forget to vaunt the gift. What a mockery of refreshment to the semi-starved, ill-clad, and worse-housed labourer! Female field-labour does not exist, either in summer or winter, to the same extent in the districts we are now describing as in other parts of Somersetshire. Taking a five-mile radius, with Yeovil for the centre, an intermittent employment at glove-making keeps the wives and grown-up daughters of the farm-labourers from the fields; but it fails, at the same time, from its precarious nature, to afford sufficient to keep body and soul together. It is a help, to be sure, when it comes, but it has the result of leading to the frightful evils of the overcrowding and huddling together in one room whole families, and often two or three families of the parent-stock. It is utterly impossible that morality or health can be preserved under such conditions.

In Stoke and Montacute we found some frightful examples of overcrowding in wretched rooms and attics, from which the blue sky could be seen above and the kitchen and its occupants below. Rotting rooftrees, bulged in, and decayed floors dangerous to tread upon, casements shattered or blown out altogether, and walls with a constant trickle from tile and thatch rusting their surface and coating it with an indescribable ooze. In a row of cottages lying at the bottom, or in the valley, at Stoke, a number of their inmates are in great want for lack of employment. The kitchens are cold, damp, and cheerless; and the bedrooms are destitute of any furniture save the miserable bedding which is strewn upon the floor, or gathered up in bundles in the corner of the rooms. One good or decent bedstead we did not meet with in any of the labourers' cottages we visited, nor a bedroom fit to sleep in, or in any way suited to meet the requirements of the inmates. Some of the houses were without hack yards, and the places of accommodation were far between and in a filthy and overflowing state. As in Stoke, so we found matters in portions of Montacute. Here, in a thoroughfare called Middle-street, we visited a row of cottages hacked against the churchyard. A few of them have had lately a wall built up at their rear about 6 ft. high, hiding the view of the graveyard from the under rooms, and allowing a space of about 3 ft. between the walls of the cottages and the churchyard wall. This space is the only hackyard these cottages have. The level of the kitchen floors is some feet lower than the surface of the churchyard soil. There is an absence of all ventilation here, and the drainage of the graveyard, of course, soaks under the floor of these ill-conditioned dwellings, and, added to these evils, there is one place of "convenience" for five or six houses.

In each of these cottages and some further down the street there is only one sleeping-apartment, the ceilings of some of them are bulged in, the rain comes down the walls, and dirt and ill-health reign. As many as three beds, or "shake-downs" upon the floor, are in one apartment of about 9 ft. by 12 ft., with scarcely standing room, and the bedding is the sole furniture. On the opposite side of the street a similar state of things exists as far as relates to sleeping accommodation, the condition of roofs, ceilings, walls, floors, and places of convenience, which are all in a state of ruin and rottenness. There are surface drains in this village, but in times of heavy rain they are unable to carry off the water, which often floods the kitchens of the cottages in Middle-street and in other portions of the village. The sewage in one place passes along an open ditch, immediately behind a row of the cottages, and winds its way into the fields, where it is absorbed in the soil. Overcrowding exists to a great extent, the members of some families being sufficient for the occupation of three bedrooms instead of the one or two used. When death takes place in any of these cottages the living must either cook, eat, drink, and work in the presence of the dead head, or sleep in the one bedroom with the corpse above.

We can proceed no further at this moment, though there is still much to be told concerning the condition of the agricultural labourer and his surroundings in Somersetshire. We have no hesitation in adding that some of the worst cottages we visited are the property of Lord Lichester and Lord Portman.

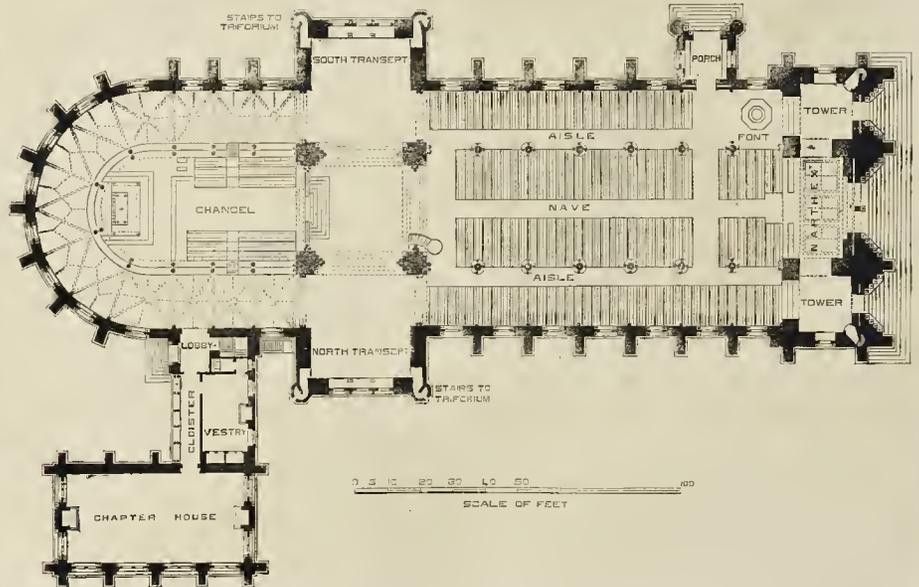
* See p. 937, ante.



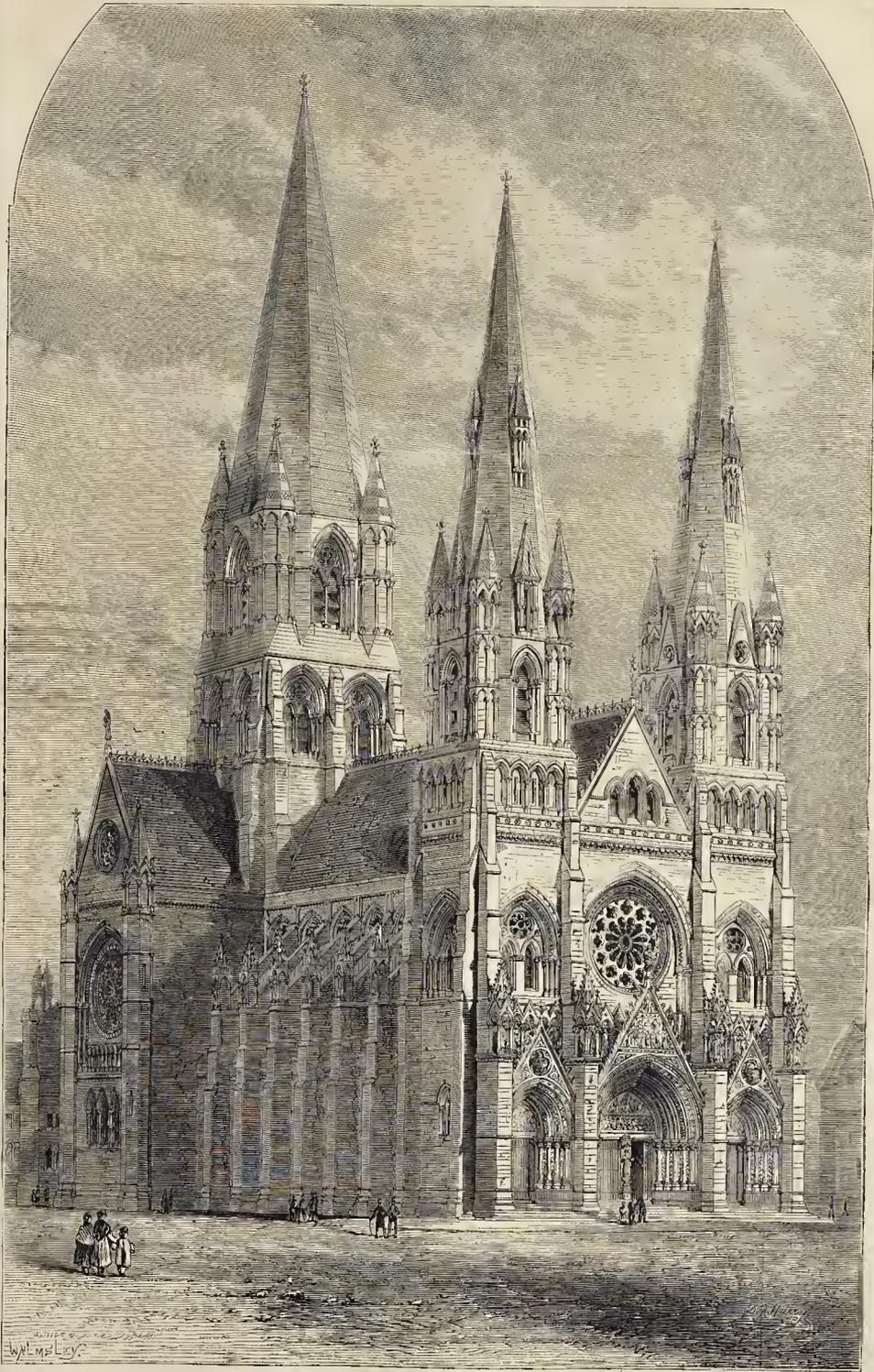
LABOURERS' HOMES IN SOMERSETSHIRE.



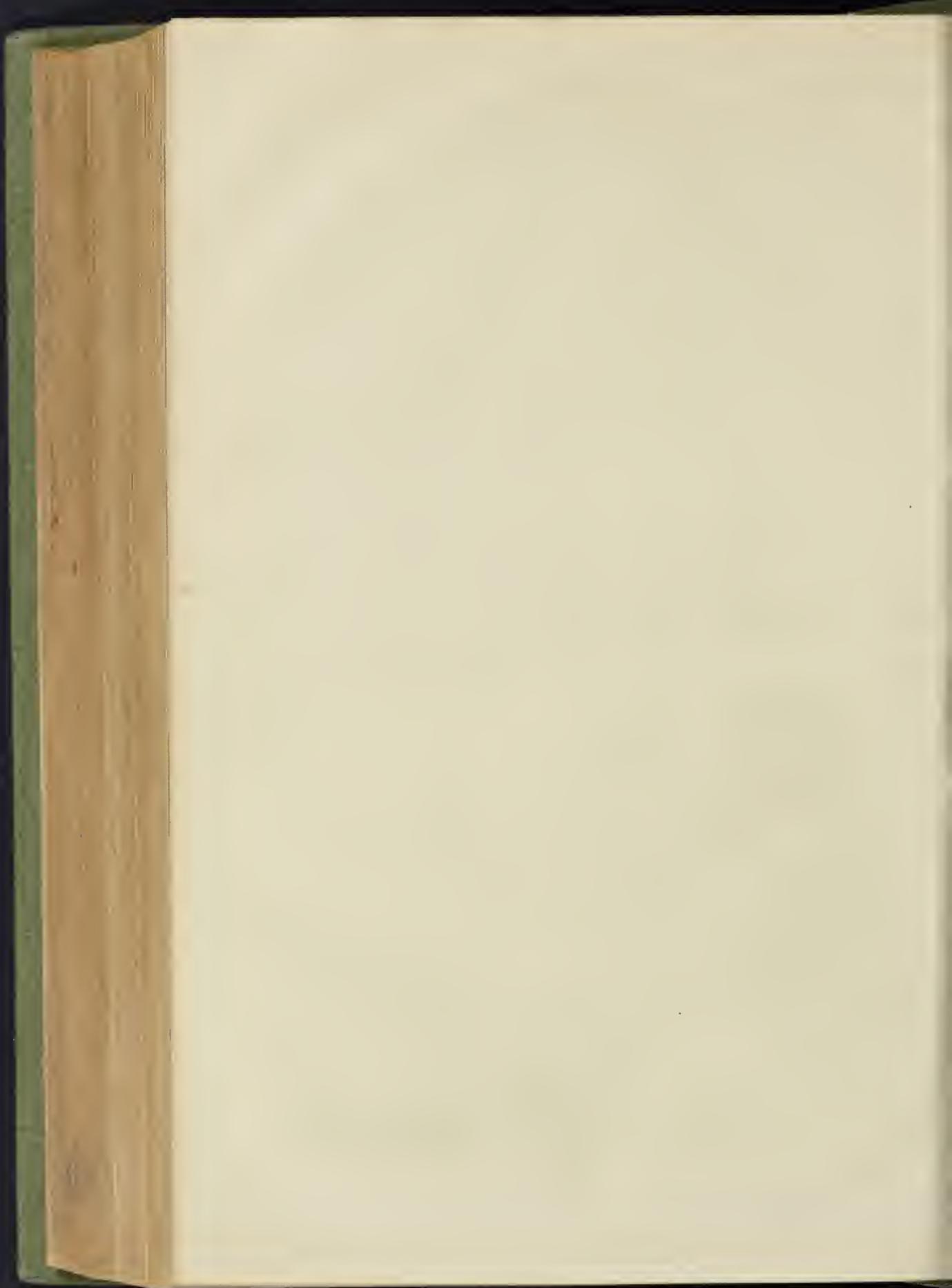
Sketches in Chincock, near Yeovil.



DESIGN FOR PROPOSED CATHEDRAL IN EDINBURGH.—Plan.



DESIGN FOR PROPOSED CATHEDRAL IN EDINBURGH.—By MR. ALEXANDER ROSS, ARCHITECT.



DESIGN FOR PROPOSED CATHEDRAL IN EDINBURGH.

We have illustrated the design for St. Mary's Cathedral Church, Edinburgh, submitted by Mr. Alexander Ross, of Inverness, to the trustees of the late Miss Walker, one to which when exhibited under the motto "Fidelitas," we awarded a considerable amount of praise in our review of the six sets of drawings exhibited in competition.* We extract a few paragraphs from the description forwarded with the design by Mr. Ross.

In arranging the plan, the comfort of the congregation was studied, and the architect endeavoured to provide for this by the introduction of a large narthex at the west end of the nave, entered through a triple porch, and by a roomy south porch into the south aisle (the necessity for subsequent inside wooden porches to prevent cold draughts being thus avoided).

The dimensions are stated to be as follow:—

	Length.	Width.
Length of nave	130 ft.	by 30 ft.
Length of aisles	110 "	" 15 "
Length across transepts	100 "	" 30 "
Length of choir	65 "	" 30 "
Chevet or circumambient aisle	75 "	" 15 "
Extreme length over all	265 ft.	
Width across west tower	82 "	
Width across transept	110 "	
Height of interior to groin	75 "	
Height to ridge	107 "	
Height of west towers	107 "	
Height of central towers	230 "	

It was proposed to seat the nave only with benches, the transepts being left clear for temporary seating by chairs or otherwise. The accommodation provided gave,—

Sittings in nave and aisles	1,082
" transepts	336
" choir	64
" stalls	24
Total sittings.....	1,506

"The architect has adopted the chevet, or mode of carrying the aisles quite round the choir, thus giving free access from the vestries and chapter-house to all parts of the building, without crossing the choir or chancel, and also providing a very suitable space for mural monuments and brasses, while at the same time it would immensely improve the architectural effect of the building. The chapter-house opens off the north side of this circumambient aisle, and is approached through a wide corridor, lighted on the east side by a rich arcade, and bounded on the west by the vestries for the clergy."

The chapter-house is in the form of a parallel-gram, 58 ft. by 26 ft., and capable of accommodating 150 people. The chapter-house was to be roofed with timber, and warmed by open fireplaces at either end.

The choristers' vestry is placed over that of the clergy, and is approached by a wide stone stair. By this arrangement a very large vestry, capable of accommodating easily forty choristers, is obtained, at a point quite detached from the other, yet adjacent.

A severe and comparatively early style of French Gothic has been selected, so as to avoid excessive detail and carving. The aisle walls have been kept perfectly plain, with the view of giving value to the richness of the clearstory, where the principal decoration has been concentrated, as being a leading feature outside and inside the building. It was contemplated to groin the ceilings throughout with stone ribs and chalk, or concrete filling, the latter presenting many very commendable features.

The walls of the building were designed to be in solid stone throughout, neatly dressed on both external and internal surfaces. This stone to be from the local quarries in the main; but in the columns and small piers a free use would have been made of marbles and native granites. Seatings in nave and choir in oak. The roof would be framed over groins, of red pine, boarded, and covered outside with Westmoreland green slates. Accommodation for the bells is provided in the north-west tower, and for clock in south-west tower.

The architect, after a careful estimate, is of opinion that the building could be well carried out for the sum indicated by Miss Walker's trustees,—£65,000.

The Institution of Civil Engineers.—At the meeting of this Society on Tuesday, the 3rd inst., Mr. Hawksley, president, in the chair, the first ballot for the Session 1872-73 was taken, when forty-seven candidates were hallooted for and declared to be duly elected.

THE WARMING OF HOUSES.*

THE usual appliances for warming houses, setting aside comprehensive systems, resolve themselves into open grates, close stoves, and, under special conditions, gas apparatus and pipes for hot air or water for warming halls and passages.

For the whole of these certain general rules may be laid down:—

1. More cannot be got out of any one of them than is put into it. This is an axiom which, truisim as it appears, is necessary should be impressed upon the public mind, which is apt to assume that engineering skill can multiply the heating power of fuel indefinitely. Thus, materials, like fire-clay, which are absorbent of heat and useful to prevent its escape, and retain it till needed, must abstract it first from the fuel before it can dispense it.

2. There are but 100 degrees of percentage. This simple fact should be kept in mind in considering methods of saving fuel, the inventors of which would otherwise persuade one that reference to coal merchants is a work almost of supererogation.

3. Some proportion of the heat generated must be expended in maintaining a draught in the flue, which is to carry off the products of combustion. This is by no means unprofitably lost since it promotes ventilation as well.

4. To minimise this proportion of escaping heat to as nearly as possible what is just necessary, and to take toll from it during its passage, as by warming the air which is to replace that abstracted by the flue, is the principal direction which efforts to economise fuel should take.

5. The products of combustion, being noxious, must be wholly removed, unless they can be chemically transformed. It is as barbarous to allow the fumes from gas to invade rooms, as it is to let the door be the sole outlet for peat smoke in an Irish cabin, or as it was to provide only louvres in the roofs of the halls of our forefathers for the smoke of their wood fires. The evil may be disguised, but the poison is the more insidious from being comparatively unfelt. The lungs of the living animals, as the leather of dead ones on the book-shelves, become corroded alike by their pernicious influence.

6. Warming and ventilation are so intimately connected that, although the latter is not my special subject upon this occasion, it is necessary that it should be kept in mind throughout, while treating of the former. In fact, infusing heated air is a more economical and pleasanter mode of warming houses than direct radiation, and it is only by their capability of combining the two methods that open fires can maintain ascendancy over stoves, and it is only by uniting proper ventilation with stoves that they ought to be tolerated.

Lastly, all appliances should be simple and as self-acting as possible. This is essential for those intended for the use of the poor, whose treatment of them is of the roughest, and who neither need nor understand anything complicated. If there be a damper to be drawn, or a handle to be turned by them, neither will be drawn or turned except occasionally the wrong way, and if there be any cover or part that is loose, it is safe to be lost. At the risk, therefore, of some waste, their scanty fuel must be consumed in the most primitive manner possible. With somewhat less force the same caution may be given to those who design apparatus for the upper classes. Everything even for them should be as self-acting as possible, for though individuals may for a time take a fancy to an ingenious arrangement that requires personal adjustment, they tire of it in time; servants in their succession are not to be drilled into its use, and the thing is soon left to itself, and failure is the inevitable result.

To proceed to the several appliances themselves.

In the race to attain economy it must be acknowledged at the outset that close stoves completely distance open grates, and that they in their turn are as far ahead of all gas-apparatus as at present invented; and yet all have some advantages as well as disadvantages peculiar to themselves, to which it is worth giving some consideration.

In stores the heat from fuel can be almost wholly extracted and utilised, and even the little that escapes with the gaseous products of combustion is heavily taxed when its ultimate exit is by the few insignificant pipes, or diminutive

chimney-stalks, which alone are suffered to peep above the roofs of houses on the Continent. English ideas of comfort will not, however, permit of the general introduction of the stove system into this country, and it is hardly to be desired that it should, unless great improvement be grafted upon that in vogue abroad, in which stiffness is ever an accompaniment of warmth.

Our British privilege, however, of being able to poke the fire, although purchased dearly by its concomitant dust and the labour it entails upon servants, is not likely soon to be relinquished, and the luxury of an open fire is a fact which no theory can demolish.

Still, the grates in common use savour of barbarism, and much can and should be done to gain further refinement, economy, and immunity from nuisance. There is no need, for instance, that our roofs should be disfigured by the ugly and even comical flue terminals which Dickens satirised in one of his latest Christmas publications. We ought not to be subject to vexatious down-draughts in windy weather, nor to chimneys that smoke unless a door or window be open. Our drawing-rooms should not be invaded by sooty chimney-sweepers, and all ought not to have to scramble for a place near the fire in a room to be warm, nor when there to have to rotate like a smoke-jack to prevent being frozen on one side while we are scorched on the other.

Such evils are to be obviated by simple means, and yet ninety-nine out of every hundred Englishmen submit to them slyly if not patiently. Whole streets, occupied by men of means, have their skyline fringed with demon-like excrescences which tell a sure tale of internal discomfort. Such was the case with that in which my own residence is situated. When I took my house upon lease, though it had been well built by an eminent architect for his own use, yet, in common with all its neighbours, it displayed a grim array of tall-boys and tortuous contrivances as chimney terminals. All these I swept away at once, without inquiry, feeling that whatever might be needed, they certainly could not be. I then introduced an air-pipe to each fireplace through the floors, and, as I expected, found no smoky chimneys to complain of, though my neighbours still grumble at theirs, as I do of their futile and unsightly expedients to remedy them.

So much depends upon the proper construction of fireplaces and their flues, without which no appliance in the shape of a grate can have fair play, that I shall in the first place describe the points to be attended to in the erection of these portions of a building, and in palliating evils in those which already exist.

The first essential to ensure a good draught is that the flue should be sufficiently raftered. For this purpose it is desirable that it should not be in an outer wall; but if it be necessarily so, the enclosing wall should be thick (at least 9 in. between the flue and the outer air) or else it should be protected by a double casing, with intermediate hollow space. Materials which absorb damp should be avoided for the construction, as they tend to the evaporation and loss of the heat generated; and the interior of the flue should be well pargetted, to further prevent the suction of external cold by the up-draught within. Another important point is that the flue be not too large, or currents of cold air descending will interfere with the ascending heated air. In old buildings flues are found of large size,—as 18 in. by 12 in.,—with wide throats, funnel-shaped, diminishing upwards. But the fuel used in them was wood, and abundant, and men were more hardy, and minded not the roaring of wind in the chimney, or cowered over the embers within the vast entrance of the fireplace, which formed an inner room of itself. There are those who would revive these large flues, on the ground that no cowl decorates their terminals. If, however, we are to recur to the practice of our ancestors, we might as well revert to that of a still earlier age, when the stately hall of Penshurst had its fire upon a hearth in the centre, and the graceful wreaths of smoke thence found exit by the lantern in the roof. We must needs then have the same goodly legs as fuel, and a supply which will enable us to afford the blaze that alone would suffice to rarify a cavern. The ordinary coal-fires of our apartments do not need a larger flue than a pipe of 9 in. in diameter. Mr. Richardson, in his work, states that the houses built by Cunit in Belgavia have flues 9 in. by 9 in. only, while others erected later have them 14 in. by 9 in., and that these are distinguishable outside by the absence or presence of

* See p. 657, ante.

* From a paper by Mr. John P. Seddon, read at the National Health Society, December 5th.

objectionable cowls respectively. Kitchen-flues must be larger, in proportion to their fires, or better, perhaps, doubled,—a practice for which old precedents may be found, and which seems calculated to avoid down-draughts.

For the avoidance of that particular nuisance, however, special provision should be made in every flue. This may be done by an enlarged space, wherein the force of gusts of wind may expend themselves upon, as if were, a cushion of air. If the first pipe above the chimney-mantel be a 9-inch pipe, let the next be a 15-inch one, and the flue above continued with 9-inch ones, and a somewhat similar arrangement has been proposed by Mr. Boyd for brick flues. He disconnects the vertical flue a few feet above the mantel with an enlarged space or pocket, and carries an inclined one from the fire-place into this on one side, and the down-draught thus meeting resistance at the bottom, eddies round the space, without being able to check the upward draught from below. Mr. Cubitt's continuation of the flue to the basement also obviously affords a resisting column of air to effect the same purpose. It may be impossible to make such cavities large enough to overcome the effect of every down-draught, but these provisions against them will generally effect this desired end if combined with ample provision of air to the fireplace.

The use of pipes for the lining of flues has the advantage of compelling a good and non-porous finish, which would otherwise be neglected by careless workmen, who often will not take the trouble to properly parge and core the flues in stone and brick walls. The interior of the pipes, however, should be rough, and by no means glazed, or their inability to give any means of adherence to soot will be found a nuisance, in consequence of its continual dropping. The old funnel-shaped throat left a large space above the grate filled with cold air, which checked the draught. This depends much upon the grate itself; but, generally speaking, the flue should be contracted to its smallest size as soon as possible above the mantel. Iron frames for this purpose, serving as mantel-bars as well, such as Gibbs's registered fireplace-lintel, are useful appliances. A concrete block may be made of the shape required at perhaps the least cost.

The construction of the fireplace itself is of the most importance. The contraction of the flue immediately over it is the first point to be looked to, and next the provision of a proper supply of air for the combustion of the fuel. To illustrate this in the simplest manner, I may refer to a small room with a large fireplace in it, belonging to a friend, which was complained of as simply uninhabitable by reason of the draughts that invaded it from all sides. A piece of iron pipe, with lower end protruded through the outer wall, the middle brought through the fire, and the upper end open to the room, stopped all cause for complaint. The reason for this is so obvious that it seems hardly credible that a vast majority of dwellers in houses are enduring continual torture for want of this pipe or some equivalent simple appliance. One looks in vain along the walls of our streets for any signs of air-hicks or other inlets of air, and, with closed doors and plate-glass windows, one wonders where the air comes from to feed the fires within. There are but few available sources, which are these: 1. The joints of the window-frames and chinks round doors, through which cold blasts whistle as they are sucked in, so that these are pasted up, and as far as possible this means of supply intercepted. 2. Unused flues of other rooms down which air pours mixed with smoke; and 3. The soil and waste pipes, the water in the taps of which cannot hinder the precious element from coming even by such undesirable channels, in obedience to the powerful suction of the several fires in the house. These failing, there are positively no other sources. Then, fortunately, the fires begin to smoke, and doors and windows are perforce opened to abate that by far the smallest and least dangerous nuisance of the whole.

The remedy for this is to provide a sufficiently ample supply of pure fresh air in such a manner that it may come in moderately warm, and from such quarter that it be felt as a draught. There are several means of doing this, each holily maintained by its partisans to be the only fit and proper one. The bottom, the centre, and the top of the room are each pointed out as being specially adapted for the purpose by those much-enduring laws of nature, and the course of the currents of air demonstrated by flights of the most obedient and flexible arrows. This cer-

tainly may be taken for granted: if openings be made in any or all of the positions indicated, the laws of nature will make a beneficial use of them, but it will be capriciously, one moment as an inlet and one as outlet, as the occasion may need. The fire being the motive power of the currents, the direction that the air will take if it can will be in a straight line to the fireplace, and therefore, to obviate disagreeable draughts, the air-inlets must not be placed so that currents thence must necessarily impinge upon the inmates of the room, as in the case of the undesigned ones of the chinks round the doors and windows. Again, they should not be so near and below the grate as to rush direct to feed the fire, and thus not only not aid to ventilate the room, but absolutely take from the fire that valuable office. By far the best mode, in my opinion, is to introduce the air below the hearth and carry it thence through warming-chambers at the back or sides of the grate, and allow it to issue into the room above the fireplace, or from the outer sides from the chimney-piece, so that it must ascend and mix with the air in the room before it finds its ultimate exit by the fireplace or outlet-flue. In fact, the fireplace itself should be the fountain of warmed fresh air to an apartment, since no draught thence can be annoying to any of the inmates of the room. The air may be brought, according to its position upon different floors, from below, by air-bricks inserted in the walls between the joists, or from above the roof by a flue constructed for the purpose; and if this flue be carried in close connexion with the chimney-flue, whether in the use of Boyd's metal tubes or ordinary brick, the air drawn down by the suction of the fire will have the temperature considerably raised above that of the outer atmosphere, the coldness of which, entering by windows, is unendurable.

WEYMOUTH SEWERAGE.

WITH reference to the letter from "Twelve Ratepayers of Weymouth" printed in our last week's issue, we have made some inquiries, the result of which we will briefly state. The plans, sections, estimates, and details, prepared by Sir John Cooke, were adopted by the Corporation of Weymouth, who, we suppose, represent the ratepayers. These plans and details were submitted to the Government Board in London, and were minutely examined by its engineer, who reported upon them, recommending the required sanction.

The scheme provides for more than sewerage, as the dam across the backwater is to prevent the continuance of a large area of stagnant, and, at times, putrid water. The "strainers" spoken of would, we suspect, be worse than useless.

A local inquiry was not necessary, legally. The sanction to borrow was obtained before the passing of the Public Health (1872) Act.

The Government may, under this Act, lend money for as low as 3½ per cent, and may also, in certain cases, spread repayment over sixty years. This may, it appears, however, did not at the time apply to Weymouth.

Sir John Cooke's connexion with the Admiralty had nothing to do with the case. The Corporation seem to have acted legally throughout, and have apparently done all for the best as affects the ratepayers. The prosperity of Weymouth depends upon its sanitary condition. We know personally what this condition has been, and are disposed to believe that the completion of Sir John Cooke's works will add 20 per cent. to the value of house and town property in Weymouth.

THE DRAINAGE OF OXFORD.

Sir,—The paragraphs which have appeared in the newspapers respecting the drainage of Oxford are calculated to mislead. It is stated that "men are excavating for sewers in different parts of the city." This has given many persons the idea that the works have commenced. Such is not, however, the case, and the only excavation has been a few holes, to ascertain the condition and level of some of the existing sewers. It is also said that "an advertisement has been issued, announcing that the Oxford Local Board propose to apply to Parliament next session, for power to purchase lands for the construction of the Main Drainage works, and the purchase of land, for the purpose of a pumping station and irrigation works."

Now, the advertisement is to the effect that

application will be made to the Local Government Board (not to Parliament) for powers to purchase a site for pumping station, and irrigation lands recommended in the report by Mr. Bailey Denton, to which you have alluded, and not for the construction of the drainage works proper, powers to proceed with which the Board already possess, and the working drawings for the first contract are in course of preparation in my office at the present time.

Oxford Local Board. WM. HENRY WHITE.

BUILDERS' CLERKS' BENEVOLENT INSTITUTION.

A GENERAL meeting of the subscribers was held at the office, 27, Farringdon-street, on the 26th ult., for the purpose of electing one pensioner on the relief fund. This election had created much interest, on account of one candidate (the widow of a former pensioner) coming up for the second time, having been unsuccessful at the last election; and the other candidate being the widow of one of the most active promoters and supporters of the Institution, great exertions having been used on her behalf to obtain sufficient votes to ensure her election.

The scrutineers were Messrs. Arthur Cates, Matthew Hall, and Thomas Stirling, and the result of the poll was for Mrs. Jefferys, 424 votes; for Mrs. Spencer, 361 votes.

Mr. Arthur Cates, in declaring the result of the poll, stated that this election was remarkable, as showing the benefit arising to widows' clerks from being subscribers to the Institution, as Mrs. Jefferys was elected by the exact number of votes to which she was entitled, on account of the subscription her clerk had paid. Had he not been a subscriber, there would have been a tie, as the voting stood.

Rule 4, section 5, referred to by Mr. Cates, states, "That should any deceased builder's clerk or his widow having been a subscriber, become a candidate, he or she shall be entitled to ten votes for each guinea subscribed for all elections at which he or she shall be a candidate." Had Mr. Jefferys not been such an active promoter of the Institution, he would have been comparatively unknown to the members of the committee and chief supporters of the Institution, who would not, therefore, have made such exertions to get his widow elected; and as Mrs. Spencer brought forward 177 votes from the last election, there is every probability that she would in that case have been elected by a large majority. Fortunately, by the rules of the Institution, Mrs. Spencer retains one-half of her husband's pension, to which she has been entitled since her husband's decease. There are eight pensioners now on the list.

STEAM LAUNDRY.

SOME extensive premises have just been completed in Carlton-road, Peckham, for Mr. James Hayes, of Thornford-road, Lewisham Park. They consist of sorting-rooms, boiling-house, mangle and calendering room, ironing-room, stove-room with stone floor, chimney-shaft, boiler and engine house. Stalling is provided for four horses, with harness-room and loft, and living-rooms over. A large tank to hold 4,000 gallons is formed over the boiler-house, carried on brick arches and iron girders. There is also a well with a plentiful supply of water, and a lift in the main building. The upper floor of the latter is arranged to serve as a drying-room in wet weather, the surplus heat from the stove-room being utilised for this purpose. The plans and specification were prepared by Mr. H. Staines, of Lewisham, and the work, including a dwelling-house adjoining, has been carried out by Messrs. Staines & Son, of Great St. Helen's.

THE REGULATION OF COMPETITIONS.

Sir,—The recent lamentable instances of public competitions, offered under conditions of the most humiliating character, would seem, more than ever, to call for interference on the part of the Institute, or for some decided action by the Conference committee who draughted the "Regulations" agreed to in June last. There were, as may be readily understood, no meetings of our committee during the autumn; but your readers may like to know that the first meeting was held a few days ago, when several resolutions were passed, which, having now obtained the sanction of the Council of the Institute, we are about to put into immediate execution.

We propose to send copies of the "Regulations" not only to those promoters of competitions whose advertisements may appear in the professional press, but also to those of whom we know beforehand that they intend to issue such invitations; and it is here that we ask the cordial co-operation of all who have an improvement of the present state of things at heart. Architects, therefore, who may know of the intention of any committee or promoter to ask for designs in

public competition, will do much good and will greatly assist the cause we all have at heart, by forwarding the names and addresses of such promoters to the secretary of the Institute, 9, Conduit-street, in order that copies of the "Regulations" may be forwarded to them before their instructions are finally decided upon. We are persuaded that promoters err in this matter not intentionally, but from want of knowledge of what, in the opinion of architects, constitutes a fair competition. If, after they have received such information as will enable them to draw up instructions and conditions in accordance with the dignity and just claims of the profession, promoters should issue such advertisements as have appeared of late, architects will doubtless know how to abstain from responding to their kind invitations. ALFRED STRONG, Hon. Sec. of the Conference Committee on Competitions.

AN OBJECTION TO SLAG.

IRON SLAG ROADWAY.

DR. LANKESTER, in his report to the St. James's, Westminster, Vestry, says:—"I have received a letter from Mr. Jennings, of Tichborne-street, complaining of a smell which I have no doubt arises from the slag used to pave the road. This substance evidently contains phosphates and sulphates which, slowly decomposing, give out phosphoreted and sulphureted gases suggestive of sewer contamination." The surveyor (Mr. Howell), on the same subject, says that Tichborne-street was coated with iron slag;—"and whether the material was defective, or the weather unfavourable, or there was want of skill on our part, I should not like too hastily to decide; but I certainly should not recommend a repetition of the experiment in the present state of our information on the subject. In addition to rapid traffic, as exists in St. James's, some kind of chemical action was set up. This produced a most offensive and oppressive odour, perhaps not dangerous, but most unpleasant. I feel bound to state that this is truly due to the slag, as it never existed before and is very nearly gone now, as is also the slag. The two disappearing together is decidedly suggestive that there was a close connexion between the two, so that, without wishing to throw any discredit on the material, it is certainly unfit or not calculated to be useful here."

SOUND.

SIR,—I feel unable to altogether agree with the remarks of "J. K. C.," in page 930, upon this subject. I can easily imagine that "cockle-shells" or "broken crockery" can be of little value; but if, instead of them, the battens between the joists be covered 1 in. thick with "deafening," made up of sand with a little lime in it,—simply coarse plaster,—then I consider that said plaster deafening does help to keep back the sound. A great improvement I think could however be made if, before the flooring were laid down, the tops of all the joists were covered with long strips of thick woollen cloth, indiarubber, or kamptulion. This being done, a non-conductor would thereby be placed between the flooring and the joists, which would prevent the easy passage of the sound from the one to the other, while between the flooring and the ceiling below we would have the "deafening" and two air-spaces. B.

I can entirely corroborate what "J. K. C." says on the subject of sound. I am living in a house built with walls 22 in. thick, and with floors of the most substantial character, and the joists well pugged. Notwithstanding, the slightest sound above is readily heard in the rooms below, and the only remedy seems to be some very thick covering for the floors above. C. H. B. H.

SCHOOL BOARDS.

Leicester.—The Board met to receive and consider a report from the architects' committee as to the plans for the school in Slater-street, and the elevation of the school in Oxford-street. Ipswich.—Mr. Smith requested to be allowed to correct mistakes in his tenders which were accepted for the California and St. Clement's infant schools. The desks and boundary walls had been omitted from the tenders for the St. Clement's school buildings. There would be 104l. 10s. increase on the 582l. 9s.; making the whole 686l. 19s. He could not carry out the contract without serious loss, but could reduce the total to 675l. As to the California school, he said he was entirely out of court: an item of 443l. ought to have been doubled, increasing his tender to 1,103l. The next lowest tender, that of Mr. Cunliff, for 680l., was then accepted for St. Clement's schools; and Mr. Luff's, of 993l. 16s. 6d., for California schools was accepted.

Bradford.—The Works and General Purposes Committee reported that the committee had decided to recommend to the Board that the tender of Messrs. Wilson & Sons, for the erection of schools at Barker-end, at a cost of 12,300l., should be accepted, and that Messrs. Duggan and Coates be dismissed. Mr. Neill then moved that the Board accept the tender of Messrs. Wilson & Sons, but an amendment, referring the tenders back to the committee for revision, was carried.

STOCKTON EXCHANGE BUILDINGS COMPETITION.

In July last the directors of the Stock Exchange Company publicly advertised for designs, but eventually the competition was limited to local architects. About eight sets of drawings were submitted, from which three were chosen, bearing, respectively the mottoes "Nota Bene," "Art and Commerce," and "Practice." In consequence of a lack of funds, none of these designs could be carried out, and the authors thereof were invited to prepare other plans in competition to suit a reduced site. Messrs. Alexander & Henman and Mr. C. J. Adams responded to the call, and the result is that Messrs. Alexander & Henman, of Stockton and Middlesbrough, have been appointed to carry out the buildings, while a premium of 50l. has been awarded to Mr. C. J. Adams.

The selected design comprises an Exchange Hall, which can also be used for public meetings and entertainments, and is capable of comfortably seating 1,700 persons, retiring-room and cloak-rooms being provided,—twenty-two business offices and a club with reading, billiard, letter-writing, [coffee, and smoking rooms, kitchen, &c. The site is a long and somewhat narrow one, with an entrance to the High-street, of only 14 ft. According to the original scheme, the frontage was to have been about 68 ft., and consequently allowed of a much more imposing facade to the High-street.

The cost of the buildings is to be 9,000l., and it is expected that they will be commenced forthwith.

HARLEPOOL'S EXCHANGE AND CLUB-HOUSE COMPETITION.

SIR,—I observe a letter on the above subject, signed, "Looker On," in last week's *Builder*, which contains several misstatements.

In the first place, it is not correct that the design bearing the motto "Veritas" is by Mr. G. G. Hoskins, of Darlington. That selected for the first premium bears the motto "On Change," and is by Mr. Hoskins. Neither is it true that "sundry alterations" have been made in the designs or estimates. The building will be carried out precisely as at first designed, except that some of the offices, which were laid out in large blocks, may, if thought proper, be divided into sets of two; and to provide for this an additional tender was obtained from Messrs. Robson & Son, of Darlington, the contractors for the whole of the works. There is no lack of funds for carrying out the work, nor is it true that "the plan for the Exchange buildings was thought to be inferior to that submitted by one of the other premiated architects." I can safely say that it was the general opinion of the directors of the Exchange Committee (not one of whom I believe, was personally acquainted with Mr. Hoskins) that the design bearing the motto "On Change" was in all respects the best, and consequently it was selected for the first premium.

I may here state that, as I have been consulted by the directors, from time to time, on several matters connected with the undertaking, and having also an interest in the same, I feel called upon to reply to the letter of "Looker On." CHAS. T. CASEBOURNE, C.E.

DECISIONS UNDER THE METROPOLITAN BUILDING ACT.

"NECESSARY REPAIRS."

MESSRS. PHILLIPS & SON, builders, appeared, on the 16th ult., at Marylebone Police Court, before Mr. Mansfield, to answer a summons obtained by Mr. J. Jennings, district surveyor of South Marylebone, for irregularity in raising certain walls without constructing the same of brick, stone, or other hard and incombustible material, contrary to rule 1, schedule 1, of the said Act.

Evidence was given to the effect that the builders had been engaged in executing extensive repairs to No. 10, Henrietta-street, Cavendish-square, and in course of these operations it was found that certain bay-windows projecting from the face of the external walls, extending from the first-floor level to the ceiling of the second-floor, and constructed of wooden framing, covered with lath and plaster (described in the summons as being) had become very much out of repair, and the surveyor under whose superintendence the works were being carried out, considered it expedient to relieve the substructures of the bays of so much of the weight of their roofs as possible, and with that object substituted framed heads, 15 in. deep, in place of the original solid heads. The district surveyor sought to prove that this was a raising within the meaning of the Act; whereas it was contended that

* A deceptive account of this decision was sent to us by one who ought to have known better.

new heads were only a necessary repair to an old building, and consequently not within the operation of the said Act.

The magistrate decided that this was only a necessary repair, to which the rules of the Act did not apply. Notice of appeal was given.

RAILWAY ARCHES.

Mr. Rendell was summoned to the Wandsworth Police Court by Mr. Jennings, Jun., district surveyor of part of Battersea, for not having given him notice of a building, as required by the Act.

Mr. Jennings said it was an irregular building, composed of wood, which had been erected under a railway arch in the Queen's-road, Battersea. He read a letter from the defendant, who expressed surprise at the interference of the surveyor, when there were so many thousand railway-arches covered in with wood.

Mr. Brewer (Baxter, Ross, & Norton), who appeared for the defendant, argued that it was not a building, as the real building was a railway, which was among the exceptions in the Act. He said it was a case of great importance to the Brighton Railway Company, as they derived a revenue of about 7,000l. a year from the letting of their arches. The defendant was their tenant, who had fitted up the arch in the way described. What he had erected was a mere fitting in the arch, and not a building. He then read a case in point which was decided in the Court of Queen's Bench in 1858, the South-Eastern Railway Company having let one of the arches of the North Kent line for a stable, the judges ruling that it was not a building.

Mr. Jennings said the two cases were not exactly the same.

Mr. Ingham said in the face of that decision he could not convict. He adjourned the summons, to give the district surveyor an opportunity of consulting the Metropolitan Board of Works as to whether they would take a case.

A BERMONDSEY CURIOSITY.

SIR,—There is in the parish of Bermondsey a small street, which bears the name of *West-street, North, South, East*; the parish authorities having supplied the "West" and "North," and the Postmaster-General having kindly added the "South" and "East." It is a very useful little thoroughfare leading from Jamaica-road by a short cut to Spa-road; that is, its main line,—about fifteen houses,—does this. But the street has this second singularity (I hope that "second singularity" is not a bull): it is not eminent with running a straight course; but at about the middle of that straight course it strikes off at right angles a longish spur, so that the street altogether forms a figure something like an irregularly-shaped capital T. But it has lately acquired this third singularity, it is now an "eminently" muddy street, even for Bermondsey, the mud in it being very high. Can it be possible that the root of mud is middle? PED.

POWERS OF BOARDS OF WORKS.

THE case *Chippenden and Others v. The Metropolitan Board of Works* raised a question of considerable importance as to the exercise of the very stringent powers given to local boards, as to their control over the erection of new buildings and the right of parties to compensation. A full report of the judgments delivered will be found in the *Times* of Nov. 30.

McCandlish v. The Board of Works for the Lewisham District, tried before Vice-Chancellor Sir J. Wickens, [Nov. 26, concerns the laying-out of streets and the right of hoards to compel the setting back of buildings. A report will be found in the *Metropolitan* of Nov. 30.

FIRE-PROOF CONSTRUCTION.

RECENT events render this subject more interesting than ever. Mr. Lewis Hornblower, of Liverpool, in a recent circular as to his new system, to which we have before alluded, says—"The disastrous fire at Chicago [to which may already be added that of Boston,—not to speak of the late fire in Thames-street], and the numerous extensive conflagrations in this country, add to the pressing importance of the subject of fireproof construction. . . . After many experiments, Mr. Hornblower tried a combination of sheet iron, fire-clay hollow tubes, and Portland cement concrete. The sheet iron and fire-clay tubes formed, as it were, the skeleton to the structure, while the concrete acted like the tendons and muscles of the human frame, knitting the whole together in a firm and homogeneous mass. Experiments were made, and the result proved a decided success. The hollow tubes forming the framework of the floor also solved the question of ventilation. The space taken up by the floor is not greater than that of ordinary joists and boards,—in fact, only 9 in. The same principle of construction is applied to walls, roofs, and partitions. Staircases can also be readily formed by this combination of mate-

rial. The question of cheap, warm, and strongly-built cottages is thus set at rest, for this invention is applicable to all classes of building."

CHURCH-BUILDING NEWS.

Purton.—The church here has been restored and reopened for divine service. Mr. Butterfield was the architect employed, and Mr. J. Phillips, builder, Swindon, gave in a tender which was accepted. The interior of the church was in a manner completely blocked up with woodwork—galleries, organ-loft, &c., and the pews were in the old horse-box style. The pulpit, in an awkward position, was an old three-decker, the seat for the clerk, the reading-desk, and the pulpit, being one over another. The roof, flooring, vestry, &c., were also in a very unsatisfactory state. The flooring has been completely replaced with the modern church tile, and the roof of the nave cleaned of the plaster which disfigured it, bringing out the timbers. The walls have been cleaned, discovering traces of wall-paintings and inscriptions in ancient characters. The arches from four of the pillars are being picked out in colours,—restored to their original decorated style. The chancel has been renovated, the windows cleaned out, two niches—one on each side of the communion-table—restored, and the old picture of the Last Supper placed in another position. From the chancel, on the northern side, a small low door formerly led into a kind of chapel; this has been walled up, and another entrance opened from the north aisle, with a carved oak screen. This will now constitute the vestry-room. The roof of this apartment has been lowered, and restored to its original state. The northern window was blocked and barred up in an extraordinary way. Seventy pounds weight of lead were removed from it, and it has been conjectured that the place was at one time or another used as a dungeon. In the corner of the wall nearest the communion-table, the workmen found a skeleton, which was examined by Mr. Sadler, and pronounced as the bones of a female. Two heads, one of a warrior and the other of a priest, are placed one on each side of the screen. The old vestry-room was over the southern porch, and very cramped in space. The organ is now placed near the chancel, on the south side of the church; and the pulpit, a new oak structure, a little lower down on the same side. The old pews are entirely swept away, and replaced by the low modern oak benches. Externally, the steeple has been repaired, and the ground lowered round the church. This church is remarkable for having a steeple and tower—the steeple at the east end, and the tower at the west. The village tradition is that the church was erected through the gifts of two old women, one of whom wanted a steeple, and the other a tower: so, as they could not agree, they each built what they fancied.

Horncastle.—The church of High Tornton, near Horncastle, has been rebuilt by Mr. R. Young, of Lincoln, from the designs of Mr. E. Christian, of London, for about 880l. It consists of nave, 43 ft. by 20 ft.; chancel, 16 ft. 9 in. by 16 ft. 10 in.; small vestry on the north side; and a tower, with octagonal belfry and slated spire, at the south-west corner, the lower floor of the tower forming a porch. The roofs are covered with Cornish slates and red ornamental ridge-tiles; the timbers are stained and varnished, the spaces between the rafters and the wall-surface to the interior being plastered. The inside apertures have quoins, sills, and arches, which, with the outside dressings, are of Ancaster stone. The walls are of the local green sandstone, hammer-dressed. The pulpit, reading-desk, lectern, altar-rail, and doors are of oak; the latter hung with wrought-iron foliated hinges. The floors of the sittings are boarded with oak joists and sills. Accommodation is provided for 100 occupants on comfortable open benches. The standards of the altar-rail are by Skidmore; the chancel floors by Maw & Co.; the alley and porch are paved with blue and red tiles. The late church was erected in 1772, and during its demolition some ancient masonry was discovered, suggestive of two previous churches on the same site, and probably on the same foundations. It consisted of fragments of Early English windows in Ancaster stone, with relics of very early Norman work. The existing foundations are now used again, for apparently the fourth time. A sufficient number of these old stones were used for the inner arch of the vestry window, and for a discharging arch over the south doorway. Messrs. Clayton & Bell have

designed a memorial light of stained glass in the south-east window of the nave, at the cost of the vicar, and have some in hand for the west window, to be presented by Mr. John Maddison and friends.

Arthingworth (Northampton).—St. Andrew's Church, Arthingworth, was reopened on the 6th November, by the Bishop of Peterborough, after its restoration and partial rebuilding, which have been carried out almost entirely at the expense of the rector, the Rev. H. R. Rokeby, of Arthingworth Manor, by Mr. James K. Colling, of London, architect, and Mr. Robinson Cornish, of North Walsham, Norfolk, builder. Unlike most of the old churches which have been handed down to us, the stones of the walls of this church were found to have been put together with nothing but mud,—clay and mortar—having no cementing qualities whatever. This discovery necessarily made the restoration somewhat more extensive than was originally contemplated. The nave, piers, and arches, south aisle and the south porch were found to be in a very insecure condition, and had to be almost entirely taken down, and new portions, in many cases, supplied the places of the old; although, wherever it was possible, the old work was simply cleaned and re-erected. A new oak roof, of steep pitch, has been put over the nave; the curved ribs spring from carved stone corbels, containing birds, foliage, and fruit. It is covered externally with Whitland Abbey green slates, having ornamentally cut bands at intervals. The east end of the chancel, which had no architectural character whatever, has been removed, and the new work erected in the position of the original foundations of the chancel, which were found 7 ft. or 8 ft. beyond the wall, taken down. The east window has been made of three lights, with geometrical tracery; and three new side windows (two on the north side and one on the south), and a chancel doorway on the north side have been added. The chancel is covered with a new roof, of the same pitch as the roof of the nave, having a ceiling of polygonal form, divided into panels by oak moulded ribs, with carved bosses at the intersections. The nave and aisle have been rescaued with oak open benches, with carved hench-ends, having foliage conventionalised from nature, consisting of the oak, hawthorn, maple, holly, trefoil, ivy, and rose, besides many other varieties. The reredos is of Caen stone. It consists of an arcade of five arches, enriched by the half-dog, supported on Devonshire marble shafts, having carved stone caps; the spandrels between the arches containing carved designs of the wheat and vine, the passion-flower, and lily. The east window has been filled with stained glass, the subject of which is the Crucifixion, executed by Messrs. Heaton, Butler, & Bayne. The church is heated by one of Porritt's underground stoves. The total cost is somewhere about 2,000l. In the evening of the day of opening, the workmen who had been engaged upon the work of the church were entertained at a dinner given by the rector, who complimented them on the quiet and orderly manner in which each had gone about his work.

VARIORUM.

SPEAKING OF JAPANESE AND CHINESE ARTS, the *Art-Journal* says,—The Japanese are a highly progressive race. From their intercourse with China they have learned much. If they have imparted little in return, the fault lies not in them, but the natives of the flowery land. The insular people have shown a wonderful power of adapting themselves to circumstances. From the Chinese they have learned to make paper, and to prepare tea. Nor have they been content with learning alone. They actually import ceramic articles from China to adorn with their own inimitable lacquer. They study the latest improvements of Europe, instead of at once despising and fearing the "foreign devils." A European official once presented to the Japanese minister a beautifully-finished rifle. His Excellency received it with courtesy, and examined it with care; but quietly remarked that he was of opinion the needle-gun was the weapon of the future! No wonder that such a people, alone among Orientals, readily attempt to intersect their islands by railways.—"Little Kate Kirby," the serial story going on in *Cassell's Magazine*, increases in interest, and is creditable to its author, Mr. F. W. Robinson.—"On the Physical Characteristics of the Missouri River and the Means used for Directing and Controlling its Channel at St. Joseph, Mo. By E.

D. Mason. Printed by St. Joseph Printing Company, 1872." This is a reprint from the local *Railroad Gazette*, of October 5th, 1872, of a paper read before the Civil Engineers' Club of the North West, September 10th, 1872. It shows what can be done in controlling a great river. "The problem was to stop the river where it was, at St. Joseph, and drive it 3,000 ft. east, and through the bar and against the clay bank which was its eastern shore ten years ago. Work was begun for this purpose in October last [1871], and by the 1st of August following all of our objects were accomplished." To give protection to the west approach to the bridge now building over the river, and to insure the passage of the channel of the river through the draw at all times, were the ends to be gained; and the works consisted of dykes and shore protection. The river had theretofore wandered at will over a channel sometimes two miles wide, and often three or four, and there was a fear of its leaving St. Joseph inland altogether.

Miscellaneous.

The Liverpool Labourers' Dwellings Company's New Buildings.—These buildings are now far advanced towards completion. They are being erected on land purchased by the company at the north-west junction of Ashfield and Latimer streets, were erected a few years ago by the corporation, and cover an area of nearly an acre of ground, consisting of two blocks, comprising in all 132 tenements. The frontage to Ashfield-street is 344 ft.; that to Latimer-street being 110 ft. Of the tenements forty-eight are houses containing a living-room and three bedrooms each, twenty-eight contain a living-room and two bedrooms, and forty-eight a living-room and one bedroom. On the ground-floor, facing Latimer-street, are four shops; and four basements are devoted to baths and washhouses. Each house is supplied with a water-closet. The sizes of the living-rooms range from 12 ft. 10 in. by 12 ft., to 12 ft. 2 in. by 11 ft.; and those of the bedrooms from 14 ft. by 10 ft., to 9 ft. 9 in. by 8 ft.; all rooms being 9 ft. high. The floors of the houses in the basement are all laid with cement, as are also the scullery floors, all the other floors being boarded. The buildings are mostly four stories or flats high. On each flat there is a stone balcony communicating with the staircases. Dust-shoots are provided, one between every couple of entrance-doors. There is an open space, or court-yard, between the two blocks, 270 ft. long and 48 ft. wide. The elevations are of common grey North Shore bricks, with Runcorn stone dressings and cornices, and chimney corbellings of patent red brick. The balconies and staircases are of York stone. The architects are Messrs. H. & A. P. Fry; the contractor is Mr. W. Thornton; and the clerk of works Mr. James Peers. The cost of the buildings will be about 18,000l., exclusive of land. The rents have been fixed at from 4s. to 7s. per week. There is already a large application for the houses.

"Godwinia Gigas."—This extraordinary plant has now been somewhat imperfectly known for nearly four years, having been discovered by the late Dr. Scemann in the Chontale Mountains of Nicaragua, in January, 1869. Though living specimens of the root-stock were at once sent to this country, it has not flowered till the present year; specimens, however, soon threw up their single gigantic leaves, one of which in a London nursery attained the extraordinary dimensions of 13 ft. in length. The flower has been looked for with much interest by botanists, and some two years ago a single plant showed signs of flowering, but owing to the negligence of the gardener, it was allowed to rot off. The flower, which comes up by itself, after the single leaf has entirely died off, was expected at the meeting of the Royal Horticultural Society on Wednesday last, but when the day arrived the bud had not opened. This single unopened bud was, however, shown, growing in a large pot; and the following are the exact dimensions:—Length of stalk, 1 ft. 6 in.; length of flower-bud, 1 ft. 3 in.; circumference, 9 in.

St. Peter's, Cornhill.—Considerable works have been executed here under the direction of Mr. J. Drayton Wyatt, and the church was re-opened by the Bishop of London, on the 1st inst. We will give some particulars hereafter.

Fire and Water.—The *American Artisan* says:—Is it possible to build sure? Can a totally fire-proof building be made? To believe that this is impossible would be greatly to depreciate the mechanical and scientific resources of the age. Nothing can burn till heated to the temperature at which it combines with oxygen; the problem of fire-proofing will then be solved when we discover the means by which the temperature of combustibles can be kept from reaching the temperature of combustion. We can apply the most intense heat to steam-boilers without burning them. Why? Because each atom of water they contain is a swift vehicle to seize upon and carry away heat. Let us make up the partition of walls of building in a manner analogous to sectional steam-boilers, and no fire would be communicated from one building to another. A thing so evidentshould have attracted the attention of architects long before this. In this way, iron, which by itself is not a fire-proofing material, can, by the most economical use of water, be made to withstand the severest ordeal. The iron-enclosed water-spaces need not be more than 1 in. in thickness, and need never be subjected to a hydraulic pressure of more than 3 ft. or 4 ft. head. These walls can, therefore, be made of thin metal. They can be supplied with water from the common water-service or from tanks placed at the tops of buildings. In case of fire, the turning of a single cock would supply them with water, and the temperature of the partitions could never rise above 212° F. till the water had all boiled away. In this way, not a tittle of the water now vainly used to extinguish such fires as those of Chicago and Boston would be needed to preserve a whole city.

Accidents.—By the fall of a mill-floor an accident has occurred at Newton Mills, Huddersfield, which resulted in the death of Mr. Fawcett, joiner and builder, and serious injury to a cotton spinner. A fire had occurred at the mills, and considerable damage was done. Since the firemen have been engaged in removing the rubbish from the garret of the mill on to the floor of the fourth story. Mr. Fawcett went to the mill for the purpose of valuing the premises. He entered the third story, and had not been in the room very long before the floor immediately above gave way with a loud crash from the large quantity of material thrown upon it. Mr. Fawcett was completely buried. A gentleman with him was injured, and Mr. Fawcett was killed. An inquest was held, when the jury found a verdict of "accidental death," and passed a resolution of condolence with the wife and family of the deceased gentleman. Mr. Fawcett was a member of the Huddersfield Town Council.—Four men were working on a scaffold at the new Church schools in Bolton road, Pendlebury. Whilst a piece of timber was being raised from the ground by means of a rope, the scaffolding gave way, and the men were precipitated to the ground, a distance of 15 ft. Two of them escaped unhurt, but the other two were badly injured. One has since died.

The Polytechnic College.—Lord Lytton presided, on Friday in last week, at the distribution of prizes and certificates to the members of the evening classes of this college, which is established in connexion with the Polytechnic Institution, and in union with the Society of Arts, the Science and Art Department at Kensington, and the City of London College. A report, by the Rev. Charles Mackenzie, Prebendary of St. Paul's, and honorary manager of the college, was presented. Mr. Mackenzie stated that the classes had been attended with great success, and that 115 certificates had been awarded by the three institutions with which the college was connected. Those of the students who had particularly distinguished themselves would receive books which had been chosen by the young men and women themselves. Lord Lytton distributed the prizes and certificates.

Institution of Surveyors.—At the ordinary general meeting, held on Monday, November 25th, a paper was read by Mr. Arundel Rogers, entitled "Minerals and Minerals." A vote of thanks was unanimously given to the author of the paper, and the discussion was adjourned. The next meeting will be held on the 9th inst., when a paper will be read by Mr. W. Sturge, entitled, "Statistical Notes on the Prices of Agricultural Produce, Labour, and Rent, from the early part of last century to the present Time, with Remarks on the present Aspect of the Labour Question."

Opening of the Workmen's Hall, Rivenhall.—This hall, which has been recently built through the kindness and liberality of Dr. Dixon, of Dorward's Hall, for the benefit of the working men of Rivenhall, Kelvedon, Braxted, and Witham, has been opened. The hall is situated in the parish of Rivenhall. The hall will be well warmed and lighted; daily and weekly newspapers and magazines, &c., will be placed upon the table; refreshments (minus intoxicating liquors) will be supplied at reasonable prices; smoking will be allowable; and arrangements are also made for bagatelle, chess, draughts, dominoes, &c. There is also a library of about 300 volumes. An excellent pianoforte has been presented by Lady Tite, and Sir W. Tite, M.P., for Bath, has presented a handsome clock, a bagatelle-board, and also a donation of 10l. The books are mostly gifts.

The Anglo-Swedish Steam Cutting Mills Company, Limited.—This new company has been incorporated under the Companies Acts, 1862 and 1867.—It is to have a capital of 200,000 (with power to increase), in 10,000 shares of 2l. each; the share list to be closed on 15th Dec. inst.; 5s. per share to be paid on application, 15s. on allotment, and the balance in two equal instalments of 10s. at three and six months thereafter. The general manager is Mr. Henry Fairman, late of Stockholm, Sweden; and the temporary offices are at 27, Leadenhall-street. The company is formed to manufacture in Sweden, and supply the trade in England with ready-made doors, window frames, mouldings, and other goods used by builders; packing-cases, boxes, and similar goods; firewood and lathwood; and to trade generally in all descriptions of wood.

The Smithfield Club Cattle Show.—On Wednesday evening the arrangements for the Smithfield Club Cattle Show at the Agricultural Hall were finally completed, under the able direction of Mr. Brandreth Gibbs, the energetic hon. secretary of the club, and Mr. Sydney, the manager of the hall. The whole of the space for agricultural implements in the galleries, and for carriages and other domestic and useful articles, will be occupied, and the demands for it were doubtly in excess of the amount of accommodation. On Monday next, the judging-day, the public will be admitted to the galleries, at a sort of private view, till 2 p.m., and then into the body of the hall. The general show will open on Tuesday, and close on the following Friday.

New Masonic Lodge in Leeds.—On Thursday night, the 21st ult., the Fidelity Lodge of Freemasons, 289, inaugurated their new premises erected in Carlton-kill, Woodhouse-lane. The new building has been erected from designs drawn by Mr. Bakewell, of the Fidelity Lodge. On the ground-floor there is a banqueting-room, 34 ft. by 27 ft. 8 in., and 12 ft. high. Adjoining this are the tyler's rooms, communicating with the kitchen, so arranged that the whole of the household is isolated from the Lodge. On the first floor are the instruction and preparing rooms and the Lodge-room. The latter is of large proportions, with open roof; dimensions, 40 ft. by 27 ft. 8 in., and 16 ft. high.

Reduction in the Price of Welsh Iron.—At a meeting of the principal ironmasters of Monmouthshire and South Wales, to consider the present position of the trade, it was unanimously resolved that notices be issued for a reduction of 10 per cent. in the rate of wages. This step has been decided upon in consequence of the scarcity of orders for manufactured iron, it having been found impossible to keep the works going at present prices. The ironmasters also decided upon reducing the price of rails from 30s. to 40s. per ton, or from 10l. 10s. to 8l. 10s. or 9l. This reduction will affect not only the iron-workers, but the colliers employed by the ironmasters.

Poltimore Hall, Exeter.—The new wing and dining-room and other alterations at Poltimore Hall, designed by Mr. Ferrey, F.S.A., of London, and carried out by Messrs. H. & F. Burridge, builders, of Exmouth, are now complete, and Lord Poltimore, as a token of his approval, has presented the foreman (Mr. James Baker) with 5l., also 5s. to each of the workmen, numbering seventy-four. Mr. Lang, the steward of Lord Poltimore, has superintended the work.

The West Ham Local Board of Health have declined to receive any payment from the Government towards the salaries of the medical officer and inspectors of nuisances.

The Antwerp Competition.—The Hon. Sec. for Foreign Correspondence at the Institute of Architects announces that he has received from the Belgian Legation particulars of a competition, inviting designs for a new hospital at Antwerp. Three premiums, viz.,—3,000 francs, 2,000 francs, and 1,000 francs, were offered. The drawings must be sent in before the 1st of May, 1873. A pamphlet containing a plan of the site and the various conditions of the competition has been forwarded to the Institute.

All Hallows Village Hospital, Ditching-ham.—A few days since the roof-raising here was celebrated by a dinner given, through the liberality of the superior of the House of Mercy, to the tradesmen and their workmen, numbering upwards of eighty, employed in erecting this building. The chair was occupied by Mr. John D. Botwright, the contractor for the whole of the work, supported by the several tradesmen associated with him. The architect is Mr. R. J. Withers; the clerk of works, Mr. Laidler, of London.

Cottages at Wincanton.—Sweetman's local *Monthly Illustrated Journal* writes,—“What can we say to the tale told us by the *Builder*? For the sake of God and humanity, let those amongst us who can, do all we can to alleviate the sorrows, and make comfortable the homes of our 'poor brethren.' Is it not possible, when the cottages of the very poorest fall into decay, and are destroyed, to build others in such a way that no loss will fall on the proprietor? If it is not possible, and no one will build and sustain cottages at a loss, what are the poor to do? Can this be an unimportant question to ask?”

Parks.—Mr. Fras. Peek offered to give 7,500l., provided that the governors of Dulwich College would dedicate for the public use 150 acres of their estate, and form and maintain the same as a park. The governors of Dulwich College came to the conclusion that they would not be able, under their Act of Parliament, to apply any portion of their estate as desired. They are ready, however, to work with the vestry in securing the means to obtain a new park for the increasing and populous neighbourhoods of Walworth, Camberwell, and Dulwich.

Society of Engineers.—At the meeting of the society held on Monday evening last, Mr. Jabez Church, president, in the chair, Mr. W. H. Fox read a paper on "Continuous Railway Brakes."

TENDERS

For the erection of schools, Woodpecker-road, Newcross, for the London School Board. Cubic contents of the buildings, 250,000 ft. Mr. F. Warren, architect. Quantities by Mr. W. G. E. Bag.—

Perry, Bros.	£5,777 0 0
High	5,750 0 0
Gerrard	7,200 0 0
Williams & Sons	7,580 0 0
Newman & Mann	7,406 0 0
Corder	7,943 0 0
Marsland & Sons	6,966 0 0
Jerrard	6,989 0 0
Roberts	6,974 0 0
Wicks, Bangs & Co.	6,962 0 0
Hill & Sons	6,950 0 0
Dove, Bros.	6,575 0 0
King & Son	7,115 0 0
Shepherd	6,250 0 0

For the erection of new schools and offices at Hamond-square, Hoxton, for the London School Board. Mr. Robson, architect. Quantities supplied.—

Hill & Sons	£7,280 0 0
King & Son	6,300 0 0
Perry & Co.	6,580 0 0
Perry, Bros.	6,577 0 0
Dove, Bros.	6,475 0 0
High	6,470 0 0
Roberts	6,469 0 0
Brown & Hollinson	6,327 0 0
Pritchard	6,144 0 0

For the erection of a villa residence, warehouse, and other works, near Midland-road, Bedford. Mr. F. T. Mercer, architect. Quantities supplied.—

Richards, sen.	£1,519 10 0
Taylor	1,503 7 0
Potter	1,459 10 0
Carter	1,449 0 0
Wootton	1,375 4 6
Haynes	1,367 5 0
Chisnall	1,277 18 0
Dunkley	1,261 0 0

Accepted for two houses at Hitchin, Herts, for Mr. J. H. Tuke. Mr. J. Shilcock, architect.—

Bricklayer, Slater, Plasterer, and Mason's Work	£329 5 0
Carpenter's Work	
Seymour	254 0 0
Plumber, Glazier, and Painter's Work	
Baker	69 10 0

For additions to the Brewery at Wilderspool, for Messrs. Greenall & Co. Mr. R. Davison, architect. Quantities by Messrs. Curtis & Son:—
 Wright £4,960 0 0
 Gibson & Son 4,830 0 0
 Collin & Son (accepted) 4,359 4 0

For the erection of St. Luke's Parsonage-house and schools, Messrs. Hooper & Lewis, architects. Quantities by Mr. J. W. Forge:—
 Parsonage. Schools.
 Thomas £1,750 0 0 £2,980 0 0
 Warr 1,630 0 0 2,952 0 0
 Robbins 1,650 0 0 2,935 0 0
 Saby & Son 1,600 0 0 2,850 0 0
 Spearling 1,751 0 0 2,783 0 0
 Tibbatts, jun. 1,636 10 0 2,761 0 0
 Haines & Son 1,688 0 0 2,698 0 0
 Stephenson 1,434 0 0 2,543 0 0
 Lewin 1,520 0 0 2,478 0 0
 Mortar 1,470 0 0 2,625 0 0
 Gibson, Bros. 1,431 0 0 2,494 0 0
 W. H. & J. Mansbridge 1,439 0 0 2,454 0 0

For new workhouse, East Preston Union, Mr. G. B. Nichols, architect:—
 Tibbatts, jun. £13,542 2 0
 T. Chappell 12,745 0 0
 Masbridge 12,263 0 0
 Peeries 12,037 0 0
 J. Chappell 11,825 0 0
 Bunby (accepted) 11,640 0 0
 Smith 11,471 0 0
 Snewin 11,440 0 0
 Cook 10,985 16 0

For schools at Belbrook Common, for the London School Board, Mr. B. Champneys, architect:—
 Wood £8,180 0 0
 High 6,162 0 0
 Perry, Bros. 5,908 0 0
 Shepherd 5,473 0 0
 Manley & Rogers 5,940 0 0
 Wicks, Bangs, & Co. 5,860 0 0
 Hill & Sons 5,525 0 0
 Emory 5,329 0 0
 Dove, Bros. 5,775 0 0
 Newmans & Mann 5,686 0 0
 King & Sons 5,518 0 0
 Roberts 5,479 0 0
 Foster 5,433 0 0
 Ashby & Sons 5,400 0 0
 Henshaw & Co. 5,385 0 0

For elementary schools, York-road, Finsbury, for the London School Board, Mr. T. W. Aldwinkle, architect. Quantities supplied by Mr. T. Nixon:—
 Scriveners & White £9,983 0 0
 Colls & Sons 9,890 0 0
 Higg 9,791 0 0
 Bress 9,780 0 0
 Hearle 9,742 0 0
 Sheffield 9,742 0 0
 Browne & Robinson 9,680 0 0
 Carter & Son 9,544 0 0
 Cooks & Green 9,317 0 0
 Cooper 9,340 0 0
 Axford & Wheeler 9,485 0 0
 Peto, Bros. 9,282 0 0
 Mansbridge 9,282 0 0
 Hill & Sons 9,230 0 0
 Langmead & Way 9,150 0 0
 Crockett 9,150 0 0
 Pritchard 8,983 0 0
 Henshaw & Co. 8,975 0 0

For 6 detached residence, to be erected in Portincale-road, Wandsworth, Messrs. Lee, Bros., & Pain, architects. Quantities supplied:—
 Aries £2,175 0 0
 Pain 2,170 0 0
 Thompson 2,075 0 0
 Aries & Co. (accepted) 2,045 0 0

For new rectory-house at Brightwaltham, Berks, for the Rev. H. F. Howard, exclusive of bricks and the materials of the present rectory. Mr. Edwin Dolby, architect:—
 Bryan (accepted) £2,336 0 0

For Welsh chapel, Seven Sisters-road, Holloway, Mr. A. G. Hennell, architect:—
 Stevens £1,841 0 0
 Pritchard 1,630 0 0
 Cooke & Green 1,606 0 0
 Richards 1,609 5 0
 Williams 1,446 0 0
 Heath 1,255 10 0

For additions and alterations to 19, Lawrence-lane, Cheap-side, for Mr. S. Gibbins, Messrs. Gouley & Gibbins, architects:—
 Colls & Sons £400 0 0

For the erection of two houses at Brixton, for Mr. W. Everett, Messrs. Gouley & Gibbins, architects:—
 Rowe & Vernon £1,971 0 0

For alterations and additions to the Prince of Wales Tavern, Denmark-road, Camberwell, Mr. G. Treacher, architect:—
 Biggs (alterations) £814 10 0
 Biggs (fixtures) 168 0 0
 Hurst (pewtering) 53 0 0

For rebuilding the Union Arms Tavern, Union-road, Mr. George Treacher, architect:—
 Knell, sen. (accepted) £1,250 0 0
 Day (fittings, exclusive of glass) 350 0 0

For villa residence at Croydon, for Mr. Styles, Mr. Paice, architect. Quantities supplied:—
 Saunders £1,070 0 0
 West 1,060 0 0
 Randall 980 0 0
 Taylor 970 0 0

For deepening sewer in High-street, Shore-ditch, for the Metropolitan Board of Works:—
 News £7,450 0 0
 Risson & Thompson 7,010 0 0
 Nowell & Robson 6,840 0 0
 Fordham 6,835 0 0
 Wigmore 6,690 0 0
 Chapel 6,500 0 0
 Pearson 6,390 0 0

For completion of three houses on the Clapham Junction Estate, for the Conservative Building Society, Mr. J. Ashdown, architect:—
 Phelps £1,226 14 8
 Spurray 120 0 0
 Wigmore 899 10 0
 Long 892 0 0

For the re-arrangement of the chancel of All Saints Church, Fulham:—
 Taylor £125 0 0
 Dove 119 0 0
 Pitts 89 0 0
 Wigmore 74 10 0
 Jones 73 0 0

TO CORRESPONDENTS.

G. S. Fiening the *Alhambra*, under the title of the Panopticon, was built from the designs of Professor Hayer Lewis. Full particulars will be found in an earlier volume of the *Builder*.—J. M. (no name) writes that the wood frame is if permission to remove has been given by the landlord.—A Reader (we must decline to recommend a stove).—F. M. (ditto).—S. & Co. Lonsdale (letter has been forwarded as requested).—W. P. G.—H. F.—A. G. H.—Miss B.—J. A. F.—C. J. A.—C. E.—R. B.—G.—J. B.—T. P.—Weymouth.—L. A.—R. Y.—C. T. C.—D. B.—J. S.—W. & J. H.—Weymouth.—J. P. of Weymouth.—C. A. K.—J. D. W.—A. W. L.—A. & H.—A. & Co.—E. L.—C. R.—E. D.—H.—T. N.—O.—O. G.—B. N.—G.—O. P.—T.—W. P.—G. S. H. & P.
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At a General Meeting of the subscribers and donors, held at the Office on Tuesday, the 26th inst. for the Election of Officers for the Relief Fund.—Messrs. Arthur Cotes, Matthew Hall, and Thomas Stirling, secretaries.—The following was the result of the Poll.—
Mrs. F. C. Jefferys (elected) votes 124.
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BUILDERS' BENEVOLENT INSTITUTION.

AN ELECTION of FOUR PENSIONERS, TWO MEN and TWO WOMEN, was held on 26th ult. at WILLIAMS' ROOMS, 11, King-street, St. James's, EDWIN LAWRENCE, Esq. President of the Institution, in the chair.

Table with 2 columns: Name and Amount. Includes Mrs. Litch (1748), Mrs. Sears (2674), J. W. Annis (2184), Mrs. Bidd (2577), F. London (1496), Mrs. Hambrook (1809), D. Thomas (412), Mrs. Bear (273), R. Bibby (745), Mrs. Williams (404), Mrs. Freeston (1485), Mrs. Silcock (284), Mrs. Lambert (604).

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The Builder.

VOL. XXX.—No. 1558.

Building Stones.

PROFESSOR

Hull's book* will be received with welcome by those whose knowledge of the distribution of the many kinds of stone is but limited.

Mr. Hull has had unusual opportunities of acquiring information on the distribution of stones and of their qualities from a geologist's point of view. The book would have been much improved if the author could have added to

this description of the qualities of stones their strength to resist pressure; but this he does of only two kinds,—those of granite and sandstone, the former of which he says will resist a pressure of from 2,300 lb. to 13,400 lb. per square inch rather than the experiments made by Mr. Wilkinson on the granites of Ireland show that it requires those weights to crush cubes of 1 inches, the strongest coming from Newry, county Down, and the weakest from Ballyknockan. The stone from Killiney and Kingstown gave good results. To those whose knowledge of geology and mineralogy is somewhat rusty it will be news to hear that the quartz of granite contains minute cells partially filled with water. Primarily granite consists of quartz, felspar, and mica, and Mr. Hull shows how its composition varies into five different forms. Syenite contains two of the elements of true granite, viz., quartz and felspar, but varies from it inasmuch as it contains hornblende instead of mica; and syenite itself varies in its constituents in two ways; thus, when the free silica (or quartz) disappears, the rock passes into diorite, and when, in addition to quartz, felspar, and mica, hornblende appears, it becomes syenitic granite.

The specific gravity of granite varies from 2.6 to 2.9, and it contains from 65 to 81.7 per cent. of silica. Taking the specific gravity of ordinary granite at 2.66, a cubic foot weighs 166.2 lb., and a cubic yard as nearly as possible 2 tons,—just about twice the weight of a cubic yard of coal. It contains about 0.8 per cent. of water, and is still capable of absorbing about one-fourth more, or 0.2 per cent.; so that a cubic yard of 2 tons contains in its ordinary state about 3½ gallons of water, and some specimens can absorb nearly a gallon more. It is important, in selecting specimens of this rock for structural purposes, to observe the quantity of water they are capable of absorbing, as the influence of frost on stone is in proportion to the quantity it takes up. The pillars of the Carlton Club-house and the Fishmongers' Hall, in London, are of Peterhead granite (Aberdeenshire), also the columns of the interior of St. George's Hall, Liverpool, and those of the Provincial Bank of Ireland, in Dublin. This granite weighs 165 lb. 14 oz. per cubic foot. It is quarried at Stirling Hill. The granite used in the Liverpool, Birkenhead, Newport, and Swansea docks is from Craigairn and Cretown, in Kircubrightshire; also the Liverpool Borough Bank; it is of a greyish colour. It was once supposed that granite is the oldest of rocks, but

it is now known that granites have been formed at several geological periods. The granite of Cornwall and Devon is of more recent formation than the carboniferous system, and that of the Alps of Savoy more recent than the Jurassic (oolitic), while that of the Eastern Pyrenees is more recent than the white chalk. On the other hand, the granites of Scandinavia, the Highlands of Scotland, Donegal, and Galway, are of great antiquity, being older than the Devonian rocks. The granites of Devon and Cornwall are of an age intermediate between the lower carboniferous and Triassic periods. Of this stone the following works are built, wholly or partially:—London Bridge, Waterloo Bridge, Westminster Bridge, the Thames Embankment, and the Tomb of the Duke of Wellington in St. Paul's Cathedral. The syenitic granite of Mount Sorel, in Leicestershire, is of a warm rose tint, and much esteemed for ornamental purposes, but it is extremely hard and difficult to work. It makes very good paving-stone. The granite of Shap, in Cumberland, is a very handsome porphyritic stone. Its prevailing colour is a rich reddish brown. It takes a fine polish, and is now systematically worked by a company, who have set up machinery for cutting and polishing by the side of the Lancaster and Carlisle Railway, near Shap Station. In Ireland granite is found in Donegal, Galway, Mayo, Wicklow, Wexford, Down, and Armagh. The use of granite for architectural purposes, says the author, "is splendidly illustrated in the city of St. Petersburg, to which it is brought from Finland. Here, not only the Imperial palaces and public buildings are constructed with this material, but even ordinary dwellings are partially or wholly built of it; so that St. Petersburg may be considered a city of granite."

The granite of Syene occupies large tracts in Upper Egypt between the first cataract and the town of Assouan, the ancient Syene. It was extensively quarried by the Egyptians 1,300 years before the Christian era, and fashioned into columns, obelisks, sarcophagi, and colossal statues, which are now scattered over Europe, embellishing the cities and galleries of France, Germany, and especially Italy. The marks of the pick and chisel are still fresh in these ancient quarries.

Serpentine, highly esteemed for ornamental purposes in architecture, has a specific gravity of from 2.5 to 2.7, and contains from 38.49 to 44.22 per cent. of silica. It is not suitable for out-door use, especially in the atmosphere of towns; for, being acted on by hydrochloric and sulphuric acids, it is liable either to decay or to become tarnished.

Marble is crystalline limestone, capable of receiving a polish, and, in Great Britain, is derived from the Devonian, carboniferous, Purbeck, and Wealden formations. The specific gravity varies from 2.6 to 2.8.

Gypsum is a hydrous sulphate of lime, consisting of 32.56 parts of lime, 46.51 of sulphuric acid, and 20.93 of water. In its crystalline form it occurs as selenite, which is translucent and colourless; or as satin spar, or fibrous gypsum, also colourless.

Anhydrite is a variety of gypsum, free from water. Its composition is lime 41.18 parts, sulphuric acid 58.82. Its specific gravity is from 2.8 to 3, and it is much harder than gypsum. The chief source of gypsum in this country is the new red marl of the Triassic formation, and the locality that probably yields the largest quantity is Chellaston Hill, near Derby. It is chiefly used in the manufacture of plaster of Paris. Other localities are Orston, near Grantam; the neighbourhood of Newark-on-Trent; Fauld, near Tutbury; St. Bee's Head, near Whitehaven; several localities in Nottinghamshire and Staffordshire; Aston, in Cumberland; and in the vicinity of Watchet, in Somersetshire; also in the isle of Purbeck, in Dorset-

shire. The author also treats of many of the rarer ornamental stones, as fluor spar, rock crystal, malachite, &c., and then proceeds to the calcareous group of building stones, which, in this country, are derived from the carboniferous Permian, and oolitic formations.

The carboniferous limestone is the foundation on which has been reared that great superstructure of sedimentary rocks, which in Lancashire attains the enormous thickness of 18,600 ft., and includes the Yoredale rocks, the millstone grit, and the coal measures.

In Derbyshire, the limestone consists of very pure granular or crystalline carbonate of lime, of grey or bluish colour, with occasional bands of a siliceous stone called "chert." Its upper beds are dark, and produce black marble. The whole mass is about 5,000 ft. thick, and appears to be composed of the remains of corals, crinoids, and molluscs. Its chief use is for mortar, cement, marbles, and for fluxing iron ore. The grits and sandstones of the millstone and Yoredale series generally occur in the neighbourhood of the limestone, and are preferred to the limestone as a material for building. In Denbighshire and Flintshire the limestone is similar in appearance and composition to that of Derbyshire. In the south-west of England it forms an encircling zone round the Somersetshire coal-field, and rises into the table-land of the Mendip Hills.

Excellent building stone is procured from the magnesian limestone of the Permian formation. Near Mansfield, in Nottinghamshire, there is an upper and lower bed of magnesian limestones, with intermediate marls and sandstones. The lower bed is the more important, attaining a thickness of from 70 ft. to 100 ft. It is variable in quality, and at Mansfield passes into a white calcareous sandstone. The compositions of the white and red Mansfield stones (siliceous dolomites) are nearly alike, the white containing 51.40 per cent. of silica, and the red 40.40; of carbonate of lime the white contains 26.50 per cent., and the red the same; of carbonate of magnesia, the white contains 17.98 per cent., and the red 16.10 per cent.; but of iron, the red contains 3.20 per cent., while the white has only 1.32 per cent.

The stone from the Mansfield Woodhouse quarries is a crystalline limestone of a fine yellow colour, in some places speckled with black. Southwell Minster is built of it (twelfth century); so is the Martyrs' Memorial at Oxford. Bolsover-moor stone is very similar; it is a yellowish-brown dolomite, compact and fine grained, but variable in quality, and requires careful selection. The stone from Anston, in Yorkshire (of which the Houses of Parliament are built), includes some stone of good quality. The front of the Museum of Practical Geology, in London, is built of it. The other important quarries of magnesian limestone are at Brodsworth, Cadeby, and Park Nook, near Doncaster; Huddlestone, near Sherburne; and Sonawse, near Tadcaster. Bolsover stone contains 51.10 per cent. of carbonate of lime, 40.20 of carbonate of magnesia, 1.80 of oxide of iron and alumina, and 3.60 per cent. of silica, the remainder being water and loss. Mansfield Woodhouse stone is similar, containing 51.65 per cent. of carbonate of lime, 42.60 of carbonate of magnesia, only a trace of iron and alumina, and 3.70 per cent. of silica. The specific gravity of a dry mass of Bolsover stone is 2.316; the weight of a cube of 2 inches in the ordinary state is 4800.8 grains; when dried, 4881.4 grains; when saturated with water, 5042 grains. One specimen from Cadeby absorbed one-fourth of its bulk of water.

The oolitic limestones are generally soft when first quarried, but harden afterwards, uniform in texture, white, cream-coloured, or yellow, and are composed of fragments of shells cemented by calcareous oolitic material, or else of small grains, or oolites, of carbonate of lime firmly bound together. It is owing to this structure

* A Treatise on the Building and Ornamental Stones of Great Britain and Foreign Countries. By Edward Hull, M.A., F.R.S. Macmillan & Co. 1872.

that the formation has received the name of oolite; but as these strata are largely developed in the Jura mountains, geologists are now inclined to adopt the name of Jurassic in preference to oolitic. In the Bath and Cheltenham oolite, the spherical grains are either hollow or contain as a nucleus a grain of sand, or a fragment of a shell or other foreign substance. The size of the spherules is generally about that of the roe of a small fish. There are four distinct formations of oolitic limestone.—1. The lower oolite; 2, the great or Bath oolite; 3, the coralline oolite, or coral rag; 4, the Portland limestone. The first is found in the Cotteswold Hills more largely than elsewhere. This stone has probably been used in Gloucester Cathedral; the Abbey Church, Tewkesbury; Sudely Castle, and other buildings in the Vale of the Severn. The principal quarries are at Bourton, Broadway, Guiting, Stanway-bill, Clovecloud, Painswick-bill, Sheepscornhill, Stryford, Brockhampton, and Longborough. The Painswick stone is of specially fine quality, approaching the Caen stone in texture. The Bath oolite is divisible into two members,—the lower, including the Stonesfield slate and oolitic freestones of Burford and Tainton; the upper, being formed of a compact white, brittle, or chalky limestone, not suitable for architectural purposes, in Oxfordshire. The most important quarries are situated along the range of the Somersetshire hills, at Sincobomb, Minchinhampton, Bathampton and Bath Bayton, Chippenham, and Douling. Of this stone has been built the Abbey Church at Bath, Glastonbury Abbey Church (eleventh century), and Wells Cathedral (twelfth to fifteenth century). A sample of Bath stone from Box contained of carbonate of lime 94.52 per cent.; of carbonate of magnesia, 2.50 per cent.; iron and alumina, 1.20. The coralline oolite seldom produces a building material.

The Portland limestone, forms the uppermost member of the Jurassic series. It is nearly a pure carbonate of lime, and containing 95 per cent. of this mineral, and 1 per cent. each of silica and carbonate of magnesia. It is superior to the oolitic limestones in hardness and durability in a smoky atmosphere, and it is less absorbent of moisture. When dry it absorbs 8.86 per cent. of its weight of water.

The sandstones are chiefly derived from three geological formations,—the old red sandstone, or Devonian; the carboniferous; and the Triassic; but of these, mostly from the carboniferous series of rocks. Sandstones are less injuriously affected by the acids contained in the atmosphere of towns than limestones are, whether proper limestones or oolitic; but some of them are very porous, and a careful selection of them in this respect is as necessary as with limestones in other respects. From experiments made by Mr. Wilkinson, it appears that some sandstones absorb as much as 11 lb. of water per cubic foot, while others take up no more than 1 lb. As a general result, it may be assumed, says the author, that sandstones of ordinary porosity absorb from 5 lb. to 6 lb. of water per cubic foot. Mr. Wilkinson found the crushing weight to vary from 1,680 lb. to 14,600 lb. for a cubic inch.

An account of the situation of the many sandstone quarries is given by the author, and he reprints the table of the weight per cubic foot of nearly every kind of stone prepared by the late Mr. C. H. Smith.

Another volume, by a practical hand, is still wanted, and many fresh experiments are needed.

ON THE PRICES OF AGRICULTURAL PRODUCE, LABOUR, AND RENT.

FROM THE EARLY PART OF LAST CENTURY TO THE PRESENT TIME.

THIS was the subject of a paper by Mr. William Sturge, read at the ordinary general meeting of the Institution of Surveyors, on the 9th inst.; Mr. E. N. Clifton, president, in the chair. After a series of statements as to the prices of agricultural produce, labour, and rent, from the early part of the last century to the present time, the writer went on to say,—“For the purpose of illustrating the fluctuations in the value of land during the last 100 years, I divide the century into the following periods, viz. :—

1st. Twenty-three years ending 1794, during which there was no great increase in the price of produce, but a gradual advance in rent.

2nd. Twenty years, from 1795 to 1815, when a range of high prices of all kinds of agricultural produce prevailed, consequent on the

French war, and (during a great part of the time) an unconvertible paper currency. I believe I am not far wrong in stating that during this period the rent of land doubled.

3rd. Seven years, from 1817 to 1822, during which prices rapidly fell, notwithstanding a corn law intended to maintain wheat at 80s. per quarter. This relapse, consequent on the exhaustion caused by the long war, and the resumption of cash payments, reached its culminating point in 1822, when the price of produce fell fully 50 per cent. below its maximum ten years before. This was a period of great agricultural distress. Landlords struggled to maintain their advanced rents. Tenants were unable to pay them. The information at my command leads me to the conclusion that the fall of rent from its war maximum may be estimated at about 33 per cent.

4th. Twenty-six years, from 1823 to 1848, exhibiting a gradual recovery in the prosperity of the country and in the prices of produce, and a recovery of say 10 per cent. in rent.

5th. Four years, from 1849 to 1852, exhibiting a very low range of prices of all articles of agricultural produce, consequent on the repeal of the Corn Laws. Rents were generally reduced about 10 per cent. In some cases landowners were obliged to submit to a reduction of 15 to 20 per cent.

6th. Twenty years, from 1852 to 1872, during which an unexampled extension has taken place in trade and manufacture, and the consumption of all kinds of agricultural produce, has enormously increased. The price of corn has been kept down to nearly its previous average by foreign competition, but the prices of meat, stock, and dairy produce have advanced upwards of 50 per cent. The rent of dairy, grazing, and stock farms has advanced 33 per cent., and is now as high as it was during the French war. The rent of arable farms has advanced 10 to 20 per cent., but it has not generally reached the maximum attained during the war; nor is this surprising, when we recollect that during the twenty years, from 1800 to 1819, the price of wheat ruled more than 50 per cent. higher than it has ruled during the last twenty years. The present high prices of meat and dairy produce are no doubt mainly due to the increase of the population, and to the greatly increased consumption of the working classes, and also, though in a less degree, to decreased production caused by the droughts of 1868 and 1870.

It will be seen that during the period of a century and a half included in the foregoing pages, agriculture has had its ups and downs, its lights and shadows, its times of prosperity and adversity. The pages of contemporary writers are pregnant with allusions to periods of agricultural distress. Evelyn, in 1703, says,—“Corn and provisions so cheap that the farmers are unable to pay their rents.” “The Landholder's Companion,” published in 1734, says,—“The interest of our British landowners has been declining several years last past; it has been a general observation that rents have been sinking, and tenants unable to make as good payments as formerly. . . . Before farmers can pay their rents, wheat of middling goodness ought, I think, to sell for about s. 3d. per Winchester bushel, barley for 2s. 6d., and oats 1s. 6d. I know in former times less prices were sufficient; but as circumstances alter the same thing is altered; iron, timber, harvest people, and servants being much dearer than heretofore, corn farms will not yield sufficient profit to the occupiers of them, unless they can have such prices, particularly as cattle, sheep, pigs, butter, and cheese are now one-third part cheaper than formerly, and what is called a living price.”

Arthur Young, writing in 1790, says,—“In the years 1776-77, prices fell considerably, and in 1779, so low that very general complaints have been heard of ruined farmers and distressed landlords; and at the time I am now writing, the fact holds that there is a considerable fall in all products, and great numbers of farmers ruined. I have the prices of wool for forty years now before me; and that which from 1758 to 1767 was from 18s. to 21s. a tod, is for 1779 only 12s., and was in 1778 but 14s. We must go back to 1754 to find a year so low as the last. Wheat and all sorts of grain are greatly fallen.”

Some of our members have doubtless a personal recollection of the collapse of 1822. My own experience does not go back to that date, but I have a vivid remembrance of the difficulties attending the low prices of the years 1849 to 1852, and the anxieties of the land agent during that period.

It is, however, only by a comprehensive survey of a long course of years, that the broad facts can be ascertained and the results fully appreciated. Such a survey I have endeavoured to take in this paper, and if my statistics have been somewhat wearisome, I trust they have not been without interest, and that they will be useful and instructive for future reference.

The general result—the progress of a century—may thus be summed up: a rise of 25 per cent. in the price of wheat, notwithstanding an enormous foreign importation; of 46 per cent. in that of barley; of 33 per cent. in that of oats; of 140 per cent. in those of meat and dairy produce; of about 50 per cent. in that of labour; and of 200 to 250 per cent. in that of rent. It is beyond the scope of this paper to allude to the greatly increased produce of land during the same period, consequent on the improvements of modern agriculture, a subject well worthy of a paper from some member of our institution competent to do it justice.

With the aid of the light of the past, let us now turn our eyes for a few moments towards the future. It cannot be denied that a cloud looms on the horizon, fraught with elements of anxiety, if not of danger: I allude to the labour question. Far be it from me to grudge the agricultural labourer a share in the general prosperity. It cannot be said that his condition has been satisfactory, whether as regards his wages or his habitation, and we must not be surprised at his endeavour to better himself. Labour, like other commodities, must in the long run be regulated by the law of supply and demand. Combination, for the purpose of reaping the benefit of an increased demand for labour is legitimate, and need not be feared were it conducted on fair and proper principles, with a board of conciliation and arbitration, to settle disputed questions without resort to the disastrous system of strikes. But, unfortunately, trade-unions are conducted in a manner utterly opposed to the principles of political economy, and to the interest of the capitalist and the working man. To say nothing of the attacks upon capital, the rules of the unions are destructive to the liberty of the artisan. All other classes in society have full scope for their energy, industry, and skill. The union forbids the strong, able-bodied, skilful man to benefit by his superior strength and skill, by limiting the amount of labour to constitute a fair day's work, that limit being measured by the capabilities of the weaker and less skilful bands. All are thus reduced to one dead level, and a loss is sustained both by the labourer and by the community at large. If similar principles are to be applied to agricultural labour, it is hard to see how farming operations are to be carried on, dependent as they are upon the weather, and requiring to be done precisely at the proper time. If the man is not left at liberty to make his own bargain with his master for piece-work, and if in the critical time of harvest the union is to dictate the price of harvest work, and to order a strike if its terms are not complied with, the position of the farmer will be anything but enviable. Let us hope that by reasonable and timely concession, the labourer may be deterred from submission to a bondage as hurtful to his own interest as to that of his employer.

What further advance may be realised is matter for speculation; but my impression is, that in the course of a year or two we shall see wages ranging from 15s. to 18s. per week, according to locality. It is to be hoped that higher wages and better food may tend to raise the labourer's physical powers, and that thus he may become worth his increased pay. Certain it is, that in those counties in which the highest scale of wages prevails, the men are superior in power and skill to those in the lower waged counties,—a difference partly due, perhaps, to race, but partly, no doubt, to better food. The use of agricultural machinery not only effects a direct saving in labour, but also acts, indirectly, in sharpening the wits and quickening the movements of the labourer. If the men have the good sense to avail themselves of these advantages, without submitting to union interference with freedom of contract, and dictation as to the price of piece-work and the hours of labour, not only will their condition be improved, but the farmer, though he may suffer some temporary loss and inconvenience, will, ultimately have no reason to regret the change. The landlord need fear no reduction of rent, except, perhaps, in the case of heavy clay farms. He will find it necessary to provide better cottages, as the condition of the labourer improves;

but, on the other hand, the labourer will be able to pay an increased rent, so as to afford a moderate percentage on the outlay; thus, it may be hoped, that both landlord and tenant may learn,—

"Out of this nettles, danger,
To pluck the flower, safety."

We have seen the great increase in the value of agricultural produce, rent, and labour, that has taken place during the last century. Is this progressive increase likely to continue? The increase during the last century has not been exceptional; but it is a type of the gradual advance which has been silently but surely going on for centuries past. The same causes that have led to this advance,—increased population, increased demand, and, above all, increased amount of realised capital,—are still operating, and appear likely to operate with greater force than ever. The supply of money has increased, still increases, and will continue to increase, and its value; its purchasing power, will therefore continue to decrease. In other words, the prices of produce will continue to rise, with the exception of articles like wheat, which can be supplied in almost unlimited quantities. It may, I believe, be safely predicted that should our Institution exist and flourish, as we all hope it may, until 1972, the surveyor of that date, whose lot it may be to chronicle the progress of another century, will have to record an advance as great in the value of produce, rent, and labour, as that which I have endeavoured to lay before you.

After a few remarks from members the debate was adjourned to January 27th.

THE EDINBURGH HOSPITALS.*

The financial history of George Heriot's Hospital is remarkable. Heriot, jeweller and goldsmith to James I. of England, died in 1624, and bequeathed the residue of his property, 23,925*l.*, to the erection of a hospital "for the maintenance, relieve, bringing up, and education of poor fatherless boys." The foundation stone was laid in 1628, but owing to the civil war the building was not opened till 1659, the cost having exceeded 30,000*l.* One hundred and eighty boys are maintained in the hospital, where they are taught, in addition to the ordinary branches of English education, French, Latin, and Greek, mathematics, drawing, vocal music, and dancing. Those who manifest talents, and a desire for the learned professions, are sent to the University of Edinburgh, with an allowance for four sessions of 30*l.* a year. Ten outdoor bursaries of 20*l.* a year are likewise bestowed on deserving students in the college. On leaving the hospital, the boys are provided with an outfit of clothes, and a suitable assortment of books. Such as are bound apprentices are allowed 50*l.* in annual sums of 10*l.* during the five years of their apprenticeship, with a present, if merited, of 5*l.* for good behaviour at the end of their apprenticeship. Notwithstanding all this beneficent work, the governors find themselves in possession of large "surplus funds;" they are not quite as rich in money, it may be, as the governors of Christ's Hospital, or Dulwich College, but they certainly seem as abundant in good works as either of those bodies. With their surplus funds, the governors of Heriot's Hospital are planting elementary free schools all over Edinburgh. They have already established thirteen of these schools,—eight juvenile and five infant. They are open, first, for the children, in poor circumstances, of deceased burgesses and freemen; second, for the children of burgesses and freemen who are unable to provide for their support; and third, for the children of poor citizens and inhabitants of Edinburgh residing within the boundaries of the city. The governors are empowered "to allow to any of the boys, in the course of their education at such schools, being sons of burgesses and freemen, such uniform fixed sum of money in bon and place of maintenance, and such uniform fixed sum for apprentice-fee, after their education at the said schools is completed, as shall be determined." About 4,000 children are under instruction in these schools. The annual revenue of the hospital is about 16,000*l.*

The governors of George Heriot's Hospital, as has been seen, devote their attention to the provision of elementary free schools for the instruction of the children of the poor. Their labours in this direction have been attended with the

most complete success. The good they have effected in the course of the last twenty years, and the knowledge and healthy influence they have diffused, are beyond conception. Other workers are occupying, worthily and successfully, another part of the educational field, in making provision of a superior middle-class education at moderate cost.

George Watson, accountant to the Bank of Scotland, who died in 1723, left 12,000*l.* to be invested and expended in much the same way and for the same objects as in the Heriot bequest. A hospital was built on "the Meadows," and opened in 1741. It had accommodation for from 90 to 100 boys, and that number was maintained in it. The youths brought up in George Watson's Hospital had an additional benefit conferred upon them, if deserving, in a sum of 50*l.* presented when they reached twenty-five years of age. A few years since the hospital and its grounds were bought for a site for the new Edinburgh Infirmary, and the administration of this hospital and other endowed institutions was remodelled, and, under the authority of a Provisional Order, which duly received Parliamentary sanction in 1870, their management was entrusted to the Edinburgh Merchant Company, in connexion with the Endowed Institutions (Scotland) Act.

The Merchant Company's Schools include,—
1. The Edinburgh Educational Institution for Young Ladies. The course embraces all the branches taught in the best institutions and boarding-schools for young ladies, and includes French, German, and Latin, lectures on literature and science, algebra, mathematics, drawing, vocal music, instruction on the pianoforte, drill, calisthenics, dancing, and needlework. The fees for the entire course are from 12*s.* 6*d.* per quarter, in the elementary department, to 2*l.* 10*s.* for the advanced division of the senior department. 2. The George Watson's College Schools for young ladies, with a precisely similar course and the same fees as the preceding. 3. The George Watson's College Schools for Boys, in which a course is pursued that qualifies for commercial or professional life, the Civil service, or the universities. It embraces English, Latin, Greek, French, and German; in addition to ordinary branches,—algebra, mathematics, drawing, vocal music, botany, natural history, natural philosophy, chemistry, drill, gymnastics, fencing, and dancing. The fees for the course range from 10*s.* per quarter, for the elementary department, to 2*l.* 10*s.*, for the most advanced. 4. Daniel Stewart's Institution for Boys, in which the course and fees are the same as in the preceding; and 5. James Gillespie's Schools for Boys and Girls. These are primary schools, and profess to provide a superior education, the course including all the ordinary branches, with vocal music and drill, mechanical drawing being taught to the boys, and sewing and knitting to the girls. The fees are 3*s.*, 4*s.*, and 5*s.* per quarter, and 6*d.*, 9*d.*, and 1*s.* per quarter for writing-materials and the use of school-books.

The rewards at the disposal of the governors are numerous and valuable, including sixteen presentations to the foundations; 154 school bursaries, each of which respectively amounts to the cost of the successful competitor's school fees for session 1873-74; and six bursaries of 25*l.* a year, tenable for four years. The governors also award twelve free tickets for the class of Professor Hodgson, of Edinburgh University, on Commercial and Political Economy and Mercantile Law.

In connexion with the George Watson's College Schools, a large house has been recently purchased in Lauriston-lane, Edinburgh, and converted into school-rooms. It is adjacent to the present school-buildings, which were formerly known as the Merchant Maiden Hospital. The new acquisition was of three stories, to which a fourth has been added. The entrance is from the present school-ground, by a new doorway, leading into the new playground, which is 130 ft. by 100 ft. There is also a playroom, 30 ft. by 17 ft., and 20 ft. high, lighted from the roof. The new class-rooms are 20 ft. by 16 ft., and 18 ft. by 15 ft. Two rooms on each of the floors, in addition to master's room, small class-rooms, another play-room, &c. The new upper floor is not divided, and gives a spacious room, 40 ft. long by 26 ft. wide. It has a lofty ceiling with two roof lights. It has also six lofty side-windows.

A spacious playground is attached, for the exclusive use of the elementary scholars, for whom a large hall for recreation is also provided.

The governors have also commenced the erection of a new lecture-hall, capable of accommodat-

ing 1,200, for the use of the senior pupils. It is in the Greek style, treated with something of the freedom of the Renaissance. It is 83 ft. long by 51 ft. wide, 42 ft. high to the cornice, and 62 ft. high to the top of the lantern-light. The added space will accommodate 808; but two other large rooms may be used with it, by the opening of sliding-doors.

When the additions have been completed, the accommodation and appliances of the George Watson's College Schools will be unsurpassed; and it is not to be wondered at that the applications for enrolment should be as numerous as the master and governors can desire, or that the utmost eagerness should be displayed to take advantage of provisions for a course of instruction and training of high order, at a cost little more than nominal.

MEDIAEVAL ARCHITECTURE IN PARTICULAR DISTRICTS.

At a recent meeting of the Architectural Association, the Prize Essay was read by its author, Mr. F. P. Johnson; the subject being "The Special Characteristics of Mediaeval Gothic Architecture pertaining to Particular Districts of the United Kingdom." Of this essay we give a short abstract.

These special characteristics (said the author) may be traced to (1) foreign influence,—priests and nobles from different parts of the Continent at and after the Norman Conquest introducing the artists of other countries, fetters brought by missionary monks and caught up on travels to Rome by hishops, &c.; (2) individual taste,—determining the application of the special forms at any time generally prevalent, the influence of the personal preferences of certain leading original artists moulding for a time at least the architecture of considerable districts; and (3) the nature of the materials obtainable,—the power of obtaining without stint the very best materials of every sort, or, owing to difficulties of transport, restraint in the use of desirable materials, or even the restriction merely to those produced in the locality.

In the Norman style, many essential features appear which, though rare in Normandy (a), may be met with in Burgundy (b), Lorraine, the Netherlands (c), the Valley of the Rhine (d), and even in the north of Italy (e). The following are examples of the illustrations given by the essayist:—

(a) Of peculiar features common to Normandy and England (as one instance among many), the two aisles to the transept at Winchester are connected across the end (a somewhat similar arrangement occurs at Ely), also at St. George de Boscherville (near Rouen).

(b) At Gloucester Cathedral, the columns of the nave (not the arches), the columns of the chapter-house bearing the wall-arcade, together with contemporary works at Tewkesbury, Malvern, and Pershore, resemble the general character the Abbey of Fountains in Burgundy. The chevet in St. Bartholomew the Great, London, is very similar to that of St. Menou, near Moulins. The west doorway at Rochester, and others in Kent, and the Prior's Doorway at Ely,—without chevrons, but with signs of the zodiac and other designs in the arch-mouldings, vesicae-pisces in the tympanum, with figures at the sides, have an almost exact counterpart in the west end of the Cathedral at Autun. Fragments at St. Benigne at Dijon, St. Ayout at Provins, and the Church at Avallon, show also a similar style of decoration.

(c) The west front of Lincoln Cathedral (1073-94) is a screen, afterwards completed in a different manner, but probably in its original design similar to the screens at the west fronts of Belgian and North German churches at this date. The Abbey Church of St. Edmundsbury, Suffolk, is triapsidal, a common arrangement in Belgium and North Germany.

(d) At Waltham Abbey and Durham Cathedral,—at this period held conjointly,—the piers are alternated square (grouped) and round, and the vaulting was originally intended to be quadripartite,—one bay of the nave to two bays of the aisle,—as in the great cathedrals of Worms and Spire, in the Rhine Valley. The arched corbel-tables, supported at intervals by small columns, at Peterborough, and the continuous interlacing arcades, and numerous square and circular turrets there (also parts of the central tower at Norwich Cathedral), are suggestive of details at such churches as Reims and Marston, in the southern portion of the Rhine Valley.

(e) At Worcester, in the nave, transept, and chapter-house, the Lombardic practice of working with two differently-coloured stones is very prominent.

In the Early English Style, the existence of several distinct schools of architecture may be traced,—such as (a) Canterbury (William of Sens, architect, 1174); (b) Winchester (Godfrey de Lucy, bishop, 1185); (c) Lincoln (Godfrey de Meiers, architect, 1186); (d) Yorkshire (John de Eber, abbot of Fountains, 1204).

(a) After the destruction by fire of the choir at Canterbury, in 1174, William of Sens adapted the design of the choir of Sens Cathedral, in the erection of the choir now existing. Here hexapartite vaulting sprung from the level of the triforium capitals, filled arches, the breaking off of the vaulting shafts on a line with the capitals of the

* See p. 942, ante.

when the question first came to the front. With the advantage of this large amount of experience, not only of the actual requirements to be fulfilled, but also in the many shortcomings of the means hitherto adopted, what is there to prevent the immediate commencement of efficient action, even though only on the basis of the apparently unappreciated Act passed last session? Shown of its details though it be, that Act provides for the organisation of the necessary local authorities, and appointment of their executive officials, medical and engineering, and defines in some measure the degree of central supervision which is to be exercised over them. It also provides for the payment of half of the salaries of the local sanitary officials out of the imperial revenue in those cases where the locally-constituted authorities are not bigoted and vain enough to suppose themselves able to cope with dirt, disease, and death, in entire independence of central instruction and control.

Now do we find that these provisions are being availed of in such a manner and to such an extent as the intent and spirit of the Act presupposes? After all the agitation which preceded the introduction of the Bill, and all the discontent which manifested itself when the proposed Act was obliged to be clipped of its details, one would have supposed that, acting upon the principle best expressed by the adage, "Half a loaf is better than no bread," the town and rural district authorities would have created such a stir as had never before been witnessed in a similar cause. It would be supposed that the health authorities would have eagerly availed themselves of the means afforded them by the consolidation of all previous legislation into one comparatively simple enactment, providing unprecedented facilities for the appointment of medical and engineering officials of high talent, to set their respective houses in order. But, giving all due credit to those towns who have so far been wise enough to do so, it must be confessed that their name is far from legion; for in a far greater number of cases valuable time has been frittered away in acrimonious and deadening discussion; while in a still larger number of cases scarcely anything whatever has been done, the authorities seeming content to let matters slide on in their primitive, humdrum fashion, to the end of the chapter.

This is far from an encouraging aspect of the state of sanitary reform, but no good can possibly come of closing our eyes to the actual facts of the case, and that those who are represented I am confident will be confirmed by others who take up the lance in this cause. England, above all other countries, should be active in the furtherance of these measures, for she has hitherto led the way in their prosecution, and is even now on the point of being used as a model in the framing of the new Public Health Bill of Prussia,—one of the greatest sanitary authorities of that kingdom, Dr. Varentzapp, having been commissioned to report as to the provisions to be contained in that Bill.

Your remarks as to the means for the proper combating and dispersion of sanitary evils are well worthy of the earnest consideration of the Minister of Public Health, in whom is vested a responsibility greater than that held by the commander-in-chief of an army, inasmuch as the health, and consequently the lives, of the entire nation are placed under his supervision. And I venture to predict that it will be a bad day for sanitary reform when active and efficient central supervision is withdrawn from the proceedings of the local authority. Local government,—an excellent principle in itself,—carried to the extent of absolute authority, is worse than the old French system of absolute central power; and it is especially in the selection and appointment of local officials where the central authority should exercise an approving and ratifying influence. Far too little attention has hitherto been paid to the qualifications of local officials, who are in many instances appointed in utter disregard of the duties which ought now to become of an important office, either in connexion with or immediately under the control of the engineer of the town or district, is, in too many cases, devoted to persons who are ready, for a low rate of remuneration, to fill the post, but whose training and qualifications are far from being such as to fit them for the discharge of the detecting and remedial duties of such an office. Hence the discreditable state of the sanitary details of many towns, which, perhaps, pride themselves upon possessing a well-organised and zealous sanitary staff. A higher scale of remuneration,

coupled with a more searching examination of a candidate's previous training, and of the nature of the posts he has already filled, would secure the appointment of a much higher class of public engineering officials than is at present the case.

With regard to medical officials,—the light cavalry, as you properly designate them,—there is not nearly so much difficulty in obtaining talented aid, as the medical officer will, in the great majority of cases, be a practitioner in the district for which he is appointed, having daily opportunities in his practice of becoming intimately acquainted with the sanitary condition of the population, and of reporting from time to time, at stated periods or otherwise, thereon. He would thus work in harmony with the engineering officials, and especially with the sanitary inspector, who should be a man having preferably a sound engineering education, and be especially accustomed to the detection and removal of the class of evils popularly known as nuisances. With officials of this standing, possessing not only professional ability, but also professional zeal, and placed under the supervision of a central authority more disposed to guide and instruct than to command, but with full powers for independent action whenever necessary, sanitary reform would rise triumphant from the bog of petty discord into which it seems falling, and we should at last be on the road to the accomplishment of the object which we have so long been bent on attaining.

As to further legislative powers, it will be well to hear in mind the opinion of an authority like Dr. Acland, who recently expressed a hope that the passing of the complete Sanitary Act might be delayed a session or two, so as to afford time for the development of the leading principles involved in the Act already passed. It leaves all local authorities, therefore, to avail themselves of this breathing-time to the best advantage, by using to the utmost and to the best purpose the powers already available, and thus qualify themselves to be heard when the more detailed Bill is brought forward. This they can only do by the immediate appointment of the necessary talented officials, and by modestly placing them and their own deliberations under the eye of the Health Department and its minister, in conformity with the spirit of the Act.

The Health Department must also do its duty fairly and effectually, by exercising its most extensive powers with discretion and firmness, and thus ensure to the nation the fullest and immediate advantage of the aids which past experience and modern knowledge can bring to bear upon the vital questions entrusted by the nation to their superior care. SANTALMAN.

DAMAGES FROM THE RECENT GALE.

CONSIDERABLE damage has been caused by the violent gale of Sunday night last in the south-western suburbs of London. At Richmond a brick wall, 9 ft. high, of over 100 ft. in length, situated at the side of the road leading from Warple-way to King-street, belonging to Mr. Sims, a builder, was blown down across the footpath, and a large quantity of hoarding, 12 ft. to 14 ft. high, adjoining the railway-station yard, was blown completely across the high road to the new station-yard. Some trees in Richmond Park were uprooted. At Twickenham the south side of a brick-and-tile built cottage, which was fortunately "to let," situated near Railway Junction, was blown in, the debris falling through the ceiling of the upper rooms to the floor. At Staines a portion of the roof of a house, belonging to Mr. Denyer, was blown off. At Brentford several of the old houses, situated by the river side, were much damaged.

A large building in Brompton, which was being erected for business purposes, was so shattered by the wind that it will have to be rebuilt. In fact, in all parts of London the damage has been more or less severe.

The gale was nowhere felt with greater severity than at the Crystal Palace, but the building remained firm, and (with the exception of a few squares of glass) uninjured.

At Ramsgate, the most serious part of the damage occurred at the Granville Farm, the property of Mr. Welby Pugin. The farm buildings, which stand near the Cranville Hotel, comprise a long range of stabling. About seven o'clock in the evening, when the gale was at its height, the wind uplifted about 80 ft. of the slated roof, and carried it several feet northwards, tearing

away a considerable portion of the brickwork. Some men and horses had a narrow escape.

Considerable damage has been done in various parts of the city of Oxford. At Oriel College the wall and pinnacles of the chapel were blown down, and at the Great Western Railway the new goods station in the course of erection was completely wrecked. In innumerable instances the boardings erected around buildings have been blown down. Great fears were entertained that the spire of All Saints' Church, which is now being taken down, having been declared unsafe, would not escape, but with the exception of the displacement of a few loose stones it withstood the gale.

One of the pinnacles of St. John's College Chapel, Cambridge, was blown down, within a few feet of the street, and the stone (weighing about 2 cwt.) was embedded in the earth. Similar damage was sustained by New Court, of the same college. The gable-end of a house was blown in in Barnwell, without doing any personal injury.

In Bristol, houses were blown down, scaffolding of new buildings was hurled across the streets, church pinnacles were carried through the roofs, and the top portions of private dwellings were either blown away or carried down through the roofs, inflicting upon the inmates serious injuries, and in some cases resulting in loss of life. The most serious calamity was caused by the wind forcing in the roof of a dwelling-house in Trenchard-street, by which two persons lost their lives, and a third was dangerously injured. The immense carriage factory of Rogers & Co., in College-place, near Brandon-hill, has been almost wholly destroyed, and the loss is estimated at about 3,000. At Christ Church, Clifton, one of the massive pinnacles falling through the roof, above the organ-gallery, did damage to the extent of about 600. Pinnacles of other churches were also blown down, but the damage was not so extensive as in this last case.

At Exeter, three pinnacles of the tower of St. Thomas's Church have been blown off amid a severe gale of wind and rain. One of the pinnacles fell on the roof, which it smashed in, and caused a large quantity of the ceiling to fall on children and other people assembled at divine service. The congregation hurriedly left the church.

At Cork the storm was terrific, and was accompanied with thunder and lightning. Glass in private houses was smashed, and part of the roof of the new granary belonging to Victoria Docks, Passage West, was blown away. Great loss of property is reported, but no loss of life as yet.

DARLINGTON INFECTIOUS DISEASES HOSPITAL.

THE foundation-stone of the proposed Infectious Diseases Hospital at Darlington has been laid by the Mayor (Mr. C. Ineson). The building will be situated a little back from the Yarn-road, opposite the workhouse, and approached by Houtden's-lane. The front will face the south, the length being 218 ft., the extent of the building backwards 192 ft. The site contains two acres of land. The pavilions or wards for the different diseases are apart from each other, but connected by a corridor. The pavilion for cases of small-pox will be at the west end of the structure, and will contain fourteen beds, twelve being for ordinary cases, and two for special cases requiring separation. The pavilion consists of two stories, the upper being for males and the lower for females. The enteric fever pavilion will be placed about the centre of the building, and divided in the same manner as the small-pox ward. The scarlatina ward is to be at the north-east angle, and will contain twelve beds—six for females, and six for males. At the south-east end, adjoining the scarlatina pavilion, will be erected a ward for special separation cases, and it will contain four beds. Each patient will be provided with 2,000 cubic feet, or 144 superficial feet, of air in accordance with the requirements of the Medical Department of the Local Government Board. The administrative department is sufficiently large to accommodate a staff capable of working the hospital if extended to double its present size, apartments for a resident surgeon, matron, and porter being provided. In connexion with each pavilion will be a room for the nurse, with a window looking in upon the patients. The separation case rooms are provided with glass doors.

The material of which the building will be

constructed is brick, relieved by stone dressings. The ordinary open fire-places will be used for heating the wards.

The architect from whose plans the hospital will be erected is Mr. G. G. Hoskins, of Darlington; and the contracts have been let to the following:—Excavating, brickwork, stonework, and plastering, Messrs. M. Watson & Son; carpenter and joiner, Mr. T. Smith; slating, Messrs. J. Atkinson & Son; plumbing and glazing, Messrs. Russell & Co.; painting, Mr. W. Dryden. It is expected that the building will be completed in about eighteen months.

In a town of similar size to Darlington, in the West of England, Mr. Backhouse said on the occasion, the people commenced to build a hospital for forty beds, at a cost of 20,000*l.*; while they at Darlington contemplated building a hospital for forty-four beds, which would only cost 9,000*l.* or 10,000*l.* It was absolutely essential that when they were building a hospital of that kind, they should meet all the requirements of the present day, and erect it according to the scientific medical knowledge of the day.

MIDDLETON BRANCH OF THE UNION BANK OF MANCHESTER, LIMITED.

THE directors of the Union Bank of Manchester have for some time past sought to add to the convenience of their clients by opening various branch banks in towns around the head-quarters. A few years ago they purchased some property in the Market-place, Middleton, and in it established one of these branch banks, subsequently altering and re-adapting the premises, to make them more convenient. The alterations consisted in removing the lower portion of the elevation fronting the Market-place; and substituting in its stead a dado of Yorkshiro pierpoint stone, having a moulded cornice, that also forms the sill for an arcade of windows above, and which have columns, caps, label-mould, and arches (with semicircular intrados and pointed extrados) of polished Yorkshiro stone. At each intersection and extremity of the label-mould of this arcade is an escutcheon carved with the armorial bearings of one of the Lancashire towns in which the Union Bank of Manchester has establishments, viz., Manchester, Salford, Bolton, Oldham, Middleton, Royton, and Tyldesley. To the entrance-hall, the arch of the doorway corresponds with the arcade of the windows; the floor is laid with encaustic tiles, having on them in yellow letters in the centre, "Union Bank of Manchester, Limited," upon a chocolate ground, surrounded with a bordering in various colours; glazed swing-doors lead through a vestibule into the telling-room, and there is also a glazed screen and door separating the business portion from the residence of the local manager.

The improvements have been designed and supervised by Mr. James Redford, of Manchester, architect; and have been satisfactorily carried out by Mr. John Grundy, stonemason, as general contractor; with Messrs. Turner for carpenters and joiners; Mr. Ogden, bricklayer; Mr. Dean, plumber, glazier, &c.; and Mr. Fitzgerald, plasterer; all of whom belong to the district.

ALL SAINTS', STAUNTON.

THE Church of All Saints, Staunton, in the Forest of Dean, has been re-opened for divine service, after considerable works of restoration, both externally and internally. The portions now remaining of the old church are certain portions of the arcades, which are of Norman date; the rest of these arcades of the succeeding transitional period, the arches being pointed; and the base and first stage of the Norman tower. No remains of the foundations of the north and south walls of the ancient aisles were found during the excavations, and there are not any indications of the existence of Norman work visible in the chancel, which is now of Decorated work. During the later periods demolitions and alterations have been perpetrated, until at length the fabric assumed the form of a nave, with a south aisle absorbing the transept, and with a continuous roof from west to east. The north aisle was swept away, with the exception of 17 ft. of its length, which, however, like the south aisle, has been thrown into the north transept.

The works of restoration,—commenced ten years since upon the chancel, which was then partially put in order,—have now been followed

by a new open roof upon the nave; the old oak roof upon the south aisle proper has been opened out, the roof of the south transept has been placed in its position, and the south gable, with three-light decorated window (hitherto in the east wall), has been rebuilt. The porch has been newly roofed; all the old rotten plaster has been taken out, and the walls made good; the old pews have been replaced by new open benches of red deal; the organ is placed in the remaining portion of the north aisle; a prayer-desk and lectern of walnut-wood stand in the two eastern angles of the nave; the north transept is now the vestry; the windows are newly glazed; and the floors are all paved with Godwin's tiles.

The architect employed was Mr. J. W. Hugall, of Oxford; and Messrs. Wall & Hook, of Brimscombe, were the contractors.

Many years since, at a depth of 7 ft. below the level of the churchyard, a remarkable font was found: it is rectangular in form, being 2 ft. 5 in. high, and 1 ft. 9 in. in diameter. It has very little ornamentation, the side having two triangular forms, 9 in. long approaching each other. There is not any base. The upper member, which is 9 in. high, consists of three very depressed circular mouldings and a line of beading. This font has staple-holes on two sides. There is a drain in the centre of the bowl, which is roughly hewn out, and the upper edge is much broken. It is now placed in the south transept for preservation. We cannot ascribe it to any other than the Saxon period, for it is entirely unlike any Norman font, and bears upon it the impress of an earlier origin.

THE GREEK CHURCH AT WOLVERHAMPTON.

To the small number of places in England which has a Greek church Wolverhampton has been added, the only other towns out of London (in which there are two) where a building for the celebration of the worship of that Church exists being Liverpool and Manchester. The structure which has been opened is a very humble one, having been built upon a small scale by the Primitive Methodists. It is, however, of sufficient dimensions to accommodate the anticipated congregation of Greek Church worshippers, who are not expected to number more than fifteen. The church owes its origin to the zeal of an English convert,—Mr. G. W. Hatherly,—who at one time was organist at Tetterhall Church. After his conversion, he advertised for any fellow-believers residing in the district, was written to by Mr. A. J. Claddo, the Greek consul at Birmingham, and a movement commenced which resulted in Mr. Hatherly becoming first, deacon, then priest, to minister in the adopted building in the Waterloo-road, Wolverhampton. The peculiarity about minister and building is that Mr. Hatherly is the first Englishman made a priest of the Greek Church, and the building just opened is the first in which the service of that Church has ever been said or sung in English.

The interior is as plain and as simple as the outside of the building—small, square, the walls plainly coloured, plain windows with stained glass borders, and the boarded floor covered with cocoa-nut matting, with a few forms on the right and left respectively for males and females, the sexes being kept separate in Greek churches. The larger portion of the floor before the eastern side of the church is left vacant, and at that side part of the floor is raised, gaily carpeted, and upon this dais is placed the Iconostasis, or place of pictures. It is a screen upon which are hung three pictures. The centre one is placed so high as not easily to be seen from the floor; that on the right is a full-length figure of the Saviour, the head surrounded by a halo, having within its circle an inscription in Greek. On the left is a copy of the picture of the Virgin and Child in the Razan Church at St. Petersburg, the complexion of mother and child being more swarthy than would be conceived by an English painter, and the effect of the whole being strange and uncounted. On each side of the Iconostasis and the dais on which it stands is an open screen of stained wood also hung with pictures. One hears the representation of the patron saint of the Church, the prophet Elijah. The artistic figure and drapery are marred by a glaring background of gold. The principal picture on the other screen is said to be a portrait of St. Nicholas; hut, with the exception of the hands

and face, it is wholly covered by a massive silver plate, of a rude style of art, the effect being anything but pleasing. Two other pictures on this screen represent—one the Baptism of Christ, the other his descent into Hades. The Iconostasis itself serves the purpose of the veil of the Jewish temple, and conceals the most holy place, into which the priest only is permitted to pass into which the sacred doors, and that only at certain times and on particular occasions. Within the doors of the Iconostasis the greater portion of the ceremony of consecrating the church was performed, the doors being closed and the performers invisible. In the reading of divine service, the officiating priests were as gorgeously arrayed as Roman Catholic priests at High Mass. The service was a lengthy one, and had to be conducted by the priest fasting.

For these particulars we are indebted to the *Staffordshire Advertiser*.

THE ROTHERHITHE NEW INFIRMARY.

THE Local Government Board and the St. Olavo's guardians have for some time been at issue respecting the building of a new infirmary at Rotherhithe. The Local Government Board requested the guardians to erect an infirmary distinct from the workhouse, which the guardians opposed on the ground of expense, but expressed their willingness to build one attached to the present workhouse.

At the meeting of the guardians held last week, a communication was received from the Local Government Board to the effect that the plan as suggested by the guardians would be sufficient, but that immediate steps must be taken for the building being at once proceeded with, as the Board would have to adopt a more peremptory method to compel them to do so. In deference to this decided intimation from the central authority, the guardians resolved that plans should be at once prepared for the erection of the new building.

NEW OFFICES FOR THE HOLBORN BOARD OF WORKS.

THE Holborn Board of Works have taken a lease of premises in Little James-street, Bedford-row, for twenty-one years, at a rental of 190*l.* a year, which they are about to convert into a new board-room and offices, together with a large hall for holding public meetings in connexion with the district. At the present time there is no public hall in the district in which such meetings can be held. The lower portion of the building is intended to be utilised for the works department, by which a saving to the parish will be effected.

THE NEW CIVIL SERVICE CO-OPERATIVE STORE BUILDINGS.

THE large and prominent block of buildings now in course of erection at the western angle of Queen Victoria-street and Bennet's-hill, for the Civil Service Supply Association, is now so far externally completed as to be ready for covering in. The building consists of two principal elevations, the chief facade being the Queen Victoria-street frontage, which is 63 ft. in length and 61 ft. in height from the street level to the top of the cornice, and contains three stories, besides the ground floor and basement. The ground-floor of this frontage, up to the window-sills of the first story, is built with Portland stone. On each side there are spacious entrances, pediment-headed, with trusses on either side of the doors and granite bases, whilst over the three windows in this part of the elevation there are massive carved figure-heads. The rest of the elevation is of Bath stone, there being five large and handsome windows in each story. Moulded pilasters with Corinthian capitals rise from the bottom of the first to the top of the second story windows, with panels over the windows of the first story, the second story windows being segment-headed. Over the last-named story is a band or string course, and above this the third story, having double semi-headed windows, between which are cast-iron columns, the elevation being surmounted by a moulded cornice, supported by consoles. The whole of the windows in the elevation will be glazed with plate glass. The return frontage in Bennet's-hill extends 107 ft. in depth from the Queen Victoria-street elevation, with which it is uniform both in design and

material to the extent of 42 ft., consisting of Portland and Bath stone, the rest of the elevation, to the extreme rear of the building, being of maln brick, with Suffolk stone dressings and moulded quoins, the windows being also uniform with those in the other portions of the structure. In this elevation there are three entrances, two being intended for the admission of goods, and the third a private entrance. The apartments in the interior of the building are very spacious. The basement will be exclusively set apart for stores and goods of different descriptions, whilst the ground-floor and the first and second stories will be appropriated for the sale of the various articles in which the association intend to deal. The principal sale-room on the ground floor, and those on the first and second stories, which will be approached by a spacious stone staircase, 11 ft. in width, are of large dimensions, being 52 ft. in length by 52 ft. in width, at the rear of which there are also other sale-rooms, each 49 ft. by 35 ft. The apartments in the third story will be exclusively set apart for the executive business of the association and domestic purposes, and will contain the board-room, committee-room, and offices, together with the housekeeper's rooms, kitchen, and other conveniences. In the basement of the building, at the rear of the Bennet's-hill frontage, there are two lifts for the raising and lowering of goods from the ground-floor to the second story. The windows on the ground-floor of the building will all be fitted with iron shutters. The estimated cost of the building, exclusive of the land, which covers an area of about 6,000 square feet, is 20,000. The architect is Mr. E. Saunders, and the contractor Mr. Brass, Mr. J. Barnes acting as clerk of works.

THE ROMAN BATH IN THE STRAND.

It is well worth remembering that, close to the busiest part of modern London, is to be found one of the earliest remains of Roman construction in the metropolis. A hundred yards down Strand-lane, close to the Strand Theatre, is to be found a bath constructed some 1,500 years ago, in which the water is now flowing as freshly and as freely as it did at that time. It is capital water, and King's College and other establishments in the neighbourhood are supplied from this source, which is constant and unvaried. At a guess the bath is about 14 ft. long and 8 ft. wide, rounded at the west end of it where the water is deepest,—say 4 ft. the bottom shelving towards the other end. It is at the deepest end that the spring rises, and the water is so plentiful, probably supplied by the Highgate hills, that it runs away at the rate of about 10 tons per day. As it runs, however, it passes, before going into the Thames, into an adjacent cold-plunge-bath, which thus has a continual change of water for bathers. This latter bath, too, has a story, for it is said to have been formed by the Earl of Essex, Queen Elizabeth's favourite, from whose mansion here a neighbouring street is named. The house, however, we are disposed to think, must have been at some distance from this bath.

The sides of the more ancient bath are formed mainly of thin bricks (about 9 in. long and 1½ in. thick), and mortar. In between the construction of this bath and to-day comes the whole History of England.

PARTIAL FALL OF THE CANTERBURY NEW SEWAGE HOUSE.

AN unfortunate occurrence has happened at the outfall of the Canterbury new drainage works on the Broadwalk-road. The men employed in the filtering-houses were about to enter at seven o'clock, a.m., according to the *South-Eastern Gazette*, when they heard a crash inside, and in a moment the greater part of the building fell in. The portions of the structure which fell were the two chief roofs, 120 ft. in length and 19 ft. each wide; one being over the filtering department, and the other over the settling-tanks, which were supported by the centre wall. This wall gave way, and with it of course the roofs came down. The cause of the unfortunate occurrence, which has entirely put a stop to the workings, is due, says our authority, to the building having been badly constructed; the walls much too thin, and the general construction of them, as well as of the whole building, had. The sewage, always passing alongside the 9 in. walls, has had the effect, or rather the acid

from it, of eating away the lime, and leaving nothing but the sand, and the immense length of the walls, 160 ft., could not stand long under such circumstances. The building was erected by the contractors of the drainage works, under the supervision of the engineer. The city surveyor (Mr. Hall) had some knowledge of the insecurity of the structure, but not the remotest idea of any such mishap as has taken place, nor had the men regularly employed at the works reported to him anything to lead him to suppose such a thing was likely to occur yet. The parts remaining are the walls inclosing, and the roofs over, the storage department, and the first tank. The estimated amount of damage is between 600l. and 700l. Mr. Hall has made arrangements for ranning the sewage into a ditch until he receives instructions as to the course to be pursued, and he was to present a report upon the subject at a special meeting of the local board.

HALIFAX INFIRMARY.

THE alterations and improvements of this Infirmary are progressing; Mr. J. W. Wilson being the mason, Mr. Plant the joiner, and Mr. Walsh the plumber. The excavation for the new ward has nearly been made. On the principal front improvements are being carried out. The narrow passage running around, and thereby darkening all the basement windows, has been done away with, and a wide slope of grass substituted. The roof of the portico has been re-lead and made water-tight, and by lowering the wide footpath leading from the front gates, two additional steps will be added to the broad flight of steps leading to the great doors, and thus more dignity will be given to the Doric front of the building, heightened as it also is by the clearing away of the basement passage. The portion of the New Assembly-rooms taken into the institution, and upon which great alterations have been made, is now nearly ready for use. Out of these rooms a dispensary for out-door patients has been formed. Altogether this part of the establishment, according to our authority the local *Guardian*, will be most complete. The expense incurred upon this part of the extension will exceed 300l. When the new ward is built, and the other rooms are converted into wards, the indoor accommodation will be raised from forty-two to seventy beds, and each patient will have a surface of at least 1,500 cubic feet, a great advance upon the present. When completed the total cost of the alterations will exceed 3,000l.

SANCTUARY REPORT, WHITECHAPEL.

MR. JOHN LIDDLE, medical officer of health, in the course of his report for the quarter ending September 28th, says with reference to *underground rooms illegally occupied*.—"The attention of the sanitary officers has, during the last fourteen years, been directed to this matter, and, as is recorded in my quarterly reports, numerous cellars and underground rooms used as dwellings have been discontinued for such use. There is, however, considerable difficulty in dealing with these cases; for it frequently happens that no sooner has one family been compelled to remove, than, in the course of a short time another, or perhaps the same family, again occupies the room. The inspectors, on visiting several new houses which have recently been erected in this district, found that the underground rooms therein were not fit for habitation, yet many of them were occupied by families as sleeping-rooms, contrary to the provisions of the Building Act. It surely would be much better to get enacted a clause, in the proposed new Building Act, to prohibit the letting of any new house, unless all the rooms therein were fit for habitation, than to allow houses to be built with rooms unfit for habitation, and then, when such rooms are found to be occupied, to empower the Local Board to proceed against the persons using them as sleeping apartments."

Mr. Liddle makes some strong remarks on the condition of the *bakehouses* in his district, and adds:—

"From the above return there will scarcely be a difference of opinion regarding the desirability of effecting a sanitary reform in the bakehouses. In these bakehouses which are situated underground,—where there is a want of daylight; where gas is burned to a great extent; where ample provision is not made for carrying off the products of combustion and the heated air which is combined with the sulphurous acid gas

given off from the oven fires; and especially where adequate means are not provided for the admission of fresh air,—it may reasonably be expected that men remaining in such places for fourteen hours daily will suffer in their health. In addition to these evils, the men are exposed to the inhalation of the fine particles of flour, which act as a mechanical irritant to the lungs. We need not therefore be surprised to find that consumption is a common complaint among the journeyman bakers. Nearly all the men whom I saw at work were pale and unhealthy-looking. On entering the bakehouses, I found in one or two instances such a difficulty of breathing that I could not remain in them longer than a few minutes; and I learned that, whenever a window was opened to let in light and air, the men, who are generally in a state of perspiration, cannot bear the cold draught which then poured in upon them; and they find it more comfortable to work in a heated and ill-ventilated place than to expose themselves to the painful effects of draughts of cold air."

THE RESTORATION OF SALISBURY CATHEDRAL.

THIS restoration is progressing. During the past year the painting of the choir roof has been restored by Messrs. Clayton & Bell. These paintings, specimens of thirteenth-century work, were covered, like much of the rest of the cathedral, by colour wash, which could not be removed without the destruction of the paintings, which, however, were plainly discernible beneath it. Drawings were made, and the paintings have been reproduced. The design of the roof is said to be foreign. In the centre is a large figure of our Lord within the vesica piscis. He is surrounded by the four Evangelists and twelve Apostles. East of this figure, towards the altar, are designs of the twelve months of the year painted in medallions, six on either side. West of the centre figure are twenty-four figures in medallions, in four rows,—six in a row,—of prophets, each bearing a scroll with a Messianic prophecy thereon. Besides the four greater and twelve minor prophets are Job, Abraham, Isaac, Jacob, Moses, David, Zacharias, and John the Baptist. One bay of the choir wall on the south side, and the east wall, have been painted as a specimen of what existed beneath the wash, and as an inducement to complete this part of the work. The old thirteenth-century stalls, the only fittings of the choir which could be kept, have been cleansed from their paint, and wait for proper canopies to be placed above them. The pavement of the choir, which is to be a mixture of encaustic tiles of the old patterns, and of black and white marble lately in the choir, has been ordered by the committee. This will leave very little in the treasurer's hands, whilst the committee have still to provide all the fittings for the choir. These have been estimated at 8,000l., and do not include the reredos and choir screen, which are promised. A lady of the diocese has promised 1,500l. towards the canopies of the stalls, estimated at 3,000l., on condition that another 1,500l. can be raised for the same purpose by Christmas, 1873.

PROPOSED CONVERSION OF PECKHAM RYE INTO A PUBLIC PARK.

THE Camberwell Vestry contemplate forming Peckham Rye into a public park, adding to it a quantity of land at One Tree Hill, Nunhead, which it is proposed to purchase. The proposal has arisen out of the scheme of the Commons Preservation Society requesting the Governors of Dulwich College to dedicate to the public 150 acres of the college estates for the construction of a park in South London. The subject was discussed at the meeting of the Camberwell Vestry last week, when the proposal of the Commons Preservation Society as regards the appropriation of the Dulwich College estates was unfavourably received. It was objected that 150 acres in one piece could not be found on the estate, and that there was a doubt as to the power of the Governors of the College to sell the land for such a purpose, and that, even admitting that they had the power, the cost would be so enormous as to prevent the proposal of the Commons Preservation Society from being carried out. It was urged that according to the present value of land in the neighbourhood of Dulwich the purchase of 150 acres belonging to the college estates would involve an outlay of

150,000l., and it was further pointed out as an objection to the purchase so far as the parish of Camberwell is concerned, that the College estate will in all probability in a short time be occupied with valuable houses, from which a large revenue will be drawn by the parish.

The desirability of a public park in the district was warmly supported by the Vestry, who appear to be unanimously of opinion that Peckham Rye should at once be converted into a park, together with a quantity of land adjoining, up to One Tree Hill, at Nunhead, which should be purchased for the purpose.

Mr. Shields proposed a resolution to this effect, in the course of which he stated that from his own knowledge this land could be purchased at a fair valuation.

The matter was ultimately referred to the favourable consideration of the finance committee, with instructions to report as to the best means of carrying out the object.

ACCIDENTS.

Fall of a Saw-mill.—Extensive stone saw-mills, just constructed by the Portland Stone Company, at Portland, have fallen, injuring several workmen. Some supports gave way whilst a heavy block was being raised.

Fatal Scaffold Accident.—In Traleo, a scaffold erected on the roof of O'Sullivan's Hotel, has given way, and the contractor, Mr. Driscoll, and a man named Cusack were killed on the spot. Another had his skull fractured; and a boy had his wrist broken. One man escaped by putting the claw of the hammer he was using into a hole in the slating, and holding on by it.

Fatal Accident in Newcastle.—A fatal accident has occurred to a master builder, named Barron Robson, at the Osseburn, Newcastle. He was standing on a ladder, repairing the roof of a house at Millar's Hill, when he overbalanced himself, and fell to the ground, a distance of about 18 ft. He sustained serious injuries to his head and hip. The unfortunate man died in the infirmary. Deceased was sixty years of age, and had resided at Osseburn.

CHARTER-HOUSE SCHOOLS.

The 12th of December is known by Carthusians as Founder's Day, and gives special appropriateness to the illustrations in our present issue. On that date, in the year 1611, died Thomas Sutton, a wealthy citizen, who established what Bacon calls a "triple good,"—a hospital, chapel, and school-house,—on the site of a monastery of the Carthusian order (*Chartreuse*) next Aldersgate-street, completed in 1370. After the Reformation the site of the Charter-house was granted by Henry VIII. to John Brydges, yeoman, and Thomas Hale, groom of the King's tents, as a reward for the safe-keeping of his royal pavilions which were deposited there, as "government" to Smithfield. On their surrendering this grant, the king presented the place to Sir Thomas Audley, Speaker of the House of Commons, from whom it passed to Sir Edward North, serjeant-at-law, afterwards Lord North, who was remarkable for keeping on good terms with the winning side all through the political and religious changes of the Tudor era. After some other changes, it came into the hands of the second son of Thomas Howard, Duke of Norfolk, who afterwards sold it to Sutton for 13,000l. Sutton died soon after he had commenced his work and obtained a charter from King James, and some of his relatives sought to set aside the will by which he endowed the establishment, but were defeated.

The hospital was to consist of two parts—the one being eighty "poor brethren," and the other being the forty "scholars," "collegers," or "gown boys," as they were formerly called, who from that day to this have formed the nucleus of the Charter-house School. The former were to have rooms rent free, with certain allowances, and a small pension, and also dinner daily in the Great Hall. They were to be, according to the statutes made by the governors, "gentlemen by descent and in poverty; soldiers that have borne arms by sea or by land; merchants decayed by piracy or shipwreck; or servants in the household of the king's or queen's majesty, and not under fifty years of age, unless they had been wounded in the king's service," when they were eligible at forty. The scholars were also to be "poor scholars," in the sense of boys whose parents needed help towards their

education. These were to be chosen between the ages of ten and fourteen, and educated, fed, and clothed at the expense of the founder. On leaving school they were to be provided with houses or exhibitions of 16l. a year, in order to help them to meet their expenses at Oxford or Cambridge; or, if they declined to go to the University, they were entitled to a grant of money towards their apprenticeship in other walks of life.

According to a recent account in the *Times*, the number of "poor brethren" or "pensioners" has never been increased from its original number (though their stipends have been raised), and the "poor scholars" remained at forty until some fifty or sixty years ago, when as the nominations to the College had come to be matters of favour and interest, it was resolved by the Governors, at the instance of Lord Grenville, we believe, to add four more, in whose case the election should be made by competition. To show how carelessly such matters were handled by a corporate body in the days of "the Georges," we may mention here that the resolution in favour of the addition of four more boys was carried, but that the condition was accidentally postponed to a second meeting, when it was—perhaps conveniently—forgotten, and the result of Lord Grenville's admirable and foresighted resolution was to increase by four the nominations, and, therefore, also the patronage of the governing body.

About thirty years ago, however, the step then taken was carried out, in spirit, at least; for the Governors resolved to add every year to the College or foundation two boys, chosen by competition, under the age of fifteen years. The competition, however, is limited, for a boy must have been in the school for a year at least, either as a boarder or a day-boy, before he can be admitted to compete.

A few years ago removal was determined on; about seventy acres of an estate near Godalming, formerly belonging to the Deanery of Salisbury, were purchased, and the old site was sold to the Merchant Taylors' Company, the amount received sufficing, we believe, to pay the greater part of the cost of the new buildings, as well as for the land.

The site obtained for the Governors by their architect, Mr. P. C. Hardwick, has special advantages which could scarcely be found elsewhere. It is high and commanding, and yet it has a large level area, and, what is of equal advantage in a sanitary point of view, it has a satisfactory subsoil; thus the ventilation and drainage may be made as good as the most scrupulous can desire.

A cricket-ground several acres in extent overlooks the valley of Godalming, and on its northern boundary is a slightly-raised terrace which extends the whole length of the buildings now erected, and what are proposed hereafter.

The present buildings comprise three houses for masters, with accommodation for 160 boarders, and a central building, which is the general school-room, with six class-rooms attached to it. This has been in use for some months.

The houses are similar in general arrangement, and in addition to the several rooms in a gentleman's house, have a series of rooms set apart for the boys, and those more immediately connected with them. The boys have two rooms on the ground-floor: one for seniors and the other for juniors; and on the upper floor they have large dormitories, each boy having his own "cubicle," all having communication with the external air by means of a wood casement. The senior boys have in addition a separate study.

Closely connected with the above are rooms and a study for an assistant master, and rooms for a matron.

Each house is well furnished with bath-rooms and other accessories.

The chapel is now fast approaching completion, and in no part will the careful painstaking of the head-master be more conspicuous than here. Stained glass, by Messrs. Clayton & Bell, will fill the windows from various donors, commencing with her most gracious Majesty.

The infirmary, or sanatorium, is already commenced, and there is but little doubt that no long time will elapse before two other houses, the sites of which form part of the general scheme, will also be commenced, which will give accommodation for 100 additional boys. Another house could be built on the north side of the cloister court, but this site will possibly be appropriated as a common hall; ample room can be found on the estate for any number of school-houses that the most prosperous establishment may require.

The floors of all the buildings are formed with iron joists and concrete, so as to lessen the danger of fire.

The face-work generally is of local Bargate stone, quarried on the estate, with Bath stone dressings.

We may add to the early part of our notice that the draught of a new scheme proposed for "the Regulation and Government of the Charity called Sutton's Hospital, in Charterhouse, in the county of Middlesex," has just been printed and circulated among the officers of the establishment and the eighty "poor brethren," who still remain, for the present, at least, in their old quarters, in spite of the removal of the school. According to this scheme, the charity and its endowments are to be administered henceforth by the newly-appointed Board of Governors, who are to take measures, under the sanction of the Charity Commissioners, to sell the outlying estates belonging to the Charterhouse, and to invest the sum so realised as part of the principal endowments of the Charity. They are then to divide the clear income annually into two equal parts, the one to be applied to the purposes of the school (including the defrayal of such part of the purchase-money of the new site at Godalming as may not be met by the sale of the playground, &c., in London, to the Merchant Taylors' Company), and the other to the purposes of the "Hospital." The "poor brethren" are to be, as heretofore, "deserving men of good character, widowers or unmarried, in decayed circumstances, being or having been officers in the army or navy, clergymen, merchants, or persons engaged in trading, professional, agricultural, or other similar occupations, who have become reduced by misfortune or accident without their own wilful default, and who shall not be less than sixty years of age at the time of appointment, unless the Governors shall see fit in any special case to relax the restriction as to age in favour of a candidate otherwise duly qualified." Each of these brethren is to have a room or set of rooms in the hospital, with an annual stipend of 36l., and a daily allowance of bread and butter (which the Governors, if they see fit, can commute for an additional payment of 6l.), as also a gown or cloak, a "reasonable supply of household linen, fuel, and candles," and a dinner in the Common Hall. These advantages, however, in the lump, the Governors may commute for one fixed annual payment of 80l. in any particular case; and if the funds of the charity shall permit, they may bestow annual pensions of 40l. or 50l. a year upon certain other deserving persons as out-pensioners.

The old building is disappearing. Within the last week the part known as "Gown-Boys," because it was devoted to the residence of the boys upon the College foundation, these boys having hitherto borne that name, has been removed. The building had but few pretensions as having been the early home of many persons who afterwards rose to high distinction in Church and State. Together with the "Gown Boys' Hall" has disappeared also the adjoining apartment, which formerly served as the chief school-room, but which more tokens of having originally formed part of the town mansion of the Howards. We may add that certain arches, with names of the "boys" deeply cut, have been carefully taken down, and will be refixed in some conspicuous portion of the new building, so that the names of the old boys may not be forgotten in the new home.

REFERENCE TO PLAN.

1. Tower.	25. Press-room.
2. Staircase.	26. Boots.
3. Corridor.	27. Boys' entrance.
4. Cloister.	28. Boys' stairs.
5. Library.	29. Master's room.
6. Master's common room.	30. Drawing-room.
7. Boys' room.	31. Housekeeper.
8. Area.	32. Store.
9. Boys' room.	33. Butler.
10. Lavatory.	34. Bed.
11. Boys' w.c.	35. Plate.
12. Hall.	36. Dining-room.
13. Scullery.	37. Bath.
14. Manicle.	38. Morning-room.
15. Bath-room.	39. Buttery.
16. Servants' hall.	40. Servants' entrance.
17. Stationery.	41. Master's dining-room.
18. Pantry.	42. School.
19. Parlour.	43. Proposed extension of school.
20. Buttery.	44. Master's house.
21. Passage.	45. Site for additional master's house, or common hall.
22. Governors' room.	
23. Sitting-room.	
24. Waiting-room.	

Earth closets.

GRATES AND STOVES.*

As regards grates, the varieties of which are endless, I can only deal with some of the more prominent points of those at present before the public, and note the principles which are or should be observed in them.

The more that fire-brick or fire-clay enters into the composition of the part which encloses the fire the better. It absorbs heat which would otherwise escape, and can communicate it to air passing through spaces in contact with it, without the unpleasant, and doubtless unwholesome, sensation caused by air which is overheated by contact with iron.

The depth from front to back should be small, sufficient that the body of fuel be not too soon exhausted, but no more, or much of the heat generated within the mass of fuel, being prevented from radiating, will be lost.

The form of the back, by what is called the Milner plan, described in a letter to the *Standard* by Mr. W. H. Wheeler, C.E., being in shape like the angular part of the letter K, projecting inwards, about 1 ft. above the grate-bottom, and then returning back, is good, as the angle catches the flame and reflects it into the room, and the smoke curling round the projection comes in contact with the red-hot fire-clay, and thereby is partially consumed. The bottom of the grate by this plan is raised not more than 4 in. above the hearth, and is of solid fire-bricks or a fire-clay slab; the fire made on which gives greater heat and consumes less coal than in ordinary grates.

The slow-combustion grate, advertised by Clark & Hunt, has the fire so placed on a low slab, and inclosed by fire-brick, but would be improved by adding the Milner back. Existing grates may be brought partly under the same conditions by fitting plates of sheet-iron over their gratings at the bottom, to prevent air entering from below. The grate should be half filled with nuts of coal, and the fire made upon this stratum of fuel and allowed gradually to burn down to it. Dr. Arnott's grate is upon this principle, having a box with supply of coal beneath, which is lifted as required upwards to the fire above. The principle would be still further carried out by having the fire beneath, instead of above the grate, if proper draught could be insured; but systems of descending flues are seldom to be depended upon.

There is, without doubt, economy in the plan of thus burning coal downwards; but it demands patience as well as care, for it takes a long time for the fire to become a good one, and it is apt to become dull, so that when really cold a poker frequently disturbs its stratification. Then, though some description of coal can so be wholly consumed, other ashes of other qualities cannot, and thus the fire becomes choked.

To inclose the space underneath the bottom formed by an iron grating would answer the same purpose of preventing air feeding the fire from below, and yet allow ashes to fall through, and these could be removed daily by the servant, by means of a removable door.

The late Mr. Pierce's (now Penfold's) fire-lump grates, and those of Mr. Edwards and others, are good in having the fire surrounded by fire-clay, and the backs grooved behind for the passage of air to be warmed and conveyed where desired. They would be improved by one or other treatment of bottom suggested, and by the Milner form of the back, as also by the provision of a larger space for warming air behind. The invention by Messrs. Young, of Queen-street, Cheapside, recently described in a letter to the *Times*, for introducing fresh supplies of coal when needed into ordinary grates and ranges, into the bottom instead of on to the top of the fire, has the same desired end of making the smoke pass through an already beated mass of fuel, and so becoming consumed, and loss of heating power prevented. Mr. John Taylor, of Whitehall, has an extremely ingenious patented arrangement by which the smoke, after it has risen from the fire, is diverted by a damper, and made to pass round and re-enter the grate at the lower part of one side, and pass through deep bars, of which the bottom is composed, so that the smoke is consumed, and only gaseous products of combustion escape through the other side to the flue proper. Thus the fire is intensified and made brilliant, creation of soot in the flue to a great degree prevented, and fresh air is admitted from the front of the grate through chambers in the substance of the fire-brick sides,

which have had the heat passing entirely round them. Mr. Taylor has recently at my request simplified its details, so that it should be as self-acting as possible, which I consider essential.

Captain Galton's stove has excellent merits in a roomy accessible heating chamber behind; in the proper connexion of the flue from the grate with the brickwork flue above, so that smoke cannot leak into the hot-air chamber; in the facility of introducing the warmed air through any part of the chimney-breast, or to other rooms; and in the shape of the back being concave, so as to have the same effect as the Milner back; but it would, in my opinion, make this grate more economical to shut off the air from the bottom, and feed it only from the front and top.

Mr. Boyd admits warmed fresh air copiously by an ornamental panel above the fireplace opening, whence it rises into the room. This, or the sides of the chimney-breast, are as good positions for inlets as can be chosen; but, if the air enter by the hearth or sides of grates, it will be drawn at once by the fire, and defeat the purpose of ventilating the apartment.

Such grates and arrangements, however, seldom find their way into the bulk of the houses of the middle class; it may be well, therefore, to state that, of ordinary ironmongers' goods, those which have regulating louvres or small doors to the flues at back are economical of heat, minimising the portion that escapes to the flue. Provision of air, however, must in some shape be secured, unless health is to be sacrificed.

Greater economy and more heat will be obtained if those who confine their metal-work to the front bars, and simply construct the rest with fire-bricks or fire-clay slabs.

Even ordinary grates may be improved by getting common pipeclay and modelling it to the shape suggested, covering bottom, sides, and back, and lighting a fire of sticks within to dry it. This will last from two to three years with care, and is not costly to replace.

It is possible, however, while saving at the spigot to lose at the hunchole; or, while careful about the parlour fire, to draw unduly at the coal-cellar for the kitchen range. The ordinary close range, though one of the best inventions of the age, is usually greedy of fuel. If it have, as it may, to aid in warming the house, and ventilate by extraction of foul air, and to heat water for baths, as well as to cook, it will need to be correspondingly fed. The Cromer range has been arranged specially, at my suggestion, to meet the varied demands of cottage and mansion with the smallest expenditure of coal, by Mr. John Barber, engineer, of Leeds, to whom I am in the habit of sending all problems of this kind which arise in my practice to be worked out.

Gas, at present, with the appliances in use, does not contrast favourably with coal in point of economy as a means of warming houses where the work is continuous, but may yet be made very serviceable, and even economically so upon occasion. It can be turned on at a moment's notice, and its full effect attained speedily; it demands little attention and causes no work, and is extinguished as suddenly as it was kindled. These qualities commend it for studies, bed and dressing rooms, and wherever heat may be needed quickly and for a short time only. It can be made cheerful in appearance, making lumps of asbestos, &c., glow with heat as red-hot coals.

Mr. Hammond, gas engineer, of Chandos-street, informs me that, according to experiments he has made, a coal-fire maintained by 20 lb. of coal at a cost of 9½d., when the price is 30s. per ton, will produce as good a result as the combustion of 200 ft. of gas, which costs 9d., at 3s. 9d. per 1,000, both fires being ten hours in action. But he states that when the work is occasional, intermittent, or for short periods, and the waste in lighting up taken into account, gas is not only more cleanly and convenient, but far cheaper than coal, and when coal-fires necessitate extra cost for attendance, this will frequently make gas the cheaper heating agent. Mr. James Thompson found, by an average of thirty-six experiments, that he had to consume 4½ lb. of coals—value, with lighting-wood at present prices, nine-tenths of a penny,—to raise one gallon of water to boiling-point; 4 cubic feet of gas, costing two-tenths of a penny, doing the same work at less than one-fourth of the cost.

There is a grate of French invention in which a ring of gas, burning out of sight above the opening, throws a brilliant glare upon a polished

reflecting metal bottom and back, which radiate heat well, and have a pleasing effect. The cleanliness and beauty of this would make it very applicable to secondary fireplaces in a suite of saloons.

George's Gas Calorigen cleverly disposes of the products of combustion by the same pipe which admits the air supply for the purpose, and provides the apartment with fresh air warmed in passage through another pipe heated by a ring of gas-jets.

All these gas-stoves, as indeed gas-illuminating burners, should, if to be tolerated, have flues to conduct out of the house the products of combustion; but Dr. Taylor claims to have invented a "self-purifying gas stove," with a chemical substance by which the noxious products passing are decomposed. For these, Messrs. Hodge, of 100, Hatton-garden, are agents, and if their promises be realised, they solve a difficult problem, and may tend to the wider introduction of gas as a heating medium for houses.

Gas-stoves constructed with rapid circulation like Gill stoves, disposing satisfactorily of the products of combustion, and warming the air by the inlets to be provided for general ventilation, would, I believe, warm houses cheaper than coal fires at the present price of gas, when account has been taken of the saving in cost of building, furnishing, and maintaining in order, all the provisions and appliances necessary for ordinary grates and stoves.

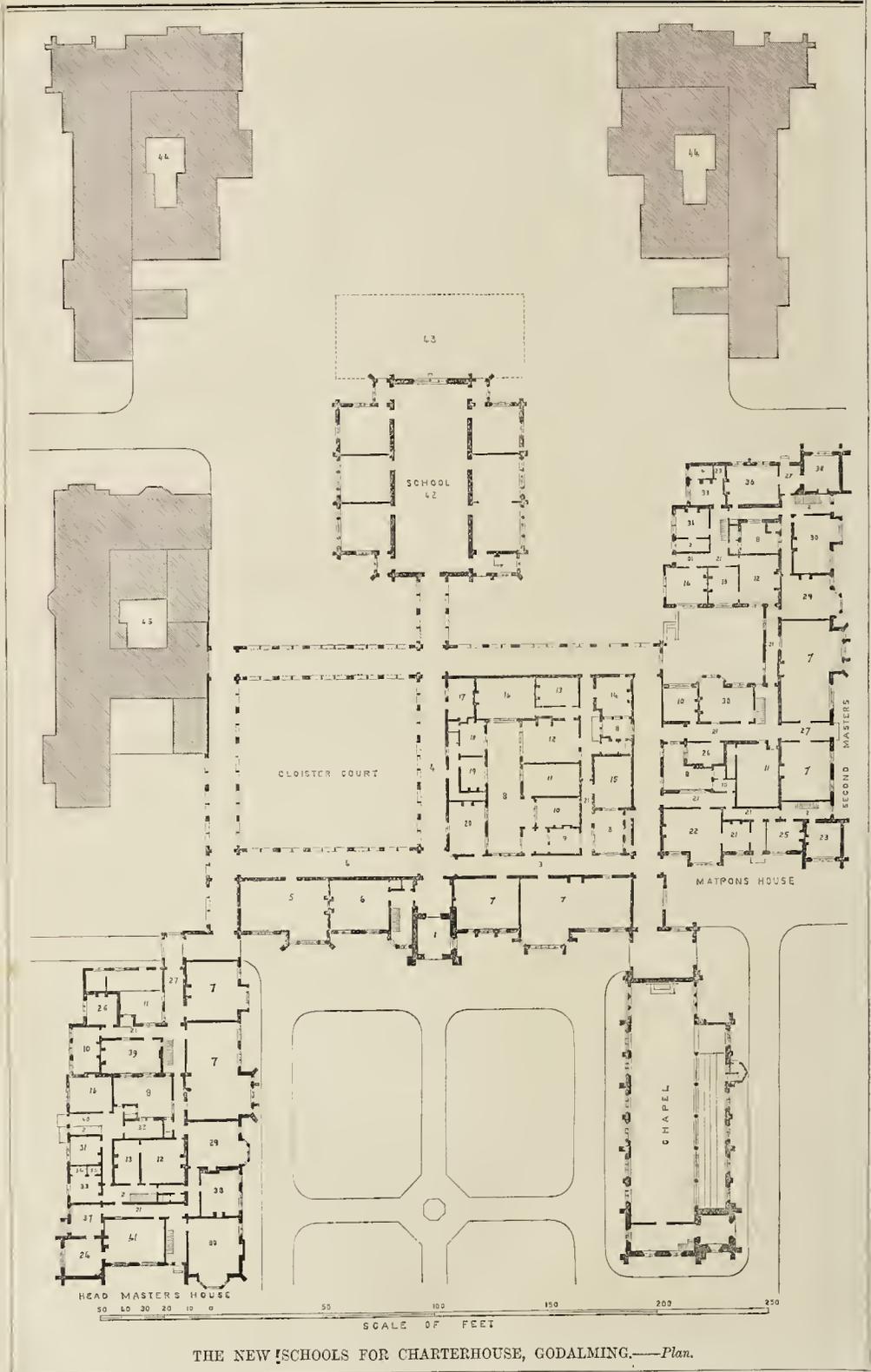
THE ANCIENT ACCOUNT OF THE DELUGE.

In the paper read at the Society of Biblical Archaeology, Mr. Smith commenced by describing the discovery of the tablets containing the text of the Deluge, which date from the reign of Assurbanipal, king of Assyria, B.C. 668. These tablets were copies from more ancient tablets, which Mr. Smith placed 1600 B.C. The Deluge text forms part of a series of legends belonging to the reign of a king named Izdubar. Mr. Smith describes how Izdubar, falling ill, went to seek Sisit, the Xanthus of the Greeks, who was supposed to have been translated. The legend describes Izdubar as seeing Sisit, who, in answer to a question from Izdubar, relates the story of the Flood. Sisit states that the gods revealed to himself the coming deluge, and commanded him to build a ship and put his family and all the seed of life into it; the ship was then to be launched into the sea. Sisit relates how he finished the ark, coated it with bitumen, and placed his treasures and family, his servants, and the beasts of the field in it; he then gives the command of Shammas to him to enter the ark and shut the door, followed by his obeying the command and the commencement of the Flood.

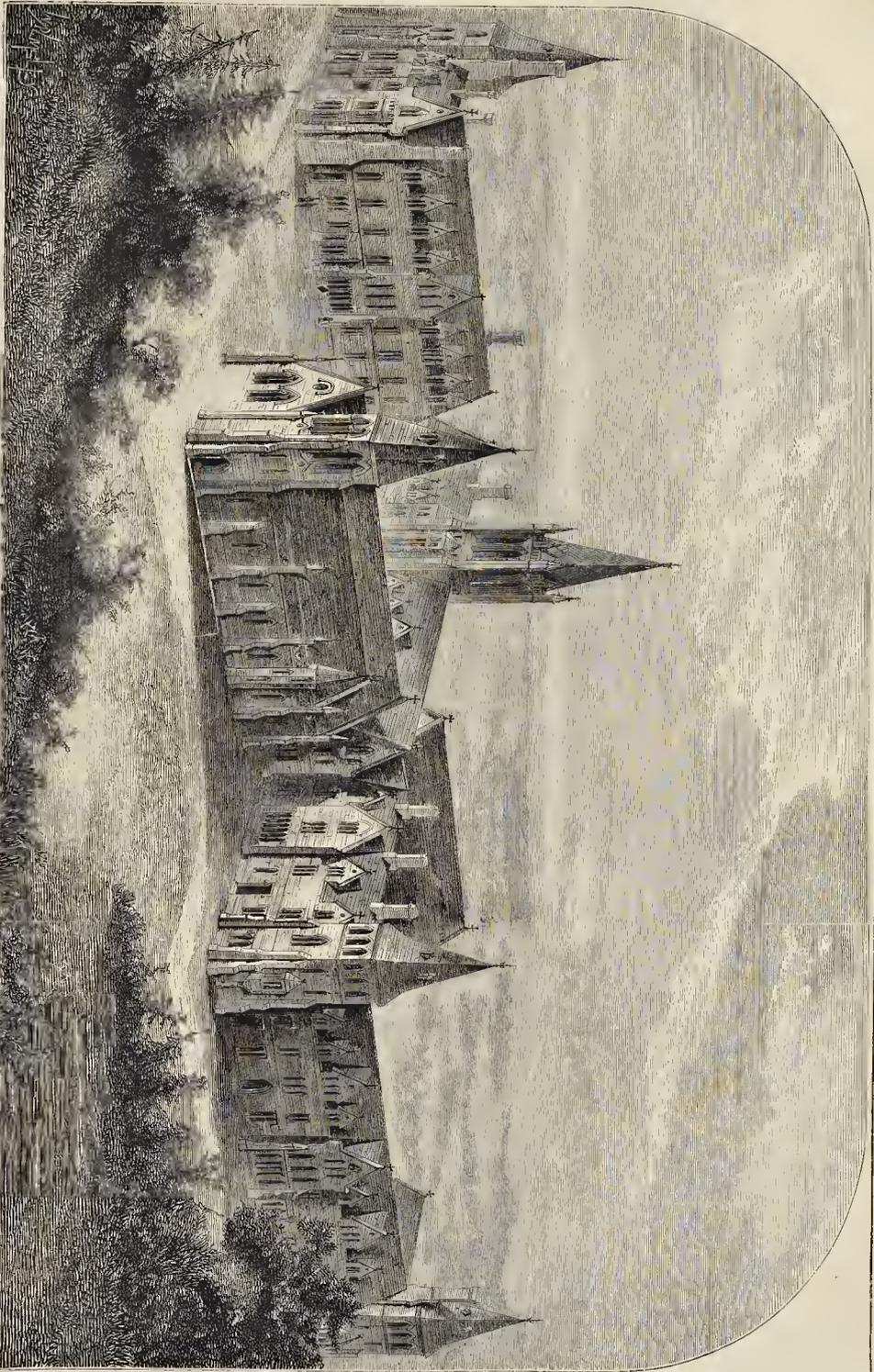
After the description of the Flood, the story described the stranding of the ship on a mountain in Nisir, east of Assyria, and the sending out from it by Sisit first of a dove, next a swallow, and last of a raven. The animals were afterwards sent out of the ship, and Sisit built an altar and offered sacrifices.

At the conclusion of the reading of Mr. G. Smith's paper, the chairman, Sir H. Rawlinson, offered some remarks on the probable age of the Babylonian legend of the Deluge. He showed grounds for believing that the historical chronology of Babylon ascended to a period at least 5,000 years before the Christian era. There was a recorded date in the inscriptions of B.C. 2280 for the conquest of Babylon by the Medes, and the number of kings assigned by Berossus to the dynasty which preceded that event would place the commencement of the historical era in about B.C. 5150. The deified Sage to whom Mr. Smith had given the provincial name of *Izdubar*, and who in his search for immortality had learnt the legend of the Deluge from *Sisit*, must be placed beyond the historical limit, but how much beyond it was of course impossible to say. The Greeks, who had picked up the early traditions of Babylon, appeared, however, to indicate a date by placing the Proto-Patriarch, from whom the Babylonians had acquired the knowledge of astronomy, astrology, magic, and genealogy, 6,000 years before Plato, or 5,000 years before the Trojan war, that is, above 1,000 years before the commencement of the historical period. If *Izdubar*, the first civiliser of the Babylonians, lived about B.C. 6400, they would still have to ascend to a much earlier period for the age of *Sisit*, who was the hero of the Flood, and from whom the legend professed to come.

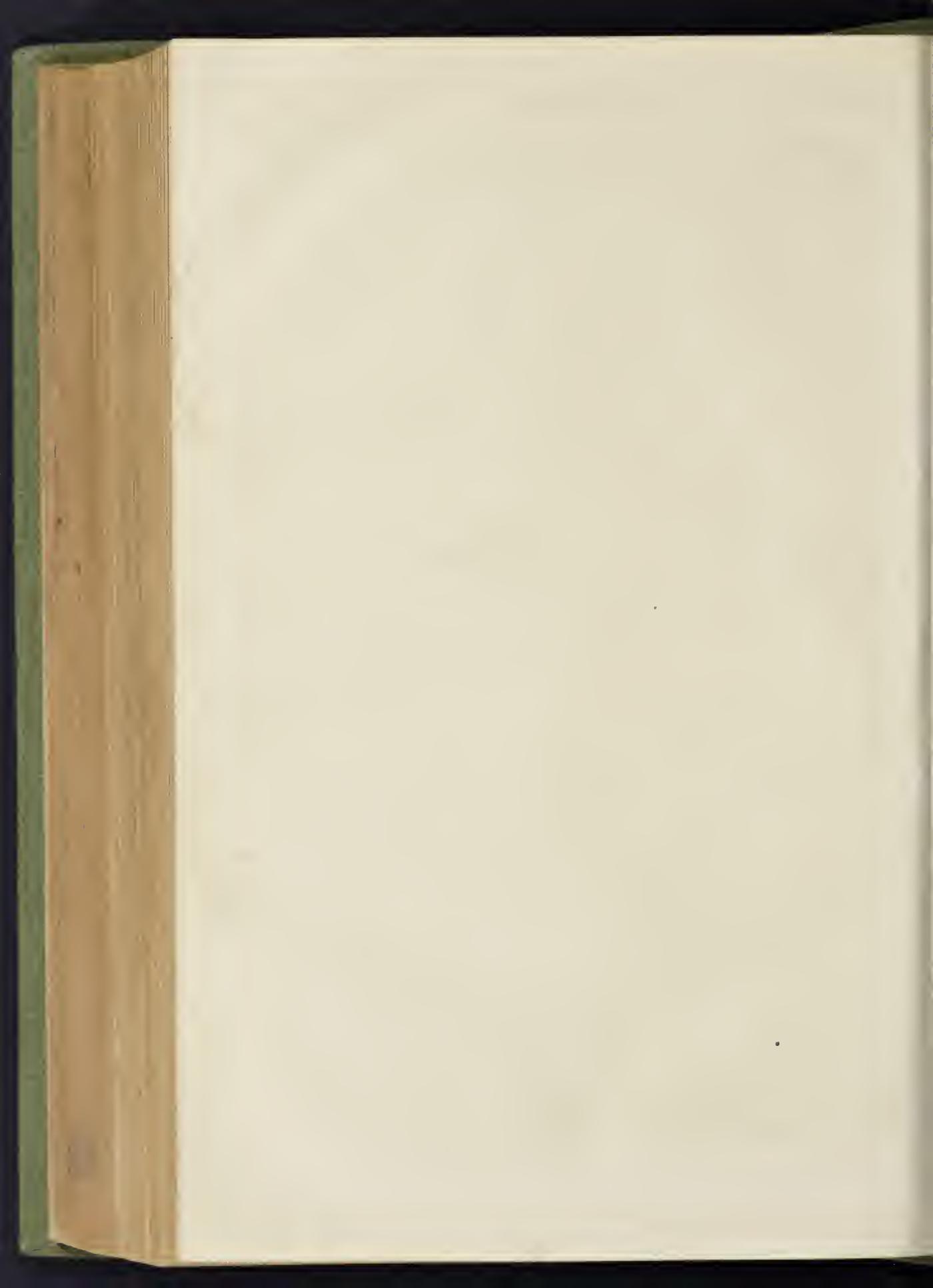
* By Mr. J. P. Seddon. See p. 969, ante.



THE NEW SCHOOLS FOR CHARTERHOUSE, GODALMING.—Plan.



CHAPELHOUSE SCHOOLS, GODALMING, SURREY.—MR. P. C. HARDY, ARCHTCT.



SCHOOL BOARDS.

Ipwich.—The chairman said he had had under consideration the rules issued by the Royal Institute of British Architects, which had been sent by Mr. Eyton, architect for Argyll-street School, in support of an application by him for payment to him of 5 per cent. upon the instalments paid to the builders, or half the commission on signing the contract and the remainder on the completion of the work, and it seemed that those rules supported the claim. The rules, however, were not in any way binding on the Board. It was agreed that 25l., 5 per cent. on the instalment paid to the builder, be paid to Mr. Eyton.

Carlisle.—The clerk reported that there had been a meeting of the Sites Committee, at which they examined six sets of plans sent in for the new schools proposed to be built. These were from Mr. D. Birkett, Carlisle; Mr. Crosby, Hetherington, Carlisle; Messrs. Schools & Cory, London; Messrs. Brabe & Smales, Kendal; "Spes," and "Knowledge is Power," whose letters containing names and addresses are not yet opened. As there were only six sets the committee had left the decision to the Board. After a brief conversation it was decided to exhibit the whole of the plans to the public before any decision were come to. The plans were to be hung in the School of Art, Fisher-street, for public inspection.

Liverpool.—Mr. Whitty moved a recommendation of the Sites and Building Committee, that the Board adopt the plans of Messrs. Read & Goodison, for the proposed temporary schools. He explained that other plans were brought in competition with these, but the cost would be 100l. more. The school might be moved anywhere. In the event of a site not being obtained the plan would not be proceeded with. The cost was estimated at 1,500l. The recommendation was agreed to.

We have engraved views and plans of a number of the schools which are about to be erected for the London School Board, and shall take early opportunities to publish them.

NEW DWELLINGS FOR THE POOR AT THE HOLBORN VIADUCT.

The Holborn Board of Works are taking steps to compel the City Corporation to erect dwellings for the poor near the Holborn Viaduct. The clerk to the Board last week wrote a letter to the Corporation, to the effect that the City municipal body have failed to comply with the Holborn Improvement Act, by which it is provided that they are to build dwelling-houses for the working classes, in room of those taken down to complete the Holborn Viaduct works. It appears from the reply which has been received to this communication from the Corporation, that the subject is now under the consideration of the Improvement Committee, with the view of the buildings in question being proceeded with.

PAYMENT OF ARCHITECTS.

WITH reference to recent observations on this subject, it is, I think, a moot point whether 5 per cent. is a proper and sufficient remuneration for the ordinary professional man. It used to be considered so, and is still, by a large section of the building public, if one may judge by the magnificent offers one sees now and then in your advertising columns. Still, the advance would not lack a precedent. Another professional man has just succeeded in getting an advance of 5 per cent.—I mean our respected relative, the "pawbroker." Whether architects and engineers would like to be associated in the same category I cannot say; but I must confess, I never could, in his case, see why his gains should be increased from 20 to 25 per cent. per annum, at the expense of perhaps the most unfortunate section of our community. Whether there is sufficient cohesion in the architectural profession to compel a general advance, is also, I think, a very doubtful question. I know there are architects who now never get 5 per cent., except on occasional small jobs; and I could name one who commands the work of one of our town corporations in the North, who, some months ago, offered to design and superintend the erection of a large building for a company, and pay the wages of a clerk of works, out of 1½ per cent. on the outlay.

I am very glad indeed to hear from so good an authority that, "not only the cost of living, but the very salaries of clerks and assistants, are so

materially increased." As I belong to that class, and have heard many inquiries on that point, I may say, that in my case, and as far as I can ascertain generally, salaries to clerks and assistants have not increased in nearly the same ratio as the cost of living. I wish they had. That is about the last thing architects think of doing, with rare exceptions. I know that, unless an advance is made on the present remuneration of my class, one, at least, will "do his endeavour" to emancipate himself from that position. There are great numbers too many of us.

E. G.

Your correspondent, "Stentor," has already been answered. He is surely not likely to assert that the price of building has not increased at so high a rate as has the price of provisions, clothing, and the like? In Mr. Brassey's "Work and Wages," however, there is given a statement on this point (p. 197), furnished by Messrs. Lucas, which, if correct, places this view out of the question. I append it:—

"We find," they write, "for some years previous to September, 1853, that the rate of wages was as follows:—"

	For Mechanics, Masons, Bricklayers, Carpenters, and Plasterers.	Labourers.
Previous to 1853	5s. per day of ten hours	3s. per day of ten hours
From Sept., 1853, to March, 1861	5s. 6d. per day of ten hours	3s. 4d. per day of ten hours
From March, 1861, to Sept., 1865	7d. per hour, or 6s. 10d. per day	4d. per hour, or 3s. 6d. per day
From Sept. 1865, to May, 1869	7½d. per hour, or 6s. 3d. per day	4½d. per hour, or 3s. 9d. per day
From May, 1869, to present time	8d. per hour, or 6s. 8d. per day	5d. per hour, or 3s. 11½d. per day

And we consider that the price of building is twenty-five to thirty per cent. more now than it was in 1853."

This calculation was made, of course, before the advance in wages of this year, which would make this per-centage higher still—say, roughly, forty.

F. H. A. H.

NEW LUNATIC ASYLUM FOR MIDDLESEX.

AT the last general meeting of the Middlesex magistrates, a report was received from a committee appointed on the 30th of November, 1871, to procure plans and estimates of cost for the erection of an asylum for the reception of chronic patients to the number of 1,700. The committee recommended that the block system in use at Levensham should be adopted, and that plans should be prepared, and the committee instructed Mr. K. H. Pownall to prepare plans and estimates for the erection of an asylum on the block system, to contain about 1,600 patients, but capable of enlargement so as to receive 2,000. Mr. Pownall had submitted plans and estimates for the reception of 1,700 patients, and recommended that they should be carried into effect at an estimated cost of 1,40,000l., including commission.

The plans and estimates submitted were approved by the court, subject to the consent of the Secretary of State. The committee were authorised to take the necessary steps to carry the plans into effect, and to enter into contracts for the erection of the asylum. The committee were also authorised to accept a tender from Messrs. Estions & Anderson for sinking a well and providing a pump on the site, at a cost not exceeding 3,560l.

WORKMEN'S SOCIETIES.

AT a recent public meeting of the Birkenhead branch of the Amalgamated Society of Carpenters and Joiners, the sum of 100l., accident benefit of the society, was presented to George Latham, one of their members, who has been disabled by disease from following his employment. The presentation was made by Mr. J. Todd, the secretary of the local branch, who enumerated the benefits to be gained by workmen becoming members. Since its establishment in 1860, the society had paid away not less than 95,000l. in benefit donations, of which 39,000l. were for men out of work, 30,000l. for sick members, 3,000l. for loss of tools, 5,000l. for funerals, &c. The local branch had been formed in 1863, with eleven members, and it now had 150, with a balance in the bank of upwards

of 200l.; the general society had over 10,000 members, and funds in hand of nearly 17,000l.

At a similar meeting of the Bradford Operative Stone-masons' Society, a gratuity of 50l. was presented to Nathaniel Watts, a disabled member of the society. The Mayor (Mr. Thompson) presided. The Mayor addressed the meeting. He expressed his entire sympathy with the benevolent objects of the Operative Masons' Society, and also expressed his approval of every legal effort made on the part of trade-unions to obtain a reasonable advance of the wages, but strongly condemned the strikes of the London gasworkers and that of the London police as being perfectly unjustifiable, as well as all unfair and violent attempts to prevent non-unionists from following any occupation they thought proper.

"ARCHITECTS" IN ANCIENT TIMES.

SIR,—I was glad to see that your correspondent "Alpha" had called attention to the unsoundness of view and false deductions of the writer in the *Quarterly*, founded chiefly upon imperfect quotations from Greek literature, as to the absence of anything like an architectural profession in ancient times. The quotation from Plato is so peculiarly direct that in his time, at all events, there was such a distinction of the "architect" as is known to our time, that, as the writer of the articles referred to by your correspondent, it may be interesting for me to say that the quotation as used by me is from the late Lord Aberdeen's work on "The Principles of Beauty in Greek Architecture," published at one time with Stuart & Revett's "Athens," but since as a separate publication (Weale).

J. H. B.

OLD LONDON.

A CORRESPONDENT writes,—In getting out the ground for Messrs. Hilditch's new silk warehouse, at the corner of Cheapside and Old Change, the workmen employed by Messrs. Sharpington & Cole, the contractors, under the direction of Mr. Stephen Rolfe, the general foreman of works, at the depth of 26 ft. below the pavement, dug up a quantity of bones, amongst which was the skull of a wolf; some deer's skulls, with the horns attached, in a perfect state of preservation; several fragments of broken skulls and horns; and what were evidently the fore-arm and some ribs of a human body. In digging for the foundation for the centre column, some fragments of pottery,—ancient water-vessels,—were dug up: on the handle of one was a name,—supposed the maker's,—and on the handle of another, the number "912." In underpinning the party-wall of the adjoining premises, at a considerable depth below the old foundation, some unmistakable evidence of the Great Fire was brought to light,—several pieces of burnt and blackened stone, which at some time had formed part of the mullions and jambs of a large window.

ARCHITECTURAL COMPETITIONS.

SIR,—In reference to Mr. Strong's letter on this matter in your last issue, may I raise a question on the policy and practical results of this course?

Is it not a fact that, as a rule, employers, or would-be employers, resent professional interference and suggestions as to the course that they should pursue as an impertinence? Architects commonly do so with builders and those they employ.

Is it not a fact that the most prominent result of this trade-unionism (for such, in truth, it is) has been to induce committees to append such a note as this to the advertisements they issue in your columns: "The committee to be the judges of the designs"?

Are committees so obtuse that they can so remove the torrent of abuse poured out upon them equalled only by the self-glorification of the architects?

Is it not a fact that, owing to the ill-advised action of the Institute in the matter of the drawings for the Houses of Parliament, the Office of Works drew up a "memorandum of terms of appointment of architects for public buildings," of which clause 17 provides that "no rules of the R.I.B.A. or any other society shall be held binding upon the Commissioners in reference to the works or matters herein referred to"?

Is not the Institute regarded as an Institute of meddlesome people continually interfering with the business of others, and fancying itself abridged by those who decline or resent its advice?

Is it not obvious that we are gradually arraying the public bodies against us? That by trumpeting forth our honesty, integrity, and self-sacrificing qualities, we are suggesting the opposite ideas?

These are signs of the times that it would be well to take to heart; and if, instead of cavilling at the outside world, who need our services, but distrust our capacity, we were to talk a little less, and study a little more, we should leave less room for builders and upholsterers to practise architecture and build, as they do, some of the largest mansions for the "upper ten."

It would be interesting to know how many of the 250 Fellows of the R.I.B.A. write their own specifications, or are capable of doing it. Quantity surveyors and builders will bear me out in this dubious point. These are the men who aspire to be arbiters on all disputed accounts, and to dictate to their brethren and to their employers what they shall do, and what they shall not do. I do not wish to cast any slur upon the "upper ten" of the Institute—their ability and high position are unquestioned, and lesser men feel a pride in being associated with them, and we never bear them cavilling on the question of competitions.

Let us leave trades-unionism to gas-stokers and building operatives, and note its results, but let us have free trade: merit needs no recommendation, or to be fenced about by bye-laws. If we must fight for our living, let us fight, and let those who cannot do so stand aside. We shall not always have to fight—some will get to the front. Let us, at all events, cease arguing about our ill-treatment, and this unseemly quarrelling with our employers.

THOS. CHAS. SOBBY.

STREETS IMPROVEMENT.

Sir,—Whatever may eventually be the beauty or otherwise of the new offices now being built for the Provident Institution Savings' Bank, at the north end of St. Martin's-place, Charing-cross, it must strike all who pass that way (I am thankful I seldom have occasion to do so), that it is simply a blocking up of what ought to be a fine opening into St. Martin's-lane, and thus losing an opportunity for starting a wide street from Charing-cross to Oxford-street and Tottenham-court-road, which has so long been wanted, and much talked about.

The new buildings now being erected are certainly set back a few feet (say 7 or 8), from what was formerly the line of old houses; but what is this trifle compared with what ought to be done, viz.—the pulling down and setting back of all the west side of St. Martin's-lane, to form a street as wide as St. Martin's-place? I need not occupy any more space in arguing for so desirable an object, but must express wonder that it has not before been attended to by the proper authorities, whoever they may be.

W. H. E.

ARCHITECTURE AND CONCRETE BUILDING.

In the report lately given in your journal of the meeting of the Northern Architectural Association, at which the discussion turned upon the uses of concrete in building, it is remarkable that points were raised which have, from time to time, been already shyly discussed by various correspondents in your pages. Mr. Oliver, at the meeting referred to, remarked, "that assuming the adaptability and suitability of concrete for building purposes, it would yet remain destitute of aesthetic and architectural character, and that resort must still be had to stucco and painting." Now, this is just the one conclusion which your correspondents have pointed out need not be arrived at, but on the contrary, that if the durability of concrete is established as free from contraction and expansion, it offers a wide field for the employment of a mode of architectural decoration, already coming more and more into vogue, and which is yet destined, probably, to play a very important part in city or town architecture, with the best and most pleasing results. I refer, as in a former communication, to encaustic tiling, which would be admirably adapted for facing concrete buildings, whether as an internal

or external decoration. What is sought at present for architectural effect in relief of parts, special features, and carved surfaces, but which is so ruinously thrown away under the dirt-producing and corroding influences of a city atmosphere, would be more than supplied by the gradation of colour, arrangement of pattern, &c., of which encaustic tile decoration would be susceptible. I am persuaded that one good, thoroughly artistic attempt at this would go a long way to initiate a much-desired change in our present overdone styles. The conditions of success, however, would be, first, to have good and simple proportions in the mass of the building, and in its subordinate parts, a sufficient variation of surfaces, i.e., not all one dead level, and then a well-studied and skilful arrangement of colour and pattern in the tiling for the respective parts of the building. All should be of an architectural character, and designed and executed specially for the building in hand, and not selected merely from already made patterns, unless these fully answered to that artistic thought which we want to bring into all our architecture, and for the lack of which we have so much that has neither vitality nor originality. The beautiful patterns already produced in encaustic tiling for minor purposes show its thorough capability, as also the remarkable skill and success in design and colour which this species of English art has attained to. Its variety and extended use are endless, and need not stop short of all here indicated as a most pleasing and effective exterior decoration, which would have the charm of novelty, variety, light, and cleanliness, in a remarkable degree, and which would set at rest for ever all questions of decay of material, re-lacquering, or repainting, which at present afflict all city architecture.

NEMO.

GENERAL ASSOCIATION OF MASTER BUILDERS OF LONDON.

The first general meeting of this Association was held on Tuesday last, at the Westminster Palace Hotel, Mr. Hennen in the chair, and was well and influentially attended. A code of rules, previously prepared by a committee, was adopted, and the following were elected officers and committee:—

President—Mr. B. Hennen (Holland & Hennen).
Vice-Presidents—Mr. C. Lucas (Lucas, Brothers); Mr. G. F. Trollope (George Trollope & Sons).
Treasurer—Mr. G. Dines (Dines & Bandrett).
Honorary Secretary—Mr. Stanley G. Bird.
Committee—Messrs. W. Nassau, R. C. (B. Colls & Sons), F. Dove (Dove, Brothers), J. M. Hawkins (Henshaw & Co.), T. R. Hill (Hill & Sons), Horner (Asby & Horner), C. W. Jackson (Jackson & Shaw), J. M. Macey, Manley (Manley & Rogers), G. Myers (Myers & Son), T. F. Rider (Rider & Son), Robinson (Brown & Robinson), Scrievener (Scrievener & White), J. Sewell (Sewell & Son), H. G. Smith (G. Smith & Co.), Waller (Waller & Son).

The Association at present consists of 352 members, usually employing about 35,000 men.

HINTS TAKEN.

Some of my letters to the *Builder* are doing good for the public, viz., public-house traps are being renewed without the conical stand-up bottoms; coal-cellar plates are receiving attention; india-rubber scrapers are now used in the City to clean the pavements; the rotary blast-fan is being adopted in coal-mines; gluey water for watering streets; and many other suggestions of mine that have appeared in the *Builder*. Thanks to Mr. Editor, or my ideas would never have been known.

R. T.

HIGH WAGES AND LOW LIVING VERSUS LOW WAGES AND HIGH LIVING.

Sir,—Wandering through a portion of a neighbouring town the other day, where every house in the locality is occupied by members of the working class, I could not help being struck by the appearance of the residences of men earning nearly two pounds a week, and contrasting it unfavourably with the homes of the many unskilled clerks and assistants, professional and otherwise (whose income is about the same as the above), or the homes of the much-pitied agricultural labourer, who earns a half, a third, and in some cases a fourth, of the wages of the skilled labourer.

In the first case, we find neglected rows of tenements, mostly dirty, ill-ventilated, unwholesome, and unsanitary within and without, in keeping with the personal appearance of the women and children. In the second, rows of well-kept dwellings, at a moderate rent, in a "cheap" suburb, neatly furnished, with an appearance of comfort, not forgetting the sometimes objectionable piano, suggestive of evening amusement. The third case offers, except where generous landlords have been content to receive a very small return for a very large outlay, a cottage dwelling, often aptly termed a "bovel," yet so tidy, and so made the most of that the interior at least is generally sweet, clean, and inviting.

Why will the skilled workmen, with these examples before him, disgrace himself by living as he does? His answer

may be, "We cannot get buildings to live in which we can take a pride; to which I reply, "It is not so." Had workmen quarrel with their trade, it is not speculative building; all alike suffer from that curse. It is in the method of keeping them in order.

It is true the clerks and assistants aforesaid do not pay tribute to the "union," nor are they liable to all the sucking processes of that excellent institution, neither do they go on strike or often get intoxicated, but they are obliged by the position they hold to dress themselves and their families decently, and keep their homes respectable, on 100*l.* a year in most cases. Again, I ask, why cannot the working man do the same? Is it from want of proper education or of that refinement, as necessary to the individual who forms a unit in any civilised society as it is to the character of the work put into his hand? Is it quite impossible for him to rise from his self-degradation, purify his conversation, and improve his mind in these times of "shorter hours" and "higher pay?"

J. J. A.

BUILDERS' RESPONSIBILITIES.

PEARSON V. JOHNSON AND ANOTHER.

In this case, tried at Manchester before Mr. Justice Mellor and a special jury, the plaintiff was an engine-driver on a travelling crane used by the defendants, a firm of builders in London, and the plaintiff's employers, a firm of stone masons in London, the new Tower-hall in Manchester, for which they were the contractors; and he brought this action for the defendants' alleged negligence in respect of the status of the crane, and the defendants' reason of which it broke, and he, together with the engine, stone, and whole apparatus, were precipitated to the ground and suffered most serious injuries, by which he sustained a fracture of the spine, and the crane lay in the rottenness of the "beam," which the plaintiff and his witnesses said was evidenced by a crack which was noticed in it some time prior to the accident, and was known to several of the plaintiff's fellow-workmen, and also to the managers of the works in Manchester.

At the end of the plaintiff's case the defendants' counsel applied for judgment on the ground that there was no personal negligence in the defendants themselves, which was necessary to render them liable to their servant in an action for negligence; and that in respect to supplying their employers with liability for negligence, superintendents or managers of works are but fellow-servants with those engaged upon the works themselves, and the masters cannot be made answerable for the negligence of their workmen. He cited "Wilson v. Merry" (*Law Report 1, Scotch Appeal 337*), "Feltham v. England" (*Law Report 3, Queen's Bench 33*), and other cases.

The judge declined to stop the case, but gave the counsel leave to move upon the point.

The latter then said that the plaintiff's injuries were so serious that he was not able to stir in view of the facts spoken to as the origin of the accident; but he would call the two managers of the works with a view to showing that their position was in reality only subordinate, and this was done. The jury assessed the damages at 500*l.*, that being the only question left to them.

RESPONSIBILITY OF BUILDING COMMITTEES.

In the Court of Common Pleas, Dec. 2 (sittings at Nisi Prius, in Middlesex, before Mr. Justice Keating and a special jury), the case of Whillier v. Roberts and Others, came on.

The plaintiff in this case was a builder in the City, and he sued the members of the building committee of Christ Church, Lower Clapton, to recover 27*l.* 2*s.*, balance due for the work done in erecting that structure. All the members of the committee suffered judgment by default except Mr. Roberts, who disputed his liability.

The evidence for the plaintiff was that Mr. Roberts had attended two meetings of the committee, and at one of them, held on the 26th of November, 1869, he seconded a resolution that the secretary be directed to communicate with Messrs. Whigginton & Morris that their plan for building the church was accepted, subject to certain terms and alterations. One of the terms was, that the contract should not be for more than 5,500*l.* The contract actually entered into was for 5,565*l.*, and the cost of the building, including extras, was 6,624*l.* 2*s.*, of which all but the balance now claimed had been paid, a large part by members of the committee. It further appeared that Mr. Roberts had early retired from the committee.

Mr. Garth submitted that there was no case for the jury, because Mr. Roberts was no party to the contract for 5,500*l.* More than this amount had been paid.

Mr. Justice Keating said that he would leave the case to the jury, but reserve the question of law for the full Court.

The case for the defendant was that the church was to be paid for by subscriptions, the committee incurring no personal responsibility.

Mr. Justice Keating, in summing up, said that the question was whether the defendant had held himself out, or had authorized other people to hold him out, as liable to pay the sum claimed.

The jury, after an hour, found a verdict for the plaintiff, the defendant being liable in references only to the original contract and the alterations necessary in it.

Leave was reserved to move to enter a verdict for the defendant, or a consent, or to reduce the amount of the verdict.

FIRE-PROOF FLOORS.

Sir,—In the *Builder* of November 30th, your correspondent "X," commenting upon Mr. Sorby's suggestion, to construct fire-proof floors with a stout timber-framed floor, filled in with or embedded in Dennett's concrete, says that the floor-plaster which is used as the binding material of that concrete would, in the event of a fire, combine with the heat, and burst on the application of water.

Floor-plaster is, as "X," states, a preparation of the coarse gypsum rock; but, instead of being merely roasted or boiled, as the ordinary plaster of Paris is usually prepared, it is thoroughly calcined in kilns.

Concrete, or other compositions formed therewith, present greater resistance to fire than any cement prepared from carbonate of lime (ordinary limestone), and this results from the greater affinity which exists between the

chemical constituents of gypsum, viz., sulphuric acid and lime.

Of course, any material used for building purposes may be injured, and practically destroyed, by a fire of sufficient intensity and duration, but extra materials may be selected in preference to others for their fire-resisting qualities and convenience of application.

In my opinion, Bennett's concrete fulfils these conditions. It may be applied in a variety of ways, to suit constructive and decorative requirements, and the highly-calced gypsum, which forms its binding element, has great fire-resisting power, as well as being one of the best non-conductors of heat, and hence forms an effective protection from the action of fire on the wood or iron portions of the construction.

I am therefore of opinion that gypsum cement or concrete, properly applied, is a most valuable material for the construction of fire-proof floors; and I should be glad to see its use extended, and the iron or steel girders and joists, in conjunction with the material, these really being the weak points, as proved by recent experience of so-called fire-proof buildings.

CHARLES BARRY.

GAS LIGHTING.

The method of lighting gas by galvanism, patented by Mr. J. B. Booth, of Preston, and already noticed in our columns, has now been more fully described in a local paper:—

"The apparatus constituting the invention looks like a moderately-sized globular instead of glass, attached by a tube to the same material, with a metallic top. Over this liquid, and within the glass tube there is a plate of zinc, with a piece of graphite, or gas-coal, and between these and a thin coiled platinum wire, fixed over the cap of the general vessel, into which a gas-burner is inserted, and ignited, almost instantaneously, in the following way.—A pipe to be screwed to that up which the ordinary gas-supply flows runs through the base of the vessel to about the centre of the surrounding tube; pressure brought to bear upon the gas in this pipe causes, by some collateral opening, a simultaneous depression upon the chemical solution, which occupies a lower level in two side-tubes; the gas occupies the vacuum caused by the displaced liquid, and ascends to a higher chamber in connection with the burner, while the displaced liquid is pressed into two side-tubes; the gas comes in contact with zinc and graphite, generating galvanic activity, which is communicated to the wire, and exciting the catalytic power of the wire, which, when exposed to the ascending jet of gas, results in immediate, almost instantaneous, ignition. The mechanism is of the simplest construction, and can be applied to any kind or number of gas-pipes, either remote from or proximate to the works, to street as well as to office or shop lamps, and the light can be extinguished as easily as it can be ignited."

Successful experiments with it have, it is said, been recently made at the Preston Gasworks.

We may here incidentally express our hope that the metropolitan gas companies will not quite exhaust the patience and the sympathies of the public. Their gas has not been good for years, but it still continues, to our experience, in the almost unusable state in which it was some time left it, although it is now full time it were at least as good as it was before they went off.

THE EMBANKMENT AND THE THAMES.

SIR,—It is a source of great regret to all who visit the Embankment of the Thames to see that it should present such an unsightly growth of green upon the granite-surfaced walls towards the river. The very bearded mask of Father Thames over Essex façade seems to regret that its waters, had as these may be, should be so encompassed. Nay, further, the insidious seeds of the mosses and fungi tend every year to increase to such a growth that in less than two generations others will see the mica has left large pits, recording the gradual but certain wreck that is being made. Our ancient mariners owe their existence to the present day, for our edification, wholly from the circumstances of that "which was worth doing well was well done,"—that was, by thoroughly polishing the surfaces. Now, if this could be done, as I hold it can, with great advantage and effect, these seeds could be precluded from nesting on the granite ground wherein they germinate. Not only does each cavity give a safe lodgment, but it is also a retaining source of moisture that helps to grow these "greens."

Portland Harbour has had its crowning stone put on in a most princely manner, and is so far considered to be completed. Why should not some of the best convict labour be employed, as a national work, to polish up the basin of the

Thames? In proposing such, it is in conformity with that which we are now doing,—to make such men learn to earn their livelihood by fair means,—a thing in time telling as a double good. We have said at our feet for the purpose, with such steam appliances as should reduce the excessive labour, and repay for effective undertaking, thus 'giving satisfaction to ourselves, as it might hereafter to that unknown "New Zealander" who may visit and view from the bridges the bright and classic works of ancient days.

HENRY GRAFTON, C.E.

A BRIBE.

"TO ARCHITECTS."—A liberal 'cash in advance' share of commission is offered by an experienced quantity surveyor, having offices in the City, upon all work placed in his hands. Highest references for efficient and expeditious performance of work.—Address, 'Surveyor,' 16, Lothian-road, Camberwell-New-road, London, S.E."

Sir,—The above disgusting circular has been sent to me as "F.R.I.B.A.," and I forward it to you for public reprobation. Doubtless the quasi-surveyor has got hold of a list of the members of our Institute, and is endeavouring to catch a few gudgeons. He is, to a certain extent, wise in his generation; for he naturally omits to offer the highest and any reference for integrity.

HENRY BAKER.

No. 108, Gower-street.

GROINED RECESS AT THE EAST END OF FAIRSTED CHURCH, ESSEX.

Sir,—A clergyman has recently sent me a sketch of a groined niche recently discovered in the above church. It is formed in the thickness of the main wall, and was entirely concealed by lath and plaster, and much mutilated. He is desirous of knowing to what purpose it was formerly assigned. Could it have been a shrine to the Virgin? or can any of your readers assign any other purpose for it?

The new pulpit is placed in it at present (which, by the way, might give a useful hint for such a purpose in modern churches, and would assist sound).

W. B. W.

THE RAILWAY-ARCH QUESTION.

PROCEEDINGS AGAINST THE SOUTH-EASTERN COMPANY.

The nuisance arising from the percolation of water through the arches of the several railway companies crossing the thoroughfares in South London was last week again under the consideration of one of the local boards. It appears that the St. Saviour's Board of Works having been unsuccessful in their endeavours to induce the South-Eastern Company to remedy the evil complained of, as regards the arches and bridges on their line, have resolved to prefer a bill of indictment against the company, with respect to the bridges crossing over the Borough, in High-street, Southwark-street, and Blackfriars-road. Similar proceedings have already been taken against the London, Chatham, and Dover and the South-Western Companies by the Lambeth and Wandsworth Vestries, but now stand over, in order to allow the respective companies to execute promised improvements at the bridges connected with their lines.

THE ARCHITECTURAL UNION COMPANY.

The report submitted at the fifteenth ordinary general meeting of shareholders, held at their house, 9, Conduit-street, on the 4th inst., showed that the galleries and premises generally have been profitably occupied during the past year. The number of shares on the register remains the same as last year, viz., 1,037, upon which 10,370l. have been paid, and the directors were able to recommend the payment of a dividend of 11s. per share, free of income-tax, amounting to 570l. 7s., leaving (in addition to 21l. 12s. belonging to the auxiliary donation fund, and 7l. 8s. 3d. unclaimed dividends) a balance in hand of 292l. 5s., of which 49l. are set apart to meet the fine of 98l. due every fourteen years (payable in March, 1880), and 243l. 5s. are carried forward to the next account. This meeting confirmed. We hear with sincere regret that Mr. Charles Mayhew has been compelled to withdraw from the direction in consequence of ill-health. Professor Hayter Lewis has been chosen to fill the vacancy in the board thus occasioned.

ST. PAUL'S CATHEDRAL.

SIR,—Will you allow me to suggest to the Dean and Chapter of St. Paul's, through the medium of your columns, that the reading minor canon, in order to be distinctly audible to the congregation, should sit immediately below the Dean's or Archdeacon's seat? Last Saturday afternoon I attended the service, when a gentleman with stentorian voice, but not a particle of articulation, intoned the prayers from, I think, the Treasurer's stall, and the result was that, to the congregation, these and the exhortation consisted of one terribly long dreary monotone, most provocative of sleep. Were the plan followed out that I suggest, it would be simply a return to the ancient custom, when the minor canons, as part of the choir, always sat in a line with the vicars choral. The labelling of certain stalls, "Minor Canonics I," "Minor Canonics II," up to twelve, is a modern invention; it only dates from the time when the organ-screen was removed from the entrance to the choir.

X. Y. Z.

CHURCH-BUILDING NEWS.

Wotton-under-Edge.—The church at Kingswood, Wotton-under-Edge, has been re-opened. The present additions, reparations, &c., comprise at the entrance at the west end the removal of a pair of Tuscan columns, connected with a spandrel top, and in its place a porch has been erected, glazed on each side, and standing on a stone plinth, with overhanging eaves and galle entrance-floors. Inside the porch are glazed doors to the church. At the angle of the chancel and transept an organ-chamber, about 17 ft. by 13 ft., has been built. Access to this is gained by ascending a few steps, and underneath is the vestry, to supply the one taken down. The latter is reached by a few steps down from the chancel. Owing to the damp in the new work, the organ is not yet put into its place. The organ-pipes will face the chancel, which part is wholly open, except a low balustrade of varnished deal and red cloth panels. One of the windows which has been taken in from the transept for the building of the organ-loft has been filled with open ornamental trellis-work, instead of glass, and serves to allow the sound of the organ to fill the church. The rest of the windows which had not been re-glazed are now being completed, the two in the east end having, together with stained glass, the emblem of the Holy Trinity; also emblems of Alpha and Omega, the monogram I.H.S., and other designs in coloured glass. The chancel and the sacarium have also been raised, the latter forming five sides of an octagon. The front side, elongated, come out from the east wall. The altar and the lectern in oak, are from the church of Dursley. The whole of the church has been re-pewed. The cost of this has been about 3500l. Mr. C. F. Pritchard, of Wotton, architect, gave the services to the work. Mr. Hart was the carpenter, Mr. Lovell, the mason, and Mr. Britton, the plasterer, &c., all of Kingswood; and Mr. Daneyce, of Wotton, was the plumber, glazier, and painter.

Westbromwich.—The works in connexion with the restoration of All Saints' Church having been so far completed, the reopening and dedication festival services have been held. The total cost of the alteration and restoration will be 7,000l., towards which about 5,000l. have been realised. This is the fourth church which has occupied the same site, and the last church which has been demolished was inconvenient, out of repair, and inadequate for the requirements of the district, and hence, about the middle of last year, the restoration and enlargement were decided upon. The tower of the old church, which was erected chiefly in the fourteenth and fifteenth centuries, has been retained, but now forms the extremity of the southern aisle. The general plan is very similar to that of the older building, saving that the single aisle is now on the south side instead of on the north. The nave is 92 ft. in length and 30 ft. in breadth; the chancel is 26 ft. wide and 43 ft. long; the total internal length of the church being 135 ft. On the south side of the chancel is a side chapel, forming a chancel to the south aisle, which is of equal length with the nave, and 14 ft. in width. This portion of the church will be more particularly appropriated to the daily services. As in the older church, there is an aisle on one side of the nave only. The western end of the south aisle is terminated by the old arch leading into the tower, an arch which was always intended to form a leading feature in the architecture of the building. The

altar, prominently raised upon a flight of five steps, occupies the main portion of the eastern wall of the sanctuary. The work has been carried out by Mr. C. Burkitt, of Wolverhampton.

Quarndon.—The foundation-stone of the new church here has been laid by Lady Scarsdale. The site is at the top of Quarndon, adjoining the new schools, and, when erected, the edifice will be seen for many miles round. It will consist of nave, two side-aisles, chancel, with organ-chamber and vestry, tower, and spire. The extreme length of the building is 82 ft., and width, 50 ft. The height of the tower and spire to the top of the vane will be 80 ft.; the height from the floor to the ridge will be 40 ft. The tower will be placed at the south-west angle, near to the high road. The entrance of the church will be through a porch on the right side. The vestry will be on the same side, having a separate entrance. Beneath will be the vault for the heating furnace. The land slopes very much towards the east end, so that under the chancel, &c., will be space for storage, if required. Under the floors will be arches throughout. The nave-roof is to be supported on each side by a series of stone moulded arches, with labels, on stone columns, and will be formed with framed principals and purlins; the spaces between showing as panels boarded and moulded, all being exposed to view. The chancel-roof is to be boarded under the timbers, and divided into panels. The roofs to aisles correspond with that of the nave. All the roofs are to be covered with Westmoreland slates. The sittings will be open benches placed on raised wooden floors, and the aisles paved with ornamental tiles. Accommodation is provided for 360 persons. The style is Gothic, of the fourteenth century. The design was prepared by Messrs. Giles & Brookhouse, architects; and the works are being carried out, under their direction, by Mr. Edwin Thompson, contractor, all of Derby.

Reading.—The first stone of the new parish church of St. John the Evangelist, Reading, has been laid. The architect is Mr. Dixon, and the builders are Messrs. Niblett & Son, of London.

Chesterton.—St. Chad's Mission School Church, Red-street, in the parish of Chesterton, has been opened. The building is in the Pointed style, and is built of red bricks, with blue brick facings, and will accommodate about 120 persons. It was designed by the builder, Mr. Wm. Lea, of Chesterton. The edifice comprises a school-room 35 ft. by 20 ft., with a chancel, which is raised two steps above the main room, and will be separated therefrom on week-days by a movable wooden frame-work, rising to the spring of the arch, and a class-room, which will also serve the purpose of a vestry on Sundays.

Gateshead.—Christ Church, in the parish of Gateshead, has been consecrated by the Bishop of Durham. The church was commenced about two years and a half ago, and was completed ready for use last November. But as no church can be consecrated on which there remains a debt, the promoters were obliged to ask the Bishop's consent to license it until the amount of the deficiency, some 1,500l., should have been raised. When this became known, Mr. Edward Joicey generously offered 700l., and the balance was quickly obtained. The church is now entirely completed. It was designed by Messrs. Adams & Kelly, of Leeds, who have been employed by the Leeds Church Building Society. The roof, instead of being divided into bays or compartments, consists of uniform rafters, placed rather more closely to each other than usual. The east end is apsidal, with five tall gables, each containing a window. Beneath these is a row of Caen stone and marble, with panels containing the Commandments, creed, and the Lord's Prayer. The floor is laid by Sopwith, with parquetry. The chancel stalls are carved, and the organ is contained in a case designed by the architects. Its chamber is on the south side of the chancel. The pulpit and desk are of Caen stone, carved, and relieved with pillars of different coloured marbles and stone. The carving was by Fielding & Dark, of Leeds. The Early English type has been adopted. A band of relieved carving is carried round the whole chancel above the reredos. The font is of carved Caen stone and marble. The windows contain stained coloured devices, and are surrounded by floriated borders in colours. Those of the east and west gables are further ornamented, and the clerestory windows are of the same design. Messrs. A. Gibb & Co., of London, were the artists. The church is lighted at night by a row of gas-jets on either side at the level of the eaves, which runs from east to west, and the architects have

run a porch across the whole western front, below the window. Over the central gable of the porch is carved a floriated cross with two guardian angels. A small light bell-turret rises at the north-west angle. The cost, exclusive of the ground, the organ, and other special gifts, has been 6,100l. Accommodation has been provided for 600 persons.

SCHOOL-BUILDING NEWS.

Hampton.—The corner stone of the new school at Hampton, near Evesham, has been laid. The site adjoins the village green, and the edifice will be in the Gothic style. The school will be built of red bricks, with stone dressings, and covered with Brocley tiles. The school-room will be 41 ft. long by 18 ft. wide. There will also be a class-room for infants, 18 ft. square. There are two tracery windows in the main school-room, and one in the class-room. Separate lavatories will be provided for the boys and girls, and over the former there will be a wooden bell-cot. The gables are finished with ornamental barge-boards and turned wood finials. There will be good playgrounds for boys and girls. A teacher's residence will be erected; the lower portion will be of red brick, and the upper part will be in half-timbered work with oriel window. The school will provide accommodation for about 100 children. The building has been designed by Mr. Geo. Hunt, architect, Evesham. The work was thrown open to public competition, and the lowest tender, namely, 890l., sent in by Mr. Harvey Hunt, of Harington, contractor, was accepted.

Ardrick.—The dedication stone of a new girls' school, which is being built in connexion with St. Thomas's Church, Ardrick, has been laid. Schools for boys and infants, in connexion with the church, were erected two years ago, at a cost of 4,200l., and the school for girls now in course of erection will complete them. The site of the new building lies between the church and the boys' and infants' schools. The space obtained enabled the architects to design a commodious school, and at the same time to arrange spacious playgrounds both for the new schools and the boys' and infants' school. The building, which is two stories high, is of Gothic architecture. It will accommodate 300 girls and 70 infants. The contract for the building (without furniture or fittings) is 2,450l., but with the cost of the land, furniture, and other incidental items added, the undertaking will cost about 4,000l. The drawings have been prepared by Messrs. Royle & Bennett, architects, and the works are being carried out under their superintendence by Mr. Robert Ellis, of Hulme.

TO ARCHITECTS.

At the special request of the Committee of Conference on Competitions we give a place to the following:—

The Conference Committee on Competitions will be glad to receive from provincial architects the earliest possible notice of proposed competitions, in order that the committee may in sufficient time transmit to the promoters of such competitions, for their guidance, copies of the regulations passed at the general conference of 1872.

Communications to be addressed to the Secretary of the Committee on Competitions, No. 9, Conduit-street, Hanover-square, W.

Books Received.

Manual of Book Work and Marquetry, with Practical Instructions to Carvers, and Ninety Coloured Designs. By W. BEMROSE, Jun. London: Bemrose & Sons, Paternoster-row, and Derby.

As a sequel to the two works, "Manual of Carving" and "Fret-cutting," already favourably noticed in the *Builder*, and which have been so well received as to call for several editions, the author has been induced to add this other manual for the sister arts of book-work and marquetry, neither of which has, as yet, been practised to any great extent by amateurs, for whom this manual is intended. The tools and the instructions are simple, and this interesting and elegant art looks as if it were easily acquirable.

VARIORUM.

In the "Companion to the Almanac" for 1873, Mr. John Plummer, in an article on "Capital and Labour in 1872," writes,—

"With every increase in the number of workmen, unless accompanied by a corresponding increase in the demand for labour or in the amount of the wages fund, the difficulty of artificially controlling the rate of wages becomes more and more perceptible. But this is a fact which trade-unionists generally refuse to recognise; hence their numerous failures. To them, as to the greater portion of the labouring classes, the doctrines of political economy appear to operate unfairly, to be intended as an instrument in the hands of capital which to tyrannise over labour. One effect of this lamentable prejudice has been to prevent workmen from availing themselves of the lessons to be derived from the study of the fundamental principles on which the doctrines of political economy are based, and thus avoid the disastrous errors committed by them in their ignorance of the inutility of the policy so often recommended by their leaders. It may appear a truism, but the one great truth which the labouring classes have yet to learn is, that no efforts, however powerful or persistent, on the part of their trade organisations, can permanently raise the rate of wages, unless the increased scale of pay be accompanied by a proportional increase in the demand for labour; and that, on the other hand, no combination on the part of employers, however wealthy or influential, can prevent wages from rising when a decrease takes place in the amount of surplus labour.—In other words, when the demand for labour begins to overtake the supply. An illustration of this latter fact is to be found in the present state of industrial affairs in this country; the demand for labour being so great that good workmen experience little or no difficulty in obtaining employment at remunerative wages; indeed, the dearth of labour is so extensively felt, that more than once it has been recommended that a supply of labour should be obtained from those parts of the Continent in which the labour pressure is less perceptible. To whatever causes or causes may be ascribed the astonishing degree of national industrial activity and prosperity which has led to the present increased demand for labour, there can be no question that it constitutes one of the great social events of the present century, and is destined to play an important part in the elucidation of more than one of those important social and industrial problems, the solution of which has so frequently baffled the earnest efforts of our most thoughtful men."

Is it quite certain that the demand for labour is so great as the writer states?

Miscellaneous.

The Drainage and Water Supply of Hornsea, in Yorkshire.—A special meeting of the Hornsea Board of Health has been held, Mr. J. A. Wade, the chairman, presiding. The chairman referred to the late inquiry commission, stating that the wisest course the Board could pursue would be to comply with the requirements of the commissioner, Mr. Harrison. He therefore moved, "That the Board take immediate steps to construct an efficient system of sewage and water supply." Attempts were made to put off the question of water supply, but the chairman said he thought they would be very foolish if they did not pass a resolution to do all that was required. To his mind the commissioner was as determined on the subject of the water supply as on any other, and a great point was made that the water supply was polluted by the sewage. He had evidently got the impression that the ground around the wells had been contaminated, and if it was as the commissioner supposed, it would take a generation to wear out that contamination; in fact, the contamination would be brought nearer and nearer to the well by the flow of water through the ground. After some further conversation, the chairman's resolution was put and carried unanimously. He further stated that he had asked Mr. C. F. Butler, as an engineer, for a statement of his terms. Mr. Butler had written stating that should he be engaged by the Board he was fully prepared to carry out an effective plan of drainage for the Hornsea district, and to obtain the approval of the Local Government Board for the same. His terms would be 5 per cent., with 20l. for travelling expenses. After some discussion, it was resolved "That the offer of Mr. Butler to design and carry out the drainage works of the Board, as contained in his letter of the 25th inst., he accepted." It was also resolved "That the surveyor be requested to ascertain the position of the water-wells and the sewage-tanks, and generally to report whether the houses have been carried out in accordance with the deposited plans and the bye-laws."

Assistant Surveyor to St. Pancras Vestry.—An assistant surveyor has been elected from the following candidates, nominated on the 20th ult.—George William Brunell, William Henry Moxon, and Thomas Rust. The voting was by ballot, and resulted in the appointment of Mr. George William Brunell by a large majority.

The Demolition of St. Martin's Church, Birmingham.—The demolition of old St. Martin's Church is being vigorously proceeded with. At the east end the massive masonry has been broken into, and two fine windows, about 20 ft. in height, of the Decorated period, have been discovered,—one on the north, and a corresponding one on the south side of the chancel. The tracery of these has been carefully removed. At the east end of the north aisle part of the moulding of an altar window has been laid bare. The old monumental effigies have been moved from their modern brick bases in the windows; and a Jacobean monument of abaster, with a shrouded bust surmounting the tablet, which was found built in the north wall, has likewise been transferred elsewhere for security. An interesting piece of painting has been brought to light in a roof-beam, which spanned the nave at a point about midway of the church, and which probably formed the top of the rood screen. On the front of this beam appears a painting (of the fourteenth century) of the head of Christ, wearing a crown of thorns, with surrounding nimbus; the uplifted hands, showing the marks of crucifixion, bear a scroll in each hand, but the Latin lettering on them is much defaced. Workshops for the new building are in course of erection on the north side of the yard. Mr. Chawlin, the architect, has made a plan of the inside of the church, so as to ensure the proper relaying of all the memorial tablets.

The Largest Yield of Coal on Record. A new method of working coal-mines was brought before the South Midland Institute of Mining, Civil, and Mechanical Engineers, at the meeting of that association, in Wolverhampton, on Monday week. Mr. John Gitting, who has the practical working of certain collieries at Wednesbury, showed that, by a system known to the coal trade as long work, in preference to square work, he had been enabled to bring up no less than 4,000 tons per acre, more than had before been realised. This he had now obtained 1,300 tons per acre, statute weight, and at the present price per ton of the mineral the colliery yielded 1,600, per acre more as the selling price of the product than it would yield if square work were still adopted. Mr. E. Jones, the mining engineer of the Lilleshall Company, who is the president of the Institute, asserted that Mr. Gitting's figures showed he was obtaining the largest yield upon record at any colliery throughout England and Wales.

Chambered Barrows in France.—Last week a paper was read by the Rev. W. C. Luke, at the Society of Antiquaries of London, Somerset House, the title of which was "On certain Prevailing Errors respecting French Chambered Barrows"; Mr. Overy in the chair. There were certain opinions respecting the rude stone monuments or dolmens of France which he was convinced, after forty years' experience, were quite erroneous, and which it was important should be corrected. The writer then proceeded to support the theory that these dolmens,—even those that were now exposed,—were at one time surrounded by barrows, or envelopes, and that their exposition in the present day was due to the ravages of time. There was scarcely one of them that did not show traces of the envelope. Mr. Luke explained in detail the structure of the monuments he visited, and appealed to drawings which he made, and which were suspended on the walls, for confirmation of his view. He did not believe in the opinion that they were Christian structures.

The New Buildings at St. Luke's Workhouse.—The Local Government Board are again taking steps to compel the Holborn guardians forthwith to erect the new block of administrative buildings at St. Luke's Workhouse, which the guardians themselves some time ago proposed, and which was approved by the Central Board, but which the guardians subsequently refused to carry out, on the alleged grounds of a decrease of pauperism, and the liability of the workhouse for assessment to the rates of the parish of St. Leonard, Shoreditch. The Local Government Board have just forwarded a communication to the guardians, containing a pe-remptory request to them at once to proceed with the erection of the buildings, the total estimated cost of which is upwards of 25,000l.

The Steam-roller in Marylebone.—At the last meeting of the vestry a discussion arose on a report of the surveyor in favour of steam-rollers or roads. It was agreed that the advantages of the new system outweighed its disadvantages.

The Woolwich Steam-Hammer.—The largest of the massive iron plates intended to form the foundation of the immense steam-hammer about to be erected in the Royal Gun Factories, Royal Arsenal, Woolwich, has been cast in the Dial-square. The casting, which has consumed about 100 tons of metal, being an open one, presented a striking appearance. The operation, which required great care, was successfully performed under the direction of Mr. Vinicombe, principal foreman of the Dial-square. The molten metal having been collected in three enormous cupels, at a given signal the whole was simultaneously poured into the mould. The heat from the molten metal, which covered an area of 24 ft., was so powerful as to break the glass in the open windows of the workshops. The large anvil-block for the same hammer, which was cast about three months since, is not yet cool enough for removal. This casting is the last required for the foundation of the steam-hammer.

Memorial Window.—A baptism window has been recently erected in the church of St. Lawrence, Jewry, Gresham-street, City, in memory of John Andrew Back, who, with a mutual friend, in the year 1867, urged upon the Rev. B. M. Cowie, that advantage should be taken of the Pan-Anglican Synod then about to assemble, to create a fresh interest in missionary work in foreign lands. Its framework is an architectural composition of Renaissance character, with festoons of flowers and foliage and scrollwork, and with figures in niches. This encloses the two main subjects,—“The Passage of the Red Sea” and “The Baptism of Our Lord.” The figures in the niches on each side are those of David and Aaron. The window is from the works of Messrs. Cox & Sons, of Southampton-street, Strand, and was exhibited in this year's International Exhibition at South Kensington.

Nottingham Architectural Association. An interesting paper was read by Mr. F. Bakewell, on Friday evening, November 29th, before this association, entitled “A Few Days in Belgium.” At the close of the paper, an animated discussion took place, in which the president, Mr. T. C. Hine, Mr. Evans, Mr. Tarbotton, Mr. Norris, and others took part. The president, in continuation of some remarks by the author of the paper upon the size of Mediaeval bricks, advocated a reduction of the thickness of bricks as productive of a more satisfactory appearance; and Mr. Norris called attention to the value of old English brickwork, and the beauty of the tints of the examples found in the southern part of England. Mr. Tarbotton regretted that Mr. Bakewell had not been able in the limits of his paper to give them more particulars of the brickwork of Bruges, alluding to several fine specimens there.

Scheme of Street Improvements in Sheffield.—Mr. Flockton has made a report to the town trustees, on the most eligible mode of improving the streets of Sheffield. He says, “It will be evident that a mere widening of existing streets (although that is very desirable on their own account) will not remedy the defects, nor supply the wants indicated. This can only be done by the opening out of fresh lines of road, and dividing the traffic, catching it before it reaches the heart, and tempting it by shorter distances, easier gradients, or other conveniences, out of the old routes into the new ones; and what may be called the internal circulation of the town must be provided for by new streets and improvements in the central portion. The scheme laid down on the plans is an endeavour to show how these views may be carried out.”

Reclamation Scheme.—An Anglo-Italian company has been formed for the purpose of reclaiming the expanse of water in Northern Italy known as the Ferrara Marshes, covering nearly 200 square miles of what was once the most fertile land in Italy. Plans for accomplishing the work were solicited from hydraulic engineers in this country and on the Continent, and the choice fell on Messrs. John & Henry Gwynne, of Hammersmith, to whom the contract for the whole of the machinery has been given. The body of water to be drawn off the land is over 2,000 tons per minute.

Going to the Root of it.—A Connecticuttetter proposes to prevent the falling of leaves by the artificial warming of trees. He has invented a system of steam-pipes twining among the roots, and kept warm by steam from an ordinary furnace boiler.

The Japanese.—On Tuesday last the Japanese ambassador and suite inspected Butcher's Wharf, Shad Thames (the largest bonded warehouse in the port of London), and spent several hours in traversing the floors and examining the various classes of goods stored. They expressed their admiration of the new warehouses, and seemed much interested in watching the building works in progress, having ascended to the highest scaffolding for the purpose. This wharf has a frontage of over 600 ft., or about one-tenth of a mile on the river, with a landing-stage the whole length for large steam-vessels. The storage area exceeds ten acres. At the close of the inspection, Mr. F. L. Hutchins (Murray & Hutchins, Birch-lane) introduced the architects, Messrs. Tolley & Dale, who handed a perspective view of the wharf and buildings to the visitors.

The Crown Co-operatives Society.—Under this title a new society, with half a dozen directors of known respectability, is being formed to carry out the system of co-operation, by which articles of general consumption and utility are supplied at wholesale prices. It is intended to open stores in the first instance at Hyde Park, W., near the terminus of the Great Western Railway, in the centre of a neighbourhood where there is every chance of securing a large number of shareholders. Families also residing on the Great Western line, and in the West of England, will find these stores a great convenience. It is, likewise, in contemplation to establish branches in other parts of the metropolis where the want of such stores is most felt. Judging from the past, this Society would seem to have a good prospect of success.

Manchester and Salford Building Trades' Institute.—The annual meeting of this Institute, for technical education, has been held in St. John's Schools, Garside-street, Mr. Isaac Holden in the chair. The report read by Mr. John M'Lean, mentioned that during the past year the efforts of the committee had been successful. The balance-sheet showed that the income had been 60l. 17s. 7½d. and that, after paying expenses, there was a balance in hand of 1l. 13s. 4½d. Mr. Thomas Lawton, in moving the adoption of the report, said he was at a loss to know why the union did not establish an institute for technical education. Mr. Thomas Spelman seconded the motion, which was passed. Professor Greenwood, after distributing the prizes, made a few remarks. Other gentlemen addressed the meeting.

The Sanitary Act in Warwickshire.—A special meeting of the rural sanitary authority for the Warwick Union has been held at Warwick, to arrange for the provisions of the new Sanitary Act being carried out in the district. It was decided to appoint a committee, under the 13th section of the Act to discharge the duties of the sanitary authority for the current year; and to invite all the sanitary authorities in Warwickshire, with the exception of Birmingham, to a conference respecting the Act, the appointment of medical officers of health, and inspectors of nuisances, and the districts to be assigned to each throughout the county. The conference will take place at Warwick early in January.

Hastings Pier.—An apparatus for warming the Pier Pavilion, by hot water, has just been fitted by Messrs. Cumming & Edmonds, hot-water engineers, of Lillebridge, Fulham, from the plans and under the superintendence of Messrs. Cross & Wells, architects, at a cost of 500l. A furnace has been fitted under the floor, and the pipes, coils, &c., have been carried to different parts of the structure. The coils will be covered with marble plates. Another improvement is the erection of lobby doors, inside the pavilion, at four of the principal entrances, so as to modify the in-rush of cold air from without. The heating apparatus will enable the directors to carry out the proposal to introduce a larger number of exotic and hot-house plants and flowers, and thus to give an improved appearance to the interior.

Camberwell Vestry has decided to put in force the stringent clauses of the Artizans' and Labourers' Dwellings Act in the cases of the premises, 18 and 19, Alpha-street, and 1 to 15, Bexley-court, Peckham, which the surveyor declares to be unfit for human habitation. Notices will be immediately served upon the owners, who will be cited to appear before the vestry, to show cause against the proposal to demolish the buildings.

Breach in the Sea Wall at Fambridge.—The work of filling up a serious breach in the sea wall at South Fambridge, has not yet progressed so far as to stay the flooding of the adjacent land, but measures to remedy the evil have been vigorously taken up. Mr. Aire, of London, engineer, has the superintendence of the works, which are being carried out by Mr. Sutcliffe, also of London. The breach has continued to get larger each succeeding day, until now there is a gap of between 40 ft. and 50 ft., through which the water rushes, as the tide reaches its full flow, carrying away further fragments of the wall, and then spreading itself rapidly over the land, to the extent of some 150 acres and to a great depth.

Unveiling of the Neptune Fountain at Bristol.—The old metal statue of Neptune, erected so long since as the year 1558, by a citizen of Temple parish, has been removed (for the fourth time) from its position, and re-erected as a drinking-fountain in a commanding situation nearly opposite the entrance to the church, in Victoria-street; and has been publicly unveiled and opened for the use of the public. The figure faces towards the railway station, and stands on a pedestal of Pennant stone, with polished granite panels. The front and reverse slabs are fitted for jets of water, and galvanised iron cups are provided for the use of wayfarers, whilst beneath are troughs for dogs.

The Royal Academy.—On the 23rd inst there will be an election of a member of the Royal Academy, in the room of Mr. Pickersgill, now on the honorary retired list. It would seem to be time for adding a sculptor to the list of Academicians, and we shall be glad to see Mr. Joseph Durham selected for the vacancy. As the author of what we must consider the best out-door monument in London, excepting the great work in Hyde Park, viz., the Memorial of the Great Exhibition of 1851, in the Horticultural Gardens, not to mention many other admirable productions, Mr. Durham has high claims to the suffrages of the members.

The Collegiate Church, Wolverhampton. We are glad to hear that it has been resolved to remove the north and south galleries in this fine old church, and to reseat the nave under the direction of Mr. Christian. The observations made during the visit of the British Archaeological Association doubtless gave an impetus to the movement. In reseating the church the old woodwork will be used as far as possible, and no material change will take place in the present form of arrangement. The total cost will be from 1,000l. to 1,200l., and the estimate of Messrs. Higham has been accepted for the work.

The Mansion House, London.—When is the justice-room at the Mansion-house to be properly ventilated? asks the *City Press*. "At present the atmosphere is simply poisonous; and some of the officials who have to stand it day after day have suffered in consequence. It is simply a question of money; there ought to be no difficulty about it." We made the same inquiry some years ago, and were assured by the then City architect, Mr. Bunning, that it was more than a question of money. Surely, however, the difficulty cannot be insurmountable.

New Inventions: London International Exhibition, 1873.—The Committee on Recent Scientific Inventions and Discoveries have suggested as special subjects for exhibition in the class all new modes of preserving stone, or of rendering wood incombustible, or of purifying water, or of copying forms in wood or metal by machinery, &c. The applications for admission, it is arranged, must be sent in before the 31st of January, 1873.

Sculpture at the International Exhibition, 1873.—A meeting of sculptors, presided over by Mr. Durham, A.R.A., was held a few days ago at the Royal Albert Hall to inspect the space proposed to be devoted next year in the East Picture Gallery to British sculpture. After visiting the spot, a resolution was passed approving of the same. The committee adjourned to the 9th of January.

Prize Cabs and the Exhibition, 1873.—The Society of Arts have notified to her Majesty's Commissioners, that the time during which cabs submitted for competition for prizes must have been running in London and other towns, has been reduced from three months to one month. The prizes offered are, as has already been announced, one of 60l., two of 20l. each, and two of 10l. each.

Scientific Lectures in Shore-ditch.—A series of scientific lectures are to be delivered in the Shore-ditch Town-hall by Professors Carpenter, Norman Lockyer, and Simmons, during the winter. The object of the lectures is to give the working population some scientific instruction at a nominal charge. The vestry have unanimously granted the Town-hall for the purpose at a reduced rental.

Monument to a late Governor of Jersey.—The Jersey States, at a special meeting, have agreed, without a dissentient, to a vote of 1,000l. for the erection of a monument in memory of General Don, who twice occupied the post of governor of that island, commenced the erection of Fort Regent, and planted the military roads, for which Jersey is so well known. The monument is from a design by M. Robinet, a French sculptor.

The Birkenhead Theatre Royal.—This theatre, which was built by a limited liability company, has been sold by auction at the instance of the mortgagees. The property originally cost 20,000l., and was knocked down to Mr. Elias Gaskell, one of the shareholders, for 8,000l.

St. John's Wood.—On Saturday, 7th, the Princess Christian laid the foundation-stone of St. Mark's Parochial Schools, Hamilton-terrace, St. John's Wood. A large marquee was erected on the site, and this was crowded by a congregation composed almost entirely of ladies.

TENDERS

For additions to the Castle, Woodside, near Torrington Park Station, Finchley, for Mr. W. B. Jones:—

Blease	£800 0 0
Lewis	846 0 0
Holding	789 0 0
Strange	791 0 0
Hingston	749 0 0
Foley	725 0 0
Jackson	723 0 0
Webster	650 0 0
McLean	647 0 0
Wadkin	620 0 0
Kelly	610 0 0
Pryors, Bros.	589 0 0
Warr	535 0 0
Batford	364 0 0

For new surgery and dispensing-room, at the Manor House, Brixton-hill, for Dr. Chauncy Pearse. Mr. Chas. Sewell, architect:—

Rowe & Verran (accepted)	£103 15 0
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For the erection of a warehouse in St. Bride-street, Ludgate-circus (exclusive of fittings). Mr. H. H. Bridgman, architect:—

Ferry & Co. (late)	£2,250 0 0
Browne & Robinson	2,209 0 0
Kelly, Bros.	2,173 0 0
Crockett	2,045 0 0
Falkner	1,986 0 0
Scrivenner & White	1,954 0 0
Elkington	1,849 0 0

* Amended tender—Additional roof stroy, £2,025 net (accepted).

For new work-rooms at the Alexandra Institution for the Blind, Queen-square, Mr. J. G. Peacock, architect. Quantities by Messrs. Gardner, Son, & Theobald:—

Adams & Sons	£625 0 0
Lathey, Bros. (accepted)	593 0 0

For Mission-room, Walham-green. Mr. E. Gregg, architect. Quantities not supplied:—

Ferry, Bros.	£435 0 0
Brown	446 0 0
Thompson & Smith	437 0 0

For erecting house and stabling in Little Queen-street, Edgware-road, for Mr. A. J. W. Keucke. Quantities by Messrs. New & Cumings:—

Aitchison & Walker	£3,745 0 0
Thompson & Smith	3,687 0 0
Mark	3,614 0 0
Aylett	3,509 0 0
Snowball	2,992 0 0

For the erection of a Danish Chapel in King-street, Poplar. Mr. J. W. Morris, architect:—

Chissell	£789 0 0
Abraham	789 0 0
Mark	758 0 0
Watts	750 0 0
Addington & Co.	725 0 0

For finishing two houses, 13 and 14, Charlton-villas, Church-lane, Charlton. Mr. J. Comfort, architect:—

West (accepted)	£370 0 0
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For schools, Cottenham-road, Holloway, for the School Board for London. Mr. Lucy W. Ridge, architect. Quantities by Mr. L. C. Riddett:—

Newman & Mann	£7,249 0 0
Nightingale	7,189 0 0
Williams & Son	7,160 0 0
Wicks, Bangs, & Co.	6,980 0 0
Roberts	6,954 0 0
Adams & Son	6,841 0 0
King & Son	6,820 0 0
High	6,790 0 0
Fatman & Fotheringham	6,710 0 0
Niblett & Son	6,630 0 0
Scrivenner & White	6,471 0 0

For building a new Rectory House at Benwick, Cambridgeshire. Mr. William Smith, architect, Adelphi, London:—

Fast	£2,065 0 0
Bennett	1,880 0 0
Bateman (accepted)	1,844 0 0

For erecting schools at Benwick, Cambridgeshire. Mr. William Smith, architect:—

Phillips	£1,663 5 4
Hutchinson	1,439 0 0
Downs	1,409 0 0
Bennett, Bros.	1,300 0 0
Bennett, Bros.	1,260 0 0
Swann (accepted)	1,240 0 0

For erecting schools at Weston Hills, Lincolnshire. Mr. William Smith, architect:—

Moore (accepted)	£499 0 0
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For erecting schools at Spalding Marsh, Lincolnshire. Mr. William Smith, architect:—

Moore (accepted)	£598 0 0
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For ice-well at No. 49 Wharf, City-road Basin, for Messrs. Marioni & Co.:—

Kingston	£1,982 0 0
Bennett & White	1,631 0 0
Kelk & Co.	1,422 0 0
Adlard (accepted)	1,330 0 0
Turrel, Bros.	1,235 0 0
Bax	1,250 0 0
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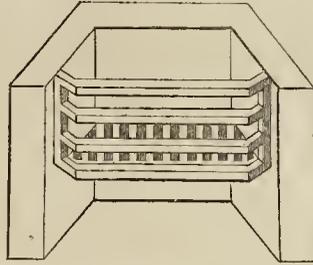
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J. H. B. Esq., Municipal Clerk, Sewers Office, Guildhall, November 29, 1872.

BOROUGH OF LEEDS.—WANTED, by the Council of this Borough a thoroughly efficient person to undertake the Office of BOROUGH ENGINEER and SURVEYOR, to carry out and perform the following duties, and giving evidence, &c.:—
1. To superintend the laying out, kerbing, and leveling all new streets, and the paving, flagging, and leveling of all streets ordered to be paved, &c., and to prepare all necessary plans and specifications.
2. The laying down and correction of all sewers and drains which the Corporation have to make or order.
3. The carrying out of all requirements under the Sanitary Acts, Local Acts, or other of any legal tribunals.
4. To make and cause to be made all sanitary arrangements and nuisances, including non-pollution of streams.
5. The superintendance of construction of privies, ashpits, and the like.
6. The ventilation of sewers.
7. The compliance with standing orders of Parliament as to plans and sections in respect of Bills in Parliament promoted by the Corporation, proving compliance with same, and giving evidence, &c.
8. The preparing of the requisite plans, valves, &c. for the purpose of enabling the Corporation to put into effect any agreements, and the requisite evidence and other matters under the direction of the Town Clerk in cases where the Corporation purchase by completion, and superintending the same and when ordered to do so.
9. The superintending of improvements in streets and corporate buildings, and superintending the same and when ordered to do so.
10. The management of Engineer when required, and of the waterworks supplying the town, so far as they are completed and in operation, and to require the necessary repairs, and when completed, and other duties which may be required of him by the Council or the Committees thereof, and which in the opinion of the Council they may consider to be within the duties of his office, and may be engaged in any or all of the above duties, and such other as may be required of him.
Salary, 600 per annum. The Corporation will in addition provide necessary clerks and other assistants, officers, stationery, and other working material. Applications to be addressed to the undersigned, and sent to the Agents for Appointment of Borough Engineer and Surveyor, and sent on or before SATURDAY, the 21st DECEMBER INSTANT.—By order, CAPEL A. CUKWOOD, Town Clerk, Leeds, 4th December, 1872.

TO ENGINEERS, SURVEYORS, AND OTHERS. THE Town Council of the Borough of Dorchester desire to procure a competent Person to discharge the duties of BOROUGH ENGINEER and SURVEYOR, and to be required to make within the borough, and superintend the management of the Corporation's waterworks, and to design, carry out, and repair of drains, and water supply, and to design, carry out, and record all such works on the Council. Plans of the waterworks, qualifications, and salary required. To be made in writing, and delivered at the Office of the Town Clerk, in Dorchester, on or before the 6th of JANUARY next.
Dated December 11th, 1872.

LOCAL BOARD OF HEALTH AND URBAN SANITARY AUTHORITY FOR THE DISTRICT OF KINGSTON-UPON-HULL.—TO FOREMEN OF ROADS.—The Local Board of Health and Urban Sanitary Authority for the District of Kingston-upon-Hull require to receive APPLICATIONS from properly qualified persons. The situation will be held under the Surveyor, and the duties will consist in superintending the Construction and Repairs of Street Surface Work, including paved and macadamized roads; also the keeping of the usual Foreman's accounts. The hours of service will be 6 a.m. to 5.30 p.m. and the Wages 2s. per Week. Applications, stating age and previous employment, accompanied by references, are to be forwarded, under cover, endorsed "Street Foreman's Application," to C. S. TODD, Esq., Clerk to the Board, Town-hall, Hull, on or before WEDNESDAY, the 19th day of DECEMBER, 1872.—By order, Borough Engineer and Surveyor to the Board, Surveyor's Office, Town-hall, Hull, 6th December, 1872.

BRIDGORTH UNION.—APPOINTMENT OF AN INSPECTOR OF NUISANCES.—The Rural Sanitary Authority of this Union will, on SATURDAY, the 28th day of DECEMBER INSTANT, APPOINT a fit and proper PERSON to act as Inspector of the Local Government Board, and such an appointment, made up to the 18th day of APRIL, 1873, only, and the remuneration to be paid to the person so appointed will be in full a fresh arrangement will be made. The duties will be:—
1. To make a complete sanitary survey of the Sanitary Authority by the 22nd day of March next.
2. Those contained in the order of the Local Government Board, dated the 11th day of November, 1871, and in such other orders as the Board may from time to time issue.
Candidates are requested to send applications in their own hand writing, to the undersigned, stating age, residence, last and present occupations in the City, to be received by the undersigned on or before FRIDAY, the 21st day of DECEMBER INSTANT.—By order, W. M. REYNOLDS, Clerk.

WANTED, immediately, a MAN, competent to work a STEAM MOUNDING and PLANING MACHINE.—Apply to Messrs. ATCHSON & WALKER, Fortham, York, Willamson-street, St. John's Wood, with upper particulars and references.

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The Builder.

VOL XXX.—No. 1559.

A Sanitary Survey: What is it?



LOCAL Sanitary Authorities are issuing advertisements for inspectors of nuisances,—taking the name from the new Public Health Act, although “local sanitary inspector” would have been a more appropriate name, and they say that one of the duties will be to make a sanitary survey of the district. It has occurred that this term has been misunderstood at both ends of the line which connects the persons sought with those who are to appoint them; and, in such things as these, what has been may be again. On a recent appointment, two at least of the half-dozen selected candidates were in much doubt as to what they would be expected to do to fulfil the requirement of a

sanitary survey. It is not defined in the instructions issued by the Local Government Board. The advertisement set forth that the salary offered was intended to include all expenses. But that cannot be. That it should include all personal expenses, travelling and other, is proper enough, and it is an arrangement that will save many small troubles to both the authorities and the officers. There will be expenses, however, incurred by the inspector of nuisances in the discharge of his duties, which must be paid by the Board as they arise; such, for instance, as the employment of occasional assistance, rendered necessary to enable him to carry out special orders of the Board; and it was apprehended by some of the candidates that these might amount to something serious. In connexion with the sanitary survey, however, there are few, if any, beyond personal expenses.

The inspector will personally observe the existing state of the premises of every house in the district, and note down his observations in a book on the spot. He will ascertain the position of the well or other source of water-supply, and take a gallon away with him as a sample for analysis, for this purpose requiring from the Board a stock of stone jars, the corks of which are to be sealed on the spot as soon as the sample has been taken. He will extend his observations of the state of the surface, and what may be upon it, to a distance all round the premises the drainage from which he may judge to have any influence on the well or other source of water supply. He will ascertain, both by inquiry and observation, the nature of the ground upon which the premises are situated, whether on clay, gravel, or rock, and the direction of the

dip of the strata, if any. He will ascertain and note down the distance from the well of any cesspool or other receptacle of refuse organic matter, and whether it is on the side of the dip or on that of the rise of the strata, in respect of the well. He will see in what manner the slops and sewage of the house are conveyed away from it, and where to. If there be a water-closet in the house, he will ascertain whether any provision has been made for carrying off the sewage gases to some place where their escape will be harmless. (If required to do so by the medical officer of health, he will inquire also into other particulars.) He will ascertain the number of pigs kept upon the premises, and the distance of the sty from the house. Comparing the evident size of the house with the number of persons living in it, he will exercise his judgment in desiring to see and to measure the rooms of the house, and distinguish living from sleeping rooms. This part of his duties may easily become disagreeable to the tenant, if not exercised with judgment and discretion. It must, nevertheless, be done wherever there is a reasonable supposition of overcrowding.

Having made such a survey of the premises of every house in the district, the inspector of nuisances is to make a report to the Board of the sanitary state of the district. Either at the same time or afterwards, upon being asked to do so by the Board, he is to suggest such remedial measures as may seem to him proper for removing all nuisances from the premises of the houses, and suggest such works of a permanent character as in his judgment may be necessary to prevent the recurrence of nuisances. These, so far, relate to every dwelling-house in the district. In addition, he will inspect and report upon the condition of every slaughter-house, and every place of business where the trade carried on is of a noxious or offensive character. Nothing less than such a survey as this will be of any avail. More might be included. To take the items *seriatim*.

1. The well or other source of water-supply. If it is situated on the rise of the strata with respect to the situation of any cesspool or other receptacle of organic matter, it will be less likely to be polluted; if, on the other hand, it is situated on the dip, it is almost certain that the water in it will be polluted. It is necessary to supplement this information by a concurrent report of the analyst as to the actual condition of the water at the time of the survey, for which purpose the inspector will deliver to him a sample. If both the inference to be drawn from the position of the well and the analysis are favourable, it will be a happy state of things for all parties; but if the dip of the strata would lead to the inference that the water would probably be bad, and the analysis confirms the inference, then, clearly, either another source of supply must be sought, or else the source of pollution must be done away with. It must be observed that to judge of the permanent quality of water by the analysis of a sample alone is not sufficient, for a sample (over a whole district inspected by only one man) can be taken but seldom, and the occasion may happen to be a favourable one or the contrary, in respect of any long time, such as a year. The physical characteristics must therefore be considered, as well as those which are chymical.

2. The house slops, and how they are conveyed away. If the ground be porous, as gravel or sand, or sand rock, it will often be found that the slops are conveyed into the cesspool, there to be contained until they soak away. This is the very worst form in which they can be dealt with. Almost as bad is that in which they are thrown out of the back-door on to the surface, thence to soak away and evaporate. The only thing in which this way is better than the other is, that the slops do not convey into the sur-

rounding ground the organic matter of the cesspool. Again, the slops may be drained away to a ditch, at more or less distance from the house; but here, while the soaking will be less, the annoyances from evaporation will be greater, and the offensiveness more concentrated. But there may be proper sewers into which to drain the house slops and other sewage. In this case it is sufficient to see that all openings at the ground level (near the house) into the drain communicating with the sewer are properly trapped, and that the gases which necessarily arise from the decomposition of the sewage are led away by one or more pipes to a place where their escape cannot contaminate the air breathed by the inhabitants; and that place will in general be above the roof of the house, providing that the place chosen be not in proximity with bedroom window. For this purpose also, the soil pipe of every water-closet should be carried straight up to a point some 2 ft. or 3 ft. above the roof, and there terminate with an open end. Fanciful cowls, hoods, or other obstructions to the escape of the gases are generally worse than useless. The size of these ventilating pipes should not be less than 3 in. diameter, but the larger the better. The drains should not be taken into the house if it is possible to avoid it; but should terminate outside the wall in a proper trap, and the slop-water should be led by a pipe into that trap.

3. Pigstyes are a great nuisance near a house, and yet it is a manifest hardship to interfere with the keeping of a pig, or even of several. Many inspectors, and amongst them some of the best, are of opinion that pigs may be kept so as not to be a nuisance, if the sty be not nearer than about fifteen or twenty yards from the house; and providing that, at whatever distance, it be kept as clean as a stable or cowhouse is kept when properly attended to.

4. It is probable that in every district to which inspectors of nuisances are now to be appointed, some houses, and often many, will be found to be overcrowded. Overcrowding is relative as to space. It is a very wide question, and one not to be hastily dogmatized upon. It is one that will cost every inspector a great deal of trouble, a great deal of investigation into the opinions of the best authorities, and a great deal of thought on his own account. It is true that he may, and ought to, throw the responsibility of deciding these things upon the medical officer of health, and ultimately be made to do so; but before he can make a report on his survey he must either understand this question himself, so as to be able to say that this or that house is overcrowded, or he must report the number of people in every house, and leave the medical officer to decide for himself.

This sanitary survey does not touch upon—rather it is beyond and outside of—the ordinary duties which are set forth in the instructions issued by the Local Government Board, such as attending meetings of the Sanitary Authority when so required; visiting any spot on receiving notice that a nuisance exists there; visiting and inspecting shops kept or used for the sale of butcher's meat, poultry, fish, game, flesh, fruit, vegetables, corn, bread, or flour, or as a slaughter-house; and examining any animal, carcass, meat, poultry, game, flesh, fish, fruit, vegetables, corn, bread, or flour which may be therein; and in case any such article appear to him to be intended for the food of man, and to be unfit for such food, he is to cause the same to be seized, &c.; communicating with the medical officer on the occurrence of any contagious, infectious, or epidemic disease; disinfecting articles to prevent the spread of disease; entering from day to day in a book particulars of his inspections, and of the action taken by him in the execution of his duties; keeping other books as a continuous record of the sanitary condition of each of the premises in respect of which any action has been

taken under the Sanitary Acts, and any other systematic records that the sanitary authority may require; producing his books to the medical officer when required, and rendering to him such information as he may be able to furnish; superintending and seeing to the due execution of all works which may be undertaken for the suppression or removal of nuisances; and, in general, that he shall observe and execute all the lawful orders of the sanitary authority, and the orders which may be hereafter issued by the Local Government Board.

In the discussions which have already taken place in various parts of the country, at meetings of boards of guardians, since the regulations of the Local Government Board have been issued, there has been considerable difference of opinion as to what would be the respective duties of the medical officer of health and of the inspector of nuisances; some members of boards being of opinion that the medical officer would have little to do but to confirm the reports of the inspector of nuisances. Without going into the question of what the particular duties of the medical officer may be, we may yet say that we think he will have very much to do if he is a really efficient medical officer of health, and if his chief attention is turned to the prevention of disease, by bringing those sciences which relate to the subject, physical and chemical, to bear upon this great question of the public health; for it is not so much to the reduction of mortality that he is to attend, as to the prevention of sickness and the contraction of those diseases which tend to deterioration of race; and, on the other hand, to insure that those who live shall live healthily. It is the responsibility laid upon him.

It is observed that the several Government inspectors appointed to advise local authorities under the new Act, do not all recommend the same action on the part of the inspector of nuisances in making his reports. Some advise that he shall report to the board, and some to the medical officer. This discrepancy may be due, not to any abstract and general difference of opinion, but to local circumstances. It is, probably, of little importance in which way the reports shall be made. The one thing above all others of importance is a thorough agreement between the two officers to promote the health of the people. Neither can possibly in this case aggrandise himself at the expense of the other, and the only way in which either can possibly be useful is to sink minor personal questions in the great public one.

THE GOTHIC BUILDERS YET AT THEIR WORK.

THERE are so many differences between the old system of things and the new of to-day as regards art and architecture, that there would be no small difficulty in fixing on any one difference conspicuously prominent. The old arts and architectures, as a rule, rose up into existence we hardly to this hour know how; they went on, and progressed, and at last for the most part died out, and became extinct, and gave place to new styles of art. Gothic architecture and fine art in this country exemplify this in a remarkable and not a little instructive manner. The growth of the Early English Gothic, to use the ordinary and so well understood terms, its expansion or development into the Decorated, and its fall, as most people think it, into the Perpendicular, and its final death in Elizabethan, all went on as perpetual change in an almost imperceptible way. No one, and certainly not those who worked out the great problem, could draw a hard and fast line between the one phase of this style, and the other next to it, and following it. There is, as all know, a sufficiently marked distinction between the Early English, and the style which succeeded it, the Decorated; but there is no particular time at which a point can be fixed as the exact changing turn in them. The styles never struck the hours. All went on in a gradual and unnoticed way. Nothing seems to have been needed but the native capacity of those who worked out the several styles, each in their own age and generation.

So much by way of reminder as to the old Gothic art and architecture, and the methods of their production. But how different was it to our modern system of bringing Gothic forms and architecture into existence. Let us consider it for a few moments, and note the difference. Before the modern Gothic movement, by a sort of accident, there occurred an architectural interregnum. Brick-and-mortar construction took the place of art and architecture, and

the Gothic that sprang by slow degrees into existence was, as all know, directly copied, as nearly as could then be, from "examples" of the old Gothic remains and ruins. The way in which this was done, and the special phase of Gothic, the "Perpendicular," which was at first fixed on as a something "Gothic," and as containing "tracery" to copy, need not now detain us; we only want to direct attention to the fact of the copying or imitation of old examples of Gothic art, and to the distinction to be observed between the old way of producing Gothic and the modern system. The one was, as we have noted, a growth; the other is as a replanting; the one was as a growth of natural plants; the other is as a copying of these natural plants in new materials, and in a modern way. Let us note, too, in passing that this new and artificial reproduction of the old forms of Gothic has not been, and is not confined to one particular phase of Gothic, but all phases of the style, and all countries have been, and are yet, drawn upon for fresh and ever new "precedent" to go by and to follow. There are many other causes at work besides this primitive one, which absolutely prevents the production of a Gothic building in the same way and in the true spirit of the old work.

But now the question occurs, and a curious one it is, what would have been the position and nature of Gothic art and architecture, had the style gone on and progressed from the Perpendicular to the present time, as it did go on and progress without any disturbing influence from the Early English to the Perpendicular? and is there anything that is constructed in the present day that is, in like manner, a following on from the old Gothic days? It would be vain, we think, to look round for any such object. All things have changed; for not only have most of the old objects of use been superseded by new and improved ones, but even those things which have not been so superseded are changed in form and in details. The old Gothic art is really, and in sober fact, as dead as the extinct animals of the pre-Adamite age. But yet there is one object to be seen by the eyes of modern Londoners,—not, it is true, in the streets, but on the river that runs through London,—which not only recalls the old Gothic forms and ways of work—the "Medievalism" of the past,—but is in truth a *bona fide* remnant, so to speak, of it. We allude to those strange-looking boats which some readers may have noticed, not too genteel to look at such out-of-the-way things, called "gallioti." These vessels are fishing-boats, and in them are stored up in water-tanks the eels which supply the London markets. They are of Dutch build, and manned by Dutch sailors, and are well worth the attentive looking at by those who take general views of art. It would be difficult, if not impossible, to describe them. They lie low in the water, and are round and tubby enough both in stem and stern; they are decked boats, with huge lee-boards, and with short single masts. Turner delighted in them, as well he might, for nothing can surpass their fitness and attractiveness as boats for the painter. They are not painted, but the natural wood is allowed to show itself; and the colour of the sails, whether in sunshine or out of sunshine, must always remain the despair of the painter, however imaginative, and buy his colours where he will. It must have been in just some such boat as this that brave Columbus and his companions sailed into that then fabulous and mysterious ocean which is nowadays crossed with as much ease and certainty as men go to Gravesend. Much has been gained, but a little something has been lost! But to the structure and mode of design and working details of these boats. They are real and *bona fide* "Gothic" boats, and are, doubtless, the traditional remains of the old Gothic or Middle-Age system of boat-building. Nothing can surpass the neatness of their build, and the carefulness with which they are put together. The mouldings and timber ornaments, and spays, show real artistic feeling, and wherever the main constructive timbers end, and show themselves, this is to be seen, as in the rudder and rudder-post. Indeed, generally, we may affirm that no modern "improved" steam-packet boat, with every possible help, and with the best materials, has any place by the side of one of those quaint vessels as an artistic performance, and as a picture. Let us repeat that these things must be seen, if not in reality, at least in pictures,—say, in one of Turner's, who never missed opportunity of putting them into his boat pictures. They are famous sea-boats, and last out many a modern craft, and come safely sometimes into harbour when other more

improved vessels come to grief. We are not going to advocate the going back, even for artistic purposes, to this style and method of boat-building, any more than to plead for a return to the coach-building of the days of Queen Elizabeth, as shown in our Lord Mayor's state-coach, as compared with a modern improved carriage or tram-car; but of the artistic difference between them there can be no manner of doubt. What, we may here ask, is the loss and gain,—an "improved" boat or carriage without art, or an old-fashioned boat or carriage with art? Can both be joined? What, for instance, can be done with a modern New York tram-car to give it a place in a picture in the same way of fitness as the old gilt coach of Elizabethan fame serves? Here is a modern problem of no small importance, significance, and difficulty.

We have thus called a little artistic attention to these curious things while they yet last, for there are signs of their disappearance into that gulf of progress which is truly absorbing everything that is of the past; and we have adduced it as a singular instance of the past in the present. The old Gothic workmen, and their mode and style of work, yet live in the present for a little time longer. What would our architects, and antiquaries, and art societies, think, if, in some solitary and out-of-the-way London bye-street, there should be not only, as there are, things out of date, and of past ways of construction and ornament; but that there should be found, yet working in the old methods and traditions, a few workmen as an object long since supplanted elsewhere by more modern and improved constructions? Or, to put it yet more significantly, what would be thought of a new chapel building up in some out-of-the-way place, by the old workmen of centuries back, in their own way, with all their prejudices and quaint ways of work, without hook "precedent" to go by, for they would need none, and but with the single purpose of use, the art being all the while simply instinctive? The past in the present! All this seems strange enough, and hard to realise; yet it is a practical reality in the case of these Dutch fishing-boats in the river Thames. They are, as we have said, probably the only things now being built, and we have seen them in process of building, timber by timber, in modern civilised Europe at least, which can be said to be, in the true sense of it, really "Gothic," not copied Gothic, or a reproduction of the old forms in new materials and by living hands; but the old work itself, and the ways of that work, still going on traditionally by it, is true, modern hands and heads, but just as though nothing had stepped in between the days of genuine Gothic art production in Gothic times and now. It is genuine and true work indeed, and the traisim of Darwin is evidenced in art as well as in nature; that while any amount of change may be going on in a race of beings in nature, the old primitive forms may yet, in some rare cases, endure and perpetuate themselves, in spite of those changes. It surely is so in these queer and quaint Dutch fishing-boats. May they last yet a little while longer!

It is hardly possible in these few hasty remarks on a new art-subject to do more than glance at it. To go into detail adequately would be impossible; but there is one speciality about these curious constructions that is well worth some attention. We refer to the drawing and character of the mouldings, i.e., the timber mouldings. It may seem curious to talk of mouldings at all in connexion with ship or boat building. Engineers and ship-builders are not much given to mouldings; but in these Dutch boats not only are there mouldings, but they are surpassingly good, and thoroughly well and carefully drawn. The ends of the timbers, where they show themselves, as we have before said, are noteworthy, and evidence how much is to be done in the way of what some might think insignificant details. There is a neatness, too, about these quaint boats for which we must give the Dutchman full credit: a little of the spirit in it and about it of that which produced the Dutch paintings, so much admired by some, and as much abused by others. Unfair abuse; for the Dutchmen have left us, not what they could figure to themselves of Italians, but what they themselves really looked like, and thought, and did! We say nothing of the quaint cabins in these boats, or of many other things in and about them, or of the men, with half Gothic lingo, who man them. But a good deal might he said. Efficient for the day and for us is the art and the architecture of it.

HISTORY IN STAINED GLASS.
ARCHITECTURAL ASSOCIATION.

At the last ordinary meeting, held on Friday evening, the 13th instant, Mr. J. D. Mathews, the President, called attention to the arrangements that have been made for the benefit of country members;—enabling them to obtain books from the circulating architectural library, and to take part in the studies of the class of construction and the two classes of design. A prize is also offered for an essay to be competed for by country members only. It is hoped that a fair number of students in the provinces will avail themselves of the opportunities thus afforded of sharing with other members the benefits of the educational work of the Association.

A lecture was delivered by Mr. C. Baily "On History illustrated by Stained Glass, as exemplified in the Windows of Long Melford Church, Suffolk." Drawings reproducing many of the Windows in their actual size and colour were hung round the walls. The Church of the Holy Trinity at Long Melford was rebuilt in the fifteenth century under the direction of John Clopton,—a representative of an old English family located from a very early period in the neighbourhood. It is one of the numerous churches of this period in which the county of Suffolk, particularly its south-eastern portion, is very rich,—the wealthy families of the district rivaling each other in endeavouring to erect grand buildings.

The history of the rebuilding of the church is told in inscriptions cut in the stone parapets outside the building; one inscription giving the date 1494, by which year the church was probably in the main completed. The people who assisted with their money and their goods in the rebuilding are commemorated,—e.g., "John Pie and Alys his wyf of whos goods yve arch was made and yes tway wyndows glaid," &c. John Clopton, thus assisted, filled all the windows with stained and painted glass, the church and its several chapels containing no less than ninety-six glass windows. Some of this has in the church at the present time, although but a small quantity compared with the large amount originally in the building, and, having regard to the ill-usage which it has received during the space of four centuries, the figures now remaining are in a tolerably perfect condition. In 1862 the whole of the then remaining painted glass was taken from the original situations, collected together, and reglazed in the east window and in two windows at the west of the aisles of the nave,—a course strongly condemned by Mr. Baily as reducing the value of the remains, especially in the case of a number of ancient fragments, each of much value in its original position, now brought together in patch-work and rendered worse than useless. The glass is of two different kinds:—

I. Figures of saints and subjects relating to sacred history; "Our Lady of Pity" (a figure of the Virgin holding the dead Christ in her lap); St. Edmund, king and martyr; St. Dominic, the founder of the great order of Mendicant Friars, a figure rarely found in English churches; also a figure of Peter Martyr (the disciple of Dominic), perhaps the only example in England,—represented with a deep gash in his head, and the blood trickling from it; a closed book in his right hand, in his left a sahe with which he was struck down,—a dagger or short sword is also stuck through his heart. II. Representations of secular persons, members of some great families of England, who have played conspicuous parts in the times in which they lived, and whose deeds are recorded in the history of our country. As works of art, the figures may not, perhaps, claim a very high position, much of the drawing and execution being of a rude character; but as illustrating the history of fifteenth-century art in England, and throwing the light they do on the peculiar costume of the time, as well as confirming many otherwise doubtful questions of a genealogical character, they are of real interest and value. John Clopton, in selecting the persons whose effigies he wished to place in the Melford windows, appears to have included those illustrious families with whom he could claim connexion either in blood, by marriage, or by political sentiment (J. C. was a zealous Lancastrian); for in most cases where information can be obtained respecting the persons represented, something appears which indicates a connexion with the Clopton family. Thus, owing to relationship to the Howard family, we have a Lady Howard in the west window; elsewhere Elizabeth Howard (wife of John de Vere, Earl of

Oxford, the Master Philipson of Scott's "Anne of Geierstein"; Elizabeth Tilney (wife of the second Duke of Norfolk, the hero of Flodden Field); Sir William Howard ("Chief Justice of England," reg. Ed. I.), but this latter figure (represented in judicial robes) being executed nearly 200 years after that time, cannot be considered a portrait. There is a marked difference in the execution of the portraits of non-contemporary persons, the individuality noticeable elsewhere being exchanged for tame drawing of conventional features. This renders it additionally probable that the portraits were studied from the living originals, where possible. Two Lord Mayors of London appear,—Sir John Godney (1427), Sir Ralph Jocelyn (1464 and 1476), both connected with Clopton by marriage; also John Haugh, serjeant-at-law and (1487) judge of assize, the giver of some of the stained glass,—a portrait especially valuable as an illustration of Chaucer's Prologue,—

"A Serjeant of Lawe, war and wys,
That often hadde ben atte parrys,
* * * * *

The rood but hoodly is a nedled [malley] coote,
Gird with a seynt [sirdle] of silk, with barres smale;"

A relic of the old custom (of wearing striped or rayed gowns,—parti-coloured, blue and green, and blue and brown) yet remains. On the first day of term the serjeants wear purple robes; at sittings in law, black cloth gowns; and on State occasions and Lord Mayors' dinners they appear in scarlet. The coif, which shows as a little patch on the modern judge's wig, is here in its old form of a white cap above the wig, and tied under the chin. A figure of Richard Pygot, facing that of Haugh, illustrates a somewhat mechanical manufacture of figures for such positions; the features are different, showing that each is intended as a portrait, but the outlines of the figures are almost identical, being merely reversed; the leaded lines exactly coincide. A similar instance occurs at Nettleshead Church, Kent; St. Stephen, with stones in one hand and a book in the other, is balanced against St. Lawrence with a gridiron,—the two figures being repeats (except the faces) as to the emblems and dress colours. Mr. Baily took in this way the several portraits (of which there remain thirty-one in all), calling attention to the genealogy, the personal and other connexion with the Clopton family of the different persons, their connexion with the history of the Government of the nation, as in the struggles of the Wars of the Roses; the specialities of their costume, or of the heraldry depicted thereon; and of the architecture and church furniture and fittings also shown. As treating more at length of the genealogical details necessary to the comprehension of the scheme of this interesting and probably unique series, he mentioned a paper read by himself before the London and Middlesex Archeological Society, session 1871.

INSTITUTE OF PAINTERS IN WATER
COLOURS.

To compliment very highly the Institute of Water-Colour Painters on the present show arranged for exhibition in their gallery, would be to stultify former recognition of the high position its members have attained in establishing a comparison between the resources of their chosen medium and any other that might be adopted as sufficient means of achievement for nearly any result the painter could look for. There is no hiding the fact that these resources, year after year, are made to appear more restricted to a humble service than former application of them made it reasonable to believe would be the case. It may be said that this is quite appositional,—a mistake proceeding from a wider-spread, a more common ability to diffuse such claim to the admiration that was formerly concentrated on the few that excited it; and that artistic excellence was never so ripe or so sure of acknowledgment as it is now. This may be answered syllogistically. An ability so widely spread must be common indeed, and acknowledgment so cheaply obtained, of little beyond to-day's worth,—acceptance of show. However, neither fashion nor photography is likely to inhibit the ready provision that abounds to feed their vanity, and these are the presiding deities that an artist's pencil swears by, nowadays, and that everybody else swears by, in exemplification of a seeming wise discretion between what should be seen and what could be seen. Everything with a colourable excuse will make a picture now, so long as the colour includes the

pink of demand; and art will sleep in its dictionary bed,—a word to signify "cunning, skill, knowledge, a trade." Let it be said that art's appearance is as evident as ever,—even in twenty shillings change for the pound we should miss the presence of the sovereign; and to hold the great coin many would hesitate who think small change small change, though great change, before they identified the equal worth, and would like to change. It is a shilling age, and a chilling one for those who would think it golden if they could.

Messrs. L. Haghe, E. H. Corbould, and Henry Warren, with whose names the celebrity of the Institute is so closely associated, are amongst the members not assisting on the present occasion. Mr. J. Abshon sends numerous examples of his rapid, dexterous, and agreeable style; heads all glorying in one complexion; single figures in the costume of hygone ages—of which the most pretentious "Geneva" (39) will not be many be voted the best. Mr. G. G. Kilburne's pretty page, "Viola" (46) may be read for Shakespeare's or not; but it is the best study amongst others here that he has worked at. Mr. J. D. Linton is at a loss for a title, by which he could make good his claim to valuable property; his presentation of three odd personages is nearly as funny as it is finished (230). Finish, to a very admirable completeness, is the predominating excellence of Mr. A. C. Gow's interesting picture of "The First Provision Boat for the Besieged Town" (58); there was more colour of a sort to such an incident 200 years, or more ago, and of this advantage Mr. Gow has made great and good use. The work only fails in its want of the intensity that later experiences have proved to belong to the subject; the depth of such colour by which recent fact makes pale all past account and fiction. Crowds, cleverly crowded, are hailing the arrival of the boat into port; it might carry hay or fireworks, so far as may be learnt—beyond the catalogue. The preserver loth in easy indifference to any exciting course beyond the pleasure of taking a long shot to pot a possible purmer; no hastily scramble for loaves to disturb the good behaviour of the hungry; no starved wretch plunging into the quiet water, clamouring and clamouring up the vessel's side for the speediest help; need gives wide latitude to the necessitous. There is nothing gannet or greedy to hint at the cruelty of want, no ugly strength in this pleasant illustration of painful truth; though it gives room for the imagination,—a great thing for a picture to do, as pictures go nowadays, when matter-of-fact not of the right kind so frequently shuts out all the suggestiveness by which very much is attained towards its real worth to lead thought, by its canvas, through and beyond it, if text were as much cared for as texture. It is a very meritorious production, notwithstanding the objection. Mr. C. Green's sketches are, as usual, careful and clever, whether in pen-and-ink (158) or stippled up and cross-hatched on bright tints, as in the view he takes of a well-worn theatrical hussiness at a side wing (195). One of the multitude of little sprites, more learned as to the heels than the head,—fairies of pink tights, golden hair, and a season's creation and evanescence, that give a special interest to the boards—the London School Board included,—at pantomime time, is graduating by dancing steps to the degree of knowledge a pretty face and figure make so easy of attainment: an admirer has thrown her "Her First Beauquet." Mr. F. J. Skille's "Broken Children" (141) are not of the fairy order; a score of his examples give opportunity for a wide acquaintance with them here, but they are all (clever as they are) too much alike. "The Sisters" (2); "Morning—A Hayfield" (104); "Sunny Hours" (116); and "The Little Pitcher at the Well" (302) are amongst the best. Mr. W. L. Thomas's thirty sketches in one frame, made during "A Tour in the Pyrenees" (12), indicate a great appreciation of colour; and this is seen more convincingly in a little bit of home scenery, "Near Petit, Sussex" (5), to make it noticeable even when so many instances of a similar gift, applied to more learned workmanship, are to be found. Exquisite colour is the nominative charm of Mr. H. C. Hine's drawings; it would be difficult to simplify such object, as he makes subject enough in "Herring-boats, Eastbourne" (19), or indeed in any other of half a dozen proofs here; and yet, by his treatment, what is ordinarily visible with ordinary effects becomes quite new matter for admiration. Mr. E. Warren's single contribution, "West Dale Sands, St. Bride's Bay, Pembrokeshire" (202), looks

the more chilly and hard by reason, no doubt, of innate consequences to proper representation; a prevailing blue being one of them, and rocks—the antithesis of many things to be mollified,—another. The sun was kinder in the vicinity of "St. Mary's Isle, Northumberland" (179), enabling Mr. J. Mogford to streak his sea with puce and emerald shadows, besides lending such warm light to the rippled countenance of the "green one," or blue one, as makes it the more agreeable for those who do not like it much at such times. "Heave and Away" (36) comes in such expressive sequence, that one would just notice how well Mr. W. May points his advice by rolls of lumpy waves,—and take it! the more especially as his luggers, colliers, or whatever they may be, so far as a passing glimpse may show, have no more than signs of comfortable cabins.

"St. Mawes, Cornwall" (96), by Mr. J. G. Philip; "On the Orwell" (112) and "Dawn" (220) upon Druidical remains, surrounded by the mist and mystery of old, by Mr. Harry Johnson; "Castle of Rheinfels, on the Rhine" (134), with a good deal of its romance about it; "Hills near Loch Awe—Twilight," by Mr. T. Collier (210); "Evening," and "Sunset" (224 and 241), by Mr. W. L. Leitch, with Mr. McKewan's clever depiction of what is out doors and in, are some of the leaders of many cognate works that form the bulk of this exhibition, to which Messrs. Fahey, Whympier, Maplestone, Hargett, Mole, Pidgeon, Reed, Telhin, Rowbotham, Mitchell, Orrock, Sherrin, and Small, lend such help as their names would promise. The promise of a name is seldom so well realised as in the case of Mr. E. H. Fahey. Unnaturally and naturally he heats his father and a great many more at the "Study of a Head" (22); but, then, he speaks very loudly of the valuable direction that could educe such forcible views of cottages, with wild tamed to cultivated garden-produce, in his "Sketch from Nature, Dorchester" (81), or more quietly and as soundly in the "Sketch from Nature, Groombridge" (180), or in that of "Cookham-on-Thames," which give in rich and deep tone a promise of even better things to come.

With apposite notice of Mr. Carl Werner's learned representation of the "Fountain of the Apostles between Jerusalem and Jericho" (78); Mr. T. H. Cromek's "Crypt of St. Peter's Church, Toscanella, Italy" (176), and Mr. L. J. Wood's pleasant Prout-like drawings of old Continental buildings, these remarks end with a question.

In observing the similarity of winter and summer exhibitions, is not the likelihood of the later show becoming too like the earlier, rather than *vice versa*, a real cause for fear?

MR. PARKER'S LECTURES ON ROME.

MR. J. H. PARKER, C.B., M.A., Keeper of the Ashmolean Museum, at Oxford, has given two lectures in the museum. The first was on the results obtained by the recent excavations in Rome, as giving archaeological evidence of the general truth of the old legendary history of that city as given by Livy and Dionysius; and the second was on the Tombs and Catacombs.

In the first, he commenced by observing that the excavations in Rome during the last few years had thrown quite a new light on the early history of the Eternal City, and had gone far to prove that the old legendary history of the foundation must be substantially true, if archaeological evidence could be relied on, and he believed that it could for the main facts. The earliest wall in Rome in architectural character was the one at the north end of Palatine Hill, built against the cliff at the top. It was built of large blocks of stone, each $\frac{1}{2}$ ft. long and 2 ft. thick, and the same width,—that is, oblong, or two squares united,—and each of a ton weight. These stones were laid alternately lengthwise and crosswise, and are supported by their own weight only, with very wide vertical joints between them. The wall can be traced around three sides of an oblong space at the north end of the Palatine; on the fourth side it is concealed by the remains of the palaces of the Caesars. In the part immediately opposite to the hill of Saturn there are remains of towers against the cliffs and the walls. The northern side of this oblong space is a wide and deep fosse or valley, perhaps partly natural, but with vertical cliffs, exported in places by walls of tufa, as in all other parts. It is probable that the tufa stone

used to build these walls was taken out of this fosse, which was at least partly made. He pointed out that this fortified oblong space was naturally the arx or citadel of the Palatine Hill as a separate fortress, such as settlers might be expected to make who had to defend themselves upon it against an enemy on the opposite hill. He thought they might fairly call this oblong space by the old name of Roma Quadrata. Behind the earliest part of the wall of Romulus, at the north-west corner of the Palatine, is a cave reservoir for rain-water, cut out of a soft bed of tufa, between two hard beds. This reservoir has conduits leading into it from different parts of the hill. In the hard bed of tufa which forms the vault over it are several wells for letting buckets down into the water when it was full. Under the same corner of the Palatine, but at a very low level, only just above the ordinary course of the Tiber, is a cave with a stream of water gushing out of the rock into it, the source of what is called the Aqua Argentina. This cave might very well have been a wolf's cave at the time of the foundation of Rome. On the top of the Palatine, in the same corner, during the year 1871, the foundations of a very early temple were found, with a grand flight of steps leading up to it from the direction of the Lupercal and the Circus Maximus. The construction of this is exactly the same as that of the wall of Romulus; and if they were to believe the legend, this could only be the Temple of Jupiter Feretrius, built in the year 4 of Rome, and the steps of Cacus (*scala Caci*), built about the same time.

Mr. Parker next proceeded to refer to the second wall of Rome, built after the peace with the Sabines, when the two hills were united, and the Hill of Saturn was made the Capitol of the united city. Of buildings of the first period there were very slight remains. The houses were all of wood for a very long period, probably for the first 700 years of Rome, or longer. The city of Rome burnt by Nero was a wooden city almost entirely, and even after that time the upper stories of the palaces were of wood. The Golden House of Nero himself was all on one level, vaulted over, and the vault covered with earth, upon which gardens and woods, and the *thermæ* of Titus, Domitian, and Trajan were made. Such a palace could not be burnt. The pavement of the old street is often now found in the cellars of the houses, at a great depth. Mr. Parker dwelt at some farther length on the structure of the buildings, &c., and concluded by saying that the magnificent buildings of the Empire were so numerous and so important in Rome that it was quite impossible that he could enter into the subject here. He had given a general sketch of the history of architecture in Rome, as historical evidence, as concisely as he could.

NOTES FROM RIO JANEIRO, S.A.

THE Brazilians are decidedly peculiar in their acts of politeness. Meet a native acquaintance twenty times a day you must shake hands; no difference between male and female friends. Enter a room, the same process must be gone through. Smoking is quite fashionable, every room impregnated with tobacco-smoke; but chewing is discarded altogether. Coffee and light wines are always offered to callers, and they generally partake of them.

Intoxication is seldom seen, so far as your correspondent can judge; during nearly five weeks he never saw one drunken man. Every householder seems to be musically inclined; a piano I noticed in every house I called at. The wives of the business people I called upon seem to be slatternly and indolent, poor housewives; and the business people have peculiarities in regard to meals. The servant brings a cup of coffee to your bed, then you rise, go to business, work until eleven o'clock, breakfast, return to work, and then have a good square meal between five and six; one good meal a day is the general household "fixing." The better half of a well-to-do Brazilian rises about nine, remains in her dressing-gown until time to "fix up" for dinner. The women are not handsome—of a tawny complexion, coarse featured; but have wonderful eyes. There are a great many coloured (negro) folks in Rio, who, unlike those of the United States, mingle together in company at the opera or receptions; and for the first time during my stay in America, I came across a real coloured mechanical professional: the chief engineer and constructor of works, whom I had business with, was a negro. Rio has no buildings to boast of,

except cathedrals; lots of indifferent *cafés*, but no real decent hotel; and if a joint-stock concern wish to make money, let them "go for Rio," and build an American or European hotel. Rio has lots of public gardens, parks, and sea-side promenades. The Botanical Garden, about four miles from the city, has one of the finest avenues of palm-trees I have ever seen; these beautiful trees, stretching out their big leaves, make the walk a pleasant place in the hot sun. Fancy an avenue of tapering palms, about 70 ft. or 80 ft. high to the first branch, and in the centre of the avenue is a splendid fountain.

Rio has a very modest English church; as, also, one for the Presbyterians (I think for the American), the Roman Catholic faith predominating, whose cathedrals are very fine. There is no Sunday kept in Rio. Horse-racing, theatres, and the shops are in full swing, and more retail trade seems to me to be done on Sunday than any other day; the only difference I could see was a few more clean shirt-fronts exposed.

Only one railroad runs out of Rio, but the place is lined with coasting and foreign steamers. In regard to hotel accommodation, I learnt that the wholesale dealers generally provide sleeping accommodation for their country buyers.

The second Sunday I spent in Rio I must plead guilty to witnessing a horse-race, and had the honour of seeing the Emperor and the royal family. Don Pedro Secundo is about a 6 ft. well-proportioned gentleman, genial and oval face, full beard, half black and half grey, dressed in simple black. My acquaintances say his donship is given to much staidy, and rather an advanced philosopher.

Monopolies seem to me the order of the day in Rio. One concessionist monopolises all the cartage for supplying the city with water. Another necropolis the burning of the dead, for the dead must not remain out of the ground longer than six hours.

Slavery exists in Brazil, though in a somewhat modified form. Hereafter, children born of slaves will be free; so death to slavery will take place in the next generation. My business in Brazil took me a greater part of the time among the planters, and the slaves appeared to me to be treated very harshly, working from daylight to dark, neither age nor sex seeming to be of any consequence. Probably the sugar-making season being on hand brought great pressure to labouring hands. Carrying loads is quite a curiosity; everything is done on the top of the cranium, from a sheet of paper to a piano,—the women carrying just as heavy loads. The amount of dress is also scanty,—an old canvas sack ripped open at the bottom and two holes for the arms, or a pair of overalls.

The country around Rio is mountainous, abrupt, and admits of very little culture; to get into the interior must be done by mule exercise.

The fashionable resort is the town of Petropolis, about thirty miles from Rio. The route is by steamboat some twelve or thirteen miles, by rail five miles to the foot of Seirao, thence by diligence to the top of the mountain, some 4,000 ft. The road up the mountain reflects great credit on its constructor: it is zig-zag in its formation, and one is compelled to go a dozen miles to get to a three-mile point. The scenery up the mountain is magnificent and beyond description, but the air becomes rarified, and it is hard work to breathe much. A diligence with four persons takes as many hours to ascend the mountain, and requires the aid of six mules. Petropolis is the resort of the Emperor in the very hottest months of the year; it is situated in a little valley on the top of the mountain, and contains about 3,000 persons.

The Emperor's Palace is a large building, void of architectural beauty, but the grounds are in the very highest state of culture, and adorned with everything beautiful in the horticultural line.

The slaves of Brazil seem to me a poor, uneducated kind of creature,—very obedient, and scarcely one passed me but his hat was taken off and a most obedient bow made, and muttering of a few words followed, which, interpreted to me, was "Praise be the Lord. Your blessing, master." Slaves are allowed to work for themselves, provided they pay their master about one dollar a day and support themselves: so by that means many from their savings are able to free themselves in a measure.

Hat-making is learnt by every negro:—at corners, garden fronts, and out-of-the-way places the coloured people seem to use every spare minute in braiding palm-leaf plaids for hat-making, which they afterwards sew together,

and construct the hat. Sickness is not very prevalent, but the Yellow Jack fever is often a visitor,—not more so, I am told, than in other parts of Southern America.

Altogether, my visit to Rio Janeiro was one of extreme pleasantness, and now that I am settled down for a short time in my old bachelor quarters in the Northern part of the United States, I hope these few jottings of a wanderer will not be altogether uninteresting to the readers of the *Builder*.

QUERCUS.

VENTILATION AND THE FACULTY.

SIR,—In an interesting paper "On the relative frequency of disease between the right and left sides of the heart," by Dr. Black,—published in the *Lancet*,—the following passage occurs:—

"Architecture has much to undo, much to learn, before it can satisfy the simple laws of nature. In ignorance of these laws houses are built, stately edifices erected, and no thought or care is taken to render the air within as pure as the air without. It is nevertheless easy to accomplish this desideratum, but blind unyielding ignorance claims death in every room."

No greater benefit could be conferred on mankind than the teaching them the necessity of ventilation, but that lesson is more likely to be learnt if it comes from the doctor than from the architect.

I think Dr. Black rather underrates the difficulty.

When there are both lighted gas and a fire it is easy, a hot chamber-stove supplied by fresh air from without will give a sufficiency of warm air, and one of Rickett's ventilating gas-burners will remove the carbonised air; but to apply this to a single room will cost, from 30*l.* to 50*l.*, and few persons are willing to incur this expense. In addition to this, when there is only a fire without gas burning, the cold air is apt to come down from the ventilating tube of the gas-burner.

In houses already built, where gas is not burnt, it is difficult to get rid of the carbonised air; the smoke that comes through Arnott's valves so blackens the walls and ceilings that the valves are not infrequently removed; and in bedrooms where there is neither fire nor gas simple ventilation by means of gauze or finely-perforated zinc is generally pasted up. To supply the whole house with warmed air, and to remove the carbonised air, requires a more or less costly apparatus, which is generally objected to on the score of expense, and which is still more costly and troublesome to execute if required for a house already built. Where an architect proposes any system of warming and ventilation, the reply usually is that the owner "is perfectly satisfied with an ordinary open fire-place and sash windows, and that he does not see the necessity of going to the expense of other means of ventilation which he understands does not generally answer."

Severe colds in the head and an increased outlay are tangible evils, while the gradual deterioration of health by living in ill-ventilated rooms is looked upon as a visitation of God.

It must not be forgotten that hitherto ventilation has been usually a failure: the costly mistake of the House of Commons is one grand stand-point of objection.

In the first quarter of this century the subject of ventilation attracted much attention, but the practical promoters were so incapable of applying it satisfactorily that people became disgusted with the expensive failure, and as no serious injury was known to be caused by the want of ventilation, all attempts to secure it were abandoned. Architects can only be supposed to know the immediate inconvenience of the want of ventilation, and not its ultimate effects on the human frame.

If my recollection serves me, in a paper on "Railway Travelling" in the *Lancet*, we were informed that greater evils resulted from persons catching cold (by having the windows of railway-carriages open) than by the diminished circulation caused by the carriages being unventilated.

A very large room in the city of London, that was built about the year 1828, was put into the hands of Dr. Arnott to warm and ventilate. On his failure, the schemes of Walker, Perkins, and others were tried, and all without the smallest success; the constant complaints of the clerks who were annoyed by the hot air, and of those who got colds and rheumatism in the head from the cold air coming in where the hot air ought to have gone out, so annoyed the secretary that at last the ventilators were blocked up, and

the clerks who complained of cold were supplied with hot-water tins for their feet.

I have seen dozens of cases in bedrooms where the perforated zinc or gauze was blocked or pasted up, which had originally admitted fresh air. My last experience of drainage and ventilation as applied to a stable may be instructive. An old stable was altered. Light was admitted at the dark end by a large shaft, the soaked soil was removed, the whole stable concreted, the floor paved with adamantine clinkers, the stable-drainage carried on the surface to the outside, the warming was obtained by means of hot-water pipes in the coach-house communicating with the stable, the ventilation by means of one fixed open louver at the top of the light shaft, by a perforated zinc tube over the mangers leading at both ends to the open air, and by an imperious pipe also open to the air at both ends supplying air to perforated plates under the mangers. The stable was no sooner occupied than the surface-drains were removed and the stalls drained by horse-pots into the general soil-drain, and directly the cold weather set in the fact of one horse having a cold was sufficient to cause the owner to have the ventilator in the light shaft permanently closed, and both ends of the other ventilating pipes blocked up.

Until the faculty can convince people that their life is shortened and serious diseases are brought on by want of ventilation, architects have no chance.

GEORGE ANCHISON.

THE LEEDS SCHOOL-BOARD.

A DIFFICULTY has arisen between the Educational Department of the Government and the Leeds School-Board in respect to broad and narrow plans. The nature of the difference will be seen, if we quote from one of the letters from the Educational Department respecting a set of the plans in question, which the local Board purposely required the architects to prepare on the broad system:—

"Their lordships' architect reports, 'These plans are very unsatisfactory. All the principal schoolrooms are 30 ft. wide, and from 45 ft. to 49 ft. long only. The class-rooms have in most cases their fittings placed so that the children would have their backs to the light, and both school and class room are so crowded with fittings that teachers would find great difficulty in managing the classes; the chief point, however, to object to is the wide school-rooms. I wish to add that the design is most unnecessarily extravagant.'"

Sir Andrew Fairbairn (chairman of the Board), Mr. Beckwith, Mr. Gaunt, Mr. Long, Mr. Kendall, and Mr. Woolley, have been appointed a deputation to wait upon the vice-president of the council relative to the demer of the Department to approve the plans of the Board on the ground of the width of the principal school-rooms.

REBEKAH.

In catering for the tastes of their subscribers, the council of the Art-Union of London, whilst generally successful in producing good art, are, apparently, anxious to vary, as much as possible, from year to year, the subject of the work provided for general distribution; thus having for last year engraved a series of plates of "Coast Scenery" from drawings by deceased British artists, they give us this year a work of a totally different character,—"*Rebekah*," from the fine picture by F. Goodall, R.A., very well interpreted in black and white by the late William Holl.

Who does not know the charming and graceful picture, by Horace Vernet, treating the same subject? It may, perhaps, be allowed that there is something in it rather more theatrical in the action, where the damsel balancing the water-pitcher on her right arm, proffers its mouth to the thirsty messenger, than in Mr. Goodall's more simple and bonely rendering.

There is, to be sure, far more scope for sentiment in the latter picture, seeing what a revolution of feelings has taken place, in the few minutes intervening between the incidents depicted, in the bosom of her who was destined to be the "mother of thousands of millions." In the former, *Rebekah* merely sees an ordinary dusty and wayworn traveller, who begs for water for himself and his camels; in the latter she is being asked to be the wife of her father's brother's son, of the possessor of "flocks and herds and silver and gold;" she sees an immo-

date escape from a single life, ever held as a kind of disgrace by the daughters of Judea; and we may assume that she had some sort of divine inspiration teaching her the destiny awaiting her descendants, that "in her seed should all the nations of the earth be blessed."

The artist has happily caught the expression of these varying emotions in the maiden's face, while the man, proceeding to place the bracelets on her wrist, "wondering at her, held his peace; or wit, whether the Lord had made his journey prosperous or not." This touching representation of an event of such vast importance in the great scheme of human redemption must have a high interest for all believers; and, whilst tending to lead to solemn and momentous thoughts, it is conceived and rendered with artistic grace and beauty. We cannot but endorse the anticipations of the council that "the plate will meet with great success."

PROPOSED FLOATING BATHS ON THE THAMES, AND THE PURIFICATION OF THE RIVER.

At their meeting last week, the Corporation took the preliminary step towards the establishment of floating-baths on the Thames for the use of the inhabitants. Mr. Deputy Stapleton said it was highly desirable that the Corporation should construct and maintain baths of this character in the interests of the health of the citizens, and in support of a proposal to that effect he remarked that there were only twenty-four public baths in London, most of which were very limited in size, and totally inadequate to the sanitary requirements of the population. He suggested that large floating-baths, not less than 150 ft. long, and 40 ft. wide, should be stationed at various parts of the river, and added that it was not necessary to wait for the purification of the water, inasmuch as there was a process by which it could enter the baths filtered. He moved a resolution to the effect that it be referred to the General Purposes Committee to inquire into the cost of construction and the probable annual outlay for maintenance, with power to confer with the Thames Conservancy Board, and to report generally on the subject. The motion having been seconded, it was objected by one or two members that the proposal was premature, and that the construction and maintenance of baths was not an appropriate task for the corporation to undertake. The feeling of the members generally was, however, warmly in favour of the proposal, and in the course of the discussion Mr. Bedford incidentally observed, that in three months the whole of the sewage of the City would be intercepted, and that the river would probably then be as pure as it would ever be. Mr. Stapleton's motion was ultimately carried, after several members had spoken in its favour.

HOLDENHURST CHURCH, HANTS.

The Church of St. Swithin, Holdenhurst, near Christchurch, Hants, has been enlarged by the addition of a chancel, with apse, and a vestry. The body of the church has also been re-seated. The building to which these alterations (built some thirty-five years since) have been made consisted of a nave, 28 ft. 6 in. wide, with a recess, serving for a chancel, and a south transept. The vestry, &c., were at the west end, and over them was placed a gallery. This arrangement has been abolished, the gallery pulled down, and the font now stands where the staircase formerly was. Owing to the limited site available at the east end, it has been impossible to make the total length of the chancel more than 18 ft., the width being 14 ft. The walls are mainly built of Swanage stone with Box-ground Bath quoins and dressings externally, and Corsham Down internally. The timbers of the open roof are of fir, and the external covering is Bangor slating. The body of the church has been seated with low, open, deal, stained benches, with shaped ends. The chancel seats are of wainscot, with open pierced book-board fronts. The pulpit is of oak, the upper panels being perforated: the base is of Bath stone. The nave passage is paved with Maw's 4½-in. red and chocolate tiles, laid diagonally in ornamental patterns. The chancel is laid with encaustic tiles, those within the sanctuary being of richer design than the others. All were supplied and laid by Messrs. W. B. Simpson & Sons, Messrs. Maw's London agents.

The reredos (executed by Mr. J. L. Jaquet, of London) is composed of brown alabaster, dove marble, yellow Mansfield stone, and marble inlay. A variety of curious pieces of mosaic, marble, and stone, collected by the vicar, from Italy, the Holy Land, and elsewhere, have been worked into the design. The church is warmed by one of Porritt's underground stoves. All the windows in the chancel are filled with painted glass, by Messrs. Lavers, Barrand, & Westlake. The total expense of the work amounts to upwards of 1,000*l.*, the whole of which has been borne by the vicar, the Rev. F. Hopkins. The contractor was Mr. J. Landon, of Barton, near Christchurch. The architect was Mr. Ferrey, F.S.A.

OBITUARY.

THE LATE MR. R. E. BANKS, ARCHITECT.

We record with regret the death, on Saturday, the 14th inst., at his residence, Dulwich Wood Park, of Mr. Robert Richardson Banks (of the firm of Messrs. Banks & Barry), aged 59. Mr. Banks had been the partner of Mr. C. Barry since the year 1847, and was, before that, nine years an assistant in the office of the late Sir Charles Barry, who had, justly, the highest opinion of his ability and integrity.

THE LATE MR. WILLIAM SLATER.

With equal regret we mention the death of Mr. Slater, of the firm of Messrs. Slater & Carpenter, which took place on the 17th instant, from complete prostration of strength, caused by a complication of diseases, from which he had suffered some years. The end was most unexpected at the last, but his partner and friend was able to be with him. The partnership in this case,—and it was the same with Messrs. Banks & Barry,—was not merely a business arrangement, but one of mutual pleasure and satisfaction. We may have more to say at another time of both these estimable men, and able architects.

LONDON CITY MISSION COMPETITION.

New official premises being required for the London City Mission, the committee invited Messrs. Spalding & Knight, Messrs. Searle & Sons, Messrs. Habershon & Pite, and Mr. Bell, to send in designs; the three architects not employed to be paid 15*l.* each for their designs, then to be considered the property of the society.

The maximum cost of building was limited to 7,000*l.*, this sum to include the extension of the vaults and footway required, stoves, bell and gas fittings, speaking-tubes, and arrangements for warming, ventilation, and carrying off gas by zinc tubes; the building to be constructed of brick, with stone dressings.

The design was to include a large-sized room for storing and distributing Bibles, tracts, &c.; a lecture-hall, to seat from 400 to 500 persons; and a library to hold the books lent out to the missionaries, with a capacity of about 50 ft. by 20 ft.

Designs having been submitted, the committee have just now decided in favour of Messrs. Spalding & Knight. The chosen design is in the Italian style, with a façade of brick and stone, and is to be erected forthwith upon a prominent site in Blackfriars, opposite the Ludgate Railway Station,—a part of the former site of Radley's Hotel and the Bridewell.

THE LONDON SCHOOL BOARD.

On the recommendation of the Works Committee, it has been resolved that the tender of Messrs. Henshaw & Co., of 13 to 15 Wharfs, City-road Basin, amounting to 5,285*l.*, for the erection of a school providing accommodation for 707 children, on the site on Eel-brook-common, Chelsea, be accepted; that the tender of Mr. W. Shepherd, of 101, Bermondsey New-road, S.E., amounting to 6,250*l.*, for the erection of a school providing accommodation for 878 children, on the site in Woolpecker-road, Greenwich, be accepted; that the tender of Messrs. L. H. & R. Roberts, of 34, Rheidol-terrace, Islington, N., amounting to 6,370*l.*, for the erection of a school to provide accommodation for 830 children, on the site in Binnell-street, Islington, be accepted; that the tender of Messrs. Henshaw & Co., of 13 and 15 Wharfs, City-road Basin, amounting to 8,975*l.*, for the erection of a school to pro-

vide accommodation for 1,388 children on the site in York-road, Finsbury, be accepted; and that the tender of Mr. G. S. Pritchard, of 108, Paul-street, Finsbury, E.C., amounting to 6,144*l.*, for the erection of a school to provide accommodation for 1,127 children, on the site in Hamond-square, Hoxton, be accepted.

PADDINGTON BATHS AND WASH-HOUSES.

A LIMITED competition of nine architects was resorted to in order to obtain a design for this building. The Commissioners met on Tuesday last, when they awarded the first premium, of 100*l.*, to Mr. Lewis H. Isaacs, of Verulam-buildings, Gray's-inn; the second, of 75*l.*, to Mr. H. H. Collins, of Queen-street, Cheapside; and the third, of 50*l.*, to Mr. Bridgman, of London-wall. Mr. Isaacs is to be instructed to prepare the contract drawings forthwith. The estimated cost of the building is 20,000*l.*

THE COST OF THE FOREIGN CATTLE MARKET.

PROPOSED ADDITIONAL BUILDINGS.

At their meeting, last week, the Corporation complied with a recommendation of the Cattle Markets Committee for the raising of a further sum of 20,000*l.*, for the payment of 14,000*l.*, which had been incurred in excess of 210,000*l.*, already granted for the construction of the Foreign Cattle Market at Deptford, leaving the balance of 6,000*l.* for such other works as might be necessary; and it was stated that this last-named sum would probably be required for the erection of additional slaughter-houses.

OXFORD IN THE RECENT GALE.

The damage done at Oxford was more extensive than last week's accounts indicated. According to the local *Journal*, at Christ Church, about 90 ft. of the parapet of the Deanery were blown off to the lead roof, which was severely damaged thereby. A small portion of the parapet adjoining "Tom Tower," in St. Aldate's, was also blown down. At Magdalen College, the pinnacle and weather-cock on what is known as the Founder's Tower were blown off, as were also the top of a chimney in the Chaplain's Quadrangle, and some battlements from the president's house. A portion of the end wall of a house, situate in New Inn Hall street, fell. The end wall of a house in the parish of Cowley St. John also fell. A portion of one of the small pinnacles of St. Mary's Tower was blown off, but no damage was done to the church. Some ornamental work on the wall in front of Pembroke College was blown down, as was also some from the Independent Chapel in George-street. About one hundred-weight of lead was blown off from the roof of a house in Isis-street, St. Aldate's. Four brick walls in the front gardens in Prince's-street, St. Clement's; one in William-street, Cowley-road; one in Filley-road; and one in Observatory-street, St. Giles's, were blown down. A square of glass was blown out of the roof of the Corn Exchange. In Church-street, South Hincsey, the gable end of a house fell in while the occupants were in bed. All escaped. Two garden walls were also blown down. Many fine trees have been destroyed, and chimneys and roofs damaged.

THE PROVIDENT INSTITUTION SAVINGS BANK NEW BUILDINGS.

An extensive block of new buildings for the Provident Institution Savings Bank has for some months been in course of erection at the corner of St. Martin's-lane and St. Martin's-place, immediately facing Charing-cross, and are now externally approaching completion. The structure contains two main frontages, the principal façade facing Charing-cross, and the other elevation being in St. Martin's-lane, with an entrance frontage at the angle of St. Martin's-lane and St. Martin's-place. The height of the building from the street level to the main cornice is 42 ft. 6 in., above which is a balustrade resting on a plinth. The elevation facing Charing-cross is 60 ft. in length, and contains two stories and dormers in addition to the ground-floor. The material used in the external construction of the building is Portland stone. The ground-

floor, up to the base of the first-story windows, is rusticated. The windows of the ground-floor are circular-headed, with carved figure-headed keystones, and coved recesses. At the base of the first-story windows, immediately under which a cornice runs across the elevation, there are sunk and moulded panels, the windows on each side having ornamental fluted pilasters, with carved capitals, and architraves, surmounted by pediment heads. The second-story windows are of a more simple character, without any attempt at ornamentation. Above the second story there are five dormers in the roof between the balustrades, which are of a bold and prominent character, and materially add to the architectural attractiveness of the elevation. These windows vary in construction, being alternately pediment and circular-headed. The St. Martin's-lane elevation, which is 40 ft. in length, is uniform in construction with the Charing-cross frontage. The principal entrance to the bank premises is at the St. Martin's-lane and St. Martin's-place angle, the first-floor window over the doorway being circular-headed, whilst on each side of the dormer window above, uniform with those in the two main elevations, there are ornamental finials.

The business of the bank will be conducted on the ground-floor of the building, which, in addition to the general office or banking premises, a large apartment, 46 ft. in length by 32 ft. in width, also contains vestibule or entrance-hall, secretary's offices, strong-rooms, and other conveniences. That portion of the premises immediately over the banking department, from the ground-floor to the top of the building, is entirely open, and the bank will be lighted by a square lantern above.

The first floor, which, with the rest of the building, is approached by a private door and staircase in St. Martin's-lane, will be exclusively set apart for the directors and board of management, and will contain the board-room, ante-room, and offices; whilst the second floor and dormers above will contain a full suite of apartments for the manager's residence.

The cost of the building, exclusive of the land, for which a large sum was paid, will be upwards of 10,000*l.*

Mr. D. Brandon, of Berkeley-square, is the architect; and Messrs. Brass & Sons are the contractors.

LIGHTNING CONDUCTORS.

NOTES on "Some Phenomena produced by Lightning," published by Father Secchi, in *Les Mondes*, are quoted in the *Telegraphic Journal* of the 6th inst., and deserve the attention of those who are engaged in the protection of buildings from the effects of lightning. Father Secchi writes:—

"Eight years ago some lightning conductors had been erected under my direction on the cathedral and on the Bishop's Palace of Alatri, situated at the summit of the Acropolis of that town, which, by its elevated and solitary position, was exposed to frequent ravages from storms. It was not long ago that a flash of lightning demolished a great part of the belfry, and damaged the organ of the church. In the erection of this lightning conductor there arose a great difficulty proceeding from the nature of the soil, which at the depth of some centimètres turns out to be entirely of solid calcareous rock.

In order to remedy this defect, that part of the conductor which enters the ground has been made very long, more than 4 metres, and has been provided with a great many couples of points, 5 centimètres broad, 5 millimètres thick, indented on the edges, with the addition of a thick copper wire twisted among the same points, to help to multiply the points of contact between the rod and the soil. The foot of the lightning conductor is entirely of copper; the rod is also of copper up to a metre above the ground, and there it is joined to the iron conductor in the ordinary receptacle made in the heart of the wall to preserve it from disturbance at the inferior parts. The ditch, into which the foot of the lightning conductor has been sunk, is 5 metres long, 0.60 metre wide, and it was dug until it came upon the roots of some neighbouring trees; a layer of cinders was then placed to a height of 20 centimètres, which extended over the whole lower surface of the ditch. Thus the surface of contact between the metal and the carbon and of the latter with the soil, was such that one would suppose it to

be more than sufficient, and the presence of trees, although they were not large, raised the hope that there would be always enough moisture. Moreover, as the edifice had two culminating points, viz.—the belfry and the hinder portion of the choir, two rods were placed with points and feet, and the two rods have been joined together on the roof by a conductor, so that, in the case of a discharge on one of the points, the lightning would find two ways for spreading itself in the soil."

These precautions produced a good result, since in this interval the tower having been struck at least four times, the edifice has sustained no damage. Water-pipes, at some distance from the foot of the conductor, however, were destroyed, and of the circumstances attending this, the writer gives an account, drawing the obvious inference, that it is necessary to devote great attention in the erection of lightning conductors, that we must allow them a large surface for discharge; and that there can never be too much of it. The surface of the foot of this lightning conductor was certainly superior to what has been judged sufficient by Matteucci for the discharges of telegraphic conductors, and yet it has not sufficed. Further, it is a confirmation of the necessity of making the neighbouring metallic masses communicate, and especially with water-pipes or gas-pipes.

BELFAST ARCHITECTURAL ASSOCIATION.

A MEETING of this society was held at the Museum on the 9th inst., Mr. Thomas Turner in the chair.

A paper was read by Mr. Samuel P. Close, on "Measured Drawings," showing the advantages to be gained by the measuring up, and close study of, good examples of ancient architectural work. The paper was illustrated by a large number of drawings.

Some of the members present added to the interest of the evening's proceedings by discussing various matters connected with the subject.

SCIENTIFIC AND MECHANICAL SOCIETY MANCHESTER.

THE adjourned half-yearly general meeting of this Society has been held. From the half-yearly report it appears that the receipts had risen to nearly three times the amount of the preceding session. The report was adopted, a new set of rules and bye-laws agreed to, and the following gentlemen elected to form the council:—

President: Sir W. Fairbairn, bart., C.E., LL.D., F.R.S., &c.

Vice-Presidents: Professor O. Reynolds, M.A., C.E., Owen's College; H. W. Hartman, M.I.M.E., A.L.C.E.; J. Shepherd, C.E.

Treasurer: Charles S. Allatt, M.E.

Hon. Secretary (re-elected): A. Hildebrandt, C.E.

Members of the Council: W. Bowker, M.E.; F. C. Lynde, M.E.; R. L. Messenger, C.E.; C. J. Allport, M.E.; J. C. Edwards, M.E.; A. Ross, C.E.

The next meeting was to be held on (this) Saturday, at the Trevelyan Hotel, to receive the inaugural address of the president, who would afterwards be entertained at dinner.

A NEW POST-OFFICE FOR WOLVERHAMPTON.

ON the south side of Queen-street, nearer to the centre of the town than the site of the old office, a new Post-office building has been erected. It has been designed by Mr. T. Williams, the architect for the new buildings of the General Post-office, in London. It may be described as Græco-Italian, with a frontage of 48 ft., and an elevation of over 60 ft., in which there are three stories, and a basement. In the lower story there are two doors, with two windows opening between them. Beneath the sill of the window at the east end will be the slits for receiving the letters and papers. The first and second stories have a range of four window-openings to each. The first-floor windows are pediment-headed. Surmounting the building is a cornice and balustrade parapet, not unlike those of the Oxford and Cambridge Club-house, in Pall-mall. A moulded balustrade string-course divides the ground from the first story, and an enriched string-course the first

from the second story. The whole of the front is built of Hollington stone. By reason of the line of frontage, there is an open pavement-space in front. The public will enter by the west door, into a lobby, with glass doors, inscribed and indicating the post-office, and telegraphic department, savings-bank, and telegraphic departments. The post-office proper is an apartment 35 ft. in length by 23 ft. in breadth, and 13 ft. in height. Extending from this room is the office in which the mail-bags are received and made up, and the letters are assorted. It is 60 ft. in length by 30 ft. in breadth, and from the floor to the raised skylight that runs the whole length of the room the height is 25 ft. From this office there is a way into the mail yard, between the building and Castle-street.

The doorway at the east end of the front will lead to the post-master's office, on the ground-floor, and, by a stone staircase of four flights, to the first and second stories. The first story will be devoted to the business of the inland revenue department; and the second, to the practical business of the telegraph department. In a well-lighted, spacious room, running the whole length of the front of the building on this second floor, eleven telegraph clerks will receive and despatch the telegrams by forty-seven wires.

In respect of Post-office accommodation, Wolverhampton is now considered to be equal to Sheffield, Nottingham, and Derby. The contractors were Messrs. Parnell & Son, of Rugby. The new office has just been opened for the use of the public.

THE PROFESSIONS AND SANITARY REFORM.

SIR,—The perusal of a suggestive article in the last number of the *Builder*, entitled "The Hitch in Sanitary Reform," leads me to inquire whether, in the writer's very just estimate of the equal necessity for the scientific engineer and the skilled medical officer of health in sanitary administration, he may not have somewhat misapprehended the line taken by the leaders of the progressing medical movement against Mr. Stansfeld's blundering attempts at legislation and administration.

To a certain extent, as that writer alleges, the object of this movement is professional,—so also is his object. But I might easily adduce many proofs of the breadth of view taken by sanitary reformers in advocating the proper official employment of engineers and architects.

1. To quote the Report (1871) of the *Joint Committee of the British Medical and Social Science Associations*, a body more than three-fourths of which are medical men:—

"(§ 18.) The last important reason which we shall adduce for wider administrative areas is, that they would supply a superior machinery for the appointment of scientific officers, whether medical or engineering, of high and special qualifications."

Again (§ 40):—"In every such (inspecting) circuit, it might be advisable, for efficient administration, that the central authority should act through three inspectors with different qualifications—one legal, one engineering, and one medical or scientific."

2. Mr. Michael, the legal secretary of the Joint Committee, in an able paper read at Plymouth, recommends for each principal district the appointment of three officers,—the clerk, as legal adviser and public prosecutor; the skilled surveyor, as engineer; and the specially-trained medical officer of health.

3. In my recent "Summary of the Principles of a Comprehensive Measure for the Improvement of the Sanitary Laws" (§ x. *Special Qualification for Chief Officers*), I urge that "this true safeguard of administration should apply to engineers, surveyors, public analysts, officers of health, and medical jurists"; and I say (§ xix. *Inspecting Circuits*),—"To each of these circuits should be appointed one legal, one medical, and one engineering inspector."

I might multiply such references, but it is needless, for the establishment of a complete scientific machinery is the demand alike of the whole educated community, of the learned professions, and of a suffering people.

Mr. Stansfeld's greatest error has been his acceptance, on political grounds, of the fanciful theory, that local and union Boards, which were constituted for other objects, and which have fully proved their incompetency for, and their indifference to, sanitary action, may be trusted "to rise to the height of their new functions."

As the writer in the *Builder* very truly says respecting this self-education of local Boards for duties of urgent and immediate necessity,—
"Time is enlisted on the wrong side."

But now that a visionary and fallacious principle has been adopted in the formation of sanitary authorities, the main point to which public attention ought to be directed is the necessity for a high and special qualification for officers. I saw, therefore, with pleasure an advertisement in the *Builder*, of October 5th last, giving notice that the Royal Institute of British Architects would grant a *certificate of competency* for the duties of District Surveyor under the Metropolitan Buildings Act, to any candidate who passed a two-days' examination, written or oral, to be held at the Rooms of the Institute. The value of such a diploma would be greatly increased if the Institution of Civil Engineers were associated with that of architects in an examination which should be required for the office of District or County Surveyor throughout England.

No one who has critically observed the execution of so-called sanitary improvements, can doubt that a number of very incompetent surveyors are employed,—men whose knowledge, whether of engineering or architecture in the sanitary department of those arts, is lamentably defective. The extravagant blunders that have been made, the useless and even positively injurious works that have been constructed, at enormous waste of time, labour, and money, show that in future no one ought to be permitted to direct great sanitary undertakings, without having gone through special study, training, and examination. That system is utterly unreliable which commits the selection of such officers to local Boards, of easy virtue, unguided by authoritative certificates of qualification, and liable to be swayed by piles of amateur testimonials.

While urging these considerations upon the professions represented in the *Builder*, I cannot avoid remarking that the scientific basis of every measure for wholesome alimentation, for water supply, for the removal of refuse and excreta, for drainage, for ventilation, and for house-construction, was in the first place laid down by the physiologist, the pathologist, or the physician; and that the precise cause of injury to health, through defective or badly-constructed works, has been generally detected by the medical expert, e.g. in the recent inquiries at Loundeshorough Lodge.

The history of the aetiology of disease must not be forgotten. It places indisputably the medically-educated philosopher in the van of the sanitary movement. We may, nevertheless, fully admit that the principles of sanitary architecture and engineering must be worked out scientifically by architects and engineers; just as the skilled analysis of air, water, and food, must be committed to chemical and microscopical experts.

Captain Douglas Galton, R.E., C.B., F.R.S., has stated the relative position of the two professions very clearly in his remarkable address at Leeds on the construction of hospitals. "My part," said he, "has been to endeavour to show how the architect must shape his building so that it shall be in accordance with what the physician has declared to be necessary."

HENRY W. RUMSEY, M.D.

OPENING OF THE NEW CONVALESCENT HOME AT SALTBURN-BY-THE-SEA.

WE now give a few particulars in addition to the announcement we made of the opening of this institution. The Pease family have not only defrayed the entire cost of the new building, amounting to upwards of 12,000*l.*, but will also be at the whole expense of its continued maintenance for the injured and sick amongst their workpeople. The services of Mr. Thomas Oliver, of Newcastle, the architect of the Prudhoe Memorial Convalescent Home, at Whitley, having been secured, and a design adopted, not altogether on the plan of the Prudhoe Memorial at Whitley, but somewhat after the celebrated Convalescent Home at Vincombes, a contract was entered into in 1870, and the works have been pushed forward since that time. The site selected is on an elevated situation, with easy approaches to the sea-beach, and facing more immediately into the Hazel Dene Valley. It is dry, comparatively protected and warm, and with cheerful views from the principal fronts. The outline is broken into distinct groups, the horizontal lines at intervals by the transverso

lines of the gables and the central block, which is raised above the whole of the other blocks, and from the middle of which springs a clock-tower, terminated by a truncated roof. The style of architecture adopted is domestic Gothic, freely treated, and the materials employed throughout are white brick, with warm cream-coloured stone dressings. Green Westmoreland slates have been used for the whole of the roofs, and the ridges are finished a deep red colour. The groups of chimneys, which have ventilating-flues attached, form a conspicuous feature in the elevation.

The frontage of the building is about 200 ft. long, the building itself being formed in two parallel lines reaching about 100 ft. from front to back, the front line being appropriated to the patients, while the back is appropriated to kitchen offices, wash-house, laundry, and snook-like purposes. The whole of the walls have been built hollow; the floors of the corridors are of coloured tiles in artistic patterns, while the floors of the dormitories, day-rooms, and sick wards are laid with pitch pine. The staircases are all of stone, and practically the building is fireproof. The encaustic tile pavements have been laid by Messrs. Minton, Hollins, & Co., of Stoke-upon-Trent. Over the large central window, and filling in the spandrels, are carved busts representing Faith, Hope, and Charity. These have been executed by Messrs. Burstall, of Leeds, who also executed the carving throughout. The building is approached by a raised stone terrace. The fittings generally in the sick wards have been furnished by Mr. Jennings, of London.

Accommodation is provided for fifty patients. The warming is secured by open fireplaces, with Gill backs which supply warm air from openings in the front of the grate; and the ventilation is secured by means of these stoves, as well as by Sheringham valves, for the inlet of fresh air, and ventilating flues in connexion with the fire flues for the outlet of the foul air.

The furniture has been executed by Mr. Sopwith, of Newcastle, from designs furnished by the architect. Messrs. Robson & Son, of Darlington, were the sole contractors for the building works; and Messrs. Walker & Emley, of Newcastle, for the engineering works. The sub-contractors were as follows:—For the carpenters' and joiners' work, Messrs. Bridges & Robinson, of Hartlepool; for the plumbers' and gas-fitters' work, Mr. Johnson, of Darlington; for the plasterers' work, Mr. Ormerod, of Carlisle; for the ironfounders' work, Messrs. Walker & Emley, of Newcastle; for the painters' and glaziers' work, Mr. T. C. Tomkins, of Salthurn. Mr. R. Robinson, of Darlington, was clerk of the works.

THE NEW ADULTERATION ACT.

THE new Act, to which we have already referred on several occasions, gives power to the courts of quarter sessions and town councils in England to appoint analysts of all articles of food and drugs, and these bodies are compelled to appoint the analyst when called upon to do so—in England, by the Local Government Board. The analysts having been appointed, the local authorities are to employ the inspectors of nuisances, of weights and measures, or of markets, to procure samples of suspected articles and hand them to the analyst to be analysed. Should the analyst certify that the articles are adulterated, then the inspectors will make a complaint before a magistrate, who will thereupon issue a summons.

The offences and punishments are as follow:—1. Any person adulterating, or causing others to adulterate, any article of food or drink, by the addition of any injurious or poisonous ingredient, or who shall in any way adulterate any drug, is to be fined 50l. for the first offence, and on the second conviction to be imprisoned for not more than six months with hard labour. 2. Any person who knowingly sells any article of food or drink mixed with anything injurious to health, or any kind of adulterated food, drink, or drug, becomes liable for each offence to a fine not exceeding 20l. and costs; and on a second conviction the name, address, and offence are to be published, at his expense, in such newspaper or in such manner as the justices shall direct. 3. The addition of any substance whatever to any article of food, or drink, or any drug, in order fraudulently to increase its weight or bulk, without the fact being clearly stated, shall be deemed to be adulteration. There is also a provision in the Act that the analysts shall make monthly reports of the adulterations they have detected. The

analysts may also give certificates of purity or adulteration of any article of food or drink to private purchasers on the payment of a fee.

Curious results are already showing themselves under the anticipative influence of this Act. Thus, at Sheffield and elsewhere the price of milk is being raised; so is the price of beer in London. At Sheffield the ingenious admission was made that it was on account of the passing of the Adulteration Act that the price was raised. The adulteration of milk with water, however, is a harmless sort of adulteration compared with that of "maddening drink" with *Cocculus Indicus*, strychnine, or grains of "Paradise," or rather of Pandemonium, which it is to be hoped, although they are organic poisons, will not escape detection.

THE SOMERSETSHIRE LABOURER.

SIR,—As you have thought the state of things at Chiselborough of sufficient importance to deserve a notice in the *Builder*, you may, perhaps, be not unwilling to insert a few modifying facts:—

1. Your readers will doubtless be pleased to hear that instances of the *gottre* are becoming exceedingly rare. I know of but four remaining, and there has been no fresh case for the last half-century, nor is there any lack of intelligence amongst the rising generation or the people generally.

2. Our schools are well attended. Out of a population of 419, by the last census, we have at day-school, 77; evening-school, 34; Sunday-school, 105; and all have been highly commended, both by her Majesty's and the diocesan inspectors. A large singing-class assembles weekly in our capital new school-room, and the benefits of our clothing and other clubs are fully appreciated.

3. As to the outward aspect of the inhabitants, your correspondent's notions may be peculiar or he may have been specially unfortunate. I should have said that so large a proportion of hearty, healthy men and handsome young girls could rarely be met with elsewhere.

4. Some of our cottages are doubtless faulty; some of the worst belong to the occupiers or to owners equally poor. Most have either gardens or allotments.

5. As to the general healthiness of the people, I can vouch for this, that the deaths since last January have been but four,—three infants and but one adult.

C. FREDK. NEWELL,
Rector of Chiselborough.

"Hazelbury, Crewkerne, Dec. 11, 1872.

In an article in your paper of the 7th inst., 'On the Houses of the Labourer in Somersetshire,' you mention Lord Portman's name as the owner of some of them. I beg to inform you that his lordship has no house or cottage in either of the parishes you mentioned.

MR. FAKORS, Steward of the Estate."

* * * We were distinctly informed on the spot by the tenants that some of the houses visited were on the property of Lord Portman. We shall not fail to inquire into the cause of the discrepancy.

CEASE THAT KNOCKING AT THE DOOR.

SIR,—I reside in an off street; some people would think it secluded and quiet, but it is not so.

In the dark hours of early morn the police are knocking up the half-past four; if no reply is vouchsafed, rap-bang go the knockers again; then a short lull, a respectful repose, and it is repeated later for others. The night police rouse out day police most vigorously,—eight bells with them,—but we are not all in their watch. It is very annoying to be so knocked up; to be woken up by the cats is trying, but you can retaliate with the water-jug.

The postman might drop our letters through box-apertures quietly; but no, he cannot resist the knocker-rat-tat starters to nervous invalids and babes in the wood. It is seriously wrong. Very early risers should have a door-bell, and thus avoid disturbing their neighbours.

R. T.

THE ORIGIN OF WOOD-WORKING MACHINERY.*

No art seems to have been so fully developed, or so nearly perfected at one time and by one man, as that of wood-cutting machines by Sir Samuel Bentham, of England, brother of Jeremy Bentham, the celebrated writer on political economy.

In 1779 Bentham was directed by the Government to make a tour in the north of Europe to examine the progress of ship-building and other

* "A Treatise on the Construction and Operation of Wood-working Machines, including a History of the Origin and Progress of the Manufacture of Wood-working Machinery." Illustrated by numerous engravings. By J. Richards, Mechanical Engineer. Spon: London and New York.

arts. During this tour, while in Russia, he invented the first *planing-machine* for wood, at least the first that could be called an organised operating machine. There is no doubt but that this was the original conception of a machine for smoothing the surface and giving dimensions to wood. It is to be regretted that no accurate description of the invention, so far as perfected at that date, has been preserved. Whether it operated by what, in his subsequent patents, he terms "rotative" motion, or whether it was a reciprocating machine, is, so far as the author of the work before us, Mr. Richards, can learn, left to conjecture. It would, however, be inferred from his first patent in England, of 1791, that it worked upon the later principle, for "planing and making mouldings" by some means that bore a close analogy to the hand operations of the times, and corresponds to the one described in the patent cited. Bentham, with that regard for his country's interest that is common with all Englishmen, communicated his invention to the British Ambassador at St. Petersburg, who advised him to keep his invention for England, which seems to have been done, as there is no account of his having made any public use of it while in Russia. He afterwards accepted a military commission in Russia, with the rank of Lieutenant-colonel, and became the manager, or commandant, of extensive factories for the production of glass, metals, cordage, works in wood, &c. His very successful management of these works would, from accounts, lead us to suppose that he invented many new and useful machines; but of these there seems (in England) to be no record. He returned to England in 1791, about which time his brother, Jeremy Bentham, had received from the Government an appointment to introduce industrial prisons in England. This kind of labour being almost devoid of skill, the talents of his brother would make the labour more profitable, and at the same time replace, to some extent, the want of skill of the convicts. To construct these machines, most of which were for working wood, the residence of Jeremy Bentham at Queen's-square-place, Westminster (now a part of London), was, with its capacious outhouses, converted into the *first manufactory of wood-cutting machines*. Seventy-eight years ago this factory was established, and, as we are informed, was not found to be sufficiently large, and a building, No. 19, York-street, was also occupied, which would lead us to suppose that a great many machines were made, and that the extent of the business fully entitles it to the distinction of being called the first general factory of such machines. Professor Willis, in a lecture before the Society of Arts in 1852, states that

"there were constructed machines for all general operations in woodwork, including planing, moulding, rebating, grooving, mortising, and sawing, both in coarse and fine work, in curved, winding, and transverse directions, shaping wood in complicated forms, and further, as an example, that all parts of a highly-finished window-sash were prepared, also all the parts of an ornamental carriage-wheel were made, so that nothing remained to be done by hand but to put the component parts together."

These machines were examined by members of His Majesty's administration, and received official notice and commendation in the House of Commons in 1794. Bentham (Sir Samuel) was next commissioned to visit different dockyards, and to determine how far his machines could be applied to facilitate ship-building. At this time he refused a flattering offer from the Emperor of Russia, in order to accept this commission, choosing rather to give his country the benefit of his services than to reap a greater pecuniary reward that awaited him in Russia.

His report was, no doubt, very favourable, as to the employment of machines, but it was not until 1797 that the Admiralty consented to their introduction. It should have been mentioned that during the time of his manufacture of machines at Westminster and York-street, patents were taken out describing all the different operations performed. After the Admiralty deciding to adopt his machines, in 1797, they were manufactured under the direction of Jeremy Bentham, and forwarded from time to time to Portsmouth and Plymouth, where they performed, so far as any record shows, all that was claimed for them.

The mills specify lathes, saws, machines for cutting, tenons for boring, also for boring bits and squaring tools, "and many other machines for different kinds of work." Machines were also devised by Bentham to facilitate block-making, an operation that is yet classed among the most difficult. His machines, however, for

this purpose did not seem to be perfect, for in 1810 he was joined by Brunel, who had invented a machine for "shaping block-shells." Brunel was at that time employed under Bentham to assist in the various operations, and to perfect his own machine, which must have had the endorsement of Bentham. In 1803 Sir Samuel, as Inspector-General, advised the Admiralty to adopt many additional machines that had already been approved, and to permit the erection of steam-engines to drive them, and they were accordingly ordered. The several dockyards were fitted with engines for sawing, planing, boring, tenoning, mortising, &c., and, apart from better construction and greater experience in their use, it is fair to infer they had nearly all the functions found in modern machines for these purposes. Their labour-saving capacity is sufficiently attested by the fact that Brunel, who had perfected and assisted in their construction and operation, was rewarded by being allowed, as a premium for his inventions, the estimated savings of one year's work over hand-labour in the dockyards, which amounted, as Mr. Richards is informed, to the very large sum of 16,000*l*.

In 1813, arbitrators were appointed, on the part of the Government, to settle with Jeremy Bentham, and who, after the examination of numerous witnesses, allowed him the sum of 20,000*l*. for machines furnished to the dockyards and penitentiaries. From the testimony given before this commission we learn that "Sir Samuel Bentham prepared a system of machinery for the employment of men without skill, and particularly with a view to utilising convict labour. In 1793 patents were taken out on these inventions to secure their exclusive use for the prisons. The testimony states that no skill was required in the use of these machines: they were introduced into the dockyards, and worked by common labourers." The use of the machines saved *nine-tenths* of the labour. "A table could be made at one-half the expense by their use," &c., which goes to show that the machines were, at least, effective,—a claim that cannot in many cases be made for those of more modern manufacture.

The machines and appliances for working wood that were invented and practically applied by Sir Samuel Bentham previously to the year 1800 are enumerated by Mr. Richards as follows:—

"Machine for planing and forming mouldings; improved planing and moulding machine (rotary); wedging-guard for circular saws; segmental circular saw; circular cutters for dovetail grooves; unloading carriage, to form saw mouldings; compound cutter-heads, to work two or more sides at once; the *slide-rest*; tubular boring implements (core-boring); crown saws (or cylinder saws); reciprocating mortise-machine; rotary mortising-machine; radius arm for sawing segments; tracer guide for sawing irregular forms; bevel and curvilinear sawing machine for grinding saw blades; taper-gauge for sawing; grooving-machine; vertical adjustment of saws in benches; T mortising-machine; sectional cutters; pivoted table for rebating-machines; forked or double-mortise chisels; sawge-lathe, with slide-rest; rotary cutters for forming screw threads on wooden screws; double-grooving saws; rack-feed for planing-machines; with many other things."

The slide rest for turning is very fully and clearly described in Bentham's patent of 1793, and it ranks with the greatest, as an invention in engineering implements. It gave us the engine lathe, without which our modern practice in machine-fitting could not be carried on.

The facts adduced will be sufficient to show that Sir Samuel Bentham is entitled to the distinction of being called the "Father of wood-working machines" in England, at a date that precludes any probability of his inventions having been anticipated in other countries.

Mr. Richards, after giving these and other particulars as to the introduction of wood-working machinery, proceeds to speak of other inventors, and of many inventions and improvements, both in this country and in America, since that period. Of American wood-working machines he says,—

"It can be safely asserted as a fact that there are throughout American factories but few wood-machines that have been running for ten years, and if any such exist there is a good and sufficient reason for abandoning them. The life of most machines used in joinery is not on an average more than six years, under any special modification. So general is this rule that in the sale of patents for wood-cutting machines their value is based upon a monopoly that will not exceed that time. For this reason it is easy to see that manufacturers who use such machines do not care to make large investments in machinery that will in so short a time be out of use."

It is to be regretted that there are no statistics at hand to show the amount of wood-machinery that is now made by the several engineering firms who make this kind of machinery a speciality; but it could, no doubt, says Mr. Richards, with safety, be set down, for the last

year, in England and America, at a value of not less than 500,000*l*. sterling. Besides, it cannot be reckoned in its importance on the same basis as many other branches of manufacture, that of monetary value: it has a deeper significance in connexion with the material advancement and welfare of the country. All the machinery of this kind made in America, and a large portion of that built in England, is for home use, to assist directly in developing the resources of the country, in building houses, ships, furniture, and thousands of articles of convenience and necessity. In fact, there is no branch of manufacture that has a more intimate connexion with the interest of all than wood conversion.

Wood-working machines were at first made, as a rule, by carpenters and not by engineers or machinists. This was especially the case in the United States twenty years since, when nearly all makers of wood-machines were themselves wood-workmen. Machinists could not, of course, build machines the functions of which they did not understand: geometrical drawings, to embody the ideas of the wood-workmen were in this, as in other branches of industry, almost unknown. Hence the carpenter, cabinet-maker, and ship-builder set about to construct machines that would perform by power what he had before done by hand. Iron was to him a new material. He had not in his mind constants, or rules for proportions, like an engineer or machinist, but blindly supplied a shaft here, a pulley there, with bolts and framing to support them, very much as he would have made a house. The movement and application of the cutting edge was the prime object,—everything else unimportant. This same fact accounts fully for the peculiar designs which we see in the framing of American wood-working machines.

In America a village of 2,000 or more inhabitants, with the surrounding country, is said to be large enough to support a planing-mill; which then means a regular wood-working manufactory, equipped with saws, planers, lathes, tools for mortising and boring,—in fact, all operations in wood-work. So general is the want of such work in America, that there is not, perhaps, in the whole country a village of the size mentioned without its planing-mill, and perhaps a half-dozen other establishments making specialities for the general market, or ploughs, wagons, furniture, &c., for local trade. Very little hand-work is done,—in the language of the country, "it does not pay." A man costs from fifteen to twenty dollars a week, but a "man-power" in a steam-engine does not cost as many shillings: hence the steam is the cheapest, it does not strike, is always at its post, and is easier controlled. The intelligence it lacks must be supplied in the machines. This is the American idea of wood-work in general. Prices are uniform all through the country, and hand-work is out of the question. Wood-cutting machines are made in all the cities in America, besides numerous shops scattered over the country, that make more or less; but, as said, there is no special centre for this kind of work, either in America or in England, where the same rule holds: wood-machines are made in various parts of the kingdom.

A fault common among builders of wood-machines is the jealousy that exists, and the inclination to keep their shops closed, or their plans secret,—an error that prevails with all kinds of manufacture when undergoing change and improvement. It, however, disappears as an art becomes more perfect, and will, no doubt, be so in this case.

From about the year 1815 to the Universal Exhibition of London in 1851, the manufacture of wood-working machines in England remained but a limited business, and no advance was made that at all compared with what was effected in other branches of engineering. Many machines for special uses were, no doubt, made and used that combined both skill and ingenuity; but, upon the whole, wood-machines may be said to have lain dormant in England for a period of forty years.

During the Exhibition of 1851, the performance of the "wood-framed" American machines was such as to create astonishment. English engineers at once proceeded to clothe the "ideas" these machines suggested in a mechanism more in keeping with their purpose and the true principles of machine-construction, and out of it grew, as we may say, a large share of modern practice in England.

In following the history of wood-machines, it might be said that, from 1835 to 1852, the

development of the art was transferred from the Old to the New World. The American people, without iron, or the means of adapting it to the many uses to which it was already applied in England, adopted instead the wood of their forests, applying it to all conceivable uses in the construction of buildings, ships, machines, roads, and the framing of steam-engines, for which purpose it is even yet, to a large extent, used. Necessity, which has been termed the mother of invention, coupled with a strong ingenuity and boldness of plan that has always characterised the Americans, led to a rapid development of an entirely new system of wood-machines for sawing, planing, boring, mortising, tenoning, &c., besides hundreds of modifications of special machines adapted to the manufacture of carriages, ploughs, furniture, joiners' work, bent work, &c.

Since 1850, the inventions in wood-machines have followed each other in rapid succession in America. The most complicated forms in wood of regular or irregular outline are produced at a cost, and with a degree of accuracy, which cannot be attained by hand manipulation. Engineers and inventors, in both Europe and America, during two or three years, have been giving to wood-machines such attention as they demand, and the wants of the market have forced out. Within the past two years the art has been raised to the dignity of recognition among other branches of engineering; the scientific journals of England have given more space to wood-machines than for the previous ten or even twenty years; and regular engineering establishments are springing up in England, America, and on the Continent, which give their attention to wood-working machines as a speciality.

The manufacture of wood-working machinery is now chiefly carried on in England, America, France, and Northern Germany.

Having consecutively followed the leading operations in wood-conversion through sawing, planing, mortising, and tenoning, which Mr. Richards illustrates with numerous and elaborate engraved views of machines of many kinds, he concludes his valuable treatise with accounts of some of recent origin,—such as shaping machinery, under which head can be classed all operations involving irregular lines, or, to state it otherwise, all operations that involve other than straight or circular lines. This class of wood-cutting machines is of recent origin, when compared with those for working straight or cylindrical forms, and yet, from the endless adaptation that the principle is capable of, it comprehends a greater variety of machines than is directed to either sawing or planing.

Down to about the year 1830, all operations in wood-work that involved irregular lines were, without exception, performed by hand; and it would be no exaggeration to say that even at the present time the general principles upon which such machines operate are but imperfectly understood.

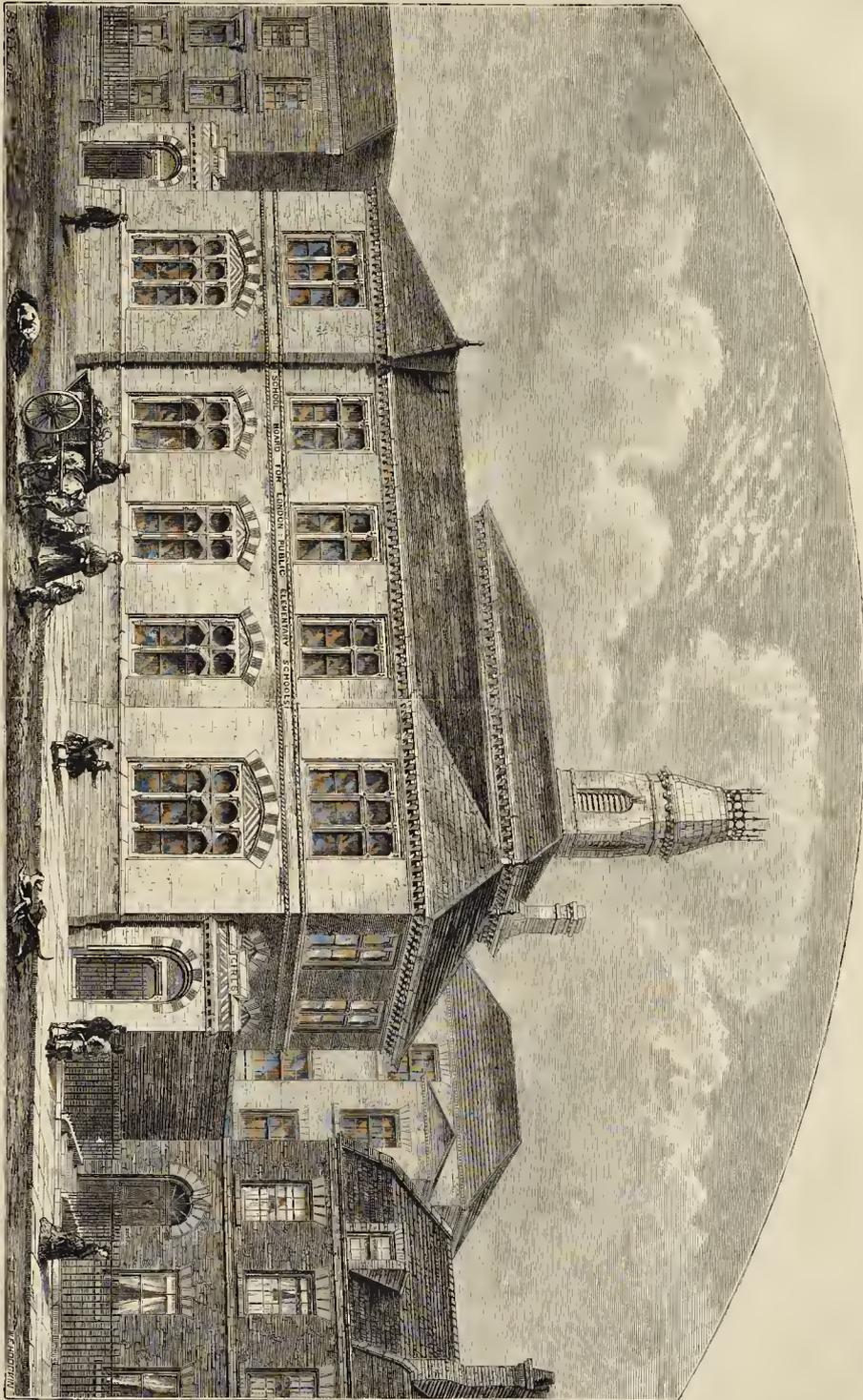
There was, in fact, such an air of improbability about the cutting out of shoe-lasts, gunstocks, &c., by machines, at the beginning, that the impression has not yet passed away.

The mechanism involved contributes to this impression: it is of a character more complicated than that for straight lines or curves,—so much so, indeed, that in some cases the plan of operating is with great difficulty explained to the unskilled.

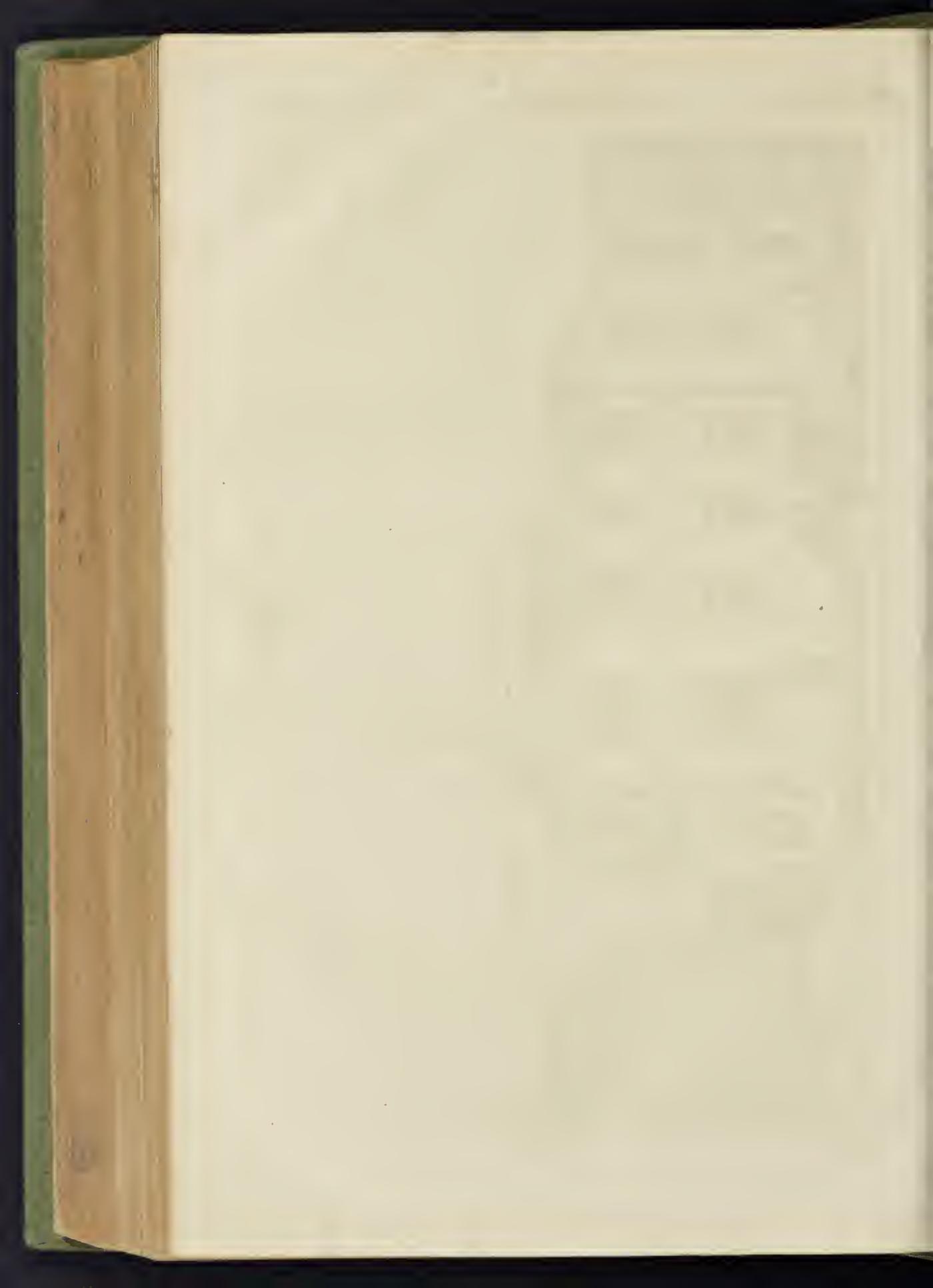
Shaping-machinery, in the sense in which the term is here employed, comprehends turning-machines for irregular forms, carving-machines, and machines operating in one plane only, such as the moulding-tables with right and left spindles. The operation of all these machines can be described, in a general way, as "working from a pattern," duplicating forms already produced, from which and by which the action of the tools is directed.

The part in contact with the model can be termed a guide, between which and the cutting-tool, or the blank itself, there is coincident movement. In all the various modifications of machinery for shaping we find the same mechanical equivalents, although, for the better understanding of them, they can be divided into two classes,—those that adjust or move the tools, and those that adjust or move the material so as to receive the action of the cutters on its different configurations.

Another recent invention connected with wood-working is the pneumatic conductor for dust and shavings, and clearing workshops, which has lately come into use in America.



SCHOOL BUILDINGS FOR THE LONDON SCHOOL BOARD, WINCHESTER STREET, FINSBURY.—MR. CHARLES BARRY, ARCHITECT.



SCHOOL BUILDINGS FOR THE LONDON SCHOOL BOARD, WINCHESTER-STREET, FINSBURY.

Our engravings illustrate the design by Mr. Charles Barry which has been selected for the school in Winchester-street, Finsbury. The builders are Messrs. Downs & Co., of Union-street, Southwark, and their tender is 9,325*l*. The schools were proposed for 1,040 children, but will accommodate 1,150. We take a few passages from the architect's original description of his design. The site, having reference to the number of children intended to be accommodated, is so small that even limited play-space could only be obtained apparently by having nearly the whole area under the boys' and girls' school formed into covered space for this purpose. This necessarily raises the lower floors—levels of the schools in each case of boys and girls about 10 ft. above the general ground-level. But as this is considered objectionable in the case of the infants, they have been accommodated in a separate block of building fronting to Winchester-street, and only two steps above its level.

The entrances for infants and also for the girls are placed in Winchester-street, while that for the boys is through the present house in Southampton-street, the ground-floor and street-front of which is to be slightly altered to evidence its character as part of the School Board's property, and the upper part of this house is proposed to be given to the care-taker for a residence.

The two infants' schools for 200 each will thus occupy the whole front in Winchester-street. The boys' school will be accommodated in two schools (senior and junior), one over the other, with covered play-space under the lower one. The girls' school will be similarly treated.

Each department is designed in a separate block of building, having between them an open court for light and air to each block, and to the play space, with a view to depend for light as little as possible on adjoining open spaces, but which are not the property of the Board.

A drawing-class room, separately approached from the senior schools of the boys and of the girls, is placed on the upper part of the centre building, in the rear portion of it, and will be lighted from the roof and from the north side. This room will be also available as a managers' room when such is required, and is therefore also approached separately by continuing the staircase of infant school to the top; a private w.c. has also been provided for the use of the managers.

Masters' and mistresses' private rooms are provided adjoining each schoolroom.

Every school and class room is lighted from two different sides of the room, and so as to ensure side lights to the class-rooms and through-ventilation in all.

The materials proposed are, for all walls except those of the front building in Winchester-street, ordinary grey stock bricks. The window openings are in wrought-iron, galvanised, with openings for air in every window.

The building in Winchester-street is proposed to be faced with red bricks; the cornices, stringers, and so on, are in white moulded bricks; and the windows in Ransome's patent stone, fitted also with wrought-iron casements.

The roof of the front building is to be covered with Taylor's patent tiles, and the other buildings will have ordinary slates.

The staircases are to be of stone, the outer ends of the steps and landings being carried on wrought-iron girders fitted to the necessary shapes.

The finishings to the walls inside will be painted to a height of 5 ft. 6 in. from the floor, and distemper above that level.

The water-closets and lavatories within the building are planned one over the other, for economy in construction and in the plumbers' work, as also for simplicity of outfall to drainage. The water-closets for the children's use are grouped all together for the sake of ready and efficient drainage. They are to be fitted with Jennings's patent trough school-closets in solid pottery, the water in each closet being always at a given level; while each range can be flushed out as frequently as found desirable by opening a valve at one end of the range and turning on a service of water at the other. The valve and service-cock will be in a locked compartment, so that the children cannot interfere with the arrangement. The drains are to be kept outside the building.

The warming will be carried out on the prin-

ciple adopted by Messrs. Haden,—a combined system of warm air and warm-water pipes. The warm air will pass by horizontal channels under the ground-floor of the schools, being admitted into the rooms either by the skirting or floor-gratings. A supply to the upper floors will be taken by flues in the walls, and admitted, in like manner, by the skirtings. This is the first school, we believe, to which this system has been applied. The class-rooms will be warmed by hot-water circulating pipes slightly raised above the floor-level, and the flow and return pipes to these will pass through the warm-air horizontal channel above mentioned, thereby assisting in keeping up its temperature.

The boiler and heating apparatus will be in the basement, and the flue of the boiler formed of iron plate will be taken up the centre of the ventilating-shaft.

As to the ventilation, from every school and class room there will be gratings near the ceilings communicating with horizontal channels formed in the floors and roofs, and all terminating in a ventilating-shaft carried above all the roofs. A strong up-draught will exist in this shaft, both from its height and also from the aid given by the warm flue from the boiler passing up its centre. In summer weather, when warming is not required, a small pilot-furnace at the foot of this flue will keep up its action in aid of the extracting power of the shaft.

The cubic contents of the buildings, including the covered play-spaces, are called by the architect 392,669 ft.

ANOTHER VIEW OF PROFESSIONAL ESPIRIT DE CORPS.

SIR,—Mr. Roger Smith's interesting paper on *Esprit de Corps* deserves the attention of all your readers, for it deals with a subject of the first importance, both to the profession and to the public. The advantages to be expected from intense *esprit de corps* are ably put forward—always of course from a professional point of view, and some of them would probably be found to result. But is there not an obverse to the medal? Is it clear that nothing worse than "fitting professional pride," courtesy of *dona*neur, increased general culture, and the extinction of "universalism" amongst architects would ensue? Or is there not cause to fear that "a homogeneous, well-organised body" strong enough to bring all this about, might be sometimes tempted to use its strength on behalf of selfish interests? Mr. Smith asks,—

"Does *esprit de corps* do for us anything like what it does for the soldier, the lawyer, and the doctor? And if so fine a profession as ours fails, in some respects, to command the social position which is generally accorded to the members of some others which I have named, is not our own deficiency in *esprit de corps* at the root of much of that failure?"

The professions named are significant, for it is precisely in these that the evil results we fear are conspicuous. The obstruction offered by "the colonels" in the House of Commons to the abolition of purchase, when our Constitutional forms were strained until they were ready to crack, will not soon be forgotten. The nation was then scandalised by the spectacle of an unseemly struggle for pounds, shillings, and pence, which any one of the gentlemen concerned would have been shot rather than be guilty of for himself, but gloried in it because it was for "the service."

Even the *Saturday Review* has recently declared the action of the authorities at Edinburgh in the case of Miss Jex Blake and her friends to be "discreditable," and the conduct of the Society of Apothecaries scarcely deserves a milder epithet; and Mr. Stansfeld has called down from the faculty a perfect storm upon his head, because he declines to deliver us into the hands of an army of doctors,—all which should warn us that even individual freedom is held subordinate to professional advancement. A perusal of the Act of 1858 reveals also the curious fact that persons holding eminent foreign diplomas, not only cannot be registered as medical practitioners in this country, but are unable even to make good a claim to be examined with a view to registration.

But it is in the law that we best see how powerful and how obstructive a trade-union of educated men may become. It is not too much to say that the public welfare is consistently sacrificed to the presumed interests of that profession. There is no reason why land should not be as saleable as Consols; and there is no reason against a fusion of equity and law; there is every

reason why "the law's delay" should cease to be a proverb, and legal education a farce. It remains to be seen whether Government will undertake with better success than private members the task of reforming the first of these matters. But we know that successive chancellors and law officers of the Crown have not attempted, or have failed, to remedy the second and third, and even Lord Selborne's character and position have not as yet sufficed to make any improvement in the last. It is not denied that a change is called for by the public good. Why, then, do we see no change? A writer in the *Spectator*, agreeing here with the Attorney-General, gives the answer. It is because the *electors* are not sufficiently aroused to insist upon it. This is for our purpose the most significant point of the whole matter. It does not occur to any one that the profession will attempt to reform itself. We all assume that acknowledged abuses must continue until they can be removed by overwhelming pressure from without. Much might be added to this, but I fear to trespass further on your indulgence. Those who desire more information should read Mr. Fitzjames Stephen on "Codification," in the current *Fortnightly*, and Mr. Vernon Harcourt's letters to the *Times*. Enough has been adduced to show that the fact that the members of a society are men of culture and social position, affords no guarantee that its organisation will not be used for purposes of the most naked selfishness. And not only so, but while the power of professional corporations alone renders these abuses possible, their position and prestige give them an air of respectability which prevents us from knowing them for what they are.

Mr. Smith would hope to obtain in a union of architects the unquestionable advantages he points out, without the evils which some of us think more than counterbalance these. Architects, however, are not made of different clay from other men, and we have no reason to believe architects in the future would show more public spirit than doctors and lawyers in the present and the past. One of the headings for clauses of contract which the council of the Royal Institute of British Architects, about two years ago, recommended to the members of the Institute for adoption, has the gnomie trade-union flavour. This clause relates to the settlement of disputes by arbitration, and contains the following proviso:—

"The arbitrator being an architect and a Fellow of the Royal Institute of British Architects, agreed to by the parties, or appointed by the president for the time being of the Royal Institute of British Architects."

We are blind indeed if we do not see here the "temper of mind" we deplore. The spirit is there,—the machinery alone is wanting. If Mr. Smith's idea were taken up with zeal, and the profession "fenced round" and built up into "a homogeneous, a shapely, a well-organised body," the *esprit de corps* which that gentleman invokes would soon pass beyond the limits he would wish to impose on it. In no long time we should have a new trade-union in our midst, as formidable in its way as any of those which are now only tolerated because they exist.

F. H.

WEYMOUTH SEWERAGE.

SIR,—Allow us to thank you very much for your courtesy in inserting our previous letter, and for taking the trouble to answer it; but, in justice to ourselves, we are desirous of joining issue on two or three points of your reply, which we think are open to question.

The Corporation of Weymouth did, no doubt, represent the opinions of the ratepayers at the time ago, but whether they do so now is very doubtful indeed. We accept your opinion that a local inquiry by a Government Inspector was not *legally* necessary; but we still think it was usual, proper, and desirable before sanction was given to works of such importance. That the experimental "strainer," which is to cost 750*l*. will prove useless is very probably a true prophecy; but are there not other methods of filtering or deodorising sewage than by this particular "strainer," or the method of irrigation proposed by Sir John Gooch? As to your statement that the dam will prevent the continuance of stagnant and putrid water, we can only say that the remark must be *opere valent*; for it is surely not consistent with common sense that to dam water up will make it less stagnant or putrid. Under present conditions the tide flows over and scours the back-water twice a day.

Referring to the borrowing question, we may observe that most precipitous and unnecessary haste was exhibited by the Corporation in entering into an agreement to borrow the 50,000*l*. on such terms as they did, long before the money was wanted. We find that the Public Health Act was passed on the 10th of August, 1872, but the works were not at that time commenced, and the money was not actually borrowed until six weeks afterwards, the first payment to contractors on account of the works not being due until the middle of October. It cannot, therefore, be said that it was too late to take advantage of the Act.

With these facts before us, it is impossible to agree with you that "the Corporation has done the best" for the ratepayers, seeing that the repayment of the loan

will fall more than twice as heavy upon the latter as it might have done if the Corporation had only acted more deliberately. We anxiously desire to see the town in a perfect sanitary state, but think you will agree with us that a choice of competing plans would probably have enabled the town to get a more satisfactory scheme than the one which has unfortunately been adopted. The Corporation and Sir John Coode, moreover, both seem by their actions to have little faith in the plan; else why after obtaining sanction, &c., are they now trying a totally opposite system, besides having inquired into other systems subsequent to the publication of Sir John Coode's plans?

TWELVE RATEPAYERS OF WEYMOUTH.

Mr. Charles E. Austin demurs to our remark on his strainers, and sends us an account of the good effects attending their use elsewhere. We must adhere to our expressed opinion, but desire to add the particular observation referred to applies only to their proposed use at Weymouth.

"ALMS CUPS."

Sir,—Will any of your subscribers kindly give me some information concerning the above, as I should like to know if they are a local peculiarity or not? I send you a sketch of one given to its present owner by the son of a former vicar of Harwich, who died at the age of 90 years; and as it belonged to his father before him, I presume it is rather old. It is supposed to have once belonged to Harwich Church. The cup (vase-shaped) is made of oak, and the heads are blacked, standing, to the top of the stem on the lid, 6 in. high.

A few days ago I saw another at Harwich, twice the size, differing in shape only in having three heads at the stem instead of one. This specimen was not perfect, having a part of its lid broken. From what I can learn, they used to be placed at the end of the benches for the people to put their alms into.

G. V. B.

ARCHITECTURAL COMPETITIONS.

Sir,—Though a "non-professional" I can from experience confirm the remarks in Mr. Thos. Chas. Sorby's bold and many letter in your last week's impression, so far as south-west Yorkshire is concerned.

Committees look upon "architectural trade-unionism" either with fear or something worse; hence it has become the rule to insert, "Committees to be judges of the designs." How has this come to pass? Have there not been too much "talk talk" and too little practical knowledge manifested by the "upper ten"?

STEPHEN SEAL.

CENTRAL ASSOCIATION OF MASTER BUILDERS OF LONDON.

We mentioned in our last the first general meeting of this Association, and gave the names of the committee. In reply to inquiries, the objects of the Association are set forth as follows:—

"The object of the Association will be the promotion and protection of the interests of the building trade of London generally, and of the members of the Association in particular, by the following amongst other means:—

1. Unity of action in the settlement of all questions arising between employers and their workmen, with a view to prevent lock-outs or unjust strikes against individual members of the Association.
2. The general adoption of equitable conditions of contract such as have recently agreed to by the Royal Institute of British Architects.
3. The interchange of information and mutual co-operation, when desirable, with other kindred societies throughout the country.
4. The collection and circulation amongst its members of statistics and other information considered to be for the general interests of the trade.
5. The keeping a register at the offices of the Association, of foremen and others who can be recommended for employment."

FOOT BRIDGES FOR CROWDED

CROSSINGS.

Sir,—I believe it has several times been proposed to construct subways to the thronged crossings, such as those at the Oxford and Focality circuits, but I do not know whether bridgeways have been suggested. The complex arterial system of gas and water pipes militates against the subway, and at first thoughts the notion of foot-bridges would be condemned on account of the space required for their approaches, staircases, &c.; but on reflection it will be seen that the supposed insurmountable difficulties might be easily got over by recessing the approaches into house space, and making the bridge ways debouch from the level of the first floors. This would, of course, involve the purchase of house property; but the outlay for this purpose would be quite insignificant to the Metropolitan Board.

To realise the suggestion at the Oxford-circus, four houses would be required to furnish the necessary space for the construction of the staircases and abutments. From the height of the first floors, I propose that the iron footways should pass diagonally, and receive, at their

* Apparently eighteenth-century work.—Ed.

intersection in the centre, support from below. At this junction point, and above, there should be the lamp support, which might be combined with the pier beneath, in such a way as to form a very handsome architectural feature, and which would, in conjunction with the footways, become novel and picturesque objects in some of our metropolitan vistas.

W. CAVE THOMAS.

. The proposition has been often made (first, we believe, in our own columns), but has never yet taken such a shape as to commend itself to authorities. Drawings illustrating the idea were submitted to one of the City Boards last session.

"I'LL BRING AN ACTION."

The *Builder* is probably the most good-natured journal in Europe. We never go out of our way to say an unkind word; we leave unsaid many disagreeable observations which might justly be made. Nevertheless, month by month (we might even shorten this period) we are informed by some irascible individual or other that unless we instantly make an apology, a writ will be served. These letters are ordinarily consigned to the waste paper-basket, and the writer escapes further notice. Patience, however, has its limits, and the limits of ours have been reached. We therefore print the following letter:—

"STOCKTON EXCHANGE.

Stockton-on-Tees, Dec. 13, 1872.

Sir,—Our client, Mr. _____ of this place, has consulted us with reference to your libellous remark contained in your impression of the 7th December, 1872, foot-note at p. 971, which reflects in an injurious manner upon our client's character. As the imputation of deceit is wholly unwarrentable, we trust you will at once withdraw the charge and apologise in your next issue; for unless you do so, we are instructed to take action against you forthwith. DODDS & TROTTER."

What we said was that a deceptive account of the decision (in the competition) had been sent to us by one who ought to have known better. If Messrs. Dodds & Trotter know who sent us the particulars alluded to, they must have obtained their knowledge from some other source than our pages. We repeat that the account received by us was, whether intentionally or not, deceptive (as we could prove in two minutes, if it were necessary), and we must, with all respect, leave Messrs. Dodds & Trotter to take just what action against us they think fit.

ASBESTOS.

Sir,—I have several wooden buildings, which are at present very cold for cows and horses. I can board them on the inside, and leave a space of about 2 in. between the outer and inner boarding, which I propose to fill in with ground asbestos, as a good non-conductor. Will any reader tell me where to purchase it or anything that will be equally efficacious? C. E.

CHURCH-BUILDING NEWS.

Rotherham.—The chief stone of a new church has been laid at Eastwood. The site is at the junction of St. Ann's-road and St. Leonard's-road. The church will be in the Decorative style of the Geometric period. There will be a chancel, 28 ft. by 22 ft.; nave, 80 ft. by 25 ft.; south aisle, with tower and spire at the west end, 78 ft. by 11 ft.; north aisle, with porch at the west end, 80 ft. by 11 ft.; organ-chamber, opening into chancel and south aisle by arches, 15 ft. by 13 ft.; vestry in north-east, 15 ft. by 13 ft.; and warming chamber under vestry. In the interior, the church will be divided into nave and aisles by octagonal stone shafts, supporting stone arches, above which are the clearstories, pierced with two-light tracery windows. The aisle windows will be of two-lights each, and traceried. The east window of the chancel will be of five lights, with geometric tracery. The west window will be of four lights, also with tracery. The roofs, which are of high pitch, will be open-timbered. The chief entrance will be through the tower, which will supply the place of a south-west porch. Pew accommodation is provided for 600 adults in the nave and aisle, and for twenty-four choristers in the chancel. The church will be built of local stone, with dressed quoins and other ornamental features; the facings will be of the same stone, rock faced. The internal portions will be of Hooton stone. The contract for the whole of the works has been let to Mr. Ripley, of Rotherham, for 3,600l. The architects are Messrs. Thomas D. Barry & Sons, of Liverpool.

Leicester.—The foundation-stone of the (Earl) Howe Memorial Church of St. Peter has been

laid. The style is of the early part of the thirteenth century. The edifice will consist on plan, of nave, north and south aisles, north and south transepts, chancel, with an apsidal eastern termination, western tower and spire, and organ-chamber and vestry north of the chancel; there will be a clearstory above the nave. The principal dimensions internally are:—From east to west, 137 ft. 6 in.; across nave and aisles, 51 ft.; across transepts, 61 ft.; length of nave, 105 ft.; length of chancel, 32 ft. 6 in.; height of nave to apex of roof, 50 ft.; height of chancel to the boarding of roof, 40 ft. 6 in.; height of transepts, 27 ft. 6 in.; height of aisles, 19 ft.; height of tower and spire to top of stonework, 150 ft. The materials of the church will be Little Eaton stone for walling, and Douling stone for all dressed masonry. The plain walling inside will be plastered. The nave and aisle roofs will be open-timbered, and those of the chancel and transepts boarded and panelled,—all of Baltic fir. The seating of the nave and aisles will be of Savanah pitch pine, and the seats and stalls in the chancel of wainscot, and screens of the same material will divide the chancel from the nave, vestry, and transepts. The eastern portion of the church as far as the centre of the first bay of the nave, west of the transepts, is alone included in the present contract. Mr. Street is the architect, and the contractor is Mr. Roberts, of Weoston, the amount of whose contract is 4,727l.

Kingston.—The new church of St. John the Evangelist, Spring-grove, has been consecrated by the Bishop of Winchester. The building stands on a piece of ground which the late Mr. W. Mercer, of Surbiton, made over to trustees for the purpose, and which is situate at the corner of Springfield-road. The materials used in the construction are Kentish ragstone for the walls, with Bath stone for windows, doors, and internal arches. The roofs are covered with strawberry-colour Broseley tiles, with ornamental tiles cresting to the ridges, a superior kind being fixed on the chancel. On plan, the church comprises nave and aisles, south porch, transepts, chancel with apsidal east end, north chancel aisle, vestry, and tower in angle of chancel and south transept. As yet it is only carried up to the eaves of the chancel, and is covered with a temporary roof. The nave is 27 ft. wide, and divided from the aisles by four moulded arches, resting on piers clustered and circular alternately. Wider and more depressed arches open to the transepts. One of the caps in the nave has been carved, and it is hoped that others may be finished in like manner. This one is the gift of Mr. Shaw, of the firm of Jackson & Shaw, contractors for the works. The chancel, raised three steps, opens from the nave by a lofty arch, having shafts in the angles of the jambs; the inner order of mouldings resting on responds, supported on corbels. The choir-desks are of oak, with a prayer-desk on each side; a brass lectern, presented by the architect, stands on the chancel steps. The apse, of seven sides, is raised two steps above the chancel level, and is entered through a second arch corresponding to that between the nave and chancel. Light is obtained from five two-light windows with tracery. The centre window is filled with stained glass, given by Mr. E. H. Bedford; it is the work of Messrs. Ward & Hughes, of London, and represents the Crucifixion and St. John taking the Virgin to his own home, being one of a series of subjects. The central light of the west window of the nave is likewise of stained glass, executed by Messrs. Cox & Sons, and given by Lieutenant-Colonel Law. Both windows are memorials. The warming is effected by means of hot air passing from Gurney stoves under north transept. The church is lighted by gas cones of brass and painted iron, on each side of the nave, and one larger one of polished brass from the centre of the chancel roof. A bell, weighing 4 cwt., the gift of Mr. John Shrubsole, hangs in a temporary wooden bell-cage on the wall of the tower. The seats throughout are uniform in character, being open benches of deal, stained and varnished. Sittings are provided for 827 persons, the south aisle being free. The architect is Mr. Arthur J. Phelps, and the works have been carried out by Messrs. Jackson & Shaw, of Westminster. The cost, including lighting and warming, is a little over 7,000l. The carving has been executed by Messrs. Farmer & Brindley; the gas-fittings and metal work supplied by Messrs. James & Willis, of London and Birmingham.

Elmswell.—Elmswell Church has been reopened after a restoration and enlargement. Mr. J. Drayton Wyatt architect having been

consulted, designs were prepared for the complete restoration of the nave, and for the addition of a north aisle to correspond with that on the south. The contract, amounting to 1,150*l.*, was taken by Mr. W. Woods, of Elmwell.

Brandon.—The ancient chapel of ease to the mother church of Hough-on-the-Hill has been reopened. This antique place of worship having been found to require a complete restoration, the Right Hon. Earl Brownlow, who owns part of Brandon, determined that a suitable place of worship should be made for the inhabitants of the village. The entire cost for the work was about 500*l.*, which his lordship has entirely defrayed. The architect was Mr. Kirk, of Sleaford, and the contractors were Messrs. Rudd & Son, of Grantham. The seats in the body of the edifice will accommodate 100 persons.

Brighthelm.—St. Leonard's Church was rebuilt some few years ago from the designs of Messrs. Slater & Carpenter, of London. The fine old tower, however, remained standing, but having become unsafe has been pulled down, and under the superintendence of some gentlemen a new tower, similar in detail to the original structure has been erected. The Rev. Mr. E. Stanbrough, the rector, under the guidance of Mr. Wiggall, the foreman, assisted by Mr. Harry Hems, of Exeter (the sculptor of the decorative part of the works), lowered the spire terminating the spire of the turret. In the evening the whole of the workmen employed upon the works were entertained to supper at the Pheasant Inn. The chair was taken by Mr. Wiggall, and the vice-chair by Mr. Harry Hems.

Bradshaw.—The new church of St. Maxentius, Bradshaw, near Bolton, has been consecrated by the Bishop of Manchester. Mr. Paley, of Lancaster, was the architect. The cost of the church is 4,300*l.*, exclusive of the site and burial-ground. Accommodation is provided for nearly 500, being more than double that afforded in the old church adjoining.

Southampton.—The dedication-stone of the proposed Millbrook New Church has been laid. The church is to be built upon a site given by Lady Barker Mill, immediately opposite the Old Manor House, and has been in course of erection for some time, and considerable progress has been made with the outer walls, which are several feet above ground. The church will be in the Early English style, with nave and side aisles, chancel and chancel aisles, vestry, tower and spire; but we believe the realisation of this as a whole is not at present contemplated. The church will be of Swanage stone, with Farley Down stone dressings, and will be 170 ft. long; the chancel taking 38 ft. and the nave 132 ft. The height of the nave roof will be 53 ft. The church will accommodate 700 people, and its total cost is estimated at 7,000*l.*, but contracts to the amount of 4,800*l.* only have at present been entered into. The architect is Mr. Henry Woodley, of Guildford; and the builders are Messrs. Newman & Son, of Winchester. The works are under the superintendence of a nephew of the architect, Mr. Coussmaker.

Wimlington.—The foundation-stone of St. Peter's Church, in this parish, has been laid in the presence of the Bishop of Ely, by Lady Frances Russell. The church will be in the Decorated style of the thirteenth century, with nave, chancel, octagon apse, and a tower, 18 ft. square, and about 120 ft. high. The amount of the contract is about 4,000*l.* Mr. T. H. Wyatt is the architect, and Messrs. Holland & Hannen are the builders.

Spring-grove.—The new church of St. John the Evangelist, Spring-grove, has been consecrated by the Bishop of Winchester. The edifice is built on ground given by the late Mr. Mercer, of Surliton, who was also the donor of 2,000*l.* It was erected to supply the wants of the still increasing neighbourhood of Spring-grove. The cost of the building, exclusive of the architect's fees, &c., has been 7,000*l.* The church is built of Kentish rag stone, with dressings of Bath stone, except the quoins, which are worked in the rag stone. The roofs are covered with Beverley tiles, of the shade known as "strawberry," and the ridges finished with tile cresting, that on the chancel being more ornate than the others. The plan consists of nave with aisles, south porch, transepts, chancel with north aisle and vestry, and a seven-sided apse. The tower is on the south of the chancel, opening into it and the south transept. At present the tower is only built to the height of the eaves of the chancel roof. The principal entrance to the church is through the south porch. The nave, 87 ft. by 27 ft., is divided from its aisles by

moulded arches, springing from piers alternately clustered and circular. All shafts throughout the building have the square abacus. One capital has been carved at the expense of Mr. Shaw, of the firm of contractors, and it is hoped that the others may be by degrees finished. The chancel is the same width as the nave. The centre window is filled with stained glass by Messrs. Ward & Hughes, of London; it is the gift of Mr. E. H. Bedford, and represents the Crucifixion and St. John taking the Virgin to his own home. The centrelight of the west window of the nave is also filled with stained glass, presented by Lieut.-Col. Law, and executed by Messrs. Cox & Sons. Both gifts are *in memoriam*. The building is warmed by hot air passing from Gurney stoves placed under the north transept, through one large grating in the north aisle. Accommodation in open benches is provided for 827 persons; the south aisle being free. The works have been carried out by Messrs. Jackson & Shaw, of Westminster, at a cost, including lighting and warming, of a little over 7,000*l.* Mr. Arthur J. Phelps is the architect. The carving has been executed by Messrs. Farmer & Brindley. The gasfittings and other metal work were supplied by Messrs. Jones & Willis, of London & Birmingham.

Hedon.—The nave and aisles of the old parish church, which for some time past have been undergoing restoration, being completed, are now opened to the public. In July, 1869, the restoration of the south transept was completed, the south front being entirely rebuilt, and an open roof replacing the old one; at the same time the floor of the nave was lowered about 16 in., bringing to light much work at the bases of the clustered columns that have been hidden from view for a number of years, and other improvements were added, the architect, Mr. Street, supplying the plans, the work being carried out by Messrs. Shafts & Barry, of York. The cost of these works was upwards of 2,000*l.*, and of this sum 1,000*l.* were given by Mr. Christopher Sykes, M.P., thus leaving upwards of 1,000*l.* to be provided by the committee. This sum was quickly subscribed, and the works commenced. Being completed, the restored portion was publicly opened by the Archbishop of York, on July 30th, 1869. The vicar selected the western portion for restoration, as the one to which his next efforts should be directed, and in a short time the funds were provided. The western portion, now completed, consists of a nave and aisles, 85 ft. long and 48 ft. wide. The works have been carried out from the designs and under the superintendence of Mr. J. T. Webster, of Hedon, architect. Mr. Charles Atkinson was the contractor for the various works, the woodwork being executed by him; the stonework and carving (the principal features of the work) being given to Messrs. Wilson, Brothers, of Hull. Mr. Smith, Hull, executed the plumbers' and painters' work. The organ, under the hands of Mr. Outhbert, of Hull, has been considerably enlarged and improved in compass and tone.

Skelbrook.—The newly-restored little church at Skelbrook has been reopened for divine service. The tower is the only portion of the structure which has not been rebuilt, though even this part has undergone considerable alteration, and has been carried about 6 ft. higher. The stone used for the wall facings and dressings (except that provided from the old material) is Ackworth, Ancaster, or sound grit of hard description. A surface drain is made round the entire walls of the tower, nave, chancel, and vestry, formed of patent vitrified bricks, 18 in. wide, with a fall of not less than 2 in. in 10 ft. The new roof is of pitch-pine, and the ironwork is joined with pins and screws. The accommodation now afforded consists of 110 sittings, all free. Part of the chancel, and the steps leading to and within the altar-rails, are laid with polished ornamental tiles, while the rest of the chancel and the nave are floored with Leicestershire tiles, all supplied by Messrs. Whetstone & Co., of Coalville. The church is warmed by means of three heated with hot air. A stained-glass chancel-window, a memorial of the late Mrs. Percy Neville, is from the establishment of Messrs. Houston, Butler, & Bayne, of London. The subject portrayed are the Good Shepherd, and some of the more notable incidents in our Saviour's life. The font is formed of Moor stone and Derbyshire spar. It is carved. The windows inserted in the Neville Memorial chapel are all to be filled with coloured glass. Only one, however, at present is completed, the subject being taken from Revelations,—Alpha and Omega, the first and the last. The stonework both of the interior and

the exterior of the edifice has been, in various places, carved; the woodwork, too, in several instances, displays the work of the carver's tool. The carver of the stonework was Mr. Soriven, of Doncaster, and of the wood, Messrs. Threlley & Mease, of Hull. The architect for the building was Mr. Joseph Goddard, of Leicester; and the contractors for the re-erection and restoration, were Messrs. Shillito & Morgan, of Campall. The cost at the present time, from the many extra charges, cannot be accurately ascertained. It is expected, however, to range between 1,500*l.* and 1,800*l.*

DISSENTING CHURCH-BUILDING NEWS.

Halifax.—The New Connexion Wesleyan Methodists in Halifax have just completed a new place of worship in the town, which has been formally opened. The designs have been by Messrs. Hill & Swann, of Leeds and Sheffield; and the following have been the contractors:—Masons, Messrs. Dixon & Oates; joiners, Messrs. Smith & Brier; plumbers, Messrs. Walsh & Son; plasterer and slater, Mr. Ambler; and painter, Mr. Birns. The chapel is in the Early Decorated Gothic style of architecture, and the principal front faces North Parade. The front entrance is surmounted by a wide stretch of mullioned windows, consisting of a four-light window, having on either side and joined up to it a two-light window. The head of each window is filled with geometrical tracery. On either side of the door is a lancet window, and the lofty gable at its summit is crowned by a floriated cross in metal-work. On the east side of this large gable is the gabled roof of the side entrance, a carved pinnacle being between. On the west side is a similar gable, while instead of a pinnacle rises a lofty spirelet, carved and crocketed, and finishing in a metal cross. All the seats are in pitch pine, low upon ones (no pew doors), and those beneath the side galleries incline slightly towards the pulpit. The galleries run around all sides of the chapel, that behind the pulpit being intended for the organ, when it is provided. The open roof has its timbers stained, and the spaces between filled in with plaster. The gallery-fronts are pierced with quatrefoils. The supporting pillars to the galleries, which are carried up to the roof, are coloured dark chocolate, and have their capitals relieved by colour and gilding. The small circular window at the north end (which will be over the organ), and the single-light window on either side, are filled in with quarried glass. The windows in the partition from the vestibule are similarly treated, whilst the tracery headings to the great window over the principal entrance are filled in with stained glass. All have been supplied by Mr. Barnett, of Newcastle. The chapel is lighted by ten gaseliers in brass, each having eighteen lights, and suspended, five on either side, and between the supporting pillars, to the roof. Beneath the galleries are large brackets, each with four lights. All these are from the works of Messrs. Hibbert & Co., of Manchester. The total accommodation gives 900 seats. In rear of the pulpit are large vestries and robing-rooms, and a covered arcade leads directly into the large schoolrooms, built some years ago, behind the old chapel. The total cost of this chapel will be between 4,000*l.* and 5,000*l.*—South Parade Wesleyan Chapel after being closed for many months, during which time extensive alterations and improvements have been made both internally and externally, has been formally reopened. The alterations, which are extensive, involving an expenditure of over 2,300*l.*, have been carried out under the superintendence of Messrs. Ives & Son, architects. The old building has been so handled that all its leading features are retained, whilst at the same time the requirements and taste of more modern days has been fully met. Built in 1776, it is a plain edifice, having in its principal front two entrance-doors, with a square-headed window between, and one on the side of each door. Over these, in the second story, are windows to correspond; and along each side are five windows in each story. Formerly there were three rows of windows, the upper ones being small and square. These have been removed, and the gallery-windows lengthened, and converted into circular-headed ones. At the east end of the chapel a large apse or organ-recess has been thrown out, resting upon stone pillars, placed so as not to interfere with the graves. It is in the interior of the chapel that the greatest alteration has been made. The whole of the eastern gallery (which

held the organ) has been swept away, as well as the pulpit and its surroundings. The recess spoken of opens into the chapel by a moulded arch, having supporting pilasters on either side. Its dimensions are 22 ft. by 16 ft., and its height 18 ft. 6 in. to the spring of the roof. The new organ, now building by Messrs. Forster & Andrews, of Hull, will shortly be placed in it. In front of this recess, well advanced, and standing upon a broad platform two steps high, is the pulpit, 8 ft. in height. Round the raised platform is a mahogany rail, enclosing the communion space. The whole of the pews have been repainted and varnished, and the walls repainted in warm tints. The gallery-fronts have been painted, all in neutral tints, the prevailing colours being light grey, drab, and light blue, the panels being filled in with scroll-work, and the running moulds slightly gilded. On the ceiling, each of the large panels is filled in with a floriated design, and the large ventilators (nine in number) are decorated. Around the sides is a deep scroll-mould. Five coronas (supplied by Messrs. Foster & Son, of Woolshops) are suspended from the ceiling. They are in brass and wrought iron. The central one has eighteen lights, and the four others twelve lights each. Beneath the galleries, running on the three sides of the chapel, are fourteen brackets, of four lights each. All the old glass of the windows has been removed, and now each light is in a single sheet of figured glass, having the Pompeian key-mould around the edges. In rear of the chapel, and on a level with the apse, is a large new vestry, whilst the old school-room beneath has been reboarded and panelled, and a new class-room formed out of it. The large school opening into the chapel, and which was built a few years ago, needed no alteration. Mr. Pickles has been the mason, Mr. Townsend the joiner, Mr. Ambler the plasterer, Mr. Naylor the plumber, and Messrs. White & Stringer the painters and decorators employed.

Chester.—Pepper-street Methodist New Congregation Chapel has been re-opened for divine service. This place of worship has undergone extensive alteration from its former half-primitive, half-modern appearance. The old benches in the body of the chapel have been removed, and supplanted by new pews, in harmony with the gallery and sides of the building. The pulpit has been lowered 1½ ft., and the stairs at the back are superseded by a flight of winding stairs on either side. Behind the pulpit are two Corinthian pillars supporting a semi-arch of the same style. No alteration has been made in the gallery, with the exception of the removal of the old perpendicular gaslights, which has been done in every part of the building, and sunlights or side-brackets introduced in their stead. The ceiling is beautified by an ornate smilight, with centre flowers. The pews and the pulpit have been repainted, grained, and gilded. The whole of the work has been executed by Chester tradesmen, Mr. Robert Ellis doing the painting, Messrs. Farrimond & Co. the woodwork, and Mr. Bird the gasfitting. A double set of hot-water pipes run along the whole building. The accommodation which the chapel will now afford is sufficient for 1,200 persons, and the cost of the alterations, &c., amounts to about 350l.

Andover.—In the Congregational Chapel, old-fashioned high pews have been replaced by open seats of Oregon and red pine, varnished. The aisles have been laid in encaustic tiles, from the works of Mr. R. Minton Taylor, of Fenton; and the few old tombstones which were brought to light during the alterations to the boarded flooring are relaid in the aisles. The pulpit has an apparatus for transmitting the voice of the speaker to any part of the chapel, by means of tubes. The expense attending the alterations has been covered by the subscriptions, although there are a few incidentals towards which contributions will be asked at some future time. The work has been executed by Mr. Frank Beale, of this town, builder, who also prepared the plans and specifications.

Norrmanton.—A Methodist Free Church has been opened here, and is a substantial red brick building, with stone dressings, open stained roof, and stained deal fittings. It will seat 200 persons. Mr. William Watson, of Wakefield and Doncaster, was the architect; Mr. John Foster, of Norrmanton, was contractor for the whole work, for 710l.

Alverthorpe.—The building committee have instructed Mr. William Watson, architect, to prepare a design for a chapel and Sunday-schools for the Methodist Church of this place.

Belper.—The new Congregational Church has

been opened for divine service. It is in the Gothic style of the Early Decorated period. The extreme dimensions are 84 ft. in length by 40 ft. in width; the height from the ground line to the ridge is 40 ft., and from the ground-floor to the ceiling, 38 ft. There is a nave, with entrance vestibule and staircase in front, and a chancel at the east end, 18 ft. by 14 ft., in which are the organ and choir. On either side of the chancel are vestries, &c. There is a gallery at the west end, and the building is so arranged that side galleries may be added hereafter if found needful. The principal entrance is in the centre of the west gable. A tower, in which there is another entrance, rises from the south-western angle of the building, and is surmounted by a spire, terminated by a metal finial, the total height being nearly 120 ft. At the south-eastern angle there is a staircase tower, with slated spire. The walls are of stone, and both ashlar and dressings are from local quarries. There are sittings for 550 persons. The seats are open. The total cost of the church will be about 4,000l. Mr. Woodhouse, of Bolton, is the architect; and Mr. Cash, of Duffield, the builder. The windows, which are cathedral tinted, and bordered with stained glass; and the gasfittings, which are of polished brass, and Mediaeval in character, have been supplied by Mr. S. Evans, of Derby. The masonry has been done by Messrs. Walker, of Wirksworth; the carpentry and joinery by Mr. Cash, of Duffield; and the painting by Mr. Holland, of Duffield.

Stockton.—The corner-stone of a new Unitarian Chapel has been laid in Wellington-street, Stockton. The new chapel will be 60 ft. long, by 38 ft. broad. There will be sitting accommodation, in open pews, for 300 persons. The style of architecture is Early Gothic. Behind the chapel there will be a school, 47 ft. long and 24 ft. broad. Mr. Eugene E. Clephan has undertaken to build the chapel and school for 1,845l. The total cost of the new buildings, including all furnishings and the land, is estimated at about 3,000l.

Maidenhead.—The foundation stone of a new Baptist Chapel (on the Marlow-road) has been laid. The dimensions are 51 ft. by 31 ft.; the accommodation will be for 280 persons on the floor, and the gallery another 200. There is also to be a lecture-room, large enough for 80 people, together with a vestry. Space is provided for a pastor's house and a school-room. The architect is Mr. Vardy, and the builder is Mr. Woodbridge.

Cheetham (Manchester).—A new Wesleyan Chapel, in Queen's-road, Cheetham, has been opened for divine service. The erection is nearly completed. It is built in the Early Gothic style of architecture, and will accommodate 550 persons. The total cost of the building will be about 5,500l., and of the land, 2,000l. The architects are Messrs. Clegg & Knowles, Manchester; and the builder is Mr. Mark Foggett, Cheetham.

Reading.—The ceremony of laying the two memorial stones of the new Wesleyan Chapel, in the Queen's-road, Reading, has taken place. The new chapel will be built in the Early Gothic style, having a tower and spire, 130 ft. high, at its north-east corner. The main entrance will be approached from the Queen's-road. The chapel will be 80 ft. long by 50 ft., and the chancel 21 ft. by 26 ft. The building will contain sittings for 900 persons. At the south end a long school-room will be built for 100 scholars. There will also be an infant school-room, four class-rooms, and vestry. The total expenditure, including the purchase of land, will be about 7,000l.

Hull.—The foundation-stone of the Latimer Congregational Church, in Williamson-street, has been laid. This church is to be erected in an early style of Gothic architecture. The materials for the construction of the exterior are red stock bricks, black bricks being introduced in the bands and arches. The stone work to the windows and doors throughout is in Idle stone. The church is approached by three entrances leading into a spacious vestibule, and consists of nave, 34 ft. in width and 66 ft. in length, and transepts, 23 ft. 6 in. in width and 10 ft. in depth, affording accommodation on the ground-floor for 454 persons. There is a front gallery which is approached by a staircase in the tower, having additional accommodation for 88 persons. The roof is to be open-timbered, having framed trusses and curved ribs, and will be plastered on the underside of the rafters. The seats are to be of red deal, having cut ends and panelled framing. All the woodwork exposed to view is

to be lightly stained and varnished. The building is to be lighted in the front by a three-light central window, and two side lights over the gallery; the nave with six two-light windows, and each transept by five single lights, and a large rose-window in the gable. The square portion of the tower is carried to a height of 54 ft., and is surmounted by an octagonal spire, which is slated in bands of blue and green, reaching a total height of 92 ft. to the top of the vane. The gas-lighting is to be effected by means of coronas, suspended from the roof, and brackets, all of Mediaeval design. Attached to the back of the church is the minister's vestry, over which is the orchestra. The contracts have been let to Messrs. B. Musgrave & Son, brick-layers and plasterers; M. Raven, joiner; R. Waller, mason; P. T. Harrison, plumber and glazier; Messrs. Wilde & Son, slaters; Messrs. King & Co. ironfounders; and A. Wright, painter. The architect is Mr. Samuel Musgrave, of Hull.

SCHOOL-BUILDING NEWS.

Higham Ferrers.—The foundation has been commenced to be laid for the new Board Schools by Mr. John Piggott, of Rushden, the contractor for the masonry. Mr. George Smith, of Higham Ferrers, is to do the carpentering; and Mr. Albert Laughton, Rushden, the painting and glazing. The expenditure will be 2,000l. in addition to the purchase of the land. The schools will face Wharf-lane, and have a playground in front. They are to be completed by Midsummer next.

FROM SCOTLAND.

Edinburgh.—The Tron Church has had its walls painted and the large west window filled with stained glass. The large east window, containing six upright lights, was filled two years ago with stained glass, containing six illustrations of the life of our Lord, viz., the Annunciation to the Shepherds, the Worshipping of the Wise Men, the Presentation in the Temple, Christ among the Doctors, the Baptism, and the Sermon on the Mount. The large west window, which has just been executed, contains also six illustrations, viz., Christ raising Lazarus, the Last Supper, the Agony in the Garden, the Crucifixion, the Marys at the Tomb, and the Ascension. In the top tracery of the one window is the *Agnus Dei* in the centre, with angels in side-lights; and in the tracery of the other is, in the centre, the Pelican, with angels in the side-lights. The remainder of both windows is filled with ornamental work, in accordance with the style of the architecture. The walls of the church have been painted a neutral green, diapered with borderings of brown and dark green. The ingoings and facings of the windows are of a drab colour, and these are also diapered with borderings in keeping with the glass in the windows. Messrs. Ballantine & Son decorated both the walls and the windows. The west window has been subscribed for by the Marquis of Tweeddale, Lord Landerdale, and by relatives and friends of the late Rev. Dr. Hunter.

The operations connected with the erection of the new infirmary in Lauriston were recently all but suspended. The explanation is, that the builder had nearly completed the work embraced in the first contract, which was limited to the foundations and basement. Before entering upon a further contract, the managers deemed it expedient to obtain a report from Mr. Bryce, the architect for the buildings, showing in what way the design might be curtailed, so as considerably to reduce the estimated expenditure without prejudice to the ultimate carrying out of the plans in their entirety, so soon as it may seem desirable to do so.

The foundation-stone of the new Watt Institution and School of Arts, now in course of erection in Chambers-street, has been laid by the Earl of Rosslyn, Grand Master Mason of Scotland, with full Masonic honours. Opposite the main entrance to the Museum of Science and Art there will be an extended open space. The site of the new Watt Institution and School of Arts is at the west corner of this open space, and the building, which is to be in the Italian style of architecture, corresponding with the remainder of the buildings to be erected on the north side of Chambers-street, will therefore possess the advantage of having both a south and east front. The building will be two stories in height, except at the west end, where there will be a pavilion carried one story higher. The

front, or that facing the Museum of Science and Art, will be rusticated on the ground floor, with balusters under the first-floor windows; while the second-floor windows will have architraves, trusses, and cornices, and the pavilion will have pilasters at each side, and decorated windows. Over the first floor will be the main cornice, furnished with dormer windows, which are intended as a feature in lighting the large lecture-hall. The main entrance will be at the west end, under the pavilion, and will be approached by a projecting porch, supported on pillars. The porch will be crowned with the statue of James Watt, after Chantrey's model, which at one time decorated Adam-square. The main entrance will lead to a spacious hall and grand staircase, from which access will be had to the lecture and class rooms, directors' room, library, masters' room, and keeper's house. The principal lecture-hall will be 88 ft. long, 33 ft. broad, and will be capable of accommodating 500 persons. It will be lighted by four large windows on either side; while in the division between the richly-decorated cone and the ceiling will be a row of lunette lights. At the east end of the hall will be a platform for the lecturers, and at the west end a gallery seated for 180 persons. The ceiling will be decorated with panelling of a rich character. Another hall for lectures and large classes will be 34 ft. long and 33 ft. wide, and the remaining accommodation will consist of a chemical class-room, 33 ft. by 23 ft.; a chemical laboratory and apparatus-room for mechanical philosophy; and two spacious class-rooms, for general purposes. The architect for the new institution is Mr. David Rhind, F.R.S.E., and the contractors are Messrs. David Sutherland & Son, Edinburgh.

Leith.—The United Presbyterian Church, St. Andrew's-place, Leith, has been undergoing an overhaul, and the congregation have taken advantage of the opportunity to place in the building permanent memorials of the two pastors with whom the history of the church is identified. The re-painting has been executed by Mr. Paxton, of Edinburgh. A brown tint on the walls affords a background for the work of the decorator. The panels of the ceiling are painted in pale blue with gold stars. A ventilator in the middle of the ceiling takes the form of an elaborate centre-piece, painted in brown and cream colour, and gilded. The windows are encircled with hands of diaper-work, the glass being obscured by being painted in light colours or a corresponding pattern. In the case of the two large windows flanking the pulpit, the ornamental border takes a more ornate form, with gilding. The front of the galleries is painted in wainscot, the surface being diversified with various mouldings and scroll ornament. The two large windows behind the pulpit have been turned to account to enhance the decorative effect, while serving as memorials of the pastors. Furnished with new stone mullions, which form in each case two round-headed lights, surmounted by a small circle, the windows have been filled in with coloured glass by Mr. Barnett, of Leith. In addition to the memorial window, a mural monument has been erected to the memory of Dr. Smart, in the lobby of the church. The work was designed by Mr. Brodie, R.S.A. Over a simple plinth, supported on two square corbels, rises a plain slab, in the centre of which, within a deeply-moulded circular panel, is placed a medallion of Dr. Smart in high relief. An outline resembling that of a Grecian pediment completes the monument at top. The whole is in marble, but the architectural portion is blue-veined white, and the medallion pure white. While decorating and improving their church, the St. Andrew's-place congregation have taken steps for providing themselves with a hall in which Sunday school and prayer-meetings may be conveniently held. A new building, designed by Mr. Paterson, of Edinburgh, is being erected in close proximity to the church, with which it corresponds in point of style. Internally its principal, indeed only, feature is a spacious and lofty apartment, well lighted from two sides, and capable of comfortably seating about 300 persons. Waiting-rooms are provided behind. A new vestry is also being built in rear of the church.

Broxburn.—The memorial stone of a public hall and working-men's institute for the village of Broxburn has been laid. Mr. R. Bell, of Broxburn Lodge, and a number of the leading men in the village, instituted some time ago a working-men's club, with the view of providing the somewhat restless mining population means of harmless and agreeable amusement.

The club proved a great success, and, encouraged by this, Mr. Bell, Mr. MacLagan, M.P., and other proprietors and employers in the neighbourhood, projected a public hall and institute on a somewhat larger and more imposing scale. Plans were accordingly procured, and operations commenced, and the memorial stone of the institution was laid with full Masonic honours by Lord Cardross. The site of the building is near the centre of the village, and will form a prominent feature in its one long straggling street. The erection will be a simple oblong building, with Gothic details. The main front will show a gable end towards the street, having a tower at the south-west corner rising to a height of 50 ft., finished with a wedge-shaped roof, tipped with ornamental cresting. Access will be gained to the building by two entrances,—one leading to the billiard and reading rooms, which will be situated on the ground floor, and measure 31 ft. by 26 ft. The other entrance will be placed at the basement of the tower, and give immediate access to the hall, which will be placed on the first floor. Extending to 60 ft. by 31 ft., the hall will be seated for 500 persons, and provided with a platform. The architect is Mr. James Fairley, Edinburgh; and the contractors are,—for the mason work, Mr. J. Rennie, Newbridge; and for the joiner work, Mr. W. Brown, Dechmont. The cost of the entire building will be about 1,300*l*.

Glasgow.—The foundation stone of a United Presbyterian Church has been laid in Glasgow. The new building is being erected in Elgin-street, off Eglinton-street. The church is in the Gothic style of architecture, and is constructed so that a spire may be added if required. It is about 70 ft. square, exclusive of the session-house, vestry, &c., which abut on the east side. The interior of the church will be ornamental. A spacious gallery will run round the sides and back, and underneath it the ground seats sweep round in the form of a horse-shoe. The body of the church is divided by two aisles. Underneath are the halls, the roofs of which are supported by cast-iron pillars. The building is estimated to accommodate 1,100 persons, and when completed will cost about 5,000*l*.

STAINED GLASS.

All Saints, Wath-on-Dearne.—An addition has been made to this parish church by the erection of two stained glass windows in the south aisle. They are of two lights each and of large size, and are designed in the style of the Tudor period. In one window, on a foliated ground, are shields and other heraldic devices, while in the other, on likewise a rich ground of foliated work, are medallions of angels holding texts. The windows have been made by Lavers, Barrand, & Westlake, of London, from a design by Mr. Bentley. The stonework of these windows has been restored, the whole having been directed by Messrs. W. Hatfield & Son, the architects, whom the donor, Mr. G. P. Nicholson, of Wath-on-Dearne, employed on the work.

All Saints, Aton.—Three of the windows in the east bay of this church have been filled with stained glass, in memory of the late Mrs. Mary Anne Dunn, the mother of the vicar (with the exception of the centre window, which contains the Ascension and Crucifixion of our Lord, with canopies and bases, and with the Majesty in the treasury). The subjects chosen are characteristic of different saintships; for instance, under the head of the saintship of Infant Innocence, we have Christ receiving little children, and the infant Saviour disputing with the doctors; for the saintship Self-renunciation, St. John the Baptist preaching and baptising in the wilderness; for the saintship of Motherhood, the salutation of the Virgin and the nativity of our Lord; for the saintship of the Gift of God, St. Peter and St. John healing the man at the gate called Beautiful, and the descent of the Holy Ghost. These windows are from the studio of Powell, Bros., of Leeds.

Bath Abbey Church.—The last of the windows of the north aisle of this church has been filled with stained glass by Messrs. Clayton, Bell, & Co. The window is the gift of Mr. Thomas Gill. It is divided into five lights, with tracery above, the central light being occupied by a figure of the prophetess Miriam, and the four other subjects are Hannah praying in the Temple, the finding of Moses, Mary at the feet of our Lord, and the Marys at the Tomb.

Milton Church.—A new stained-glass window has just been placed in the east window of the

parish church, the gift of Mr. James Packe, of The Lodge. The window is a three-light Gothic, with geometric tracery. There are six subjects, two in each light, representing the "Last Supper," the "Agony in the Garden," the "Betrayal," "Bearing the Cross," the "Crucifixion," and the "Descent from the Cross." The whole of the groundwork is filled with designs, and the lights are surrounded by a foliated border, and have respectively at the top of the sacred monogram the interlaced triangles of the Eternal Trinity, and the X P C, or Greek monogram of Christ. The tracery above the lights is filled in with floral, foliated, and geometric devices. The work was done by Messrs. Ward & Hughes, of London, who, we understand, received a *carte blanche* as to price from the donor.

St. Clement's, Cambridge.—This parish church has just been enriched by a stained-glass window, made and presented by Mr. W. H. Constable. During the summer this work of art was exhibited in the International Exhibition.

Leesfield Church.—The single-light window on the north side of the chancel of this church has just been filled with stained glass in memory of Mr. Higson. The subject represented is the parable of the talents. The window is from the works of Mr. Shaw, of Saddleworth. Another stained window, also from the works of Mr. Shaw, has been placed under the gallery at the west end of the north aisle of the church. It consists of two short lights. In the first light is a circle surrounded with a wreath of vine-leaves, inclosing the monogram "I. H. S." In the second light is a similar circle, inclosing a cross. Running round the two circles are the words, "Him that cometh unto me I will in no wise cast out." The ground-work of the window consists of oak-leaves and acorns.

Cirencester Parish Church.—A window has been placed in the lady chapel of this church by Mr. T. W. C. Master, of the Abbey. The window represents the principal points in the histories of the Marys mentioned in the New Testament, and has been executed by Messrs. Hardman & Co., of Birmingham.

Books Received.

A Handbook of Chemical Technology. By RUDOLF WAGNER, Ph.D., Professor of Chemical Technology in the University of Wurtzburg. Translated and edited from the eighth German edition, with extensive additions. By WILLIAM CROOKES, F.R.S. With 336 illustrations. London: Churchill, New Burlington-street, 1872.

In this valuable and important work there is a great variety of topics, many of them of special interest to our readers. The technology of glass, limes, and mortars; the preservation of wood; the latest methods of preparing iron, zinc, lead, copper; and technology of beating and illumination, are among these; and there are under these and other headings many subjects dealt with, such as the manufacture of bricks and tiles, terra-cotta, &c.; of porcelain and other wares; oils and resins; colours; varnishes; picture restoring; cements; glues; dyes; and many other materials in the technology of vegetable matters, such as paper-making; bread-baking; beer-brewing; and of animal matters, as of silk, wool, and preservation of meat.

We shall on another occasion give some extracts in a separate form on the subject of glass, as a specimen of the thorough mode of treatment which seems to be adopted throughout the work.

VARIORUM.

A USEFUL little volume, titled "Sanitary Science," has been published at a moderate price by Mr. R. Scott Burn (Glasgow and London: W. Collins, Sons, & Co.), on the principles of sanitary science. Starting with a motto which is taken from Lord Derby's recent speech at Liverpool, that "sanitary instruction is even more necessary than sanitary legislation," he proceeds to develop briefly, yet perspicuously, the general sanitary conditions of town and country districts; adding a separate essay on the various subjects involved, such as healthy construction of houses; heating and ventilation; the smoke nuisance; water supply; and disposal of sewage. The illustrations, as far as they go, are appropriate and well selected.

Miscellaneous.

The Metropolitan Water Companies.—In accordance with the Act of Parliament passed last session, the water companies of London have issued their balance-sheets for the last year, and these have been embodied in an official return. From this it appears, says the *Times*, that the capital of the West Middlesex Water Company is 885,712*l.*; gross revenue, 125,915*l.*; net revenue, 85,197*l.* The gross earnings were thus 14*l.* 4*s.* 4*d.* per cent. on the capital; 32*l.* 6*s.* 9*d.* per cent. of the gross receipts were absorbed by the working expenses, of which 23*l.* 9*s.* 3*d.* were for maintenance, and 8*l.* 17*s.* 6*d.* for management, leaving 67*l.* 13*s.* 3*d.* per cent. on the gross receipts available for division, which is at the rate of 9*l.* 12*s.* 4*d.* per cent. on the capital. The capital of the Kent Water Company is 477,011*l.*; gross revenue, 62,130*l.*; net revenue, 40,815*l.* The gross earnings were thus 10*l.* 12*s.* 9*d.* per cent. on the capital; 35*l.* 2*s.* 3*d.* per cent. of the gross receipts were absorbed by the working expenses, of which 27*l.* 2*s.* 8*d.* were for maintenance, and 7*l.* 19*s.* 7*d.* for management, leaving 64*l.* 17*s.* 9*d.* per cent. of the gross receipts available for division, which is at the rate of 8*l.* 9*s.* per cent. on the capital. The capital of the New River Company is 2,651,975*l.*; gross revenue, 311,664*l.*; net revenue, 196,251*l.* The gross earnings were thus 11*l.* 15*s.* 1*d.* per cent. on the capital; 37*l.* 0*s.* 7*d.* per cent. of the gross receipts were absorbed by the working expenses, of which 27*l.* 11*s.* 9*d.* were for maintenance, and 9*l.* 8*s.* 10*d.* for management, leaving 62*l.* 19*s.* 5*d.* per cent. on the gross receipts available for division, which is at the rate of 7*l.* 8*s.* per cent. on the capital. The total capital of the eight companies of which details are given is 10,008,310*l.*; gross revenue, 1,058,566*l.*; net revenue, 666,608*l.* The gross earnings thus averaged 10*l.* 11*s.* 6*d.* per cent. on the capital; net earnings, 6*l.* 13*s.* 2*d.* per cent.

Metropolitan Assessments.—The Lewisham Board of Guardians, according to the *Metropolitan*, have submitted a series of questions to the clerks of the Assessment Committees of the metropolitan parishes and unions respecting the Valuation (Metropolis) Act, 1869. To the question, "On what principle is property held on lease without premium, assessed, as distinguished from property held from year to year?" the clerk of Camberwell replies, "By adding 10*l.* per cent. to rent." In Chelsea, "the rent paid of a recent letting, and considered the fair market value, is taken as the rateable value, and the value of repairs, &c., added to ascertain the gross value." In Hampstead, "5*l.* per cent. is added to rent." In Islington, "each case is considered on its merits." In Kensington, the practice is "to add 5*l.* per cent. to rent, except on new properties of 40*l.* and upwards." In Paddington, "the estimated cost of repairs is added to rent." In St. Pancras, they "add 5*l.* to 10*l.* per cent. to rent, if lease is granted within seven years; and the value of an old lease is judged from adjoining property." In Shoreditch, "no hard-and-fast line is adopted; the property in the parish is of a varied character, and the gross value is arrived at in the best way we can." In Fulham Union, the assessment is made "on the assumption that the real does not represent the gross value." In Greenwich, "10*l.* per cent., if repairing lease; if not, 5*l.* or less, according to circumstances." In Hackney Union, "the rent is deemed to be rateable value, and the percentage fixed by the Act is added to it to ascertain the gross value." In Holborn, "a fair average amount is added for repairs; the amount paid for insurance, and the average of the landlord's taxes paid by tenant."

The Canterbury Town Sewage.—The Local Board have received three tenders for taking a concession of the sewage, in only one of which anything was offered for the sewage, and that was conditionally, that if any profit resulted, the Board should have 10 per cent. of that profit. The tenderers in this case were Messrs. Shelford & Robinson. In the other two cases the tenderers required annual payments to them of 750*l.* and 1,000*l.* respectively. The Board, after some further discussion, agreed that the tenders of Messrs. Anderson & Goodwin and Messrs. Banks & Walker be not entertained, and that the meeting should be adjourned for a fortnight, in order that the surveyor might report upon the remaining tender. Messrs. Shelford & Robinson propose to introduce the Dugald Campbell patent manure system.

Aspect for a Conservatory.—I have often heard the remark, "I would build a conservatory, but have no proper place for one,"—meaning, no south aspect. Now, however right it may be to build fruit-houses with an aspect direct south, I think it is the worst possible one for a conservatory. In the first place it certainly does not add to the pleasure of any one looking at plants in a glasshouse to be exposed to a hot sun, and still less to those working amongst them. Then, again, flowers, even when shaded by blinds, soon drop their petals in such a house, and many plants, as camellias, ferns, &c., seldom do well, however shaded. About two years ago, I built a house 100 ft. long, with an aspect due north, and a high back wall about 10 ft. This house has been full of zonal geraniums which have been in bloom ever since last April, and have been the admiration of all who have seen them; and though it is now November, and they have been blooming more than half a year, they are still in full beauty. The question is, would they have done so well in a house facing the south? I think not; though perhaps such a house would suit them better during the winter. If such sun-loving plants as geraniums will do well in a north house, there are but few plants which could not be cultivated in it. Were I to build a camellia house, I would face it to the north-east, so as to avoid the afternoon sun even, as few plants dislike a hot sun more than camellias do. Some may, therefore, be glad to know that a south aspect is not necessary for every kind of glass house.—*The Gardener.*

House Property in Melbourne, Australia. The prices realised at a recent auction sale, says the local *Argus*, show the value of freehold property here. An allotment in Flinders-lane, near Elizabeth-street, of 26 ft. frontage by 96 ft. in depth, on which is erected a bluestone store, was sold for 7,050*l.* or about 270*l.* a foot frontage. Premises in Flinders-lane, near Market-street, which possess a frontage of 59 ft. by a depth of 129 ft., fetched 6,000*l.* Two shops in Little Collins-street, near the Police Court, were sold for 2,450*l.*; and the Emisicorthy Hotel, in Little Bourke-street, with a frontage of 27 ft. by 40 ft., realised 1,650*l.* The allotment at the corner of King and Little Collins streets, 94 ft. by 99 ft., brought 3,300*l.*, or 35*l.* per foot frontage. The buildings on this ground were but of little value. Other property in Little Collins-street was sold for 17*l.* per foot. A piece of land, possessing a frontage of 62 ft. to Spencer-street, and 112 ft. to Dudley-street, was sold for 1,255*l.*, and 60 acres of the Yat-Orrong estate, at Tonrak, subdivided into building allotments, fetched 10,000*l.* There was a spirited competition for the various properties, and the sale realised over 35,000*l.*

The Improvements in Holborn Valley.—It appears from the report presented to the Court of Common Council by Mr. Shaw, chairman of the Improvement Committee, that from the date when the tenders were accepted until the undertaking was completed the time occupied was just three years and a half, and that the entire cost amounted in round numbers, to 2,500,000*l.* Of this sum only 355,166*l.* were expended on the actual works themselves; the remainder of more than two millions sterling was laid out chiefly in the purchase of land, and compensation to tenants. It is calculated that the value of the land now in the hands of the corporation is not less than a million and a half. There has therefore been really sunk upon the improvement a million. Already the corporation are beginning to receive an income from the property. In January last the total rental was no more than 7,000*l.* a year; now it is as much as 29,000*l.* a year; and, as a matter of course it will rapidly increase every year.

Interesting Discoveries in the Aleutian Islands.—Dr. W. H. Dall, of the U.S. Coast Survey, has been making explorations of late among the Aleutian Islands of Russia, in the North Pacific Ocean; and has discovered various ancient remains of natives, such as lamps, knives, spoons, arrow-heads, hearthstones, and skeletons. Around the sites of ancient villages he found several specimens of peculiar ways of burial. In certain places a sort of cave was formed under overhanging rocks, and here were put the bodies of the dead, preserved, attitudinised, and gaily dressed out. Some of them were covered entirely with wooden armour. Occasionally the cave had a theatrical appearance: the bodies of renowned hunters were placed in canoes, armed, and apparently rowing. Women were represented engaged in the labours of their lives,—sewing, dressing skins, or holding their children.

Alleged Protection of Crops from Frost. The manufacture of artificial clouds is reported to have been resorted to in the French wine-growing districts, to protect the crops from frost. Tin receivers, filled with a peculiarly prepared tar, were disposed over an area of many acres, and when the tar was ignited thick white clouds rose into the atmosphere, and, spreading out evenly over a large region, remained suspended several yards above the soil. In seasons when frost is feared, the tar clouds would interpose between the crops and the sky, thus checking the night radiation which often causes such ravages in vineyards and gardens, both in spring and harvest time. By the way, we hear no more of the alleged protection of the hop crops from hail, which was talked of, and said to be practised some years since.

Fall of a House in Kensington.—Preparations for the erection of new buildings for postal, money-order, and telegraph purposes in Young-street, Kensington, have necessitated the demolition of a large house in the street, and the excavation of a deep foundation. The majority of the houses in the street are very old, but as the contractors had pined and shored them up, they still continued occupied. One of these houses was occupied by a greengrocer and his family, and at about half-past two in the morning his wife was awakened by a creaking noise. She had just time to arouse, and get out her husband (who is partially paralysed) and her family, when the house fell, burying their furniture and stock-in-trade in the ruins.

Society of Engineers.—At the annual general meeting of this society, the balloting lists were handed to the scrutineers, who ultimately reported that the choice of members had fallen on Mr. Church as president; Messrs. J. H. Adams, W. MacGeorge, and V. Pendred, as vice-presidents. Eight other members of council were also elected. Mr. A. Williams was re-elected hon. secretary and treasurer; and Mr. J. Walker was elected auditor. It was announced that the council had awarded premiums of books to the following members for papers read by them during the past session, viz.—Mr. E. G. Bartholomew, Mr. W. H. Fox, and Mr. H. Davey.

Bath Abbey.—The eighth annual meeting of the subscribers to the Abbey Restoration Fund was held on Monday afternoon, the 9th, at Bath, the Mayor presiding. A very satisfactory report was read, and the chairman congratulated the subscribers upon the approaching completion of the work, and hoped the sum now necessary would be raised in the ensuing year. The third and last portion of the work is estimated to cost 6,000*l.*, which sum would be somewhat exceeded. Other special works are also projected, such as Corporation pews and stained-glass windows, but it was hoped that the choir would be open for worship in the spring. The usual resolutions were adopted.

Experiments with Acids on Stone.—At a recent meeting of the Manchester Literary and Philosophical Society, Dr. R. Angus Smith, F.R.S., said that he, like others, had observed that the particles of stone most liable to be in long contact with rain from town atmospheres, in England at least, were most subject to decay. Believing the acid to be the cause, he supposed that the endurance of a silicious stone might be somewhat measured by measuring its resistance to acids. He proposed, therefore, to use stronger solutions, and thus to approach to the action of long periods of time. He tried a few experiments, and he says with promising results.

A "Right of Way" Question.—A communication was raised in the parish of St. Michael, Cornhill, last week, from an attempt on the part of the trustees of the parish, to raise a strong barrier across a part of St. Michael's-alley, with a view to obstruct a disputed "right of way." Resistance of a similar nature, says the *City Press*, was brought to bear, each party having forty to fifty workmen engaged in the struggle, mostly bricklayers and carpenters. On an application to the City inspector of pavements, he had a detachment of the City police brought on the ground, and they stopped violence.

Rotterdam.—It seems likely that a new town will be built on the other side of the river. The Rotterdam Commercial Company (with a capital of fifteen millions) offers to buy grounds on the other side of the river to the extent of 4,000,000 acres, and to pay for them a sum of 2,600,000 florins.

The Proposed New Metropolitan Water Supply.—It appears that the proposed Colne Valley Waterworks, for obtaining a supply of water from Bushey, near Watford, for the North London district, was brought forward some twenty years ago, when it was defeated by the New River Company. The present proposal, which involves the sinking of wells at Bushey, and which will be submitted to Parliament next session, is for supplying the district of Harrow, Stanmore, Edgware, Hendon, Kingsbury, Willesden, Elstree, Aldenham, and the surrounding locality.

Industrial and Fine-arts Treasures Exhibition at Wigan.—The opening of the new infirmary premises at Wigan, which have been erected at a cost of nearly 30,000*l.* is to be celebrated at Easter by an exhibition on rather an extensive scale. The inhabitants of this part of the country are making great efforts in connexion with the undertaking, having already raised, by voluntary subscriptions, nearly 25,000*l.* An industrial section, to include machinery in motion, is also being formed. A special exhibition of coal-cutting machines is talked of.

The Site for the Municipal Buildings, Leicester.—A meeting of the municipal buildings committee, consisting of the whole council, was held last week in the town library. A long discussion took place as to whether the municipal buildings or the sewerage of the town be first gone on with, and it was ultimately decided, by a majority of 25 to 18 votes, to sell the Friar Lane site, and proceed at once with the erection of municipal buildings on the Cattle Market site. What has become of the competition designs?

Wall-Painting in St. Martin's, Birmingham.—An interesting discovery has been made in the course of the removal of the chancel-walls at St. Martin's Church, Birmingham, namely, a wall-painting of St. Martin, the patron saint of the church. The saint is mounted on horse-back, and is in the act of dividing his cloak between two beggars; the legend peculiarly associated with his name. The painting was found upon the chancel-wall, near one of the side windows. The period is believed to be early in the reign of Richard II.

Gratifying, if correct.—The medical officer of the Westminster Board of Works says, in his annual report (the sixteenth),—"From the vigilance that is exercised by your sanitary inspectors in constantly visiting the dwellings of the poor, I am at once informed of any infringement of the Act relating to overcrowding, and I am happy in being able to inform you that during the past year the cases have been so few as hardly to render it necessary to refer to them in this report."

Indian Views at the Society of Arts.—The lecture-room of the Society of Arts has been crowded by an interested audience, attracted by a series of views of Indian temples, idols, and illustrations of every-day life, exhibited by means of the magic lantern. The photographic views, which have been taken by Captain Lyon, late of the 86th regiment, during a stay of six years in India, include, it is said, every type of note in the great Indian empire.

Discovery of a Painting in St. Joseph's, Axbridge.—During the repairs to the roof of the ancient church of St. Joseph, Axbridge, some lead had to be replaced, and underneath, to support the old lead, two perfect paintings of St. Paul and Zacharias were discovered. Some hedge-carver had divided the panels, upon which the paintings appear in excellent preservation, into three parts, and had then nailed them to the lead. The paintings appear to have been done in or about the fifteenth century.

Reading Architectural and Archaeological Society.—The opening meeting of the season was held on Wednesday evening, the 4th inst., at the Athol-nunn. An address was delivered by the newly-elected president, Mr. Joseph Morris, after which a paper was read by Mr. C. Holmes upon "Mechanical Appliances considered as Building Improvements." Captain Kennedy and Mr. Clapton C. Rolfe have been elected members of the Society.

The Shaft at Leavesden.—The chimney-shaft at the Leavesden Schools was blown down during the recent heavy gale of wind. The bricks fell on the roof of the boys' playground, and destroyed it. A correspondent thinks some explanation is needed.

Fall of a Factory in Bristol.—A serious affair has occurred in the vicinity of the Great Western Railway Terminals at Bristol, in the sudden fall of the roof and three floors of the great factory just erected by Messrs. Brock & Bruce, builders and contractors, for their own workmen. The circumstances are so peculiar that we hope to be able to obtain some further information on the subject before we say more about it.

Fire at a Chapel in Tewkesbury.—On Sunday before last a fire broke out in the Independent Chapel, Tewkesbury. The stove in the class-room, in the front part of the chapel, had become heated and had set fire to the wood-work. The fire was subdued by the active exertions of those who had assembled in response to the crier's bell, and who were fortunate in having a good supply of water near at hand.

Surveyor for the County of Montgomery. A correspondent states that Mr. Sweetenham, of the firm of Powell & Sweetenham, of Newtown, has been elected. About fifty candidates sent in testimonials. Another correspondent forwards a letter for publication which would subject us to an action for libel on the part of the Board.

Winchester Cathedral.—In the recent gale the parapet of the east end (south side) fell, and very seriously damaged the roof of the southern aisle of the choir, the lead being crushed and beaten into holes, and even the massive rafters were in two or three cases snapped. The repairs are being executed under the eye of Mr. John Colson, the cathedral architect.

An Exportation of Labourers.—The largest sale of land ever made to one person has just been effected by Gen. Carr to Mr. G. Grant, of London. The land is said to consist of seventy square miles, adjoining the territory of the Kansas Pacific Railroad, and will be let out in farms to labourers who will emigrate from England next spring. We are sorry to hear it.

The Albert Gold Medal of the Society of Arts.—The Prince of Wales, as president of the Society of Arts, has presented to Mr. Henry Bessemer the Albert Gold Medal, for his eminent services in developing the manufacture of steel.

Female School of Art in Bavaria.—We are glad to hear that a plan has been arranged with the sanction of the king for establishing a school of art and industry in Bavaria for female students.

Local Boards' Engineers.—The West Ham Local Board, London, have unanimously granted their engineer the privilege of private practice in addition to a salary of 500*l.* per annum.

Ely.—At a meeting held on Wednesday last, Mr. R. Reynolds Rowe, F.S.A., of Cambridge, was unanimously appointed to the office of surveyor to the Dean and Chapter.

Horfield Barracks, Bristol.—We hear that the plans have been adopted for the enlargement of Horfield Barracks, and that the works will be almost immediately begun.

Salisbury Cathedral is being provided with an efficient supply of water, and hydrants are being erected for use in case of fire.

TENDERS

For road-making and drainage works, at Shepherd's Bush, for the British Land Company, Limited.—

Ames	42,850 0 0
Chamberlayn, Bros.	1,614 0 0
Harris	1,460 0 0
Bloomfield	1,487 0 0
Haynes	1,420 0 0
Jackson	1,400 0 0
J. & S. Williams (accepted)	1,300 0 0
Neave & Son (too late)	1,250 0 0

For business premises, at Penge, for Mr. F. Andrews, Messrs. Spalding & Knight, architects. Quantities by Mr. Fleetwood:—

Brass	21,837 0 0
Carter & Son	1,832 0 0
Scribner & White	1,784 0 0
Temple & Forster	1,790 0 0
Dowds & Co.	1,786 0 0
Nightingale	1,757 0 0
Tokeville	1,747 0 0
Hughesdon (too late)	1,675 0 0
Oskenden	1,625 0 0
Boye	1,624 0 0
Archer (too late)	1,682 0 0
Saul	1,549 0 0

For Danish Chapel, King-street, Poplar. Mr. John W. Morris, architect:—

Sheffield	£799 0 0
Abraham	799 0 0
Mark	758 0 0
Watts	750 0 0
Atherton & Latta (accepted)	725 0 0

For proposed alterations at Abney Chapel, Stoke Newington, Messrs. Tarring & Son, architects. Including extra cost of pitch-pine for joiners' work and iron ornamental castings:—

Hayworth	£1,442 10 0
Shurmer	1,369 0 0
Stalves & South	1,357 0 0
Richards	1,168 0 0
Stevensou	1,165 0 0
Brindley	1,127 0 0
Linfield	1,105 0 0
Wagner	1,044 0 0

For fitting up the Free Library, borough of South Shields, with pitch-pine book-cases, counters, &c., and altering and extending lavatory, w.c., &c. Mr. Matthew Hall, borough surveyor:—

Library Fittings, Lavatory, &c.	
Suddards	£224 298
Chapman	257
Scott & Co.	250 120
Nichol	235 118
Parsons	213 88*
Fishburn	209 105
Harwood	183* 110
* Accepted.	

For pulling down and rebuilding carriage factory, at Paddington, for Mr. Wm. Miller. Mr. Edward Monson, jun., architect:—

Harris, Bro.	£1,155 0 0
Hatten	875 0 0
Snoesam	820 0 0
Parsons	725 0 0
Preedy & Son	698 0 0
Temple & Forster (accepted)	647 10 0

TO CORRESPONDENTS.

Cast Sheet Lead (a correspondent wishes to be informed the price of cast-sheet lead one and two centuries ago)—J. W. M.—G.—R. Y.—B. R. T.—L. H. I.—N. S. T. B. R.—T. H.—S.—S. T.—B. J.—T.—G. A.—G. W.—H. O. R.—O. E. A.—H. & Son.—An Architect.—T. P.—J. L. H.—J. P.—F. K. S.—W. J. B.—J. R. G.—R. C.—List. O. (we will be heart from him)—S. O. B. (see our last number)—E. D. (enclosed, having appeared elsewhere)—E. (ditto) we will have nothing to do with "circles"—W. & Sons (next week)—Mr. N. (ditto)—G. W. B. (ditto).

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

Notes.—The responsibility of signed articles, and papers read at public meetings, rests of course with the authors.

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The Builder.

VOL. XXX.—No. 1560.

Sculpture, Criticism, and Record.*



E owe to German writers the best works on Greek art. The enthusiasm with which the German mind throws itself into special branches of pursuit is extraordinary. The advantage to be derived from the principle of subdivision of labour, or of specialisation of pursuit, is nowhere more distinctly manifest than in the monographs and detailed studies that we owe to the literature of Germany. Thus we may find men to whom all that possesses any genuine or overmastering interest, as a matter of contemplation, is contained in the brief period of a century and a half, or at the utmost two centuries, of which the era of Pericles forms the central portion; and while the literature of this time is familiar to them, even to the position of an accent, it is only as illustrative of one art,—of the great Attic school of sculpture,—that they care even for classical literature.

It is thus that we have attained an insight into much of the inner spirit of the art of Greece at which we might otherwise yet have been far from arriving. At the same time, we have to deal with a difficulty, and to suggest a caution—Greek can be translated into German with far greater ease, elegance, and precision than into English, but the result is still a translation. So the most elaborate view of Grecian art to which we can refer is yet a German view. It is not purely Greek. It may, we do not deny, take a loftier standpoint; but it is not the classic standpoint. German art-writers see things in ancient art which,—we do not say are not there in truth, but which,—were not intended or comprehended by Greek artists. Again, they do not see things which those artists did see,—or, rather, feel.

For here lies the secret of the difference. The Greek was a sensuous artist; the German is an intellectual critic. While the first had a vision or an inspiration of beauty, which he clothed, he hardly knew how, in a material raiment of marble or of bronze, the latter seeks to analyse the method by which the former instinctively wrought. Not only so, but he is only too liable to suggest some predominant influence as ruling over the studio, of which the sculptor had no notion whatever. Thus the latest German writer who has had his very beautiful essays on sculpture translated into the English language, imports his own political opinions into Greece, and sees them reflected from the marbles of the Parthenon. It was the spirit of freedom, he thinks, that produced the excellence of Greek sculpture. This is a thoroughly Northern idea. Those who are most familiar with the population

and the habits of Southern Europe best know its extreme divergence from fact. That the finest period of sculpture coincided with a time when Greek society was in a state of seething transition is no doubt true. But from the petty and mischievous disputes of the former, the artist held ever apart. Thriving most, in all periods, under the beneficent protection of some great prince, whether he were called Pericles or Alexander, Cosmo or Leo, art has for the most part shrunk and withered when politics have absorbed the public mind. In Greece we know that there were artists who lived in extreme poverty, while devoting their whole soul to some noble triumph of their art; just as there were philosophers, who descended to servile toil in order to gain that daily bread which would support a life mainly devoted to speculative thought. Thus Herr Lübke enters the temple of Greek art somewhat by climbing over the wall, instead of approaching by the proper avenue.

The history of sculpture, indeed, is a subject too vast and grand,—we will not say to be attempted, *inter alia*, by one man,—but certainly to be comprised, in any but a very imperfect manner, within the limits of two such volumes as these, which do much credit to the enterprise of Messrs. Smith, Elder, & Co.

Thus the introduction, and the account of Indian, Egyptian, and Assyrian sculpture, are all contained within fifty-seven pages. Not only is a space so limited entirely disproportioned to the geographical province reviewed, but it is so small as to preclude that species of technical investigation which ought properly to precede any philosophical attempt to appreciate Greek sculpture. The direct influence of the long-established traditions of Egyptian art is, we think, undervalued. The great Nilotic people had one strong characteristic in common with the younger Semitic tribes,—that is to say, horror of change. Permanence was an attribute of the divine nature. Innovation, therefore, was sinful, and a cause of misery. With the Aryan people, on the contrary, novelty has always been the chief charm. It is thus that we find the periods of highest excellence in Greek sculpture to have been so brief and ephemeral. The greatest pupil of the greatest master was not content to follow that master's footsteps. Even from Phidias to Polyctetus there is a wide step. But while acknowledging a mental constitution which caused art to spring up like a flower, to blossom into the utmost glory, rapidly to transform itself, to wither, and to decay; we must still bear in mind the long ages through which the elder people, from whom the sacred fire was really caught, toiled with unshrinking diligence. And even in the very severity of Egyptian sculpture are to be traced the phenomena of growth, of over-growth, and of decay, although they have occupied millenniums instead of decades. Herr Lübke does not recognise the great decline that took place under, and down to, the Ptolemies, or appreciate the wonderful grandeur with which the works of the great eighteenth dynasty illustrate the golden period of Egyptian art. The subject had better have been altogether omitted, than treated of in a chapter in which the author evidently thinks each word a mere waste of time, until he arrives at the shores of Greece.

We wish to exhaust our objections to a work at which it is impossible to look without admiration, or to peruse without sympathy and delight. The real motive of the book is Greek art. To this, however, only 272 pages, out of the whole work are devoted. The result is, that justice is hardly done to any part of the subject. This is more especially to be noted in the crowded sequences of individual names. A man need not be thoroughly familiar with the whole encyclopædia of artists at all to follow the writer in many places. The indication of a name may often be quite enough for a student; but for an ordinary reader, it is a mere hieroglyphic. When we add

to this, that references are almost entirely absent, except to one or two books which are themselves of an encyclopædic nature, it will be seen that a great deal has to be done before a history of sculpture, worthy of the title, is forthcoming.

In some places we are left in doubt whether it is the author or the translator who is altogether at sea. Thus we are told that "Glancus, of Chios, is said to have devised the art of soldering iron, about the beginning of the seventh century." As no such art is known to the metallurgy of the present day, we are left in some doubt as to what is meant. "The ancients," continues the author, "justly attached great importance to this advance in technical skill, which at once undoubtedly was applied to the working in bronze." It is evident that the translator here is not to be alone blamed. We concluded at first that the word "solder" had been used in technical unacquaintance with the subject, instead of the word "weld." But as this is inapplicable to bronze, it is difficult to read the riddle. Hammered work, cast work, and the peculiar qualities of iron and of the alloys of copper, are regulated by principles so different, that it is impossible for an author to write intelligently as to sculpture in metal without some elementary knowledge of the procedures of the forge and the foundry.

It is unsafe to allow a popular and easy translation of a work on a technical subject to leave the press without the proof-sheets having passed under the eye of a classical scholar,—we might, indeed, add, of a master of English composition. The passages are numerous in which we are left in doubt, as we have said, whether it is the author or the translator who is to blame. Some points seem to depend exclusively on the latter. Such are the irregular modes of spelling adopted. Some words, Greek, indeed, in their source, but familiar to English literature as introduced through a Latin medium, and as spelt in all English classics in the Latin form, are made to assume a quasi-Greek dress. Such are *Peirous* and *Peirichous*. At times we are introduced to an old acquaintance in such a form as to be almost utterly unrecognisable, as in the instance of *Gæo Curotrophus*. On the other hand, the Greek name of the Goddess of Victory is hardly to be recognised when we read of the Temple of *Nice*. Both this word and others, such, for instance, as the architectural term "*metope*," are used indifferently in the singular and the plural. Sometimes the meaning which the words convey must be the opposite to that which the writer had in view. Thus, when we read, "This more vigorous position corresponds letter with a champion goddess, as the people styled her, than the calm bearing of a *Promachus*," it seems that the writer is unaware of the fact that a *Promachus* is a champion. One of the most unpardonable of these blunders is to be found in p. 160 of vol. i., which speaks of "the parting of Orpheus from Eurydice after he has seduced her into the lower regions." It is with fear and trembling that we proceed in a work in which we stumble upon revelations like these.

Apart, however, from the account which the author has to regulate with the translator, we take definite issue with Dr. Lübke upon some important points of artistic criticism. We select those on which we are able to speak, not as a mere matter of difference of opinion, but as guided by those exact laws of Grecian sculpture which an English writer has recently wrought out into complete and demonstrated system. We may, indeed, take exception to such expressions as "Bronze, however, is less adapted to ideal figures." No evidence is offered in support of an assertion which such artists as Benvenuto Cellini would certainly have directly contradicted, and for which no reason is adduced. But we entirely disagree with the notice given of one of the most perfect and admirable bronze

* History of Sculpture, from the Earliest Ages to the Present Time. By Dr. Wilhelm Lübke. Smith, Elder, & Co. 1872.

figures in the world, the "Wearied Mercury" of the Museum of Naples. This figure is highly naturalistic in its treatment, while the closely-cropped curling hair, and the deformity, common now to the races of the Magna-Grecian blood, of large up-pricked ears, date it as post-Alexandrine. But the main character of the statue,—its absolute motive,—is the breathless, panting exhaustion, which is evident, not in the face alone, but in the pose of the entire figure, and in the perfectly consistent relaxation of the entire muscular fabric. The photograph of this beautiful figure, which is to be obtained at the Museo Borbonico, is a very inferior production. But the woodcut in the "History of Sculpture" fails to give the slightest idea of the subject. The expressions, "the head is slightly bent forward, with an intelligent expression of countenance," and "it presents a fresh picture of elastic youth, resigning itself to a moment's easy repose after preceding effort," show that the critic has altogether missed the motive of one of the most wonderful pieces of pathognomic expression within the range of antique art.

Again, under the head of the Attic School, and within the period "from the freedom of Athens to the death of Alexander," we find a criticism on the marble now in the Louvre, known by the inappropriate name of Apollo Saurictonis. It is merely the figure of a boy about to transfix a lizard running on a tree. If the name of any member of the Pantheon is to be ascribed to the slight youthful figure, it is that of Cupid, not of Apollo, of whom it presents neither lineament nor attribute. The confusion of the ordinary lizard of Southern Europe with the python connected with the oracular Sun-god, is not new; but it should not be repeated by any critical writer. But, what is of more importance is, that the actual proportions of the figure, when reduced to a tabular form, betray its late date, and are perceptibly faulty; the length from the forehead to the nipple of the breast being much in excess of that proper to the pure Greek scale. Nor is this a disproportion that is likely to have crept in by the slovenly copying of an originally symmetric figure.

In speaking of Praxiteles, the Correggio of sculpture, in connexion with a work that shows the influence of Lysippus on a declining art, the critic attributes to that sculptor the magnificent Cupid at the British Museum, to which we have, on a previous occasion, called attention, with reference to the faulty restoration of the left foot. From the spot where it was found, from the marble, and from the style of the work, there is every reason to attribute this exquisite relic to Phidias. The very low relief in which the belt, or rather ribbon, that suspended the quiver is indicated across the bust of the figure, is enough to show that it is not from the chisel of Praxiteles. Mention is made of, although scant justice is done to, the Cupid of Centocelle, now in the Vatican, which is one of the most beautiful relics of the purest Greek art in existence. There is a east of this Cupid at the Crystal Palace, and an even more perfect representation of it is furnished by the beautiful photograph of the Berlin Photographic Company. As clearly as any artistic fact can be proved, in the absence of a direct pedigree, this figure is a copy of the famous Cupid of Praxiteles, which that sculptor prized above all his other works. It is worthy of such an estimation. There exists in the Museum of Naples the broken figure of a Psyche, parts of which have been sawn off (no doubt after the fracture of the statue in consequence of being thrown from its pedestal by an earthquake), which is a fit companion for this Cupid. It speaks highly for the taste which has presided over the collection of sculpture at the Crystal Palace, that the casts of these two precious relics are thus brought together in the court.

It is evident, however, that a very popular, a very instructive, and a very charming book may be written on sculpture by an author who is not in the very foremost rank of criticism. And such is, no doubt, the case. The illustrations are not of the first merit, but they are passably good. Altogether the work is one calculated to become a great popular favourite, and to turn the attention of the reading public towards that noble art for the full development of which our climate is not the most favourable. We can hardly blame Herr Lübke for his unacquaintance with English sculpture (or with sculpture in England, which is not altogether the same matter), owing to the fact that no works exist on which he might have based his acquaintance with the subject. And yet to write a history of sculpture in which the name of

Flaxman is almost the only one which belongs to English art, is something like writing a history of Europe in which the existence of the United Provinces is ignored. Among "modern sculptors, from Bernini to Canova," it is strange to find no mention of the artist of whom Flaxman was the pupil and the godson; whose "Newton" was considered by Canova the finest work in the country,—a man whose brief career influenced his successors so powerfully as that of Roubillac. Again, Bacon has left a name not to be omitted; and Westmacott should not be passed over. In short, there is a chapter of art of no mean significance which is entirely ignored by the German critic. For this there can be no excuse. But it remains an opprobrium to the art-literature of this country that no competent work exists which catalogues, to say nothing of critically appreciating, our historic monumental sculpture. Not only in our two metropolitan *campi santi* of the abbey and of the cathedral, in the well-known precincts of the Temple, and in many a time-honoured site that is not ecclesiastical, exist some monuments of artistic merit, and others of great historic value; but throughout the country, scattered wide if not thick, are to be found portrait statues, the faithful delineation of which would illustrate at once the history of sculpture and the history of England. The bronze monuments of Westminster Abbey alone afford materials for a most instructive chapter. The mortuary chapel of the Dukes of Bedford, at Chenies, Bucks, contains beautiful effigies of the Tudor times, as well as relics of crusading date. In the church of Great Bedwyn, Wilts, is a statue of Sir John Seymour, the grandfather of Edward VI, which is remarkable, not only for its heraldic enrichment, but for depicting a phase in the series of modifications by which mail passed into plate-armour, which is of great interest and value. We might pass from county to county (even as we did a year or two back with reference to the stained glass of early date) and constantly light upon monuments of greater or less importance. It is extremely desirable that an index of all effigies now existing in the churches and cathedrals of England should be compiled. With every year that elapses, the task will become more difficult properly to execute. For with every year the work of church repair and restoration is extended. And in how many instances a cruel and ignorant neglect, or a still more cruel and ignorant attempt to smarten up and restore ancient monumental effigies, is dilapidating irrevocable records of the past. The index completed, the work of the illustrator should commence. This is one of the subjects which is admirably adapted for photographic representation. Photographs of marble sculpture are more truthful and more beautiful than those of any other objects. Even the distortion which occurs is, to a certain extent, within the reach of calculation to avoid, or, at least, to estimate. A work of this kind would be truly national. It is to be regretted that the attempt made by the Society of Antiquaries to commence such a task has not called forth a more worthy response. But the scope and range of that effort were not sufficiently wide. The work should be exhaustively undertaken. There are, of course, monuments of a high character, and others of very low merit. But we ought to have a list of all. It is never certain how much light may be thrown on any branch of study by a single fact, however simple, when once arranged in its proper place. A headless, cross-legged effigy, in an obscure village churchyard, may furnish to the historian or to the genealogist the very clue of which he is in search. It ill becomes a nation which calls itself civilised to be without one national and reliable account of either its public monuments or its historic effigies.

We shall do good service to those of our readers who feel an interest in Greek art if we take this opportunity of mentioning a subject which, though not directly applicable to sculpture, yet is illustrative of the art. One single specimen of what may be called easel-painting among the antique masters is known to exist. It is called the Muse of Cortona, and is preserved in that city. What we have to mention with reference to it is, that a very good engraving of it is to be found in the Italian periodical called *L'Arte in Italia*, for the year 1870, a work which publishes many beautiful illustrations. Physiognomically speaking, the pointed form of the upper lip is not correct for a Muse. But the face is one of rare beauty. The treatment is thoroughly sculptural, and our appreciation of the range of Greek art is enhanced by the study of the engraving.

SANITARY SCIENCE AND STATISTICS IN IRELAND.

If with the advance of sanitary opinion and knowledge corporate and public action kept pace, Ireland in general, and its capital in particular, might be congratulated on some progression. Within the last two years, and notably within the last twelve months, the sanitary question has been receiving more than the customary attention accorded to it in the sister kingdom. Throughout the provinces, in several places where local matters are attended to, or supposed to be attended to, by the town commissioners, there appears to be yet a lamentable amount of ignorance on the part of officials as to their precise duties, and an indifference as to whether this necessary knowledge is acquired or not. Between sanitary inspectors of Local Boards on the one hand, and relieving officers of Poor-law unions on the other, matters are either continually clashing, or remain in a state of neglect. When neither town commissioners nor Poor-law guardians will take the trouble of informing themselves of their duties, we need not wonder at the curious decisions given sometimes by the magistrates at petty sessions, the said magistrates curiously enough being often both guardians and town commissioners. Despite the existing middle, we are glad to bear evidence to the growing desire to manage things better in various quarters of the island. No country has suffered more terribly for the criminal neglect of its corporate and local bodies than has Ireland within the last five-and-twenty years. Epidemics have visited Ireland with as startling a constancy and accuracy as eclipses. They have been almost periodic every ten years during the present century, and the probability exists that Ireland will soon feel the effect of another visitation, which, though it may not be possible to entirely prevent, yet it might be robbed of its severity by timely precautions. In matters of this kind we would rather that events would prove us to be false prophets than otherwise, for we have no desire to witness a spectacle that all honest hearts must mourn, though they at the same time must censure the administration that rendered such spectacle almost inevitable.

In the month of May last some professional men and other citizens met together in Dublin to consider what steps should be taken to improve its deplorable sanitary condition. The corporation previously were repeatedly appealed to, on behalf of the citizens, to perform their obvious duties, but the corporation was too intent on promoting political or partizan objects, or projecting sinister Bills for Parliamentary powers, all tending to harden the city, benefit private individuals, and eventually to end in smoke. After some deliberation on the part of the individuals who convened the meeting to consider the sanitary state of Dublin, an association was formed, called "The Dublin Sanitary Association," with the following objects:—"First, to create an educated public opinion in regard to sanitary matters in general. Secondly, to direct attention to those points in which the existing powers for the maintenance of the sanitary condition of the city are either not duly exercised or are inadequate, or in which the machinery at the disposal of the sanitary authorities is insufficient. Thirdly, to watch the course of sanitary legislation on behalf of the public. Fourthly, to form a body in whom the public may have confidence, and through whom they may, if necessary, act." A prospectus, setting forth these objects, was issued, inviting at the same time the sympathy and assistance of the citizens. Now, all these objects were undeniably good, and pressing, and the endeavour to effect them was most commendable. The association was founded, appointed its own officers, and performed the voluntary work of sanitary inspection by the aid of its own officers or members, and has been the means of leading, since its formation up to the present, to some reform.

At a general meeting of the Dublin Sanitary Association, held recently, the working committee brought up their report, giving a detail of the labours of the Association since its formation in May. It appears that the committee from time to time furnished weekly reports of inspection of nuisances to the Public Health Committee of the Corporation. The Corporation were ready enough to avail themselves of the assistance of the Sanitary Association, but pleaded their usual excuse, inability to financially assist the Association in any way, although the volunteer body were actually carry-

ing on a course of sanitary inspection at their own cost and loss of time that the Corporation itself should have performed. The Public Health Committee admits there are in the city more than 1,000 houses unfit for habitation in their present state, also many houses deprived of the means of drainage owing to their defective construction. The Public Health Committee of the Corporation found to add that the Corporation maintain in five districts of the city five monstrous aggregations of filth, or manure and sewage deposits. These depôts of manure have been for a length of time chronic institutions with the local authorities, and are retained for the purpose of coining money. In keeping this filthy manure in the heart of the city for sale, the Corporation is at the same time killing the inhabitants. How can the Corporation of Dublin consistently proceed against individuals retaining filth or manure in their back yards, when they show such a bad example to the citizens?

From our own knowledge of the city, we can safely say that, instead of 1,000 houses unfit for habitation, the number might be safely tripled; and instead of extending neglect on the plea that the houses are badly constructed, which, no doubt, many of them are, the defect is more for lack of proper drainage in the city than in construction. If a proper system of town-drainage existed, house-drains could soon be provided, and their outfall procured.

Dr. Grimshaw, at the meeting of the Sanitary Association, holdly said that certain houses in the city were dens of fever. He traced, some time ago, himself, 1,825 cases to these haunts of fever, and found that a large number of them originated from a small number of houses, 125 houses having furnished 517 cases. These were all on the south side of the city. During the last fifteen years Dr. Grimshaw, who is a practicing Dublin physician, found that there had been admitted into two city hospitals 42,534 cases of fever, and this number was exclusive of the fever statistics of the *Mater Misericordie*, Stevens' Hospital, the Meath Hospital, St. Patrick Dun's Hospital, and the Baginbun-street Hospital. Fifteen hundred citizens of Dublin died of small-pox alone, which is one of the most easily preventible of diseases. There are few sensible men who will not agree with Dr. Grimshaw when he says, "The greater portion of the disease that we have amongst us is preventible, and has arisen from directly violating the laws of God."

Notwithstanding the terrible exposure which the report of the Dublin Sanitary Association, as well as the proceedings of their general meeting, have given of the management of the city, the corporation has nothing but excuses to make on the one hand, and promises by indicating the teach the science of health by inculcating the laws for the prevention of disease, instead of the laws of the cure, was at one time considered heresy, and is still adjudged such in more than one quarter of the British islands. *Preventive medicine before curative*. If it be a schism to preach this doctrine, it is a glorious schism to die in defence of. Let Ireland be inoculated with this schism, let it be the lymph of her sanitary vaccination, and her posterity will rejoice in their strength. Be it remembered at the same time that sanitary education, like scholastic, if it will not be accepted where it is necessary for the interest of the commonwealth, must be made compulsory, until it takes root in the habits of the people and the mind of the age.

TECHNICAL EDUCATION AT THE CRYSTAL PALACE.

MUCH has been spoken and written of late years concerning the contrast presented between the United Kingdom and different countries of Western Europe, little Switzerland inclusive, regarding the means provided for technical instruction, but comparatively little has been done as yet in the way of remedying the defect. True, there are the Royal School of Mines in Jermyn-street, the Royal School of Naval Architecture at South Kensington, the Department of applied Sciences at King's College, a Department of Civil and Mechanical Engineering at University College, London, and engineering classes in the Universities of Edinburgh, Glasgow, and Dublin, at Queen's College, Cork, and Queen's College, Manchester; but none of these "chairs" or provisions have the rank or capabilities of the Continental *Écoles Polytechniques*, and are only fit, if they can do as much, to qualify students to enter such Institutions. The lectures and text-

books of the English schools may be unexceptionable, but to practical as well as theoretical technical instruction and training they make no pretension.

It is gratifying to know that a really practical school of mechanical engineering, available for London and the districts near it, is about to be opened under the auspices of the Crystal Palace Company at Sydenham. Last week a number of gentlemen were invited to the Palace to inspect the drawing-offices, pattern and fitting shops, smith's shop, foundry, &c., that have been fitted for the use of the students. These shops are on three floors at the base of the south tower, with the exception of the smith's shop and foundry, which are to the north of the tower, and on the ground immediately adjoining. The tower is practically circular, and 48 ft. in diameter. The smith's shop and foundry has a furnace suitable for such comparatively small castings as will be undertaken; for smithy purposes it is furnished with two smiths' fires and two anvils. The basement of the tower will be used for stores, and the first-floor for engine-fitting, principal's office, timekeeper's box, and so on. The machine tools, which have been specially designed and ordered for the shop, include shaping, planing, slotting, drilling, and other machines, with three lathes, and a beam engine to supply the necessary power. The second floor is of the same dimensions of course, but divided across the centre, one half being for pattern-making, turning, and wood-working generally; the other half being a drawing-office. The third floor is also divided across the centre, and one half devoted to the lecture-theatre; the other half being intended for a mess-room, for such of the students as may wish to use it. It need scarcely be said that benches with vices for metal work, and benches for sawing, planing, and working wood, are supplied in the respective shops, which, being glass all round, have abundance of light, and are in other respects well adapted for the uses to which they are to be applied.

It is intended to divide the year into three terms of fifteen weeks each, and that the students should devote one term of the course to the study and practice of mechanical drawing, one to pattern-making and foundry work, and the third to fitting and smith's work. In the drawing-office the students will be employed in making drawings of machinery and constructions from sketches; in tracing and getting out quantities and estimates; and in calculating the strength of materials. In the pattern-shops they will be engaged in preparing patterns or models of engines or machinery. In the fitting-shop they will fit and erect engines of from 3 to 6-horse power, or in other work suitable for the market. In the smith's shop and foundry they will forge and mould and make small castings. Examination by eminent engineers will be held at the end of each term, and certificates will be granted to such students as have attained the requisite degree of proficiency. In case of students not having obtained the three certificates at the end of the course, they may remain as students on payment of a proportionate premium for each, or any, of the departments in which they may have failed. Lectures on engineering subjects will be delivered twice a week; the students are expected to take notes of these lectures, and will be required to work out examples from them between the date of one lecture and the next; they will also be examined upon the subjects of the lectures at the close of each term. Lists showing the students' order of merit will be exhibited. The hours of work will be from 10 a.m. to 1 p.m., and from 2 p.m. to 5 p.m., except on Saturdays, when the school will be closed at 1 p.m. A sufficiently rigid degree of discipline will be maintained. On entering students will be required to see that their names are inscribed in the attendance register. Those who enter late will be required to pass through the principal's room, and to explain the cause of their irregularity. Application must be made to the principal for leave of absence, or for permission to write a letter during school-hours, or to do anything out of the regular course of institution work. Inattention and misconduct, if they should be chargeable, will expose the student to work after hours, and to restriction for such time as may be determined. A warning-bell gives fifteen minutes' margin to clean and put away instruments and tools, cover up drawings, and clean and arrange machines and benches ready for inspection, which takes place before the bell rings for closing.

Mr. J. W. Wilson, associate of the Institute of

Civil Engineers, is principal of the school, and will have under him a competent superintendent for the several departments. In Mr. Wilson the students will have the advantage of a teacher who can not only tell them in perspicuous language how and why a thing can and should be done, but one who can also show them how to do it. Mr. F. K. J. Shenton, superintendent of the School of Art; and Mr. Grove, the accomplished joint manager and secretary of the Crystal Palace, have devoted their best energies to this new enterprise, which is, in this country at least, as yet, *stui generis*, and which ought to prove a great success.

WATER-BEARING STRATA.

The late Mr. Samuel Hughes wrote a treatise on waterworks for "Weale's Series" of rudimentary books, of which there is now a new edition.* A work which shall fully describe the whole practice of supplying towns with water must be of greater magnitude than this one; but in so far as the water-bearing strata are treated of, and the machinery for and cost of pumping water from them go, this is a tolerably complete little work. The nature of springs is fully elucidated, which requires a constant reference to the science of geology; but in the short notice we can give of Mr. Hughes's book, we must pass over this part of it and proceed to consider the water-bearing strata in order downwards from the surface,—downwards, that is to say, in geological order of precession. Water is everywhere found in the drift gravel and superficial sands, in quantities sufficient for individual wants, but not for the supply of towns. In the open and comparatively uninhabited country, the water from shallow wells is often of sufficiently good quality for domestic use, but it never is so in or near a town, even if the quantity obtainable were sufficient. It is to strata at considerable depth that attention must be turned for a supply of water. These are often overlaid with impermeable ground, and have their outcrop at considerable distance from and height above any probable place where a well would be required for the supply of a town. In such a case the clay or other impermeable ground being penetrated, the water rises in the well or borehole, sometimes to or above the surface, and more often to within some short distance of it. The name of Artesian is given to such a well, from the success with which the great well at Grenelle, in the French province of Artois, was sunk, where the water rose many feet above the surface.

The first water-bearing strata arrived at after passing through the London clay are the tertiary sands, which overlie the chalk. These have their outcrop at considerable height along the edge of the basin, and in some cases yield large quantities of water. For instance, in the valley of the Wandle there are about fifteen or twenty artesian wells, which yield a daily supply of from 800,000 to 1,200,000 gallons from the tertiary sands; and in the valley of the Lea, from twenty to thirty such wells yield from 120,000 to 200,000 gallons per day. There are few instances of a single well yielding more than 100,000 gallons per day from these sands.

The chalk, which underlies these tertiary beds, yields large quantities of water. On passing through the chalk, a bed of marl is arrived at, which, in general, holds up the chalk-water, and prevents it penetrating the "upper green sand" which lies immediately below it. The upper green sand yields a few springs in the district west of a line from Farnham to Petersfield, but in general it does not yield much water. Selborne is situated on the upper green sand, west of Woolmer Forest. The wells at Selborne are said to average about 63 ft. in depth. "When sunk to this depth, they seldom fail, but produce a fine limpid water, soft to the taste, and much commended by those who drink the pure element, but does not lather well with soap" (quoting from White's History of Selborne).

The gault clay, which lies immediately under the green sand, overlies the "lower green sand," a famous water-bearing stratum. The common mode of procuring water for towns situated on the gault, is by sinking through it into the lower green sand. When a boring is thus made the water generally rises nearly to the surface, and sometimes overflows it. Wells and borings through the gault are common at Cambridge,

* Waterworks for the Supply of Cities and Towns. By Samuel Hughes, F.G.S., Civil Engineer. Lockwood & Co. 1872.

Higgleswade, Shefford, and all the line of flat clay country through Leighton Buzzard into Wiltshire.

A considerable number of towns are situated either on the lower green sand, or in such contiguity to it that this formation may not improbably, says the author, be resorted to for a supply of water, either now or at some future time, amongst which he mentions St. Neots, Potton, Higgleswade, Bedford, Shefford, Buckingham, Fenny Stratford, Leighton Buzzard, Aylesbury, Thame, Oxford, and Abingdon. Similarly situated are the towns of Wellington, Chard, Fomton, Arminster, Sidmouth, Colyton, Axmouth, and Charnmouth. Mr. Prestwick has been led by experiments to suppose that each cubic foot of the lower green sand is capable of absorbing two gallons of water.

Below this water-bearing stratum lies the Wealden clay, and below that the jurassic or oolitic series of alternately porous and impermeable beds, which circumstance gives rise to innumerable springs all over the oolitic country.

Passing through the oolite, and the lias which underlies it, we arrive at the Trias, or new red sandstone formation, the upper part of which consists of clayey beds; but in the lower or more arenaceous part large quantities of water are found, as at Liverpool, Birkenhead, St. Helen's, Birmingham, and Coventry.

Below the new red sandstone lies the Permian series, or the magnesian limestone, into which wells are sunk at Sunderland.

Below this formation we come to the old and tilted rocks, from which but little water is derived; but from their elevated surfaces large quantities of water are caught in reservoirs, and supplied to towns by gravitation. The millstone grit and the mountain limestone, as well as the still older slate rocks of the Silurian and Cambrian formations, shed water for the use of neighbouring towns. The millstone grit itself has scarcely any towns situate upon it, but is very important, especially in Lancashire and Yorkshire, as furnishing the drainage area which supplies water to several of the principal towns in the kingdom by gravitation. Lancaster, Preston, Liverpool, Manchester, Stockport, Bradford, Leeds, and many other towns, are all supplied from the united springs and surface water of the great millstone grit formation.

Mr. Hughes proceeds to well describe the means of pumping water out of these water-bearing strata and the cost of it, and here ends the originality of the book; but he quotes the recognised authorities on the gauging of rivers and streams and the flow of water through pipes. As there is nothing new in these, however, we had better refer the reader to the original writers whom the author quotes.—Coulomb, Prony, Du Buat, Bossut, Comptet, Dr. Matthew Young (and Dr. Thomas Young), Girard, Wollmann, Panck, and Brunning; Eytelwein and Weisbach; Dr. Hutton, Mr. Beardmore, Mr. Blackwell, Mr. Neville, and M.M. Poncelot and Leshros; also M. D'Aubuisson and M. Genieys. These are authorities on the flow and conveyance of water. Mr. Hughes is rather an authority on where it is to be found, and how to raise it to the surface, for the use of towns.

PADDINGTON BATHS AND WASH-HOUSES COMPETITION.

WHEN the parish of Paddington rightly determined to have a proper establishment of baths and wash-houses, the Commissioners who were appointed took pains to obtain information on the subject from other localities, and came to the conclusion to invite not less than six, nor more than ten, architects to submit plans, and to offer premiums of 100*l.*, 75*l.*, and 50*l.*, for the best, second-best, and third-best designs. The instructions to architects included stipulations,—

"That the Commissioners shall be the judges, and shall decide as to the respective merits of the plans sent in, and shall determine as to whom the prizes (premiums) heretofore mentioned shall be awarded; and their decision shall be final, and without appeal therefrom.

"That the successful competitor shall, if required, carry out the works for a payment of 600*l.*, exclusive of the amount awarded as prize-money, but he is not to be entitled to any prize or payment whatever, unless a substantial contractor will undertake the work at a price not more than 10*l.* per cent. above his estimate of the cost, which estimate must be sent with the plans.

The payment of the sum of 600*l.* shall include all travelling expenses and attendances, and the supply of all plans, working drawings, sections, &c. that may be required. All plans of the successful competitor are to be the property of the Commissioners."

"Every part of the building is to be of the plainest design, consistent with the same being thoroughly substantial and suitable for the purpose required.

The architect is to provide for all gas, water, and drainage; for all necessary steam-engines, boilers, and machinery, wringing and drying apparatus, tanks, mains, and fittings, and the delivery over of the building in a complete state, with all engines, boilers, machinery, apparatus, tanks, mains, and fittings in good working order. The Commissioners will appoint and pay a clerk of the works until the completion of the building, who will act under the Commissioners and the architect.

The Commissioners (if they decide on taking out the quantities) are to approve of the surveyor selected to take out the same, and the scale of payment. The party employed is being responsible to the contractor for the accuracy of his quantities.

Accommodation to be provided for—a Board-room, superintendent's office, two day-rooms for superintendent, four bedrooms, a kitchen and a scullery, and a residence for engineer, next to or over the wash-houses.

Three Swimming-baths.—One first-class men's, 90 ft. by 40 ft.; depth, 5 ft. 6 in. to 3 ft. 6 in. One second-class men's, 70 ft. by 30 ft.; depth, 5 ft. to 3 ft. 6 in. One third-class men's, 70 ft. by 30 ft.; depth, 5 ft. to 3 ft. 6 in. Reserve space for a women's bath, 45 ft. by 24 ft.

Single Baths.—23 men's first-class, 64 men's second-class, 10 women's first-class, 12 women's second-class, waiting-rooms for each class of baths.

Hot-water.—Provide 70 compartments for washers, with two troughs in each, supplied with steam. Sufficient drying apparatus. Sufficient wringing apparatus. Sufficient mangling apparatus."

No amount was named, so that competitors worked somewhat in the dark. But the amount of remuneration offered to the architect who carried out the design, 700*l.*, seems to point to about 14,000*l.*, as so respectably a parish as Paddington would scarcely propose less than the ordinary rate of payment to its architect, especially when that architect had run the risk of getting nothing at all for a considerable expenditure of skill, time, and money.

A certain number of architects were then invited, and the following is a list of those who competed, in the order of the estimates accompanying the designs:—

Mr. H. H. Collins, "Non quis sed quid,"	230,000
Mr. C. Eales, "O,"	30,000
Mr. Saunders, "Little Dulci,"	24,000
Mr. Wilkinson, "Ippissima Conditiones,"	23,238
Mr. Edw. Roberts, "Utility and Economy,"	22,354
Mr. Gundry, "Nator,"	20,000
Mr. Lewis II. Isaacs, "Courthope,"	20,000
Mr. Bridgman, "Cleanliness, Convenience, Comfort,"	19,500

Of these, two put themselves out of court by inattention to the instructions.—Mr. Eales (who is well acquainted with the subject, and submitted a plan well deserving consideration), by adopting a smaller scale than that stipulated; and Mr. Gundry, by not sending his drawings until the morning after the date named for receiving them, and the estimate and particulars later still. The Commissioners, therefore, had only six to deal with, and from these they selected, in double quick time, the design by Mr. Isaacs for the first premium, as we mentioned in our last number; that of Mr. Collins for the second; and Mr. Bridgman's for the third.

An entirely different view of the problem to be solved has been taken by the architects to whom the first and second premiums respectively have been awarded, one having sought to straighten the accommodation as much as possible, compatibly with the instructions (in some cases, probably, it may be found, scarcely meeting them), and the other making it his endeavour to produce a complete establishment, with something like a monumental character. Some expressions in a report made by a sub-committee of the Commissioners might perhaps be taken to justify this latter view.

Modern Italian is the style used by all the competitors except Mr. Edward Roberts, who has adopted and modified the Gothic style, producing therewith a very satisfactory result; the back-front, though simple and inexpensive, is especially agreeable. We must commend, too, his plan, which seems well calculated for economical working,—a matter of considerable consequence, in the long run.

Without wishing to cast the slightest slur upon the Commissioners, who seem to have desired to act in a fair and proper manner, we must express regret that they did not call in professional assistance, and give a longer time than was spent in the consideration of the designs, before coming to a decision. Even now such assistance would be useful.

Considering the time and thought which the competitors have bestowed upon the work, we venture further to submit that the Commissioners would set a good example if they were to advise the payment of a fee to each of the unsuccessful, in part payment of the expenses incurred.

Sir,—I have had a glance at these plans, but not sufficient to enable me to do more than express astonishment that the Commissioners should have ventured (I had almost written dared) to determine in a few hours what any professional man, however skilled, would have taken at least as many days to have decided upon. As the first premium was awarded to a design of which the estimate

is 20,000*l.*, and the second to one of 30,000*l.*, it cannot be assumed that the price had anything to do with the decision; but the result of the matter will be watched with interest, because the "instructions" are most explicit as to the execution of the works for the sum estimated plus 10 per cent. What will the Commissioners do if the tenders for No. 1 should exceed the stipulated amount, or if it should be found that the building when erected is not complete? Will the miserable 3 per cent. commission (which is all that is offered as to No. 1, or 2 per cent. on No. 2) be withheld, or will the architect of No. 1 be called upon to pay the expense of the "quantities" if the tenders be unreasonably above his estimate? But I presume that the premiated designs have been paid for, and there the matter ends for a time. The Commissioners should take counsel of some surveyors, who should examine the whole of the designs, and when they have given a rough report of the probabilities of expenditure, then the Commissioners should call in an experienced, unbiased architect (which they should have done at first) to guide them, inexperienced as they are, in the selection of a design such as they desired,—plain, cheap, and useful.

A PARISHIONER.

THE SCHOOL BOARD NEW BUILDINGS AND THE VESTRIES.

AT the meeting of the London School Board last week, the Statistical Committee presented a long and elaborate report in answer to the charges brought against them by several of the metropolitan vestries, to the effect that they are extravagantly and unnecessarily spending large sums of money in the erection of new schools, and also in the proposed new offices on the Thames Embankment.

The committee endeavour to show that there is no foundation for such charges, and that so far as regards the expenditure in the erection of new schools, it is obligatory upon them under the provisions of the Education Act. They state that the Board has satisfied itself, from a house-to-house inquiry, that provision is needed for 104,000 children over and above that afforded by existing schools, and that the schools in course of being built and to be erected will not provide for the education of more than that number. As regards the Board's new offices about to be built on the Thames Embankment, the committee remark that it is only owing to the courtesy of the corporation that the Board have been able to hold their public meetings during the last two years in the Guildhall, and that they cannot expect to have the accommodation much longer extended to them; and they add that the two houses in New Bridge-street which they rent from the corporation up to Christmas of next year, are at the present moment entirely inadequate for the business of the Board.

With reference to the site, which has been objected to as unnecessarily expensive from its situation, the committee contend that as the School Board represents the whole of the metropolis the offices must necessarily be in some central spot, easily accessible by rail, not only to members of the Board, but also to all those who have business to transact; and that the site which the Board has selected is less costly than several others in a central position which had been examined. The committee further state that instead of the cost of the building amounting to 80,000*l.*, as has been asserted by some of the vestries, they have reasons to believe that it will not cost one-fourth of that sum. The committee also state in their report that the new arrangement made by the Board in July last in the architect's department in reference to the planning of the new schools, will have the effect, during the next two years, of saving upwards of 20,000*l.* The report of the committee was affirmed by the Board.

ON THE ART OF PAINTING.

MONSIEUR CAPEL (popularised by "Lothair") has recently delivered a lecture on the "Art of Painting." In the course of his observations he said:—Long discussions had taken place as to whether painting held the first place in the Fine Arts; but, be that as it might, one thing they must be convinced of—that painting represents more truly than spoken language all that is associated with what he might call universal language. Since the division of tongues, we were obliged to learn the languages of different peoples in order to communicate with them; but it was otherwise with painting. The Turk, the Creek, the Italian, the Spaniard, the German, the Frenchman, the Englishman, all looked upon a picture, and to all it spoke the same language. Not only did painting differ from language in its universality, but it delineated with much more precision everything that was to be said upon canvas than it could be said by language. There was no written or spoken de-

scription, however minute, that could possibly be so graphic as that produced by the pencil of the painter. While it was a precise language it was a detailed one. The whole art of painting, and the study of painting, as such, must necessarily be associated with our outward sense of sight, and with our inward feelings, using the word in its broad sense. Painting had distinct elements which would constitute the interest in examining pictures. They had commonly heard persons in a picture gallery, stopping before some subject or portrait familiar to themselves, exclaim "How wonderfully like this is." That was what painters was external to himself. But that mere imitation of what was to be found in the outer world did not constitute that which was embodied in the idea of fine art. Yet they must not entirely reject the mere imitation itself, but while examining what was mere imitation they must cultivate a facility of comparison of the thing represented with the representation before them. It was difficult for those who lived under western skies and European civilisation, and who were familiar with a wet climate, to realise what was meant by the burning sky, the clear atmosphere, and the strange costume of those who lived in the East. Their duty as to that, therefore, was not only to observe, but to extend their own personal knowledge by reading and inquiring about the countries and peoples of whom they knew nothing. Under the general head of Imitation must be included landscape painting. All art began with imitation, but when man began to study nature, and the mind developed itself, there came what might be called the second element in art. It was no longer the mere reproduction of the object the painter saw, for he thought he could always see in his object a defect, and thought there was some object of beauty beyond that. There was in his mind, under such circumstances, not man as he saw him, but man with his imperfections removed. So in like manner with landscape. They would remark that the productions of the ideal had two elements in it—the object upon which the mind rested, and also the mind of the painter; and these two combined produced a third element which took its character from them. This was so striking that in all master of ideal pictures the early associations of the painters' lives would invariably rest.

LEPERS' WINDOWS.

TEMPLE CHURCH, BRISTOL.

MR. NICHOLLS, of the Bristol City Library, writes, with reference to works now going on at Temple Church, in that city;—There is a small niche or window under the large east window of the chancel. Another and larger one exists, also walled up, under the east window of the weavers' chapel. It has been matter of great conjecture what purpose these windows could have served. They were not for use; the larger windows gave already, if anything, too much light. They were not for ornament, that is tolerably certain, for they must have been a perpetual eyesore to any educated eye that chanced to see them, which, perhaps, was but rarely, as they were at the end of the church that was seldom visited outside, and, being behind the altar, they would scarcely be seen at all by the worshippers within. A few days since I met with a statement that a certain church had a grated "lepers' window" at the east end, and I immediately thought of these inscrutable windows in the Temple Church of Bristol. I have visited, and, through the kindness of the vicar, closely examined them, and am satisfied that both these windows were constructed for the purpose of giving to persons outside in the churchyard a view of the altar and the elevation of the Host,—in short, that these were "lepers' windows," giving to those miserable an opportunity of joining in the worship in this obscure corner of the churchyard, which they were by law forbidden to do in the great congregation. Of all the churches in Bristol that of the Holy Cross would have been the one selected for such a means of grace to a class so terribly afflicted, for there can be little doubt that the Crusaders brought the loathsome disease from the East into this country. There were several hospitals for lepers in Bristol and its suburbs; one of these we know for a certainty was on the west side of Redcliff-hill, just two furlongs through the gardens from Temple Church. The sill of each of these windows is about 5 ft. from

the ancient level of the outer ground: hence a person standing outside would look up and with ease see the action of the priest, and have a good view at the back of the altar. Each window had a grating, but there is this singularity in connexion with the larger one in the weavers' chapel, that it had, it seems to me, an inner as well as an outer grating. But whatever the inner bars might have been, whether window or grating, the horizontal bars were about an inch higher than those on the outside, so that they did not interfere with the line of sight from a person in the churchyard who wished to observe the ceremony at the altar. Had they been level these bars would have been a great obstruction to the view. The window in the weavers' chapel is larger than that in the chancel, and its filling in may be plainly seen from the inside. The fair inference is that during the interim between the building of the church and the erection of the weavers' chapel, the increase in number of the afflicted demanded more room. The fact, too, that the chancel overlapped the chapel, thus giving a retired, solitary corner, where curious eyes could not annoy the sufferers, or they themselves be a nuisance to others, may have had somewhat to do with an increased attendance, and created the necessity for the later window to be the larger of the two.

THE LATE MR. R. P. BROWNE.

We have to record the decease of Mr. Robert Palmer Browne, architect, which took place suddenly at his residence, Royal-place, Royal-hill, Greenwich, on Tuesday last, the 17th instant. The immediate cause of death was disease of the heart. Mr. Browne, who was, we believe, in his seventieth year, was originally intended for the Bar, and did not receive any regular training for the profession he afterwards adopted. He enjoyed for many years an extensive practice, and was remarkable for the scrupulous care he bestowed upon his architectural works. He erected several private residences, and had only just completed, at the time of his death, an extensive mansion,—"Redleaf," near Farningham,—for Mr. Hills. He built the wharf belonging to the General Steam Navigation Company at London Bridge, Greenwich Workhouse, and other buildings. He was for many years district surveyor for Greenwich, but resigned that appointment a short time since. He was also surveyor to Huggons's Almshouses, Northfleet. He was a man of varied accomplishments, including music, and will be greatly regretted by all who enjoyed his acquaintance. Mr. Browne was unmarried.

BRICKWORK AND MASONRY IN IRELAND.

The president of the Institute of Architects of Ireland said, at the close of his address, of which we printed the earlier portion recently:—We, the architects of Dublin, occupy a most unfortunate position. When we proceed to have our designs carried out (presuming that both architect and employer have got beyond the compo stage), this difficulty at once arises, and has to be got over as best it can,—we have neither bricks nor bricklayers, we have neither good stone nor good stonecutters. This is, perhaps, a startling statement, and one which at first sight does not command ready assent; but a little steady and unprejudiced reflection will, I think, show you that it is only too true. As regards the bricks, there can be no second opinion. If we want good facing bricks, we import them; but the art of laying them is lost. If you will look out a really good specimen of brickwork in the city, you will find that it is 100 years old. The fact is, our bricklayers have become demoralised by the bestial and pernicious system of wiggling down the fronts of our brick buildings, and naturally so. It is his and his employer's interest to expend as few bricks as possible in facing a given surface, and to make his mortar-joints as wide as possible; and when the whole face is raddled over, and the joints are filled in with brick-coloured mortar, and nice neat white lines are drawn upon them, who is to be the wiser? And to this vile and utterly abominable practice we do architects have been consenting parties. I do hope that, having had your attention called to it, you will consign wiggling to the same limbo as stucco and all other such pretensions and tamable devices, and use your best endeavours to get external brickwork so done as to bear inspection, without any after patching and

cobbling. As regards stone and stone-cutting, my thoughts were principally directed to our granite. Of its utter failure in durability our buildings give painful proof. It is a most worthless stone; and, in giving this opinion, I include the Wicklow stone, which is so generally used by us. There is granite of fine quality at Dalkey and Kingstown, but it is used only locally. I only know one building in this city where Dalkey granite is used, and there the difference between it and the Wicklow stone, which is used in the same building, is most striking. The stone commonly used is not merely bad in itself, but, from its peculiar friability, it has led inevitably to slop-work; arrises are anything but sharp, mouldings are merely approximated to, and the whole surface is left mealy and stunted. Compare the material and workmanship of the granite wall of the Thames Embankment with the enclosure wall of Trinity College, and it will be evident to any one that there is reason for saying that, as far as granite is concerned, we have neither stone nor stonecutters. At our opening meeting last year Mr. Harte, county surveyor for Donegal, exhibited to us some specimens of red granite from Donegal. I understand that the quarries there of red and grey granite are about to be worked on an extensive scale by a limited liability company; and as the cost of water-carriage from Donegal would not exceed, and probably would not equal, the cost of land-carriage from Wicklow, it is worth our consideration whether it would not pay, not to mention other advantages, to use it in preference to the granite we are now using.

THE NORTHERN ARCHITECTURAL ASSOCIATION.

The ordinary quarterly meeting of the members of the Northern Architectural Association was held at the Old Castle on the 19th inst. Mr. T. C. Ebdy in the chair. Mr. M. Thompson was re-elected president, Mr. Ebdy vice-president, Mr. J. Hogg treasurer, Mr. Thos. Oliver hon. sec., Mr. G. W. Hodge hon. solicitor, Messrs. F. Charlton, J. Johnston, F. R. Wilson, W. Henman, W. J. Shotton, E. Thornhill, Geo. Connel, T. Reay, and Sept. Oswald the committee.

Mr. Oliver, the secretary, read a paper on "The Newcastle Town Moor Schemes." He referred to the various schemes which have been before the town for improving the moor, and spoke in terms of praise of Mr. Hancock's first scheme. He (Mr. Oliver) maintained that it was better to build in a sanitary way upon open spaces, than to have such spaces for generations unsewered and undrained in the neighbourhood of a large town.

RECKLESSNESS OF WORKING MEN IN REGARD TO ACCIDENTS.

If the coroners' black lists of deaths of workmen occasioned chiefly by their own carelessness and indifference to life and limb were published in the newspapers it would be a startling record; but it is only occasionally that London editors can find space for a report of a fatal accident. The workman, however, know it, as when a man killed leaves a family, a subscription goes round amongst his mates to help the widow and to bury her husband.

London house-painters are, perhaps, as a class the greatest sufferers from building accidents, and this too frequently arises from little masters not providing safe scaffolding or sound ladders.

Still, builders, architects, clerks of the works, and foremen may lavish capital, care, and skill on insuring, as far as human power can do so, the safety of the workmen, and all will be of no avail when the men themselves break rules and set danger at defiance. The pipe and the glass have much to answer for in cases of accident, and in none more so than in mining disasters. A coroner's recent investigation in the north of England, by which no fewer than thirty-four lives were in question, disclosed the reckless indifference of men in pits. The "Morley Mine" was, from its immunities from serious disasters, looked upon as a safe pit, and both masters and pitmen seemed to consider they dared do anything. The blow came at last, and need it be wondered at? The evidence showed that gas was allowed to accumulate; all preventives were set at naught; gunpowder was constantly used for blasting; naked lights were burnt; and the miners smoked, struck matches,

and forged keys to unlock their safety-lamps. In the pockets of those who were killed at Morley Main Colliery, there were found tobacco, lucifers, and vesuvians. When such conduct as this is carried on, neither laws nor rules are of avail against accidents.

THE BUILDINGS AND WORKS IN THE METROPOLITAN BOARD'S AREA.

IMPORTANT STATISTICS.

At the meeting of the Metropolitan Board of Works last week, Mr. Dresser Rogers, chairman of the finance committee, in bringing up the estimates required for the ensuing year, made some interesting statistical statements in reference to the property under the control of the Board, and the works which had been effected by it. He stated that the Board represented a population of 3,266,987 persons, and that there were at the present time 419,642 houses in the metropolis under their charge. There were 416,511 householders within their district, and the present area over which they had administration was 75,490 acres. The area of taxation over which their precepts took effect, was 117 square miles; the rateable value of the property 20,367,281. and a penny rate over the whole of the metropolis at the present time amounted to 81,8687. 11s. 10d. The total length of sewers in the main drainage system completed was 82 miles; the total length of local sewers constructed by vestries and district Boards since 1856, and sanctioned by that Board, was about 700 miles. He further stated that the Board had now determined to take charge of the embankments, which would cost about 3,0007. a year, and that various other open spaces had also been brought within the Board's care during the present year. They had also paid during the past year for the land fringing Victoria Park, which had been thrown into the park at a cost of 20,5507., but that as the Government had taken upon themselves the care of the land, the Board was relieved from any further charge in the matter. He added that the Board had incurred liabilities during the past session of Parliament for the carrying out of improvements, which would entail a gross capital expenditure of 2,500,0007., or a net expenditure of 2,000,0007.

THE NEW BRIDGE AT PETERBOROUGH

On Friday, the 13th instant, the new bridge from the designs of Mr. John Fowler, C.E., obtained for the town by the joint subscriptions of the counties of Huntingdon, Northampton, and the Liberty of Peterborough, was formally opened. The structure is Gothic in character. It consists mainly of three arches, two of 35 ft. and one of 70 ft. span, supported on four cast-iron columns, each of 3 ft. diameter, and terminating in abutments of cement concrete, faced with asblar.

Projecting from the girders are cast-iron cantilevers, carrying the footway and parapet. The bridge is 30 ft. wide and 150 ft. long, and from the Huntingdon side of the river Nene is approached by a bank and retaining walls, some 210 ft. in length, from the designs of the county surveyors.

The cylinders were sunk by excavation and the use of caulkedge, and an old road, upwards of 3 ft. thick, was met with in their descent to the rock foundations; also some good examples of coin of the time of Charles II. were found, and some date stones, which point to the tenth and seventeenth centuries, as the probable date of the origin and restoration of the old bridge, now removed.

The works have taken some nine months to complete, but have been much retarded and disturbed by the excessive floods during the late summer and autumn. They were carried out under the inspection of the surveyors, Messrs. Law & Hutchinson, by Messrs. Handyside & Co., Derby, and under the immediate supervision of Mr. Woulf Brennan, the resident engineer. Mr. Thackeray, of Huntingdon, was the contractor for the masonry and brickwork.

Purchase of the Dublin Gas Works by the Corporation.—The works, plant, and business of the Alliance Gas Company have passed into the hands of the Dublin Corporation, which body, from the 1st of July next, will be gas-makers for the city.

ANCIENT STONES NEAR STORNOWAY.

The stone circles at Calhornish are comparatively little known. A writer in the *Standard*, who has recently visited them, says:—"At Calhornish the Druidical enclosures are two in number, the first and more important, a group of forty-three venerable pillars ranged in a cruciform manner, with a circle at the point of intersection. In the very centre of this circle stands an altar-stone, beneath which is a tank of heath granite that one can scarcely help supposing was once a receptacle for the blood of the victims slain. So far as I could calculate, the long limb of the cross extends north and south 600 ft., the transverse line 200 ft. Half a mile away to the west, on an eminence nearer by some four hundred yards to the waters of the loch, is another group of these same inscrutable obelisks, disposed, I think, into two concentric circles, but much less distinct in their arrangement, and much more deeply imbedded in moss. Within a space of several miles round these immemorial remains are cairns and monumental stones innumerable. Were the circles themselves places of the old Pagan Celtic worship, and the outlying districts the burial-ground of priests and warriors? Curiously enough *cleichen* is the Gaelic for stones,—such stones as those of Calhornish, Stornis, in the Orkney Islands, and Stonehenge; still more curiously to go to the *cleichen* is the Gaelic vernacular for going to church. The stones of Calhornish were in all probability erected where they now stand long ere the moss deposit had commenced, and this, according to the calculation of competent scientific authorities, who can see in the different layers of the velvet parasite the signs of centuries past and fled, must have been at least two thousand years ago."

QUERY AND ANSWER.

SHALL we have pills or paving stones?

Shall we have drugs or drains?

Shall we have air or stifling moons,

And poison'd hearts, and aching bones,

Or homes without these pains?

Is prevention better than cure?

Illness better than health?

Shall we battle, or still endure,

And fain believe our lives secure,

While plague creeps on by stealth?

While doctors differ, let us agree,

To build well, drain, and pave;

Thus we'll stamp out impurity,

And make the poor man's dwelling be,

His home and not his grave?

When we give light and air to man,

Water ample and pure;

Homes fit to live in; then we can

Prove in spite of the world's lan,

PREVENTION IS BETTER THAN CURE.

ROOF COVERINGS.

STB.—I see from your columns that the restoration of Worcester Cathedral has called up the much-debated question of the comparative advantages of slates and lead as the roofing material for large churches. So far as appearance goes, I think there can be no doubt as to the superiority of the latter. The defenders of slates support them on the more tangible grounds of cheapness, convenience, the absence of danger from the "careless plumber," and the like. And there can be as little doubt as to the reason of this marked difference in appearance. It is the broken and jointed appearance of slates that mars them, more especially the unavoidable horizontal divisions. Lead has much fewer joints, and those are all vertical. Will, then, the architects and other professionals pardon a more amateur student of architecture, who knows very little about construction, and generally prefers to judge works of art by their appearance, if he ventures to make a suggestion on this important point? Could not the roofs of large buildings be covered with a kind of cement, which would be without the chief objection to lead roofs,—the "careless plumber,"—and the second objection,—their enormous cost; which would be cheaper at the outset, and would require less frequent repairs, than either lead or slate; which would be lighter, and what is of great consequence, a worse conductor of heat, than either; which could be repaired with the

greatest expedition, and by the simplest means, when it became defective in any point; which would be free from the pettiness of the jointed slate roof, and might be left in one unbroken expanse, or, if it were thought desirable, might receive some vertical divisions, like those which add lightness to the effect of a lead covering; and which might, at the architect's discretion, be made of such a colour as would best harmonize with the tint of the stonework of the building, as slaty blue certainly does not always do. Details of construction and the like I will not venture to speak about, my architectural studies being purely artistical; but, supposing it to be a constructional possibility, I am convinced that, with an appropriate cresting, such a roof would have an effect far better than one of slate, and, at least, as good as a leaden one. To the architects, then, I leave to decide what my suggestion may be worth.

IN STATU PUPILLARI.

BRITISH GOODS SENT ABROAD.

A SUBSCRIBER in Rio de Janeiro (Mr. T. E. Parker), who says he obtained from England a certain wool-working machine, in consequence of a notice of it in our pages, writes to us very strongly to complain of its incompleteness and the want of proper instructions accompanying it. If this paragraph should meet the eye of the manufacturer he will doubtless inquire into the matter. Our correspondent says, at the conclusion of his letter, and there is much truth in the observation,— "If my workshop had been in London instead of Rio de Janeiro, I know perfectly well that I should have had no cause to trouble the *Builder* with any complaint of this sort. And this, a most important matter, should be remembered by all who have an interest in British manufactures. If you will not care or interest yourselves in goods sent to a foreign country, you may depend upon it there will soon be others who will."

LOCAL BOARD'S LIBERALITY.

A CORRESPONDENT writes:—"The 'Standish-with-Laughtree Local Board' have offered by advertisement 207. a year for a 'professional engineer and surveyor to the Board.' I hope you will draw public attention to it, showing the absurdity of such an appointment with such a salary, when I tell you that the population of the district is close upon 4,000; the area, 3,264 acres; the rateable value, 19,5007. yearly; and the length of roads repairable by the Board between ten and eleven miles. The poor engineer and surveyor is to be paid at the rate of 7s. 8½d. per week! What next?"

LADIES' SANITARY ASSOCIATION, MANCHESTER.

THE annual meeting of the Ladies' Sanitary Association was held on the 18th inst., in the Mayor's Parlour, at the Town-hall. The Bishop of Manchester occupied the chair; and amongst the other gentlemen present were Mr. Hugh Birley, M.P., Dr. Crompton, Mr. Alderman Davies, and Dr. Syson.

The Secretary (the Rev. C. Keeling) read the annual report, of which the following is an abstract:—"With increased income, and additional ladies willing to give personal superintendence, the Association had been able to extend their operations and to carry out some of the plans sketched in former reports. Beginning the year with four mission women, the committee felt they were justified in increasing the number to nine directly after the annual meeting. These ladies had been at work throughout the year, and the committee were thankful to be able to say that they had never had any reason to think of retrenchment lest the necessary funds should fail. All of these nine women had been, with two exceptions, permanently located. This was better than the old plan of changing them from district to district, for the work now became permanent, and the good could be followed up. Ladies had also by this means been encouraged to take up a poor town district permanently. The work had been carried on through the whole year in the following districts: St. Michael's, Angel Meadow; St. Oswald's, Collyhurst; St. Matthew's, Campfield; St. Luke's, Chorlton-on-Medlock; St. Silas's, Ardwick; St. George's, Oldham-road; two districts in Salford, suggested

and marked out by the medical officer of health, for nine months in the year in St. Peter's, Oldham-road, for three months in St. John's, and St. Ann's, Deansgate, and Jeakinson-street district, Oxford-road. In all these cases the mission woman had been superintended, and more or less accompanied, by a lady. Domestic teaching of almost every kind was being carried into the homes of the people as heretofore. The disinfecting powder and the medical soap were the keys by which doors and hearts were opened. There were so many irritating and degrading discomforts against which these simple remedies secured them, that the poor were most grateful for the agents' visits, and showed every willingness to profit by their teaching. Large quantities of disinfectants had been distributed, and it had been noticed that the districts in which this had been most done had been unusually free from fevers and similar disorders. Special attention was given by the committee to the districts visited by the Medlock foods. The balance-sheet of the society showed an excess of income over expenditure of 100*l.*, of which, however, 75*l.* was the balance from the previous year. The total donations and subscriptions included in the income amounted to 371*l.* 12*s.* 5*d.*

Mr. Hugh Birley moved the adoption of the report.

Dr. Crompton seconded the motion, which was carried.

Mr. Alderman Davies next moved,—"That this meeting recognises thankfully the extension during the past year of the home sanitary work, and appeals to the ladies of Manchester and Salford for increased support." This was agreed to.

SANITARY MATTERS.

St. George's, Hanover-square.—Dr. Corfield, the new medical officer of health, reports to the local works committee that he has instructed his inspector of nuisances to order the waste-pipes of drinking-water cisterns to be disconnected from the traps and soil-pipes of water-closets, and to be diverted so as to discharge into the open air, either over the surface of the roof or yard, or into a rain-water pipe not connected with a sewer.

Bucks.—A conference of the sanitary authorities of the county of Bucks has been held at the Police court, Aylesbury, to discuss the advisability of combining in the appointment of a medical officer of health under section 10 of the Public Health Act. Delegates were present from Amersham, Buckingham, Newport Pagnell, Winslow, High Wycombe, and Slough, rural; and Aylesbury and Buckingham, urban. Sir Harry Verney, M.P., presided in the absence of the Duke of Buckingham. Mr. J. Henley, Poor-law inspector, said he had called the meeting in pursuance of a requisition received from the Aylesbury Local Board. There were in this county seven urban and seven rural authorities, and fifty-one districts, with each a medical officer. He strongly urged that in order to secure independence, efficiency, and economy, two or more sanitary authorities should combine in the appointment of a medical officer. Oxford and other counties had taken advantage of this part of the section of the Act, and several other counties were about to do so. The Rev. G. Phillimore opposed Mr. Henley's scheme. He thought the object of the Act would be best secured by the appointment of the district medical officers. The combination of districts as suggested by Mr. Henley was negated by nine to eight.

Gloucestershire.—A conference of representatives of the urban and rural sanitary authorities in the county has been held at Gloucester, to discuss the appointment of medical officers under the Public Health Act. Mr. Longe, Poor-law inspector, suggested that the county should be divided into three areas, and a medical officer appointed for each district. The first district comprised the unions of Gloucester, Wheatlanurst, Dursley, Westbury-on-Severn, Newport, Chipping Norton, and Tewkesbury, with a population of 119,000. The second district, Cheltenham, Stroud, Cirencester, Northleach, and Tetbury, with 130,000 inhabitants; and the third district, Clifton, Thornbury, and Chipping Sodbury, with 163,000 inhabitants. Stow-on-the-Wold and Winchcombe unions he proposed to connect with either Shipston-on-Avon unions. He suggested that a medical officer should be paid a salary of 800*l.* per year,

and said he had estimated this would involve a cost of from a farthing to a halfpenny in the pound. Ultimately the following resolution was carried by a small majority:—"That the opinion of one medical officer to superintend the sanitary arrangements of the whole county; and that this opinion be communicated to each union for their consideration."

SCHOOL BOARDS.

London.—The Works Committee received the following tenders for the erection of a school to provide accommodation for 954 children, on the site in Cottonham-road [not the York-road site, of course], Finsbury:—Newman & Mann, 7,249*l.*; B. E. Nightingale, 7,189*l.*; Williams & Son, 7,160*l.*; Wicks, Bangs, & Co., 6,980*l.*; L. H. & R. Roberts, 6,911*l.*; Adamson & Son, 6,911*l.*; D. King & Son, 6,892*l.*; J. High, 6,790*l.*; Patman & Fotheringham, 6,710*l.*; Niblett & Son, 6,630*l.*; Scrivener & White, 6,471*l.* The committee recommended the acceptance of the lowest tender, that of Messrs. Scrivener & White, amounting to 6,471*l.*

North Walsham.—The choice of a plan for the new buildings came before the Board. Mr. Pilson, of Norwich, architect, was present to advise as to the relative merits of the different designs presented. After going through the whole, the difficulty was to decide between the plans numbered six and twelve, which, when the notes explaining the mottoes were opened, proved to be those of Mr. Bottle, of Yarmouth, and Mr. Gaymer, of North Walsham. It should be understood that Mr. Scott, though a member of the Board, acts as honorary clerk, and in this capacity was able to gather from the correspondence he had carried on with the competitors, and from the personal calls which had been made upon him, who the gentlemen were that had sent in plans, and with this knowledge he gave the Board to understand that he should not vote upon the question, and accordingly did not do so. The choice has fallen upon the plan sent in by Mr. Bottle, of Yarmouth.

THE ANCIENT DEFENCES OF SOUTHAMPTON.

At the head of the inlet known as Southampton Water, between its two principal tributaries of the Test or Anton and the Itchen, intervenes a considerable neck or tongue of gravel, which is thus bounded on three sides by water, and is a position of considerable natural strength, and the more valuable that it overlooks a fine roadstead, having the Isle of Wight for its breakwater. By whom this spot was first occupied is unknown. Bittern, an unquestionable Roman station, under the name of Clausentum, is nearly two miles farther up the Itchen, and upon the opposite bank. Even the origin of the present name of the town is a subject of dispute. The "Anton" presents a tempting source, but it seems most probable that the name means simply "the town of the southern dwelling," as opposed to Northam, a place close to the Roman station. Certainly the name has no reference to Northampton.

"Hamfunsire" is mentioned in the Saxon Chronicle in A.D. 755, and the town was a Saxon place of some mark, coining money in the reign of Athelstan, and occasionally plundered by the Danes. Canute held it, and his experiment upon the advancing tide is said to have been tried in Southampton Water.

Southampton is named in Domesday, and the Normans found it a convenient port both for military and commercial purposes. It was visited and maintained by the Plantagenet monarchs, who here mustered and embarked their troops for Normandy. Hence the town was fortified from an early period, both after the Saxon and the Norman fashion.

The walls enclosed a roughly rectangular space, averaging about 370 yards east and west by 770 yards north and south, but in actual circuit about 2,200 yards, or 1½ mile. This area is divided lengthways by the main street, but the western is the larger moiety, partly because it contains the older castle, and partly because of an irregular projection upon what is called the "tin shore." The north and south gates were upon the main street. There was an east and a west gate, but not at all opposite to each other, nor were the roads cruciform. There is no reason for attributing to he moderately rectangular plan a Roman origin.

It was probably dictated by the general figure of the ground.

The surface of the area varies from 15 ft. to 35 ft. above the adjacent sea level. The northern half is higher than the southern, the western than the eastern. The highest ground, therefore, is in the north-west quarter, where was the castle.

In consequence of this, the wall of this quarter, towards the west, is built against a scarped bank, and is a revetment 30 ft. high, whereas elsewhere the wall is built upon ground nearly level, or at best not above 3 ft. or 4 ft. higher on the inner than the outer side. Beyond the castle there is no considerable earthwork, and no reason therefore for attributing the defences of the town proper to a period earlier than the incoming of the Normans.

The earthworks of the castle are, on the contrary, considerable. The naturally high ground was scarped and pared and somewhat raised, and near the centre of the area the highest point was surrounded by a circular ditch, the contents of which, thrown inward, converted the raised platform into an artificial mound. This, beyond doubt, was the Saxon fortress.

The later rectangular area was also well defended. It had the sea for its ditch nearly at the foot of the wall along the west and south fronts. Along the east a broad and deep ditch, wholly artificial, and in part, at least, admitting the sea, ran along the foot of the wall, and divided the town from a strip of lower land, which slopes towards the Itchen, and is now covered by an important suburb. Along the north front a ditch, also artificial, was cut across the ridge; it is said, too, a ditch allowing it to be filled from the sea. As this would involve a depth of about 40 ft., with a corresponding breadth, the tradition is probably an exaggeration.

The north and east walls, least affected by any irregularities of ground, and nearly straight, are in length about 318 and 790 yards. The south and west fronts are curved and broken to suit the ground, and measure about 320 and 650 yards. The south-west angle is largely rounded off. Of recorded gates, there were the north or Bargate, still standing; the east gate, removed; the spur gate, remaining; the south, or water gate, removed; the west gate and the postern, preserved; Biddies, or Brillo's gate, gone; and the castle water-gate, closed up.

The mural towers were chiefly drum, or half-round. The north front is flanked by two drum towers, and west of the Bar is one, and east of it two, half-round. Upon the east wall, north of the east gate, was one; and, south of it, six, of which one remains, half-round, and one rectangular. At the south-east angle, the south wall was prolonged eastwards as a spur tower, covering the ditch; this remains. Upon the south wall there were six towers, including the south flank of the spur gatehouse, and, on the opposite flank, the Bugle tower. All but one are half-round. The west wall had many buttresses, and few towers. There was one where the south wall of the castle joined the town wall; and near the north end is a fine half-round tower,—an addition.

Passing to the details, the north gate, called the "Bar," is a large handsome structure, about 60 ft. broad by 60 ft. deep in the centre. It is of two stages, pierced below by a central and two lateral passages, and contains above a chamber, 52 ft. long by 21 ft. broad, used for public purposes. In each wing is a staircase. That to the east is old, that on the west may have been so. The side passages are modern. They communicate with the central roadway by two cross arches on each side, of which the two next the north are original, and probably led into the flanking towers. An examination of the central passage shows the original gate to have been Late Norman; at least a round-headed portal there placed is probably in that style, though it has rather a Decorated aspect. Then in the Early Decorated time two bold half-round flanking towers were added, and still remain. At this time the rear was probably re-facced, and four windows and a centre niche inserted, and the council-chamber enlarged, and probably the east staircase added. The Norman gatehouse had an upper room, of which a round-headed door, with a foliated head, remains. Next, in the Perpendicular period, a bold projection, three sides of an octagon, was added to the front. The gateway thus advanced is flanked by two bold narrow buttresses, which run up to a very bold corbel table, having six machicolations in the central face, and three in each of the oblique lateral ones. The battlements are good Perpendicular, and carried round the rear towards the town; one embrasure is occupied by an alarm-bell

This gate has been much injured by restorations. The openings to the rear, archways and windows, have been re-faced; but they preserve much of their old type, and have a Decorated aspect. The main passago has been cut away and widened, and the portcullis grooves are gone. When the ditch in front was filled up, a century ago, all trace of the drawbridge was lost.

West of the Bar much of the wall remains, but is so blocked in by houses as to be invisible. Forty-six yards from the gate is the site of a half-round tower, beyond which the wall extends in a straight line to Arundel tower, so called from Sir John Arundel, an early governor. This is a drum, 22 ft. in diameter, which caps the north-east angle of the town. This tower is 50 ft. to 60 ft. high, and seems to rise out of a rectangular mass of masonry, possibly added to strengthen it. Here the internal level is 30 ft. or more above the external, being a part, no doubt, of the old earthworks.

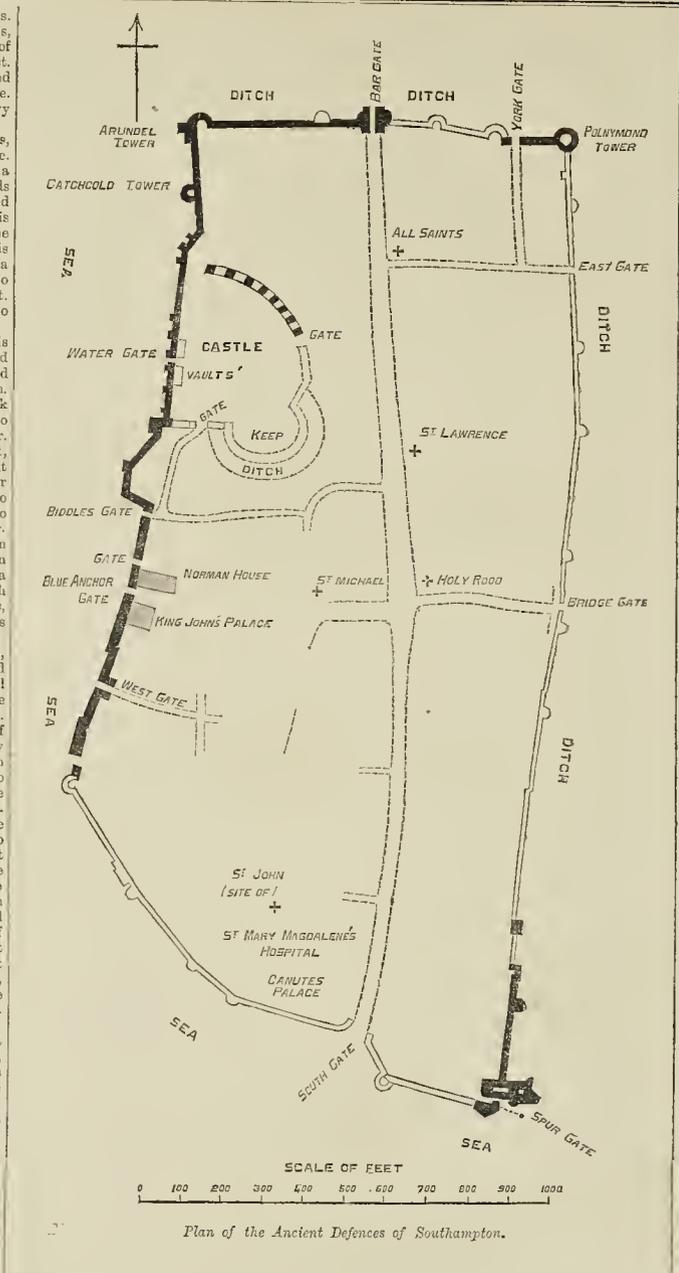
Continuing along the west wall, at 763 yards is a bold half-round tower, 20 ft. diameter, and 30 ft. high, of excellent rough ashlar, with bold machicolations at the level of the adjacent curtain. This is Catchcold Tower. Built against the bank it looks solid, or like a bastion, but it is said to be hollow, though how entered does not appear. This tower, with the adjacent wall for some feet, is apparently a Perpendicular addition to what seems to be a Decorated wall. Beyond the tower is a flight of steps, modern, ascending 30 ft. to the summit of the wall, which is there common to both town and castle. The wall then runs forward obliquely, probably to allow of the inclusion of the earthworks of the castle. It seems in substance Norman. The salient is capped by a rectangular buttress, the hollow angles of which on each side are crossed by low pointed arches, pierced as garderobes, as at Porchester. This buttress tower is of Decorated date.

Then follows about 13½ yards of straight wall, probably Norman, about 38 ft. high, and backed to the summit with earth. Upon it a small rectangular buttress marks the junction of the north wall of the castle with the town-wall. Further on are five rectangular buttresses of various dimensions. The three first are evidently additions upon the Norman wall, the rest seem original. Part of the wall here is divided into two stages by a bold horizontal bead. Below are two narrow windows of about 18 in. opening, resembling large loops, and which seem to have had square heads. Above are traces of two windows, apparently round-topped. There must have been an interior chamber, now closed. The central buttress is broad and flat, and here are traces of the old water-gate of the castle, which must have been reached by steps, the ground behind being above 30 ft. high. Close north of this water-gate is a large vaulted chamber, built against the town-wall, and now closed. This part of the wall ends in a rectangular projection, probably the root of a tower, and marked the junction of the castle south wall with the town-wall.

From hence the wall is low and thin for about 33 yards, marking the end of the castle ditch, and on the rising ground of its counterscarp is the root of another square tower, marking the recommencement of the regular town-wall, which then turns inwards so as to protect Biddles Gate.

This gate, now removed, opened into a steep and rather narrow ascent called Simmel-street, out of which, on the north side, opens Castle-lane, thought to represent an old entrance to the castle.

At Biddles Gate commences a very curious part of the wall, which, as far south as a little beyond Blue Anchor postern, is unlike anything known in England. The original wall, here about 30 ft. high and 4 ft. thick, with the soil nearly level within and without, seems to have served not only for the town-wall, but for the wall of several dwelling-houses within it, the doors and windows of which are visible in the wall, though now closed up. These openings show the wall to have been Norman, and of a moderately early period. This wall was not found sufficiently strong for the purpose of defence, and a second wall, also 4 ft. thick, was built against it on the outside. But this second wall was built like an aqueduct, as an arcade, upon tall and slender piers, about 2 ft. 2 in. broad, from which, at 10 ft. 6 in. high, spring arches mostly semicircular, but some pointed, and two very flat and probably much later, above which was the parapet. The arches are about 12 ft. span. The result was to increase the rampart to a walk of 5 ft., with a



parapet of 2 ft., and probably a rear wall of 1 ft. Of course, an arcade so placed afforded great shelter for those attacking the wall from without; but to obviate this, while the piers touched the wall, a space like that for a portcullis, a chase about 2 ft. broad, was left between the arch and the wall, by means of which any one standing at the base of the wall could effectually be molested with missiles or a long pike. Eighteen arches of this arcade remain. The arrangement is a very curious one, and supposed to be singular. This masque or outer wall may be of late Norman date, but is possibly Early English. The piers interfere much with the earlier doors and windows. The wall where double is 35 ft. high. There are traces of some kind of building outside a part of the wall.

A hole broken through the wall into Blue Anchor-yard, shows the rear of the wall, and a little further south is Blue Anchor postern, an original archway in the wall, much cut about and enlarged, but of which the portcullis chase worked from the battlements, still remains.

From the postern a very steep winding narrow lane leads up into the town, between lines of ancient houses, of which two, one on each side, next the gate, are Norman. Both are curious, but that on the south side especially so. It is the shell of a Norman house, of the age of the older part of the wall. It is called locally King John's Palace, but is in truth an ordinary Norman private house, and a very curious one. The principal room was on the first floor. The roof is gone, but the door and windows remain.

These are coupled, small, round-headed, and divided by a short column, with a slightly sculptured capital. The space within the walls is 45 ft. by 45 ft. There is a good Norman fireplace, with hood and flanking columns. In the south and part of the east wall is a mural gallery. The house on the northern side of the lane is 44 ft. by 15 ft. There is a good view of the town wall, and a plan of the two houses, in Parker's "Domestic Architecture of the Twelfth Century" (p. 34).

South of the postern the wall ceases to be double, and is all of one date, and about 6 ft. thick. In this part is a fatisht rectangular mural buttress tower, much blocked in with houses, but having its south hollow angle crossed by a garderobe. Near this is a high pointed doorway, evidently an insertion, of 2½ ft. opening, leading into Collis-court, and about 60 ft. further is the west gatehouse.

This is a perfect and plain rectangular gatehouse, 30 ft. deep by 24 ft. broad, without buttresses, flush with the wall outside, and of bold projection within. It is pierced by a high pointed vault, of 12 ft. opening. The passage has been a good deal mutilated with a view to widening it. Near the centre was a good recessed doorway, the profile of the head of which is still traceable where it has been roughly cut from the wall. Between this and the inner face are two square porticulis grooves, and just within the inner entrance is a chase, 18 in. broad, over the head of the arch. In the vault, in front of the central door-case, are nine holes, about 4 in. square, three in the crown line, and three along each haunch. These latter converge towards the central line.

The gatehouse has a porticulis chamber on the first floor, and a second floor above this. An open stair against the south side leads to the battlement, from which a door, an insertion, opens into the porticulis chamber. These upper rooms are plastered and papered, and nothing can be seen in them.

South of this gate the wall gradually sinks, and finally has been pulled down and removed. It may be traced as far as the site of a half-round tower, and some remains of an arch. Beyond this, also, the line of the wall may be traced as far as the site of Bugle tower, 180 yards from the west gate, and which caps the south-west angle of the town.

The south wall is almost wholly destroyed, and the foundation either removed or covered up by the broad and handsome quay which now increases between the base of the wall and the sea. This front was more or less convex, or rather polygonal, the angles being capped with drum towers. There are some traces of the south gatehouse. In the rear of this part of the wall are the site of St. Mary Magdalene's Hospital, and in Porter-lane what was called Canute's Palace. A representation of the south gate before 1784 is preserved by Grose. It had a low, broad Edwardian arch, with bold machicolations above, and toward the east it was protected by a long flanking wall, parallel to its approach. It was removed 1830-40.

Forty yards from the south gate was another half-round tower, and thence the wall ran straight east for 83 yards, when it reached the south-east angle of the town. In the rear of this part of the wall, in Winkle-street, is "God's House," a Norman church, now restored very badly, and converted into a French Protestant place of worship.

At the south-east angle of the town, in the end of the east wall, is a gate, called God's House Gate, or South Gate, but which should be called Spur Gate, as it opens upon a work of that class. This gate-house is rectangular, quite plain, and without buttresses, having two upper floors. Its dimensions are 28 ft. broad by 23 ft. deep, and the south end projects as a low salient of two faces, upon the south wall, now removed. The passage is vaulted with a high pointed arch 12 ft. broad. Like the west gate, it had a central recessed doorway, now much cut away, and two porticulis grooves. The vault in front of the door is supported by two, and in rear of it by three, cross-ribs. Altogether in substance this gatehouse resembles that of the west gate, and is of Early Decorated date. Its front may have been rebuilt when the spur tower was added.

The spur work projects from the northern flank of the gate of the gatehouse for about 80 ft. It is composed of a sort of lofty gallery, or curtain, terminating in a rectangular tower, about 22 ft. square, with buttresses capping the two east or outer angles diagonally. It is of three stories,

and is built across the eastern ditch, no doubt to contain and protect its sluice communicating with the sea, which originally flowed up to the wall of the tower. There are seen large arches in the north and east faces, which look as though there had been a passage for boats; but these seem really to have been arches of construction only, intended to throw the weight of the building upon the corners, which probably are more deeply founded than the curtain. In the north face is also a large modern arch, a relic of the canal which was to have been carried beneath the tower. The spur-work and the gatehouse were long used as a Bridewell. All still bear marks of that degrading occupation. The whole spur-work is good Perpendicular. Leland calls this the south gate, and the spur tower the Castellot. Grose gives a view of it about 1770. From the Spur-gate the town wall is tolerably perfect as far as the first half-round tower, 60 yards. From hence the wall may be traced 35 yards to a flat buttress, 14 ft. broad and 3 ft. deep, of which there are some remains. Beyond this, at 37 yards, is the site of a rectangular tower, 30 ft. broad and 24 ft. deep. These two are said to be additions of the time of Edward VI. They look much older.

From hence to the north-east angle of the tower the wall has been pulled down, but its line may be traced, partly by occasional foundations, partly by its materials which have been used in the houses built on its site, and partly by the direction of the lane called "Back of the Wall," which runs along its rear, and by the parallel road which runs along the counterscarp of the ditch, and is called "Canal-walk," from an abortive canal which was carried along the line of the ditch at the commencement of the present century.

The east gate spanned East-street, and was taken down in 1772. Grose gives a drawing of it, and attributes its erection to the year 1330, 13 Ed. III. Between this gate and the north-east angle is one mural half-round tower.

Of Polymound Tower, which caps the north-east angle, there are considerable remains. It is a three-quarter drum tower, about 28 ft. in diameter. From it to the bar, 160 yards, the wall, or part of it, remains, but so clustered with buildings as to be inaccessible to ordinary visitors. Here are remains of two half-round towers, and a breach in the wall, called York Gate, probably representing a postern.

The east ditch is marked by a depression, in part due to the canal. The north ditch is completely obliterated and built over, and its breadth is not recorded, and has not been ascertained by probing. If Hanover-buildings mark its counterscarp, it was 46 yards broad; but if, as is much more probable, its limit is marked by Cold Harbour, it was only 24 yards, which tallies with that along the east front.

THE CASTLE.

The castle was very probably the oldest, and perhaps the only pre-Norman fortification connected with the town. It occupied nearly the whole of the north-western quarter of the walled area, and included also the highest ground. In plan it was a rough semicircle, the chord of 124 yards being the town wall, and the arc measuring about 300 yards. There is, however, also a considerable knoll, on the south-east of the area, of about 45 yards diameter, about half of which lay outside the curved *enceinte*.

This was the keep. Leland calls it the dungeon (*donjon*), and the "glory of the castle." "It is," says he, "both large, fair, and very strong," both by works and by the site of it; and other writers describe it as a lofty mound. As usual, in forming such works, advantage was taken of high ground to make it the base of an artificial mound encircled by a deep and broad ditch. The keep, no doubt a shell of masonry like Arundel, towered above the rest of the works. Of the curved wall of the *enceinte* a part remains to the north. It was built on piers about 8 ft. square and 9 ft. apart, a round-headed arch with a tendency to a point connecting these. The tops of these arches were about 12 ft. above the base of the piers, and upon them rested a wall, which carried the battlement. The arches were buried in a bank of earth about 15 ft. high. This bank has been removed to allow bonnets to be built up to the wall, which now, therefore, stands like a Roman aqueduct. The foundation is excellent, so that this plan was adopted solely to save material and to profit by the older work. The roughness of the masonry shows the height of the haul,

above which the remaining wall rises about 4 ft. It is much to be regretted that this curious piece of Norman wall has been so badly treated. About 90 yards of it remain, including eighteen arches. It stops at the Castle-lane, where was the main gate of the castle, removed at the end of the last century.

The wall, beyond the gate, was continued up the mound to the keep, and beyond it till it reached the southern gate, whence it was continued till it again struck the town-wall. Thus the keep was upon and formed part of the *enceinte*, as was usual. From the south gate, also removed in the last century, a winding road, commenced from the wall, led down to Simnell-street, a few yards within the postern.

Besides these two gates, the castle had a small water-gate in the wall towards the shore, reached probably by a flight of steps or a subterranean passage, as the outlet was so far below the platform of the castle. To the north of this gate is a large subterranean vault, now closed; and, judging from the openings in the wall, there was a corresponding vault to the south. Probably these were connected with the gate.

The whole area of the castle is high, and much of it has been still higher, the mound having been lowered, the ditch partially filled up, and the bank along which the wall was built having been removed.

To judge from the material evidence afforded by an inspection of the works, it would appear that the castle represents the Saxon or Danish earthwork, probably the earliest strong place, and was composed of a truncated mound, its circular ditch, and a bank of earth encircling an area, of which the mound or a moiety of it made part.

The Normans, probably in the reign of Henry I, enclosed the castle and town in a rectangular wall, and dug the east and north ditches. Also the castle was enclosed with a wall built in part on arches, and a shell keep placed on the flat summit of the mound. The wall of the castle, and much of the west wall of the town, and the two houses in Blue Anchor-lane, may be attributed to this period.

Then it became necessary to strengthen the town wall, and this was probably done in the reign of King John, who, it appears, remitted to the citizens 2000. out of their *fac-farm* rents for the enclosure of their town and the thickening of the wall, and perhaps the west and spur gates were begun at that time.

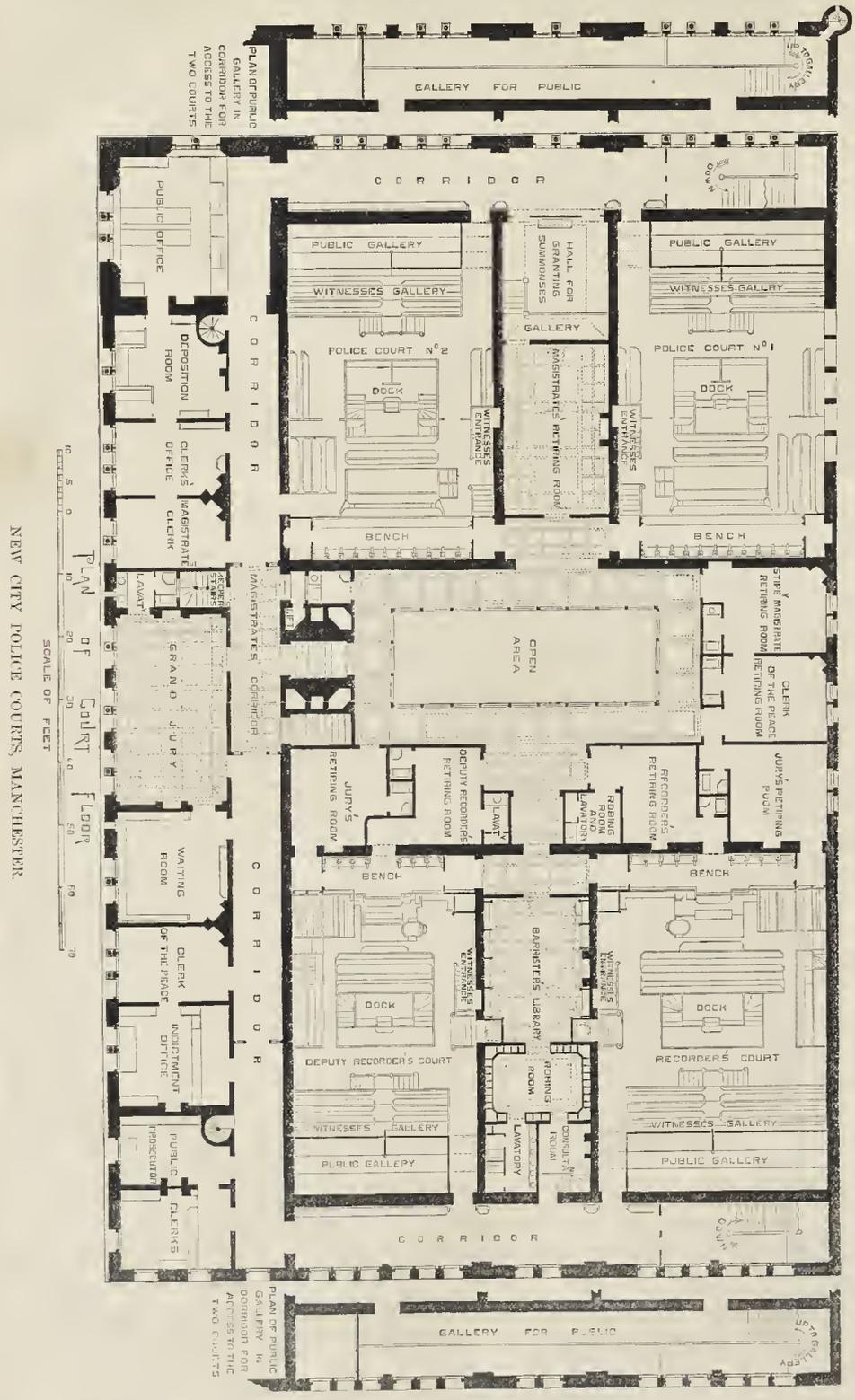
Much must have been done to the fortifications during the reign of Henry III. or Edward I. To this date are probably due the older drum towers and much of the wall connected with them, and the recessing of the Bar-gate and the addition of its flanking towers.

It appears that the town was attacked by pirates and sacked in October, 1338, 12 Ed. ward III, and in consequence it was strengthened in the next year. The south and east gates may have been of this date, and the spur tower and its gallery, unless this latter he, with the completion of the Bar-gate, the work of Richard II. This king seems to have done much to the castle.

The vault indicated on the plan as on the north side of the water-gate is at present wholly under ground, being built against and within the exterior wall, its floor being about the level of the footing of the wall. The vault measures 55 ft. 3 in. north and south, by 19 ft. 6 in. east and west, and is about 25 ft. high. Sir H. Englefield says it has much the air of a chapel. Others call it a guard-room to the water-gate. A chapel would scarcely have stood north and south, and a guard-room, especially so large a one, however necessary for a main gate, would be quite out of place beside a mere postern. The vault was entered a few weeks ago through a long closed-up opening in the west wall, but the writer has been unable to learn what was then observed.

To the south of the water-gate is, or was, a similar vault, indicated by the openings in the wall, one 3 ft. and one 1 ft. from the ground, both long since built up. Probably these two were the substructures of two buildings which formed a part of the exterior wall, and were used for stores or cellars.

It is difficult to speak too highly of the large scale-plan of Southampton executed under Sir H. James, upon which the lines of the old wall, and position of other objects of antiquity, are shown in a manner which leaves nothing to be desired.



Plan of Court Floor NEW CITY POLICE COURTS, MANCHESTER.

SCALE OF FEET

0 10 20 30 40 50 60 70

PLAN OF PUBLIC GALLERY IN CORRIDOR FOR ACCESS TO THE TWO COURTS

PLAN OF PUBLIC GALLERY IN CORRIDOR FOR ACCESS TO THE TWO COURTS



MANCHESTER POLICE COURTS.—MR. THOMAS WORTHINGTON, ARCHITECT.

MANCHESTER NEW CITY COURT-HOUSE.

In the early part of our present volume we gave descriptive particulars of the Manchester Court-house then in progress.* We now publish a view and the plan of the principal floor. The building, which fronts Minshull-street, comprises accommodation for the daily police, for the City Quarter Sessions, and other magisterial business. We repeat a portion of the account already given. The style adopted, it will be seen, is that type of Gothic architecture of which examples abound in Florence, Verona, Siena, and other cities of Northern Italy. At the angle of Minshull-street and Bloom-street is a lofty tower, the lower portion of which is occupied by offices, and the upper by the clock. The principal entrance into the building, for the use of magistrates and persons officially connected with the courts, is in the Minshull-street façade. From the entrance a broad flight of steps leads to a corridor parallel with Minshull-street, which is about 6 ft. above the footwalks, and gives access to barristers' dining-room, porters' room, and various other apartments on this floor. In the centre of the Bloom-street façade is the entrance to the public hall, connected with the police-courts, which is 81 ft. by 40 ft., and contains rooms for witnesses in waiting, separated by low glazed screens. A staircase from this hall admits the public to a corridor on the court-floor, which gives the witnesses and officers access to the two courts. From the corridor a short flight of steps leads to the balcony connecting the public portion of the two courts, and gives admittance to that portion which is reserved for spectators only, who are entirely separated from those having business to transact. Opposite to the entrance in Bloom-street a staircase from the public hall admits witnesses immediately wanted to a gallery which is raised 8 ft. above the hall floor. The remaining portion of the ground-floor is occupied by the rooms for prisoners awaiting trial, which are reached by double flights of stone steps from the cells below, and have each a separate stair leading to the docks. These waiting-rooms on the session side are separate from those on the police side by a large open area, 86 ft. long by 44 ft. wide, with entrance for the police-van to drive into for the purpose of discharging prisoners, and a large courtyard for the police.

The four courts, two of which are appropriated to the police business and two to the sessions, occupy the centre of the building, and are surrounded by the offices and corridors before mentioned, an arrangement by which the noise of the adjoining streets will be materially lessened. Each court is 53 ft. by 33 ft., and 36 ft. high, and is lighted by sixteen windows, and has a ceiling of pitch-pine, panelled and perforated for ventilation; the walls are also panelled to a certain height. The magistrates' stalls on the bench are covered by a canopy the full width of the court. In order to give increased facilities for the rapid despatch of business in the two police-courts, speaking-tubes and bells have been arranged to communicate from each of the magistrates' clerks' seats and the two docks to the general office. Similar provision has also been made for communicating with the officials in the basement. A corridor, 15 ft. wide, extending along the back of the building, and two shorter passages at right angles with the main corridor, give access to the cells, which are of various sizes. The windows in these corridors are large and numerous, glazed with obscured plate-glass. The warming and ventilation of the courts is a subject to which special consideration has been given, and provision is made for passing heated air from the basement through a series of cavities or flues into the court-rooms and corridors. Air-ducts are arranged, so as to convey a supply of fresh air to the courts, and secure a constant change in the atmosphere. Heating-chambers and boiler-house are placed in the basement, and large channels are constructed under the former to convey fresh outer air thereto, which, after being purified and warmed, passes into the courts at the time in use.

The general contractors for the main building and the fittings of the courts have been Messrs. R. Nail & Sons; the ironwork was done by the Fairbairn Engineering Company; the heating and ventilating, by Messrs. Haden & Son; the carving, by Messrs. Earp & Hobbs; the gasfittings, by Messrs. Thomason & Co.; the stained glass by Messrs. Lavers, Barrand, & Westlake; the clock and bell, by Messrs. Cook & Sons, of

York; the grates and chimney-pieces, by Messrs. Wilson & Co. Mr. Samuel Taylor acted as clerk of the works, and the whole of the works have been executed under the direction and superintendence of the architect, Mr. Thomas Worthington, of Manchester.

The works have been substantially carried out, and the cost of the building will be about 45,000l.

The fittings of the four courts, which are executed in pitch-pine, and necessarily of very intricate nature, together with furniture and fixtures of various kinds, will probably cost about 10,000l. additional. The principal part of the furniture is in black oak, substantial, and in accordance with the architecture of the building.

FIREPROOF FLOORS.

If the author of a letter on this subject in the *Builder*, p. 990, will heat a piece of old plaster floor, or of a plaster cast, in the fire, and then place it under a water-tap, he will have reason to change his opinion about the fire-resisting properties of manufactured gypsum.

The terms "roasting," "burning," and "calcining," are practically synonymous when applied to the conversion of minerals; and it is self-evident that unless the gypsum is subjected to the proper heat, it cannot be made into plaster floors. No person placing his bare feet on one of these on a winter's morning will dispute your correspondent's assertion that it is a non-conductor of heat, and its non-liability to ignition, makes it so far fire-preventive.

The "Denmett" arch is a clever adaptation of a cheap and useful material, and it is a pity the mistaken zeal of its advocates should tend to mislead, by crediting it with properties it does not possess. It will not resist a fire. Such an event would make the material red-hot, completely destroying its tenacity; and the effect of water poured upon it in that state would be to reduce it to "utter rottenness."

The best protection for iron in a building on fire would probably be an adaptation of the American scheme mentioned in a recent number of the *Builder*; by making the girders hollow, and keeping them and the columns constantly filled with water, with proper supply, expansion, and escape pipes. This would involve considerable expense in fitting, but there can scarcely be two opinions as to its effect in preserving the iron in its original shape and position.

Supposing this could be done, then brick arches and lime concrete spandrels would probably be found most suitable to resist the spread of fire.

SCHOOLS OF SCIENCE AND OF ART.

Nottingham Mechanics' Institution Science Classes.—The annual distribution of prizes gained this year by the students at these classes has been made in the lecture-hall of the Mechanics' Institution, by Mr. T. Hawkesley, president of the Society of Engineers. There was a large attendance of students and their friends. Mr. E. Gripper presided. The chairman, in opening the proceedings, said he was glad to tell them that these classes were rapidly increasing. Four or five years ago the number of classes was only four or five, whereas now it was sixteen, and he looked upon that as showing that the efforts of the committee to place the classes on the best possible footing had been appreciated by the town. Mr. Hawkesley, in his address, said,—The inhabitants of Nottingham have been for long past, and are still chiefly, although not exclusively, occupied in the production of textile fabrics, limited, for the most part, to articles of lace and hosiery. But, although the production of these articles will, for many years to come, and, perhaps, always, constitute an important portion of the trade of Nottingham, yet, I feel assured, that the time is not far distant, nay, is fast approaching, when Nottingham, following in the holder steps of Leeds and even in the feather steps of Derby, will begin to turn its attention to the realisation of the no longer hidden treasures which a beneficent and an even prodigal nature has placed at its immediate and easy disposal. If my anticipations be correct, Nottingham will become in a few years hence a great centre of the coal and iron trades, and (her manufactures no longer confined to lace and hosiery) will emulate in wealth and enterprise the prosperous towns of Glasgow, Newcastle, Leeds, Sheffield, and Birmingham. I recognize in the scheme of tuition of the rising generation

adopted by this Institution, much that is valuable as an educational training, and much that is well fitted, if properly directed, to help on the attainment of the important object to which I have asked your attention. Yet I am not without apprehension, lest our modern system of competitive examination should bring to the front all the clever lads full of "cram," and leave in unmerited obscurity the young men of greater abilities and sounder acquirements, but so far, unfortunately, of a more deliberate and less showy activity. Avoid cram, for cram is but scientific gossip, which goes in one ear only to go out at the other, and be lost for ever. With preliminary knowledge the student of the science classes connected with the Nottingham Mechanics' Institution will be well prepared to assist, with no common advantage to himself, in the developing and utilising of the natural resources of his country, in few places more abundantly displayed than in the circle of twenty miles radius which has Nottingham for its centre.

The Ryde School of Art.—The president's conversation has been held at the town-hall. About 800 ladies and gentlemen attended. The walls were almost entirely covered with a collection of oil and water-colour paintings, crayon drawings, etchings, pyrographs, photographs, &c. Mr. R. J. Jones read the report, which showed that the number of persons in the artizan class at present on the books was thirty-five. At the examination thirty-five out of fifty-seven candidates obtained certificates, eight passed in the third grade, and eight in the second; and no means a bad average. After the distribution of the prizes, the president, in allusion to the master of the school, Mr. J. C. Swallow, said that he had come to Ryde with the highest testimonials from South Kensington, and in January next, he was pleased to announce, Mr. Swallow would deliver a course of lectures on the progress of art, which he knew would be well worth attending.

The Projected Stafford School of Art.—The members of the committee have had several meetings and discussions, and Mr. Buckmaster has been addressing them, and other gentlemen at a meeting recently held. The address is being circulated in a printed form. The success of the experiment now depends entirely on the interest taken in it by the inhabitants.

The South Kensington School of Art.—The annual distribution of the prizes awarded to the students of this school took place in the Lecture Theatre at the South Kensington Museum, Lord Ronald Leveson-Gower, M.P., in the chair. His lordship was introduced by Mr. Cole. The prize winners were the students of the two schools at South Kensington—one for male and one for female students, the schools being in competition with each other, and with all those of the United Kingdom. The competitors did not, however, include all the students of the schools, those in training for future teacherships and the national scholars not being eligible to compete for the school prizes. The medals and books to be distributed represented only the higher grades of distinctions obtainable by students, the minor honours not being included. They consisted of two gold medals, nine silver medals, nine bronze medals, and eighteen Queen's prizes of hooks, all won in the national competition, besides forty prizes of hooks won in the local prize section. These included the whole of the prizes gained at the great annual competition.

Newcastle School of Science and Art.—The annual meeting of the friends and supporters of this institution has been held in the Guildhall, was largely attended. The walls of the room were adorned with the works of the students, which were numerous. The chair was taken by Mr. C. M. Campbell, who was supported on the platform by the Mayor of Newcastle and others. The hon. secretary read the reports. The committee said "They have much pleasure in stating that there is a decided increase in the attendance of students, as shown in the increased amount received for fees. They are encouraged not only by the satisfactory progress of the school, but also by the improved state of the income."

The Manchester School of Art.—At the annual distribution of prizes in connexion with this school, the Bishop of Manchester was present. His lordship said he had not had much opportunity of judging of the state of art in Manchester. He had, of course, the privilege of an *entrée* into many mansions, the walls of which were hung with magnificent productions of modern artists; but those, or most of them, were not the products of Manchester artists.

* See p. 162, ante.

The main phenomenon in Manchester that presented itself to his mind was the beautifying of churches, and he must confess that, if Mr. Mickleby could introduce a higher and a purer taste in this matter, he would have done something which he should rejoice to see.

EXPERIMENTS ON THE OXIDATION OF IRON.

PROFESSOR F. CRACE CALVERT, F.R.S., in the *Journal of the Society of Arts*, gives an account of some experiments, the results of which we may state in a condensed form:—Some two years since, Sir Charles Fox inquired of me if I could give him the exact composition of iron-rust, viz., the oxidation found on the surface of metallic iron. I replied, that it was admitted by chemists to be the hydrate of the sesquioxide of iron, containing a trace of ammonia; to this he answered that he had read several books on the subject, in which the statements referring to it differed, and, from recent observations he had made, he doubted the correctness of the acknowledged composition of rust. He further stated, that if he took a bar of rusted wrought iron, and put it into violent vibrations by applying at one end the fall of a hammer, scales would be separated, which did not appear to him to be the substance I had described.

This conversation induced me to commence a series of experiments.

The specimens gave the following results when submitted to analysis:—

	Conway Bridge, Llangollen.	
Sesquioxide of iron	82.900	83.694
Protoxide of iron	6.177	6.810
Carbonate of iron	0.617	0.935
Carbonate of lime	0.293	0.293
Silice	0.121	0.196
Ammonia	trace	trace
	100.000	100.000

These results clearly show the correctness of Sir Charles Fox's statements, that the composition of the rust of iron is far more complicated than it is stated in our text-books. Therefore, the question may be asked, is the oxidation of iron due to the direct action of the atmosphere, or to the decomposition of the aqueous vapour; or does the very small quantity of carbonic acid which it contains determine or intensify the oxidation of metallic iron? To reply to these queries I have made a long series of experiments, extending over two years, which I hope will tend to throw some light on this very important question; and, although it appeared to me an easy matter to solve, still I have had many difficulties to overcome.

The results prove that, under the conditions described, pure and dry oxygen does not determine the oxidation of iron; that moist oxygen has only a feeble action; dry or moist pure carbonic acid has no action; but that oxygen containing traces of carbonic acid acts most rapidly on iron, giving rise to protoxide of iron, then to carbonate of the same oxide, and lastly to a mixture of saline oxide and hydrate of sesquioxide.

As these facts tend to show that carbonic acid is the agent which determines the oxidation of iron, I am justified in assuming that it is the presence of carbonic acid in the atmosphere, and not its oxygen or aqueous vapour, which determines the oxidation of iron in common air. Although this statement may be objected to at first sight, on the ground of the small amount of carbonic acid gas existing in the atmosphere, still we must bear in mind that a piece of iron, when exposed to its influences, comes in contact with large quantities of carbonic acid during twenty-four hours.

These results appeared so interesting that I decided to institute several series of experiments.

One series, on the action of oxygen-carbonic acid on iron in presence of water, confirms the previous ones, that carbonic acid is a most active agent in determining the oxidation of iron.

Another, on the action of carbonic acid on iron in presence of water, further illustrates that carbonic acid is the real determining agent of the oxidation of iron.

Whilst I was engaged in the above experiments, it occurred to me that it might be useful to make a series with the view of throwing light, if possible, on a fact stated by Berzelius, and well known to alkali and soap manufacturers, viz., that caustic alkalis have the property, even when dilute, of preventing the oxidation of iron.

I was much surprised to find that the carbonates and bicarbonates of the alkalis acted in the same manner as their hydrates, in preventing the oxidation of iron, not only on that part of the blade immersed in the solutions, but also on that which was exposed to a damp atmosphere of common air. Previously to obtaining these results, I was inclined to believe that caustic alkalis prevented the oxidation of iron by absorbing the carbonic acid of the atmosphere; but, as carbonates, and even bicarbonates, act in a similar manner, it is evident that this view of the action was erroneous.

The series of experiments confirms the opinion that the iron exists in a passive condition, and that this condition only attains sufficient power to resist oxidation by atmospheric oxygen when there is 5 per cent. of either hydrate or carbonates of alkalis in solution.

I have made many experiments with the view of discovering the cause of the interesting preservative action which alkaline solutions exert on iron, but have failed. Knowing the destructive influence which sea-water has on iron, and the serious injury done on iron ships through the action of bilge-water, a series of experiments were made with sea-water, to which was added such a quantity of caustic soda, or potash, or their carbonates, that, after the salts of lime and magnesia were decomposed, there still remained in the solutions 1 to 5 per cent. of alkalis or the alkaline carbonates; and when iron blades were introduced into such liquids, they gave the same results as when iron had been dipped partially into an alkaline solution of Manchester water. I would propose, in conclusion, that a certain quantity of soda-ash should be introduced from time to time into the bilge-water of iron ships, as by so doing a great saving would be effected, as it would prevent the rapid destruction of such ships.

As iron ships are rapidly destroyed when used for conveying sugar from the colonies to this country, I instituted a series of experiments. Blades of iron were partly immersed in a solution containing 10 per cent. of sugar, and in similar solutions to which had been added 2½ to 5 per cent. of caustic and carbonate of soda; after a month the same results were obtained with the saccharine as with the aqueous solutions. A piece of zinc covering about a fifteenth part of the blade preserves the iron from rusting in that part of the blade immersed in the sugar solution. The use, therefore, of plates of zinc fixed on the sides of an iron vessel, or, perhaps better, the employment of galvanised iron plates in the construction of ships, deserves the attention of shipowners.

EXTRAORDINARY IMPROVEMENTS.

A BRICKLAYER, John Hurren, was brought up on a warrant, at Hammersmith, charged with maliciously damaging premises during his tenancy.

Mr. James Gutteridge said the prisoner had occupied a house belonging to him in Peel-street, Kensington. The tiles had been taken off, and a hole made through it, letting in the water, and causing considerable damage. He found the staircase window taken off the brickwork removed, and a dog placed in the opening, leading to a considerable fall. The cistern had been shifted, and the wash-house wall pulled down and left open. He estimated the damage to the house at 84, besides 144 for rent.

Mr. Ingham: All these alterations might be considered tenant's improvements? Did he send in a bill for them?
Witness: No, sir; he could not, as the place was not inhabitable: the prisoner said he intended the works for improvements. He termed the hole in the roof a "dormer." He took out the staircase window for an improvement, as he intended to put in a glass door. He altered the wash-house to live in it in the summer time.

Mr. Ingham said the alterations seemed to have been made to make the house a pleasant one for the summer. He did not see any reason for saying that the prisoner was out of his mind, only that he had that man's father for changes which was to be found in other men. He ordered him to pay 84, and 42, costs, and in default of distress, to be imprisoned for one month.

LAW OF CONTRACTS.

THE following extracts from the index to the *Lavo Journal Reports* may be usefully noted. The cases to which they relate have been already referred to in our pages, but the decisions are here put in a more precise manner:—

Builder and Architect: Rectification: Negligence; Extra Work: Arbitration: Undisclosed Agreement.—A builder made a tender undertaking to sign a contract to execute for a certain sum certain works described in some rough sketches and verbal explanations of an architect. The architect subsequently sent by special messenger to the builder a contract to perform the sum named the works delineated and described in certain plans and specifications thereto annexed. These differed materially from the works described in the rough sketches and verbal explanations on which the builder had made his tender. The builder,

however, signed the contract without any examination, and completed the works according to the plans annexed to it. He then filed a bill claiming to have an account taken of the works executed by him on the basis on which he had made his tender.—*Held*, that as the mistake under which he signed the contract was due to his own negligence, and he had not taken proceedings for rectifying the contract as soon as he discovered it, he was not entitled to any relief in this respect. (*Kimberley v. Davies*, appointing the architect arbitrator in respect of extra works; the architect had guaranteed to his employer that the total cost should not exceed a certain sum, but that fact had not been disclosed to the builder, he was not bound by the submission to the architect's arbitration, and the Court would perform the part of arbitrator in the matter.)

—1 L. J. (N. S.) C. 38.
Liability of Builder on Building Contract by Civil Code of Lower Canada.—By the Civil Code of Lower Canada, Article 1,688, it is provided that, "If a building perish in whole or part within ten years, from a defect in construction, or even from the unavoidable nature of the ground, the architect superintending the work and the builder are jointly and severally liable for the loss." The appellant, a builder, entered into an agreement with the respondent, the rector of the cathedral of Montreal, to build a new cathedral on foundations which had already been constructed by another builder. Shortly before the completion of the work, a defect in construction, and other damage occurred, owing to the insufficiency of the foundations.—*Held*, that inasmuch as the contract did not limit the appellant's liability to his own work, he was liable for the damage caused by the insufficiency of the foundations. (*Wardley, Belauze*.—1 L. J. (N. S.), F. C. 1.)

ADULTERATION OF COALS.

Sir,—Although I quite admit that one should not feel the slightest astonishment at any phases of development in the most popular of the present day—the coal-trade, adulteration.—I must candidly confess that I was not prepared to see the extent to which it could be carried in the matter of household coals. Mixtures of inferior qualities, of course, have long and systematically accustomed to. I am not going to complain of that, for I understand so much of the principles of political economy as to know quite well that the price of such a commodity is not to be universally with its quality. Even if I did complain, I suppose it would turn out to be a work of supererogation, and I am too old a hand to commence carrying coals to Newcastle. It is what I do complain of, however, and I think it a most justifiable complaint. In the last cellarful of coals which I stored (or, rather, which were stored for me with the utmost despatch and celerity), it turned out that they were mixed with stones, in the proportion of about a hundredweight to the ton. Surely this is too bad. I would not, perhaps, have been, even now reluctantly, driven into print, had the quarry selected by the coal-masters not consisted of a hard, laminated, and schistose rock, which, in place of silently crumpling into powder and dust, by the action of heat, does not melt but splinter and splur and splur out of the grate the whole evening, to the great annoyance of my temper and the damage of my carpet. Indeed, I was actually hit on the face, last night, by a red-hot splinter of the same nature, about the size of a Turkey-bean. For the sake of honesty, and truth, and fair dealing, pray let us have a sharp denunciation of such villainous malpractices in your respected columns. A HOUSEHOLDER.

FALL OF BUILDINGS.

Fall of a Factory in Birmingham.—A large factory at Balsall Heath, near Birmingham, belonging to Messrs. Daveport & Cole, jet ornament manufacturers, has fallen, leaving only the warehouse standing. The factory adjoined the river Bae, which overflowed its banks and undermined the foundations. Indications of weakness were observed some hours before, and the work-people left the premises in time.

Fall of a large Wall at Mexbro.—A large wall recently built by the Manchester, Sheffield, and Lincolnshire Railway Company, in connexion with a new road from the town of Mexbro' to the station, has fallen. The part which fell, owing to the ground giving way, was about 50 yards in length, and the damage is estimated at 800l.

Fall of a House in St. Miles's, Norwich.—The house had been uninhabited. Mr. Moran, the city surveyor, was quickly on the spot, and at once determined that the adjoining house, which was in a most critical condition, should also come down. For this purpose, two scaffolding-poles were used as battering-rams, and a rope was passed through the chamber windows. The house was struck at from the churchyard, and in a few minutes the ruinous old structure fell down. A gable belonging to the first house that fell, and which was left standing, was also demolished. The houses had previously been condemned by the surveyor as dangerous and uninhabitable.

Royal Academy.—Mr. Edward Armitage was on Monday night elected a Royal Academician in the place of Mr. H. R. Pickersgill, retired. Mr. J. Durlman, A.R.A., was next to Mr. Armitage in the ballot. The election for associates will be held in January.

CHURCH-BUILDING NEWS.

Penninghame (Galloway, Scotland).—All Saints' Church, Penninghame, has been consecrated, in presence of a crowded and fashionable congregation. There was previously no Episcopal place of worship in the neighbourhood before Mr. and Mrs. Stoford Blair, of Penninghame, caused the one under notice to be erected,—the nearest for Newton Stewart being the chapels in Galloway House and at Gally, sixteen and eighteen miles distant respectively. The church consists of nave and chancel, wood porch on stone base, and gabled organ-chamber and sacristy. Three bells are hung in a wooden bell-cot at the eastern end of the nave. The edifice is simple in its design, which is Early Decorated of the thirteenth century. It is built of blue limestone, with white freestone dressings, and is lined throughout with Bathstone ashlars. The east and west windows are three-light, with plate tracery, and the others are single lights, with trefoil heads. The seats are open, and all free. All the roof is wrought and moulded, and in the nave is exposed to view, being plastered between the rafters, the plastering to be tinted sky-blue, with gilt stars. The aisles, chancel, and sacristy are laid with encaustic tiles, by Mr. M'Colla, of London. The chancel is raised above the nave, and is separated therefrom by a low wrought-iron screen, worked by Messrs. Hart & Peard, London; and the organ-chamber is enclosed by a moulded screen of wood. The cross, candlesticks, and vases for the altar were presented by Sir Thomas Dick Lauder, bart. The windows are filled with tinted cathedral-glass, the east window and three side windows being stained by Mr. G. Gibbs, of London. The three latter are "In Memoriam." The church measures 70 ft. by 22 ft. internally, and has been erected, with the exception of 500l. from Mrs. Blair, at the sole cost of Mr. and Mrs. Stoford Blair, of Penninghame House. The architects are Messrs. W. G. Habershon & Pite, of London; the clerk of the works, Mr. Park, Newton Stewart; and the builders respectively, Messrs. Murray, Girvan, and Annandale, of Edinburgh; whilst the pulpit, font, and wood screens have been made by Messrs. Cox & Sons, London; the bells, by Mr. Mears, London; and the organ, by Messrs. Telford, of Dublin.

Tortworth.—The small parish church at Tortworth, after undergoing considerable restoration, has been re-opened for public worship. In every possible way the materials employed in the old building have been replaced in the new. The building is, in fact, the same. The entire cost is estimated at about 5,000l., and the whole of this sum is the gift of Earl Ducie. The work has been done under his lordship's direction, and under the superintendence of Messrs. Carpenter & Slater, of London, architects. The actual work has been managed by Mr. John Groves with regard to the carpentering; by Mr. T. Hudson executed the mason's work; Messrs. Gay, of Bristol, were the glaziers; and Messrs. Clayton & Bell, of London, have supplied the stained glass. The ironwork of the church has been done by Messrs. Chew, of Stroud; the painting by Mr. J. Tillot, of Winterbourne; the plumbing by Mr. J. Isaac, of Wickwar; and the tiling by Minton, of London. The tower has been partially restored; it was pulled down about 30 ft. from the top, and the pinnacles have been restored as they originally were. The body of the church has been entirely rebuilt. The walls are of sandstone and Box freestone. The seats in the church are for the most part of pitch pine. There has been an addition to the bells, which are now six. All have been re-hung, and there is a new treble bell, while the second has been re-cast. This portion of the work has been done by Messrs. Taylor, of Loughborough. The organ, on the south side of the chancel, was built by Mr. W. G. Fowles, of Bristol. The case was designed by the architects of the church restoration. The monuments that were in the former church have been replaced in the new.

Watton Fitzpaine.—The ancient parish church of St. Paul, which has just been almost entirely rebuilt and generally restored, has been consecrated and re-opened for divine service. In 1871 it was proposed to re-roof and re-seat the church. An architect, Mr. G. H. Birch, from Messrs. Christian, Malford, & Co., was consulted, and condemned the whole building as ruinous and insecure. The chancel, nave, and south aisle have been taken down and rebuilt, and the north transept and vestry restored. It is built in the Early Decorated style of architecture, and con-

sists of nave, chancel, south aisle, north transept, vestry, and tower. It will accommodate 200 people. The windows are all plain, except two,—the east, and one in the south aisle. The east has borderings of stained glass around the lights, and in the head are the Royal arms of the arms of the diocese, and those of the Drew family. The other window in the east end of the south aisle has been erected by Mrs. Luttrell to the memory of her brother, Mr. Ross Drew, and of her son, Mr. R. F. Luttrell. It contains, in three lights, the Virgin and Child in the centre, with the Shepherds and Magi on either side. Above the altar is a reredos in mosaic, consisting of three panels, the central one containing a white jewelled cross on a gold ground, and in each side panel is an angel bearing a scroll with the word "Alleluia" inscribed on it. The chancel stalls are of oak, with their ends carved. The nave, south aisle, and north transept are seated with open benches, of stained deal. The roof is of stained deal, covered externally with slates. At all the gable ends of the building are carved crosses. There is at present only one bell in the tower. The whole expense of the restoration has been defrayed by Mrs. and Miss Luttrell, of Wotton House, and Mr. and Mrs. Bosanquet, with the exception of the new north transept and vestry, which will be, or have been, paid for by subscription. The reredos was presented by Mrs. Bosanquet, and the altar and altar-rails by Miss Luttrell. The architect was Mr. Birch; and the contractor Mr. W. Langford, of Lyme Regis, under whose superintendence the whole of the works have been carried out.

Sheepscombe.—The church here has been reopened. The building had undergone various alterations and additions, under the superintendence of Mr. F. Niblett, of Gloucester, architect, Messrs. Wall & Hook, of Brimscombe, being the contractors. The length and width of the nave, which has not been extended, is 39 ft. 8 in. by 22 ft. 6 in. It had originally a flat ceiling, which has been removed, and the timbers of the roof are now shown—painted, stained, and varnished. A large western gallery projected into this nave to the extent of some 13 ft. This, as well as the external steps leading to the same, has been removed. A kind of aisle, 14 ft. 6 in. by 12 ft., existed on the south side. All this has been removed, and the space thrown into the present south aisle, which has been extended westward 17 ft. The new chancel is 13 ft. 6 in. by 10 ft. 6 in.; and a new vestry has been built adjoining and open to the chancel by an archway. The east window has been filled with stained glass, by Constable, of Cambridge, erected to the memory of the late incumbent, the Rev. George Gibbon, M.A., the cost of which has been defrayed by subscriptions collected by his widow. The chancel floor is laid with encaustic tiles, in pattern, by Gerwin. The new stalls are of oak and pitch pine mixed, of open work, carved, stained, and varnished. The whole of the interior has been re-pewed with open settings. The church is also now warmed with stoves by Mr. Hill, of Stroud. The finish to the bell-turret should be improved.

Tolleshury (Essex).—Tolleshury Church has been reopened after having had a sum of about 2,000l. expended upon its restoration. The works include the rebuilding (last year) of the chancel, in stone, at the cost of the lay rector, Mr. E. R. Benyon; the removal of an old gallery at the west end; the opening of the tower into the church; the removal of the old box pews, and the substitution of benches of a modern pattern; a new chancel arch, moulded; new open-timbered roofs, and a general strengthening of the walls in various parts. The works have been under the care of Messrs. E. Habershon & Bruck, of London, architects; and, so far as they concern the tower and nave, have been executed by Mr. H. Rannacles, of Halsted, at a cost of about 600l.

Halifax.—An influential meeting has been held in St. Augustine's Schools to consider the practicability of commencing the building of the church of St. Augustine, which has been long in contemplation. Col. Akroyd presided. The following resolutions were unanimously passed:—"That it is desirable that St. Augustine's Church should be commenced in the early spring; that the architect be instructed to draw out working and detail drawings and specifications, with a view to letting the tenders; that the gentlemen present form the building committee, with power to add to their number." We understand that a sum of 3,427l. has been already promised towards the church.

Levenshulme.—The Church of St. Peter, Levens-

bulme, which consists of nave, aisles, and very short chancel, has been altered and decorated from designs supplied by, and under the superintendence of, Messrs. Maycock & Bell, architects, Manchester. A new reredos has been fixed, having moulded arcading in Caen stone, with alabaster shafts and panels. There are new choir-stalls, together with reading-desk and pulpit, in pitch pine, having arcaded fronts, with walnut-wood shafts. Hood-moulds have been placed round the nave arches and east and west windows, springing from heads modelled by Messrs. Williams & Millson, who also executed the reredos. The roofs throughout have been cleaned down, and varnished. The decorations have been carried out by Mr. J. Owen, of Bowdon. Messrs. Sidebottom & Co., of Blackfriars-street, have executed the pulpit, choir-stalls, and other joiner work.

Hadfield.—The foundation-stone of a new church for the district of Hadfield, in the parish of Glossop, has been laid. The new edifice, which is dedicated to St. Andrew, is estimated to cost 2,500l. The church, which will be erected on a site purchased from Lord Howard, of Glossop, will be built of stone, ornamented with a spirelet 60 ft. high, and accommodate 500 persons.

Kirby Knowle.—The present owner is making very extensive alterations on "New Buildings" of Kirby Knowle castle, from the plans of Mr. G. F. Jones, of York, architect, under the supervision of his clerk of works, Mr. G. Harrison, of York. In connexion with this restoration, and by the same contractors, viz. Mr. Palliser, North-alerton, mason and brickwork; Mr. W. Belleby, York, joiner and carpenter; Mr. Varvil, York, plumber; and Comptroller Rawling, York, plasterer,—there is also the restoration or rebuilding of the church at Kirby Knowle, and which is of very ancient date. The foundation-stone was laid recently, by the present owner of the estate, Mr. Charles Easley. In commemoration of the roof of the first new wing, and the laying of the foundation-stone of the new church, the owner gave the contractors and workmen connected with the two works an excellent dinner, at which upwards of forty sat down.

Hull.—At a meeting of the Burial Committee of the Local Board of Health, the surveyor (Mr. J. Fox Sharp), agreeably to the committee's resolution of the 9th of August last, submitted a plan for draining and laying out the new Hedon-road Cemetery, together with an estimate of the cost, and of the two chapels, entrance lodge, shed, and other requisite buildings, and of palisading and fencing the same, amounting together, including the cost of the land, to 18,000l.; and the same having been examined, it was resolved that the plan be approved, and that the surveyor advertise for carrying out the same.

New Hincsey.—The suburb of New Hincsey, which has become a populous neighbourhood, has now a church and schools. During 1870 a building was erected from designs prepared by Mr. E. G. Bruton, architect, Oxford, to serve the purposes of a school-room as well as a place of worship, and which continued to be used as such until last October twelvemonth, when proper school premises were completed, and formally opened. The chancel of the church was the only part that had been consecrated, and as the nave was no longer required for secular purposes, the earliest opportunity was sought to invite the bishop of the diocese to consecrate it, which ceremony has now been performed.

Newcastle-under-Lyme.—At a meeting of St. Giles's Church Rebuilding Company, it has been unanimously resolved "that the plan and perspective drawing of the proposed addition to and restoration of the parish church of Newcastle-under-Lyme by Sir George Gilbert Scott, now before the committee, be accepted and adopted and this committee pledges itself to use every effort to carry the execution of them to a successful issue."

Wolverhampton.—At a meeting of the committee for the interior restoration of St. Peter's Church, it has been resolved "that an appeal be made to carry out Mr. Christian's plans, and that while the open seats are being constructed temporary ones be used to prevent the church being closed." In re-seating the church, the old woodwork will be used as far as possible, and no material change will take place in the present form of arrangement. The new seats will be like those at St. John's Church. The total cost will be from 1,000l. to 1,200l., and the estimate of Messrs. Higham has been accepted for the

SCHOOL-BUILDING NEWS.

Wargrave.—The new buildings erected at the Wargrave district schools have been opened. The schools are for the accommodation of the children sent from the Reading and Wokingham Union, and for some time have been out of repair, and have been reported by the Government inspectors as unequal to the requirements of the children. The managers (under the advice of their architect, Mr. Charles Smith, of Reading), have remodelled the whole of the buildings, and taken down two of the wings which were very low and in a dilapidated state, and built two wings, one containing the schools and classroom, and the other the superintendent's apartments, stores, the Board-room, &c., the whole forming a complete set of school buildings, and equal in cubical space to the Government requirements for 180 children, both as to schools and dormitories. The accommodation is as follows:—Boys' and girls' schools, each 43 ft. by 18 ft. and 12 ft. in height; class-room, 18 ft. by 15 ft., pay-rooms, dining-hall, bath-rooms, &c. The dormitories, which are in all 260 ft. in length, are so arranged that the master and governess have respectively oversight of the children. New farm buildings are also in course of erection on the land in connexion with the schools, the labour on the farm being principally done by the children. The building works have been carried out by Mr. Woodbridge, of Maidenhead.

Colchester.—St. John's district school, Colchester, has been opened. The building is close to the church, on a site given by the Countess Cowper. The new school is of red brick, with Bath stone windows, oak blocks, and open-timbered roof. In addition to the school-room, there is also a class-room and gallery, and it is fitted up with desks, &c., in the customary manner. The cost of the building, which was designed and executed by Mr. J. Grimes, builder, Colchester, is estimated at 350*l.* or 400*l.*, and very nearly the whole, if not the whole, sum has already been raised. The school will accommodate ninety children, and it is to be hoped that it will be well attended.

Loughborough.—The memorial stones of the new schools in connexion with the Wesleyan Methodist body have been laid. The site of the new schools is in Leicester-road. The architect is Mr. Hodson. The Leicester-road front is designed in the Gothic style of the Decorated period, and is to be built of Mountsorrel granite, with quoins, string-courses, &c., of Bath stone. The central feature of the elevation is a porch with gabled doorway, giving access to the main building. On either side is a large lance window of Bath stone, with red Mansfield stone columns and carved capitals. Access to the schoolrooms and offices is also gained through a side entrance porch, the uniformity being retained by a class-room on the south side. The plan provides for a main schoolroom, 50 ft. by 30 ft., an infant schoolroom, two class-rooms, and in the basement a large kitchen and storeroom. Internally the building will be 17 ft. high to the top of the wall plate, the roof being carried on hammer-beam principals, ceiled at the collar, the enclosed space being used for ventilation. Provision is made for the heating and ventilation of the building by hot air. The erection will cost nearly 1,000*l.*

Brentwood.—The memorial-stone of new Congregational Sunday schools has been laid at Brentwood. The schools are to cost 800*l.* The schools are so far completed as to admit of the principal beams being raised for the roof. They are built of stock bricks, with red brick courses and mouldings, a free adaptation of the Geometric style of Gothic being adopted. The roof will be surmounted by a bell-turret. The principal room is about 30 ft. by 50 ft., and will accommodate about 300 children. An infant school, in which ninety children can be taught, is attached.

St. Austell.—The new schools erected by the St. Austell School Board at Mount Charles have been opened. These are the first schools built and opened in the Western Counties by a school board under provisions of the Elementary Education Act, 1870. The old British school-room will be still used as the infant school-room. The new rooms were erected, from the designs of Mr. S. Trevail, of Par Station, by Messrs. John Paul (carpenter) and Henry Edc (mason). The new buildings, separate rooms for boys and girls, a class-room being attached to each room, will accommodate 375 children, and have been erected at a total cost, including desks, forms,

cupboards, &c., of 945*l.* Over the boys' entrance is a tablet in Ransome's patent stone, bearing the inscription: "The site of these schools was presented as a free gift by the family of the Veales to the parish of St. Austell."

STAINED GLASS.

Eye Church.—A window has been placed in the south transept of this church. It was painted and presented by Lady Caroline Kerri-sou. The subject is, "Christ blessing little children."

Petworth Church.—A stained-glass window has been placed in the chancel of this church by Mr. H. G. Brydone, in memory of his late wife and children. It is a double window, and represents the parable of the good Samaritan. The top of the window is a representation of our Saviour in the act of delivering his injunction,—"Go thou and do likewise." Messrs. Clayton & Bell, of Regent-street, executed the stained glass.

FROM SCOTLAND.

Rutherglen.—A new R.P. church has been opened for divine service, by the congregation which assembled for nearly three years in the new town-hall. The church is designed in the Early English style of architecture. The front elevation presents a large gable, in which there is a four-light window filled with tracery; the entrance-door is in the centre, with deeply-moulded jambs and shafts, with bases and capitals supporting the arch, which is also moulded. There is a tower and spire at the south-west angle of the building, rising to the height of 128 ft. Internally the church is divided into nave and aisles by columns with carved capitals supporting moulded arches. The timber trusses of the roof are exposed, and varnished. Light to the interior is derived from the large front windows, four windows on each side-wall, and a rose window (12 ft. in diameter) in the back wall over the pulpit, and filled with tracery and painted glass. The tracery of the large front windows is also filled with painted glass, and all other windows throughout the building have coloured border panes. The pews are of open framework, with stall-ends, and the entire timber-work of the church is stained and varnished. Seatings are provided for 750 persons. The architects were Messrs. G. P. Kennedy and R. Dalgligh, Glasgow. The contractors were:—for the mason work, Messrs. Thomson & Martin; wright work, James Council; slater work, Wm. Meikle; plumber work, A. & J. Tuff; plaster work, James Jordan; glazier work, G. & J. Rae; smith work, D. Somerville & Co.; heating apparatus, James Comho & Son; gas fittings, Kenny & Brown; upholsterer work, Joseph Gow; bell-founders, Wilson & Christie, all of Glasgow; and the decorations were executed by Mr. Andrew Clark, of Rutherglen.

Galashiels.—A new suburb, with a population of about 500 people, has lately been built along the Edinburgh-road, and on the foot of Buchholm-hill. It is beyond the burgh boundaries, and consequently the local authority of Galashiels has no control over its sanitary condition. In Halleyburton-place, the houses are mostly new, and have been occupied as soon as the plaster was on the walls. There is neither lighting nor cleaning, no foot pavement, and no Macadamised roadway, and the nightsoil and ashes are laid out on the small garden plots at the back. The drainage is bad, and the water worse, and as a consequence fever generally prevails, and has resulted fatally in a number of cases. The Galashiels local authority has called the attention of the local authority at Melrose to the circumstances. In one block of eight houses the families are supplied with water from a well about 3 ft. deep, into which a large quantity of filthy surface-water finds its way.

Stirling.—At a meeting of the Town Council it has been agreed that a small granite block be erected beside the Roman stone on the Govan Hill, to receive a copy of the original inscription, and that an iron post be placed above to point out the locality of the stone. The following inscription can be traced:—"IN EXCV. ANTI. LEO. II." (*In ex cubicis egredientes legiois secunde*). At the same meeting Provost Christie intimated that Sir William Stirling Maxwell intended to present the three oak carved heads which he had in his possession to the Smith Institution, to be placed in the ceiling of the library of that Institution. The provost suggested, and it was

agreed, that the eight heads which were at present in the Justiciary Court-room should be placed at the disposal of the Smith Institution Trustees, for the same purpose. These heads were carved in the reign of James V. [and first of England], and formerly decorated the ceiling of the Presence Chamber of the Palace within Stirling Castle. Several of the heads having fallen from the ceiling, they were all stripped off, and it was only by accident that some were rescued from destruction.

Arbroath.—A mission meeting-house in connexion with the Ladyloan Free Church, Arbroath, has been opened. The house has been erected in East Grimsby-street, from plans by Mr. Aitkenhead, architect. It is in plain Gothic, and consists of a hall and vestry. There is a recess or apse at the east end. The hall is seated for 275 persons. The cost of the building, including the price of the ground, is between 500*l.* and 600*l.*

Forfar.—Plans of the new county buildings for Forfarshire have been prepared by Mr. Wardrop, Edinburgh, and approved of by the Forfar County Commissioners, by whom the committee were empowered to obtain further subscriptions and confer with the subscribers on the works. The convener of the committee is Lord Dalhousie, who subscribed 1,000*l.* towards the buildings. It is proposed to erect them in connexion with the new Sheriff Court-houses at Forfar, and the plans embrace a county hall, 65 ft. by 35 ft., with committee-room adjoining, 26 ft. by 21 ft.; entrance-hall, cloak and retiring rooms, with all necessary conveniences; and rooms which may be turned into account either for a keeper's house or for chambers for the clerk of supply. The estimated cost, exclusive of architect's fee, which will be little if at all over 200*l.*, and the cost of the site and furnishing, are estimated not to exceed 4,000*l.* To provide a strong room for the records, some slight modification of the plans will be necessary. The sum already subscribed for the buildings amounts to 3,386*l.* 5s.

Aberdeen.—The Harbour Commissioners of Aberdeen have made their annual inspection of the New South Breakwater, and other works at the harbour. Nearly 2,000 ft. of the entire length of the breakwater have been finished. The construction will be suspended as usual during the winter.

VARIORUM.

AMONGST the Christmas books comes to us "William with the Ring," a rhymed romance from the graceful pen of Mr. J. R. Planché.* The principal incidents in it formed originally the plot of an opera book written by the author for Mendelssohn, but which, from circumstances, was not set by him. It is a deeply-interesting story, admirably told, with the *faulx*, according to some critics, of being thoroughly lucid and understandable from first to last, and suggesting Scott rather than Browning. We can honestly praise it warmly.—"Manual of Mythology" (Asher & Co.), by Alexander S. Murray; and "Næmia Cornubie," illustrative of the Sepulchres of Cornwall, by W. C. Borlase, F.S.A. (Longmans & Co.), will have proper notice in due time.—The capital little story, "Marion Lee's Good Work," by the author of "A Trap to Catch a Sunbeam," showing how a powerless child built a church, and which we praised warmly when it first appeared in a periodical, has been issued in a separate form for a few pence (Cassell & Co.), and ought to have a very wide popularity.—The new little almanack issued by the Art Union of London will be found to contain information on art matters not elsewhere collected in one publication.—Messrs. Do la Rue & Co. publish, as usual, various sorts and sizes of pocket-books and diaries, all distinguished by excellence of workmanship and completeness of finish.—We take a paragraph from the first number of Mr. Thornbury's "Old and New London," just published, concerning a "House with a Story":—

"No house in Fleet-street has a more curious pedigree than that gilt and painted shop opposite Chancery-lane (No. 17, south side), falsely called 'the palace of Henry VIII. and Cardinal Wolsey.' It was originally the office of the Duchy of Cornwall, in the reign of James I. It is just possible that it was the house originally built by Sir Amyas Paulet, at Wolsey's command, in resentment for Sir Amyas having set Wolsey, when a more parish priest, in the stocks for a brawl. Wolsey, at the time of the ignominious punishment, was school-master to the children of the Marquis of Dorset. Paulet

* Tinsley, Catherine-street, Strand. 1873.

was confined to this house for five or six years, to appease the great cardinal, who lives in Chancery-lane. Sir Anyas rebuilt his prison, covering the front with badges of the cardinal. It was afterwards 'Nando's,' a famous show-house, where he now picked up his great life. One night Thurlow, arguing here keenly about the celebrated Douglas case, was heard by some lawyers with delight, and the next day, to his astonishment, was appointed junior counsel. This case won him a silk gown, and so his fortune was made by that one lucky night at 'Nando's.' No. 17 was afterwards the place where Mrs. Salmon (the Madame Tussaud of early times) exhibited her waxwork kings and queens. There was a figure on crutches at the door; and Old Mother Shipton, the witch, tickled the astonished visitor as he left."

—Cassell's "Household Guide" gives a few hints on carpets:—

"Stair carpets should be in length a yard longer than is needful for each flight of stairs, so that when they are taken up for shaking (not beating), they may not be put down again in the same creases, and thus at a trifling expense the carpets will wear as long again as by the usual method of exact measurement. The length required is ascertained by allowing half a yard for each stair, and adding to this the length needed for their landings. Brass stair-rod's of the ordinary kind are not expensive, and the same are purchased by the dozen. Parlours with folding-doors are the most convenient for a small house, as the doors may be closed at pleasure; but both rooms should be similarly furnished as far as an carpet, chairs, and curtains are concerned. The patent 'felt' carpet is to be had in suitable tints; it is not expensive, and is easily made, and, when good, will wear tolerably well. There are many advantages in the felt carpet; not the least is, that when it is worn out in the centre, the sides which are good can be cut off, bound, and arranged for use as a carpet. There is also a machine which serves instead of buying hose-bladder, for cleaning door-steps, kitchen-hearths, and other rough work."

—The *Lithographer* says, as to staining and spotting of paper:—"Ink-stains, from common writing-ink, can best be removed by the use of chlorine-water, a solution of chlorine gas in pure water. The engraving should be wholly immersed in a very dilute solution, and, as soon as the marks disappear, be freely washed in pure water. Vegetable stains of most kinds will also yield to this treatment. As chlorine-water cannot always be obtained, we may use, especially for mere local spots, a dilute solution of the hypochlorites of soda or potassa, the so-called Labarraque's fluid, or *eau de javelle*, or, in default of either (but less suitable), a solution of ordinary bleaching-salts, hypochlorite of lime. In all these cases, there must be free washing with pure water. Grease-spots may be removed by the various kinds of hydro-carbon known as benzine, or in worse cases sulphide of carbon must be used. In such instances, great care must be taken, for these solvents not only remove extraneous grease, but they attack the oil of the printing-ink, and if they act too long or too powerfully they set loose the whole of the material of the ink, and the print or engraving will be destroyed."

—The Metropolitan Management Acts: Board of Works for the Westminster District. The Sixteenth Annual Report of the Proceedings of the Board, 1871-72. Mitchell, Parliament-street.—"This report has been issued in a printed form. Amongst other points of interest, the reporters record an outline of the costly litigation with Lord Auckland, in which the Board were worsted as regards the line of frontage in York-place. Allusion is also made to the case as to the line of frontage at the corner of Bridge-street, in which the certificate of the superintending architect of the Metropolitan Board of Works was quashed by order of the Court of Queen's Bench. The attempt is also referred to of the Board to obtain the consent of Government to the demolition of the houses in front of the Government offices between Charles-street and Downing-street, but which were required for temporary offices till the new offices were completed."

Miscellaneous.

Destruction of Wick Breakwater.—The effect of the waves in a gale on the new breakwater has been seriously to damage the works, which were executed on a new principle, with huge blocks of concrete. One of these, weighing, it is asserted, about a thousand tons, was laid down at the seaward end of the building, and so constructed as to give hope of resisting the most severe storms of winter. These hopes, however, have proved to be delusive, for this ponderous block was hurled from its place, leaving exposed to the fury of the storm the masonry on its landward side, which continued to be swept away as each successive wave dashed against and over the breakwater. Strong iron bars, measuring about 8 in. by 3 in., by which the masonry was secured, were twisted into all shapes, and broken.

A Ferry Steamer.—Illustrations are given in the current *Engineer*, of a steam ferry, for the conveyance of railway trains across the Little Belt, which has been recently built for the Danish Government railways by Messrs. Wigham Richardson & Company, of Newcastle-on-Tyne. The Danish Government have long had this service in contemplation, being desirous of making all the traffic of Scandinavia converge upon their country as well as the mail service from Finland. The ferry was to be so constructed as to cross the Little Belt in all weathers and at all seasons of the year. Usually the surface of the water is very calm, but occasionally in north-easterly storms there is a heavy sea running. Further, it was stipulated that the steamer was to be capable of taking on board 100 first and second-class passengers, 300 third-class passengers, and at the same time six of the largest trucks possessed by the railway administration, all fully loaded. The connecting bridges were also to be capable of supporting the heaviest locomotive engine and tender. Messrs. Wigham Richardson & Company have well carried out these conditions. The steamer is 110 ft. long, 26 ft. beam, and draws 7 ft. of water when loaded. It has been working uninterruptedly now for many months without any hitch. The last report from the engineer was as follows:—"I may state that the ferry and the whole arrangements are a most perfect success, and have been greatly admired by the French, German, and Russian engineers who have been sent by their respective Governments on purpose to see the arrangements."

The Master Builders and the London Carpenters.—It will be recollected that one of the clauses in the agreement signed between the Master Builders' Association and the carpenters and joiners in October last, expressed that 8½d. per hour should be the standard rate of wages for skilled men in London. A case came before the judge in the Southwark County Court last Saturday, in which a joiner, named Jepps, sued a master builder of the name of Jocelyn for 1s. 7d., being the balance between 8d. and 8½d. per hour for 39 hours' work. The defendant pleaded that he had several men working for him at 3d. per hour less than the standard rate of wages, and further declared he was not bound by the agreement with respect to the advance in wages, as he was no party to it. The judge said no master builder could plead ignorance of the agreement, and if he wished men to work for him for 8d. or 7d. per hour, he must make a special agreement to that effect. As there was no agreement of that nature with the plaintiff, he should give judgment for the amount claimed, with costs: in all, 7s. 1d.

Liability of a Workman for Damages owing to Carelessness.—At the Small Debt Court at Edinbrough, James Clark, house painter and decorator, sued John Monk, painter, for 11. 15s., as loss and damage sustained by pursuer in consequence of defender, by wilful carelessness or fault, breaking a pane of plate-glass while painting the sashes. In support of the claim, pursuer explained that defender was ordered to paint the cupola of a saloon, but not the lead by which it was bound. He painted the sashes and the lead, and, when nailing down the lead, broke the glass. Defender said there was no woodwork to paint, and he had to lift the lead to paint underneath it in order to prevent the rain from coming in. The sheriff said the fact of defender's not saying anything about the matter at the time looked as if it had been done through his fault; therefore the presumption was against him. Decree for the full amount was passed.

The Temple Gardens.—The Metropolitan Board of Works have had under their consideration the question of removing the ugly fencing front of the Temple Gardens, on the Barbican side, and replacing it with one of ornamental iron and stone. The design at first submitted by the engineer of the benches was considered extravagant, but a second design, presented to the parks committee of the Board, was approved, tenders submitted, and that of Messrs. Gibbs & Co, for 7,000*l.*, was accepted.

Indian Views at the Society of Arts.—Captain Lyon has fulfilled his promise of showing, by means of the camera, another series of photographic transparencies illustrative of the Indian Temple architecture. Having on the former occasion seen the principal views of the South, the audience was this time conducted, *via* Malta and Alexandria, to Madras and the North.

Fire at St. Andrew's Church, Southport. This edifice, which was consecrated so recently as July 23rd, took fire, on a recent Sunday night, after the heating apparatus, of course, had been at work. Some two months ago, the hot-air apparatus by which the church is heated set fire to the joists, but on that occasion it was happily discovered in time to prevent the destruction of the church. Since that time the vicar, instead of using this apparatus, has heated the church morning and evening by means of gas. On Sunday the apparatus was brought into requisition, the consequence being the entire destruction of the south-east end of the church. The apparatus being placed immediately below the organ, which was opened a few weeks ago by Mr. Bost, of Liverpool, that instrument has been entirely destroyed. The building and the organ, &c., are fully insured.

Professorship of Fine Arts, Cambridge. The Professorship of Fine Arts, on the foundation of Mr. Felix Slade, is vacant, and the election of the new Professor will be held on Wednesday, the 29th of January, 1873. The Professor is required to give annually in the University, in full term, and free of charge as regards members of the University, a course of not less than twelve lectures on the History, Theory, and Practice of the Fine Arts, or of some section or sections of them. The Professorship is tenable for three years, and the Professor may be re-elected. The Professor will receive by way of stipend the dividends of a sum of 12,000*l.* Three per Cent. Consolidated Annuities. He is not required to reside at the University. Candidates are requested to send their names to the Vice-Chancellor on or before Friday, January 17th, 1873.

Bishopsgate Ward Schools.—The opening of the new schools, between Skinner-street and Primrose-new, in Bishopsgate Ward, took place in the presence of the Lord Mayor, who presided; Sir William Tite, M.P., Mr. Alderman Lawrence, M.P., Mr. Lyall (governor of the Bank of England), and many others. The school now completed will accommodate 800 children. There will be an upper school and a lower school for boys, an upper school and a lower school for girls, a school for infants, besides a place in which religious services and lectures will be conducted. In all the schools there will be space for 1,500 children. There is also to be a Board school in the adjoining district. It is hoped that the school will be self-supporting, when the debt of 1,250*l.* is wiped away.

Builders in Birmingham.—A meeting of the master builders has been held to take into consideration the notices received from the men asking for an alteration in the working rules. The men, in these notices, demand an extensive rise of wages, and the carpenters and joiners require a reduction of hours as well. These are the principal points, but there are details as to working hours, &c. At the meeting the master builders agreed upon a new set of rules, which they will issue as a counter notice. The representatives of both parties will meet to discuss the points at issue, and in the event of their being unable to agree, the dispute will be, it is hoped, referred to arbitration.

New Bank, Swindon.—The County of Gloucester Banking Company have just opened a new branch bank at New Swindon. The building, which is from designs by Mr. William H. Read, of Swindon, is in the modern Italian style. On the ground-floor there is a hall, bank-room, strong-room, lavatory, and back parlour. On this floor in the rear are also the usual offices of a residence. The floor above consists of drawing-room, four bedrooms, and lavatory. The interior of the bank is fitted with wainscot polished oak. The exterior of the building is ornamented with some carving, executed by Messrs. Chapman & Stillman, of Bath. The contractor for the erection of the building is Mr. G. Wiltshire, of Swindon.

Telegraphic Improvement.—Some experiments have been made by the postal telegraph staff to ascertain the possibility of sending simultaneously two messages in opposite directions on the same wire. Mr. W. H. Freese, engineer of the Post-office, has spent fifteen years in experiments and study to perfect the process. The trial is said to have been a success. Messages were transmitted at the same moment both ways between London and Penzance, a distance of 330 miles, with perfect distinctness, and at the ordinary speed. Mr. Sendamoro and other officials were at the ends of the wire.

Restoration of the Church of St. Burian, at the Land's End.—This church has been unusually neglected, and is in a most deplorable state. An effort is now being made to collect funds for substantial repairs. The building has been examined by Mr. Butterfield. He reports that the church is in such a state that it must rapidly become a useless ruin, unless extensive repairs are made. It is in a peculiarly exposed situation, four miles from the Land's End, swept by winds from all quarters. At least 3,500*l.* are necessary to put the church in thorough repair. The *Cornish Telegraph* says that Mrs. Paynter offers 400*l.*; the Rev. John Tonkin, 200*l.*; Rev. T. B. Conlson, 200*l.*; &c.

Opening of a New Military Theatre at Chatham.—The new military theatre, which has been building for some time, and may be considered an offspring of the soldiers' institute, has been formally opened by Major-general Browning, C.B., the commander of the district. The small building is erected out of the spare funds of the institution, and cost considerably under 1,000*l.* There are a pit, a dress circle, and a gallery, calculated together to hold between 600 and 700 people. The interior is very simple. The seats are comfortable and the ventilation is said to be good. There is a communication between the stage and the billiard-room, which makes the two buildings one.

Right of Way at Bromley.—A practical protest, in the form of a demolition of 300 ft. of oak-fencing, has been made at Bromley, in order to test a right of way which it has been attempted to close up. As remarked by the *Bromley Telegraph*, "this may have been an exhibition of brute force, but it possessed this advantage over legal proceedings—that it was prompt and reliable, and it threw the onus of proof upon the adjoining owner. Should that gentleman intend to punish those who tore his palings to atoms, he must first prove that his fence had a legal right in the position from which it has been removed."

Art Lectures.—In a recent lecture at the Taylor Institute, Oxford, Mr. Ruskin described his recent visit to the Gustave Doré Exhibition, which he called the abomination of desolation—a mass of devils, corruption, and death: no life, no motion, nothing but the vilest art, and the vilest conception. After a bitter philippic against Doré, his admirers, and imitators, he closed the lecture by reading an address to his pupils, in which he told them that humility was one of the first rudiments of art, and that they must understand not only the technicalities of the great masters, but must have in them the spirit of that religion which called forth all the masterpieces of Medieval art.

American Journalism at the Vienna Universal Exhibition, 1873.—It is proposed in the United States that through and by the periodical Press of the country, the American system of common school education be thoroughly represented, both in its aim and its results. To that end, a single specimen number of every newspaper, magazine, or review issued in the United States, it is wished, should be exhibited; the collection also to embrace all periodical publications circulated gratuitously by tradesmen and others.

Combustion at the Gasworks, Marlow.—The overturning of one of the gasometers during the recent furious gale, occasioned much consternation in Marlow, as it caused the whole of the gaslights in the streets and private houses to be suddenly extinguished, and the gas on escaping from the gasometer became ignited and rose in a large volume of flame high into the air. The gasometer contained nearly 5,000 ft. of gas, but fortunately the flames were exhausted before any of the surrounding property became ignited.

Election of a Borough Surveyor for Durham.—At a special meeting of the Durham Urban Sanitary Committee held lately, a successor to the late Mr. Collinson as borough surveyor was appointed. There had been originally 39 candidates for the office, and out of that number four had been selected. The choice of the committee ultimately fell on Mr. Brunton, of Sunderland, who had a large majority.

Art in the 1873 International Exhibition.—The Commissioners have resolved to include in each annual Exhibition of the Fine Arts a representation of the works of one or more artists who have died in the preceding ten years. In 1873, the works of Messrs. Phillip and Creswick will be exhibited.

Fall of a Mission Hall.—At Salford a disaster has occurred in which a considerable number of persons were much injured, and the lives of over 200 placed in jeopardy. A tea-meeting was being held in the Mission-hall, the floor of which gave way, precipitating the mass of people into a large coal-cellar beneath. Naturally the panic was extreme, and it was some time before the struggling men, women, and children could be extricated.

Industrial News.—It is announced that a new half-crown monthly magazine is about to appear under the title of the "Practical Magazine." It will be "an illustrated cyclopaedia of industrial news, inventions, and improvements, collected from foreign and British sources, for the use of those concerned in raw materials, machinery, manufactures, building, and decoration." It is to be published for the proprietary at Printing House-square, next door to the *Times* office.

New Sewer at Weston-super-Mare.—The tenders for constructing a new sewer from Orchard-street to Clarendon, Weston, were—Ritson, London, 5,410*l.*; Neave & Sons, Bristol, 4,301*l.* 18*s.*; J. Harvey & Son, Torquay, 4,250*l.*; Stradling & Son, Weston-super-Mare, 3,995*l.* 15*s.*; W. Merrywear, Bristol, 3,825*l.*; G. Taylor, Weston-super-Mare, 3,245*l.*; J. Hand, Weston-super-Mare, 3,150*l.* The last-named tender, being the lowest, was named for acceptance to the Board by the local Drainage Committee.

Boring the Wealden at Battle.—Mr. Henry Willett (hon. sec. and treasurer to the exploration fund) has issued his first quarterly report upon the sub-Wealden boring. The recent bad weather has, it appears, rendered the work unusually heavy and tedious: 96 ft. is the total depth reached. The diameter of the bore is proceeding at the stipulated minimum (9 in.). Mr. Willett intends to try to get the originally proposed diameter (6½ in. to 7 in.) adopted; otherwise, he says, 2,000*l.* will not do it.

Monument to the late Sir Thomas Winnington, Bart.—A plain monument has just been erected in the churchyard at Stanford, over the vault in which are deposited the remains of Sir Thomas Winnington, bart. The lower stage consists of three chamfered stone plinths, on the uppermost of which rests a coped tomb of Sicilian marble, bearing a floriated cross. The monument is from the atelier of Mr. Joseph Stephens, of Worcester, who has contributed to the Cathedral, to the Cemetery, and places of sepulture there and elsewhere, many works.

The Bristol Assistant City Surveyorship.—Mr. Pape, of Manchester, has been chosen by the Bristol Improvement Committee assistant to Mr. Josiah Thomas, the city surveyor, at a salary of 200*l.* a year. Mr. Pape held a similar office in Manchester. Mr. Munro, of the Ordnance Department in Bristol, received seven votes to Mr. Pape's eight.

A New Church in Paddington.—The foundation stone of a new church about to be erected in Paddington, has been laid by Lord George Hamilton, M.P. The intended new church is situated in Desborough-terrace, Harrow-road, in the immediate vicinity of Westbourne Park, where the large increase of the population has rendered a new church necessary.

Opening of a New Town-hall at Wirksworth.—A new town-hall has been opened at Wirksworth. The building was designed by Mr. Bradley, of Liverpool, the contract being let to Mr. Thompson, builder, Derby. The design is semi-Gothic, freely treated, and comprises large assembly-room, shop, reading-room, billiard-room, sundry offices, and a covered market-hall. The total cost is about 7,000*l.*

Raising a Building.—An American paper states that more room is needed in the Washington Post-office, and, as a proposition to put another story on the top of the edifice met with opposition, the architect has decided to raise the entire building 20 feet from the foundation, and make the required enlargement from the base.

Mortuary for St. Martin's-in-the-Fields. The Vestry Committee appointed to consider this question, reported recommending that a mortuary be erected upon the burial-ground in Drury-lane, and the report has been adopted.

The Late Mr. Weightman.—The death of this architect, late of Sheffield, is announced. It took place at South Collingham. Mr. Weightman was in the 71st year of his age.

TENDERS

For Weston-super-Mare drainage. Mr. William Gas-	
kell, surveyor—	
Ritson	£5,410 0 0
Neave & Son	4,301 18 0
Harvey & Son	4,251 0 0
Stradling	3,995 15 0
Merrywear	3,825 0 0
Taylor	3,245 0 0
Hands	3,150 0 0

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Cubitt & Co.	3,156 0 0
Outwaite & Son (accepted) ..	3,123 0 0

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Osborne, Brothers	1,722 0 0
Law & Sons	1,724 8 6
Herbert	1,654 0 0
Bennett	1,582 0 0
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Wagner	1,140 0 0
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Abstracts.—This material, not being always obtainable, we depart from custom, and mention, in reply to "C. E.," that Mr. Swinburn, of 12, Southwick, Bridge-road, has a stock on hand.

E. R. (Thanks No.)—Mr. K.—B.—Major I.—T.—C.—W. S.—G. W.—O. H. S.—J. S.—J. H.—A. H.—E.—J. C.—G. J. (he could do more than ask for compensation. He could stop the proceeding altogether).—J. K. (next week).—G. J. F.

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MADEIRA, S.W.—THE PUBLIC HEALTH ACT, 1872.—Notice is hereby given, that the Royal Sanitary Authority of this Union, in consequence of the Local Government Board at their Meeting, on the 17th inst. have resolved to appoint an INSPECTOR OF NUISANCES for the whole of the Union. The Inspector will be required to reside in the Union, and to devote his whole time to the duties of his office, and to superintend the execution of the Local Government Board. The number of inhabited houses in the Union at the census of 1871 was 6189. The appointment will be for one year, to be made forthwith, from the 17th JANUARY, 1873, at a salary of 4s. 6d. per week, which salary includes travelling and other expenses. Applications, with testimonials, to be sent in on or before the 10th JANUARY next, and the Candidates selected will receive notice to attend on the day of election. By order, HENRY BOYCOCK, Clerk, Ironbridge, December 17th, 1872.

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